



# ARCHITECTURAL RECORD

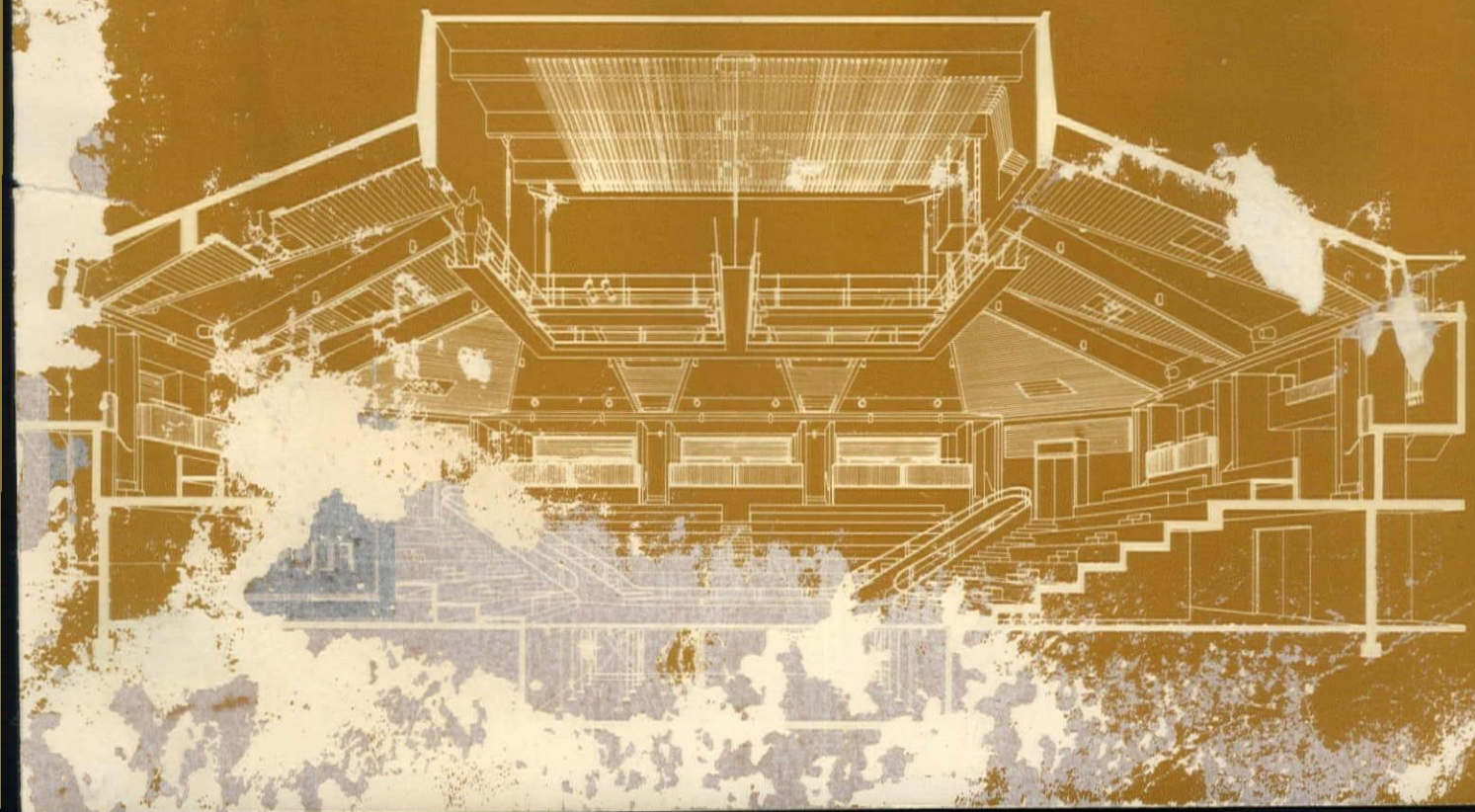
**2** *February 1962*

*Building Types Study: Schools*

*New Ideas of Victor Lundy*

*Theater by Harry Weese*

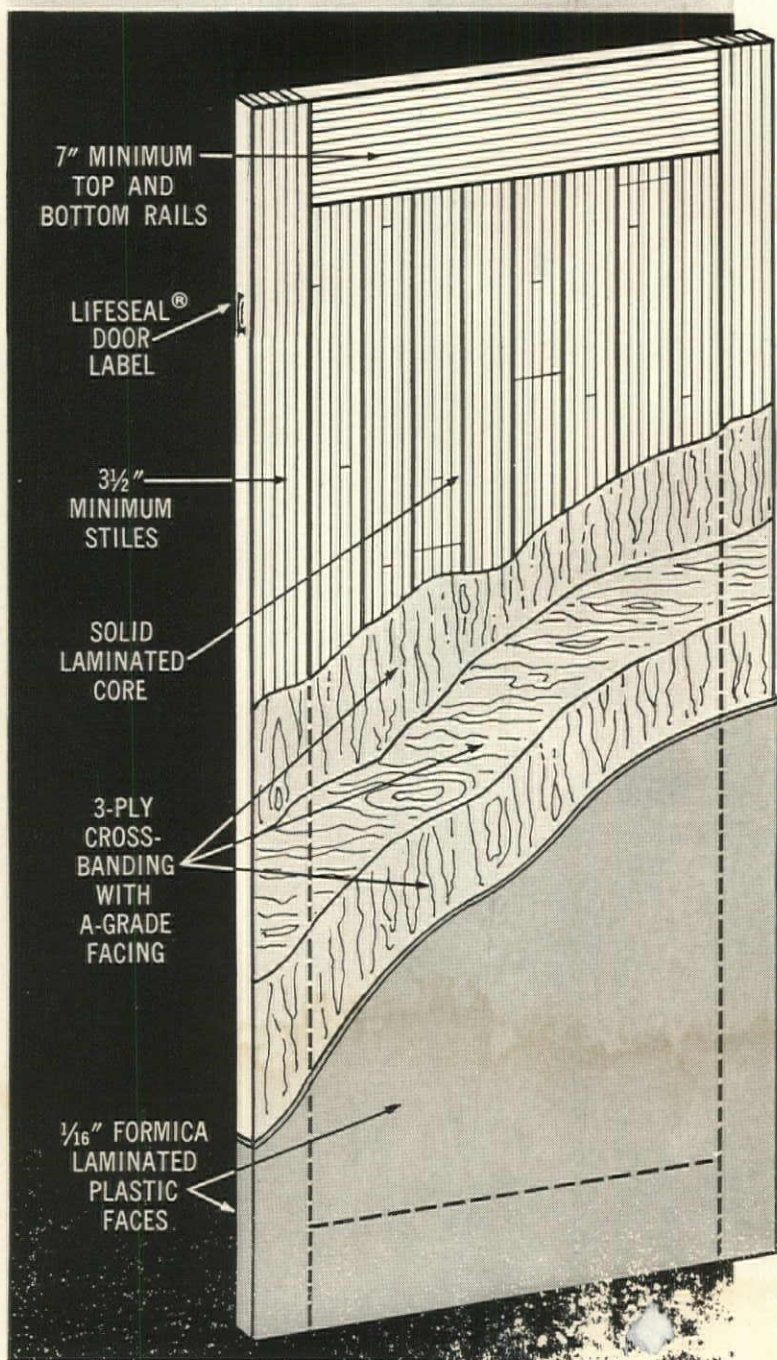
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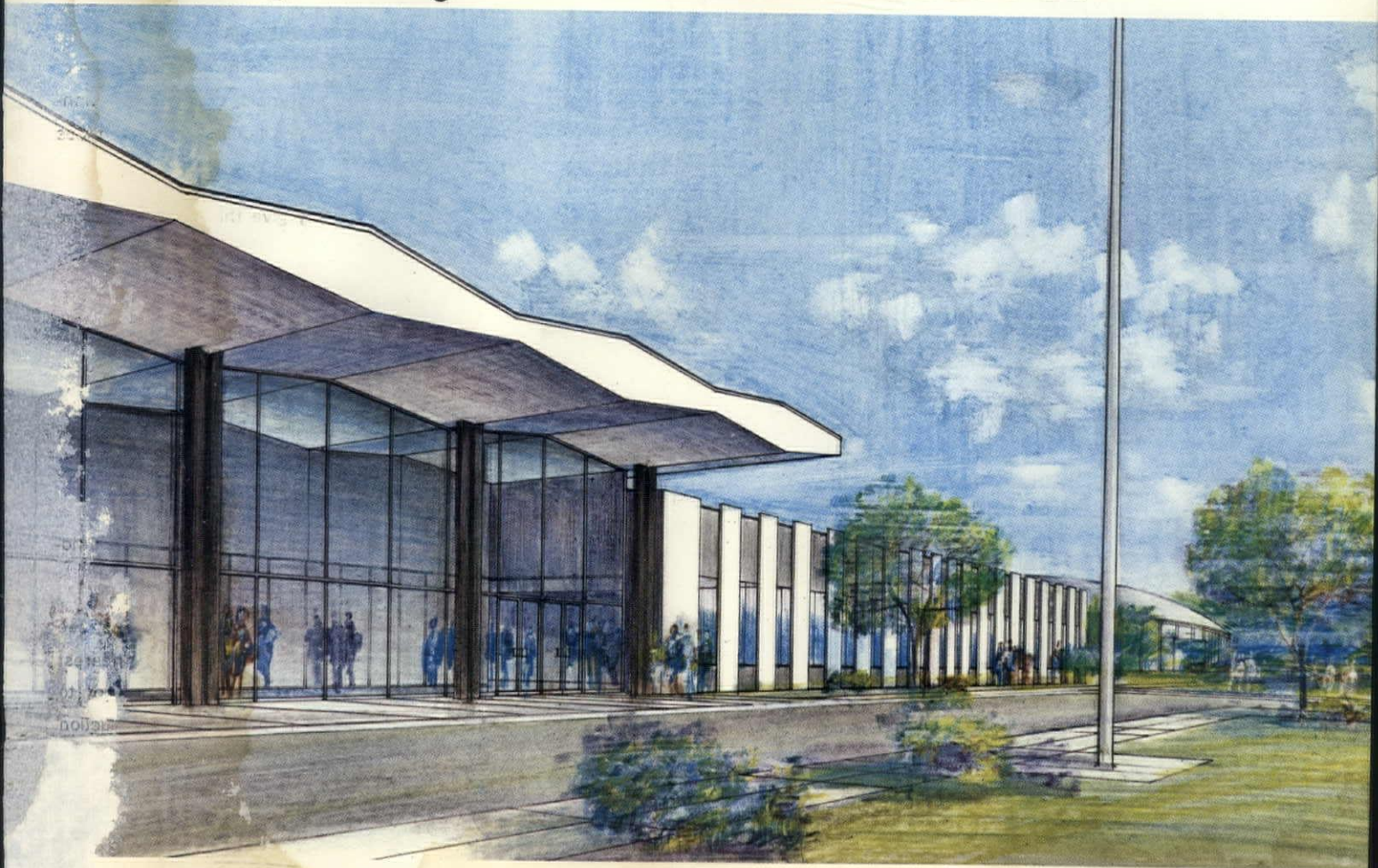
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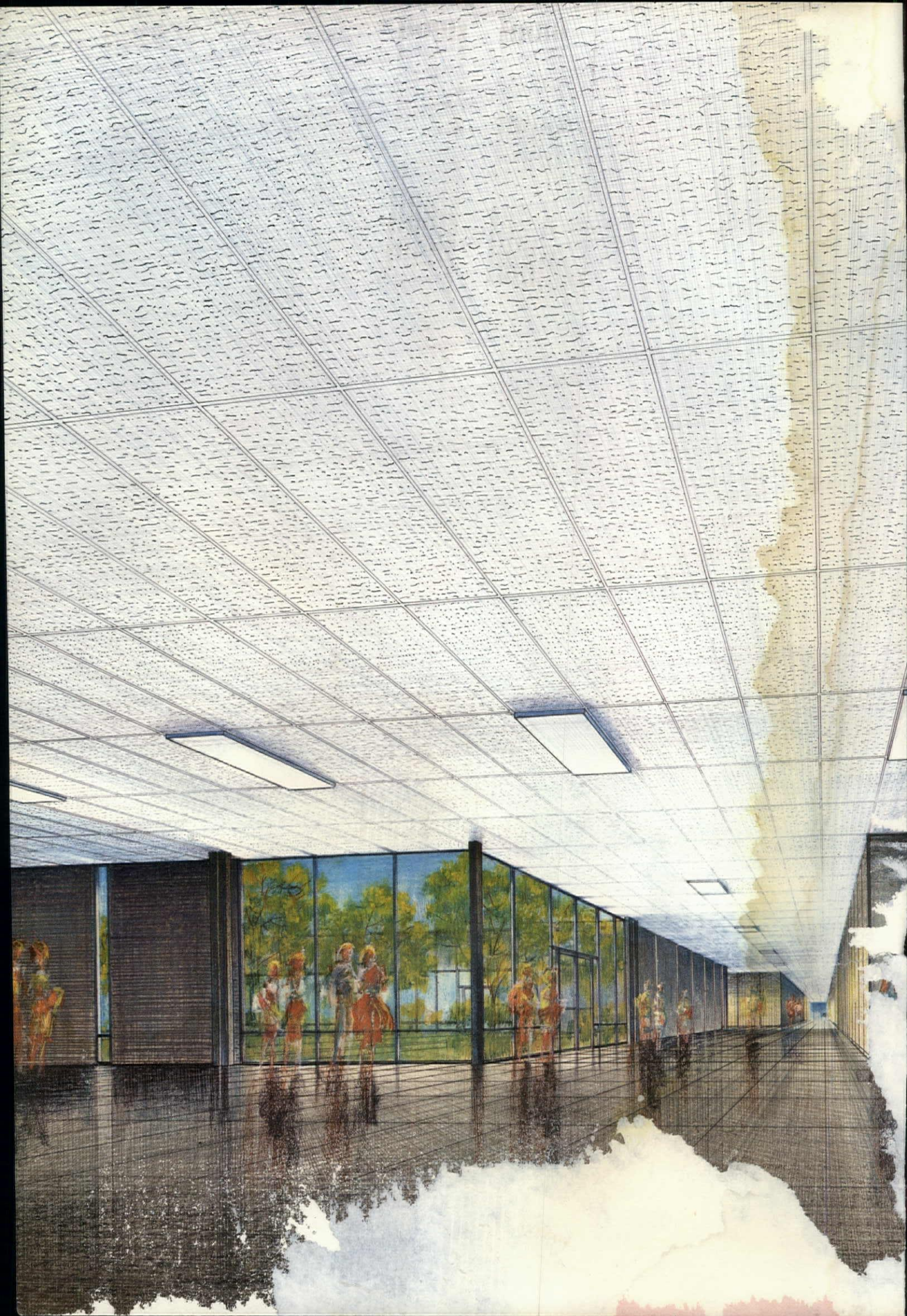
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***Contemporary school architecture:***



***a remarkable kind of ceiling—and how  
it saved an Indiana school \$76,500...***

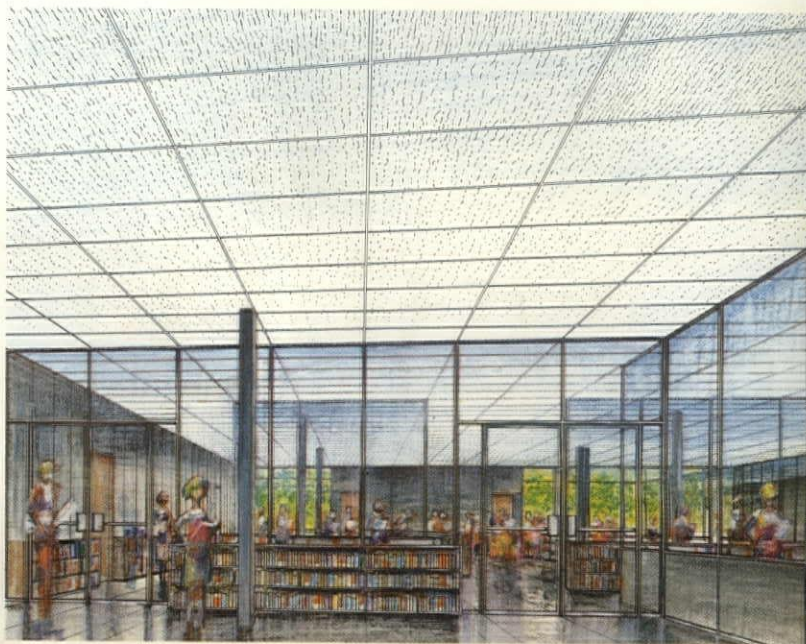


# Indiana school saves \$76,500 with Armstrong Acoustical Fire Guard Lay-In ceilings

Even though rated fire protection wasn't required for this new Indianapolis school, the architects wanted the extra safety of a fire-retardant ceiling—so they built it in with Armstrong Acoustical Fire Guard ceilings. As a result, Fire Guard helped qualify the school for the lowest possible fire insurance rates. Because it's an exceptionally efficient, yet dense, acoustical material, Fire Guard quiets noise and greatly reduces the transmission of sound from area to area through the ceiling. The architects estimate that, to provide similar advantages of fire safety and sound control, a combination of conventional fire-resistive ceilings and acoustical tile would have cost \$76,500 more than Fire Guard.



Lawrence High School, Indianapolis, Ind. Architects: Lennox, Matthews, Simmons and Ford, Indianapolis. General Contractor: F. A. Wilhelm Construction Co., Indianapolis. Acoustical Contractor: Commercial Floor Covering & Acoustics Co., Inc., Indianapolis.



Whether you're in the hallway shown on the opposite page, the library above, or any other area of Lawrence High School, the Fire Guard ceiling, with its handsome fissured design, is a noteworthy decorative asset. And the 24 x 48" lay-in units provide above-ceiling accessibility, no matter what interior arrangements are created with the school's nearly two miles of movable partitions.

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### NEW DESIGNS OF MARCEL BREUER

Next month's feature will present, in very special drawings, three new projects of Marcel Breuer's—a church in Muskegon, Mich., a synagogue in Short Hills, N.J., and a ski resort in the French Alps: a whole new town in a mountain wilderness. All are designed in concrete, both as structure and as finish, and offer an extremely intriguing study of Breuer's virtuosity in the handling of a single material to achieve diversity in unity.

### FREESTANDING TOWER WITH 132 PER CENT SITE OCCUPANCY

Sounds like quite a trick, but air rights are, of course, the key. Anshen and Allen's newly-completed International Building in San Francisco is interesting for many other reasons, too: among them the effective and innovative approach to integration of architectural concept with structural and mechanical design.

### "PPC" AND HOSPITAL DESIGN

The Building Types Study on hospitals will lead off with an article on that much-discussed, much-debated subject, "progressive patient care," illustrated with plans of prototype units. Also a group of new hospitals ranging in type from general to osteopathic.

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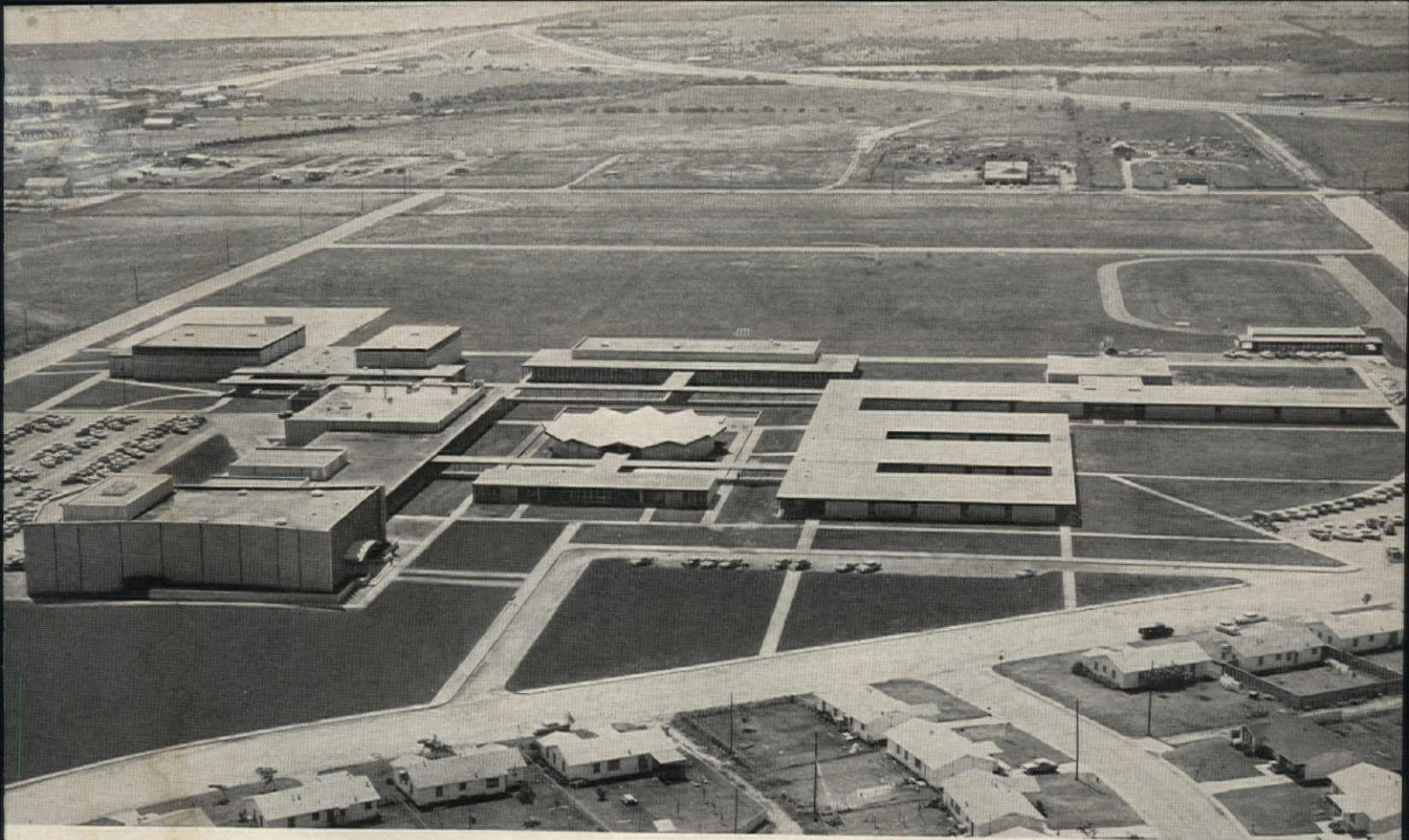
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# big school with a big future

The new Cooper High School in Abilene, Texas, is an ultramodern complex of structures that lives up to Texas billing—not only in size but in scope of vision in planning. Equally impressive is the enduring quality of its construction! ¶ Designed to accommodate 2200 students, this massive \$2,700,000 educational project on a 46-acre site covers a total floor space of 219,000 square feet, including covered walkways. The campus-type layout with its nine interconnecting buildings is zoned into three classifications—a quiet study area, activity or noisy areas, and areas used by both students and the public. ¶ Construction of this big school was done in four separate contracts. Lone Star Masonry Cement—a uniform, ready-to-use material, scientifically formulated to provide maximum workability, permanence and economy—was used throughout the entire project. Lone Star Portland Cement was used for foundations and floors and Lone Star Air-Entraining Cement was used for all the “Featherlite” light weight concrete blocks.

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⬆ Hub of the Cooper High School is the circular library, which serves as a “buffer zone” between the activity area and the study area.



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## Three Months in Rome

A few years ago I got a missive—postcard, I think it was—from an architect in Rome, who made a casual remark about Rome and architecture, which at the time I didn't really sort out properly. His remark was, "Every architect should be required to spend three months in Rome every so often." He didn't explain exactly what he meant on the card, and I think I misunderstood him. When I spent a little time there afterwards, however, I remembered the remark and got a different thought from it.

When you are surrounded by Rome and its architectural works you can't help thinking of architects, and somehow you are more impressed with them as men than with their works. You realize how architects really dominated the world of their time. You are overwhelmed by what they "got away with." You feel that architects were the great doers and leaders of their period, the "Inventors of all Conveniences."

That last phrase comes from one Leone Battista Alberti, who spoke at length for his time. It comes up at this time via "The Beer Can by the Highway," a new book by John A. Kouwenhoven (Doubleday & Company, Inc.). Readers may remember a talk by him called "The Wellsprings of Design," published in ARCHITECTURAL RECORD (April, 1960), the gist of which was that the architect seems to be primarily responsive not to life but to architecture.

In the book Kouwenhoven recalls Alberti's definition of an architect: "Him I call an Architect, who, by a sure and wonderful Art and Method, is able, both with thought and invention, to devise, and, with execution, to complete, all those Works, which, by means of the movement of great Weights, and the conjunction and amassment of Bodies, can with the greatest Beauty, be adapted to the uses of Mankind: and to be able

to do this, he must have a thorough insight into the noblest and most curious Sciences.'"

Prophetic, that Alberti.

"I do not want to underplay the significance Alberti attached to 'Beauty', about which he says a good deal in Book VI and Book IX of his treatise. 'Beauty and ornament' (he likes to refer to them in tandem) are the sources of the 'pleasure and delight' we take in looking at buildings. Beauty he defines as the harmony or congruity of all the parts of a structure; ornament he defines as something 'added or fastened on' so that the unsightly parts of a structure will give less offense and the handsome parts will be even lovelier. In one place he even says that the architect's having satisfied necessity by his structure 'is a very small matter,' and that even if he has also achieved 'conveniency' his building will give no pleasure if people are shocked by its 'deformity.' But when he returns to the subject later, he is careful to restore the balance. It should always be clear, he insists, that the architect has 'consulted necessity and convenience in the first place.'

"First and foremost the architect is, in Alberti's phrase, the 'Inventor of all Conveniences.' Mankind, he tells us, is obligated to the architect not only for safe and pleasant shelters, but for having 'contrived' many other things, 'of the highest use and convenience,' such as sweat baths; aqueducts; tunnels; ships and vehicles; bridges; and engines of war. More victories in war, he says, have been won by the 'art and skill' of architects than by the conduct or fortune of the generals."

Well, if we can't spend three months in Rome every so often, it might be refreshing to spend a little time with Alberti. Or, "The Beer Can by the Highway" is good reading too.

—Emerson Goble

## EERO SAARINEN NAMED TO RECEIVE 1962 A. I. A. GOLD MEDAL

The American Institute of Architects announced last month that its 1962 Gold Medal will be awarded to the late Eero Saarinen, whose tragic death last September at the age of 51 shocked the architectural world.

Mrs. Saarinen has been invited to come to Dallas to accept the award. The Gold Medal, the A.I.A.'s highest honor, is traditionally presented at the annual dinner held during the A.I.A.'s national convention, scheduled this year May 7-11 in Dallas.

The award to Eero Saarinen follows by 15 years presentation of the A.I.A.'s 1947 Gold Medal to his father Eliel, three years before Eliel's death at 76. In the 55-year history of the Medal, it is the first time it has ever gone both to a father and his son.

### Youngest Winner?

It is also probably the first time the Gold Medal has been awarded to so young a man: earlier records are not clear on this point, but it is certainly at least 30 years since the Medal has gone to an architect under 60; and it is a frequently-remarked fact that the four "great makers" of modern architecture were well on in their seventies before it came to them—Frank Lloyd Wright first, in 1949, at 79; Gropius in 1959, at 77; Mies van der Rohe in 1960, at 74; and Le Corbusier just last year, at 74.

There has been only one other posthumous presentation—to Louis Sullivan, in 1946.

### 29 "Most Distinguished"

Authorized in 1906 and first presented in 1907, the Gold Medal "may be awarded annually in recognition of most distinguished service to the architectural profession or to the Institute"; but the award is not mandatory; and the Medal has, in fact, been awarded only 27 times altogether—the award to Eero Saarinen will be the twenty-eighth. In addition, a special Centennial Medal of Honor

was awarded in 1957 to Ralph Walker at the Centennial Convention.

Reflecting, perhaps, the coming of age of modern architecture, the Medal has been awarded with far greater frequency in the last 20 years or so. There were only 13 awards from 1907 through 1946; but from that year on there has been an award every year except 1954.

Though the award is not limited to American architects, it has been presented only nine times to foreign architects, most recently, of course, to LeCorbusier last year.

### Roll of Medalists 1907-1962

Following is a complete list of A.I.A. Gold Medal Winners, with years of award: Sir Aston Webb, London—1907; Charles Follen McKim, New York—1909; George B. Post, New York—1911; Jean Louis Pascal, Paris—1914; Victor Laloux, Paris—1922; Henry Bacon, New York—1923; Sir Edwin Landseer Lutyens, London—1925; Bertram Grosvenor Goodhue, New York—1925; Howard Van Doren Shaw, Chicago—1927; Milton Bennett Medary, Philadelphia—1929; Ragnar Ostberg, Stockholm—1933; Paul Philippe Cret, Philadelphia—1938; Louis Henri Sullivan (posthumous), Chicago—1944; Eliel Saarinen, Bloomfield Hills, Mich.—1947; Charles Donagh Maginnis, Boston—1948; Frank Lloyd Wright, Spring Green, Wis.—1949; Sir Patrick Abercrombie, London—1950; Bernard Ralph Maybeck, San Francisco—1951; Auguste Perret, Paris—1952; William Adams Delano, New York—1953; Willem Marinus Dudok, Hilversum, Holland—1955; Clarence S. Stein, New York—1956; Ralph Walker (Centennial Medal of Honor), New York—1957; Louis Skidmore, New York—1957; John Wellborn Root, Chicago—1958; Walter Gropius, Cambridge—1959; Ludwig Mies van der Rohe, Chicago—1960; Charles Edouard Jeanneret (Le Corbusier)—1961.



# HOW NOT TO SELECT A HARDWOOD FLOORING CONTRACTOR!

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- You establish his responsibility for the complete installation from subfloor to finished floor.
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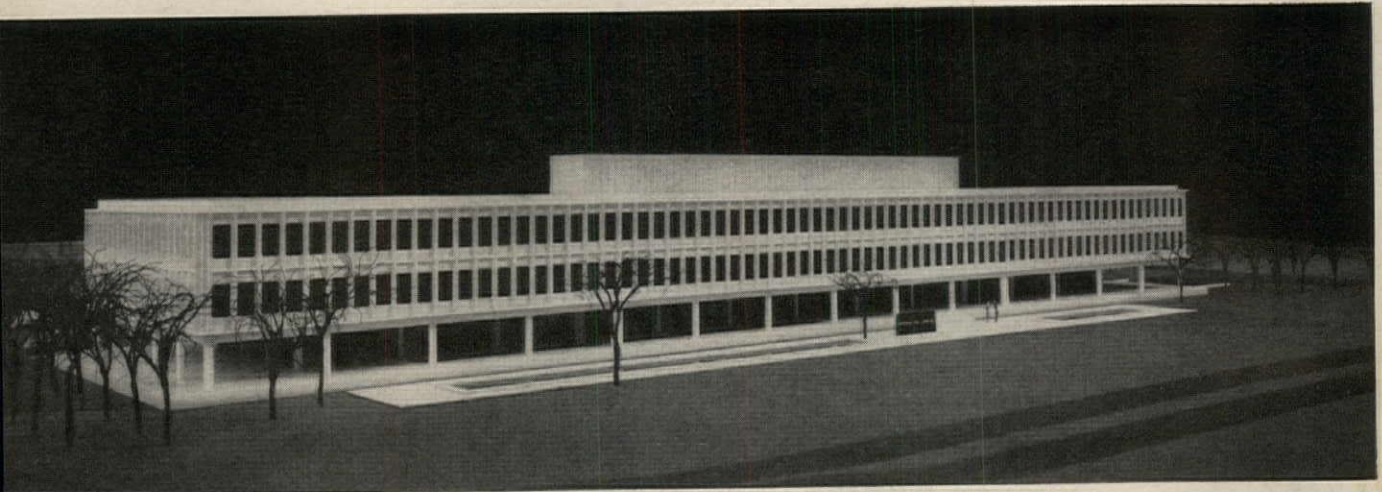
This "Air Thrust" Pneumatic Hard Maple Floor System was installed by Chas. H. Anderson Floors, Inc., Chicago, Ill., in the Prospect Heights Field House, Arlington, Ill. It is an example of a fine hardwood floor system . . . well made . . . well laid.



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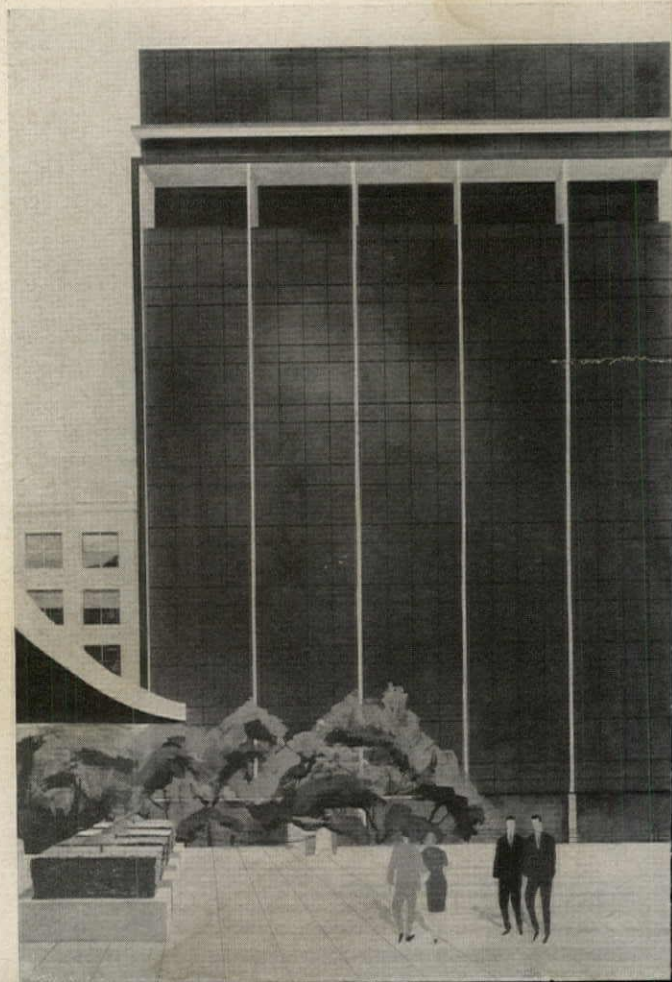
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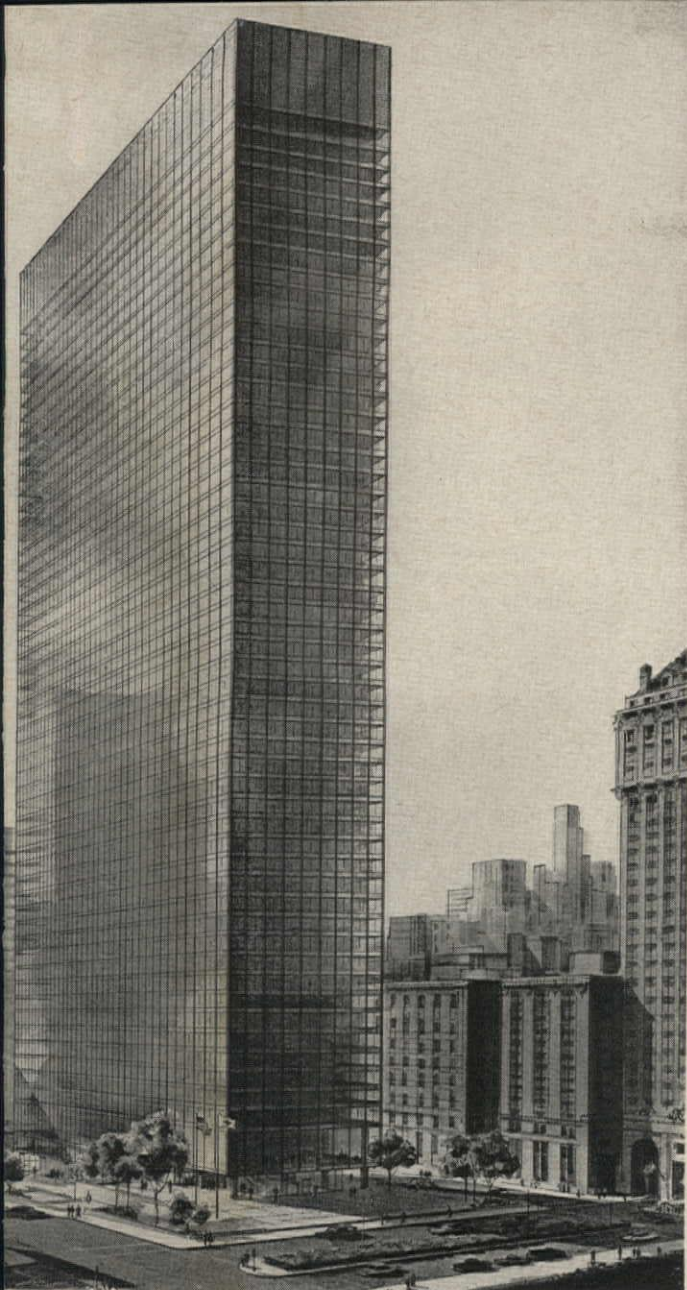
1. John B. Parkin Associates are architects of this \$2 million, three-story office building for Imperial Oil Limited, in the Don Mills area of North York, Ontario, Canada. Exterior is white precast concrete panels of white quartz aggregate on five ft module. First floor has an open colonnade. A roof super-structure will house elevator machinery and air-conditioning equipment. The building, having a gross area of 110,000 sq ft, will be completed by fall 1962.

2. Part of a general complex of state buildings being built around the state capitol in Austin, Texas under the direction of the State Building Commission is the State Insurance Building designed by Broad & Nelson, Fehr & Granger, Pierce & Pierce. The structure will contain approximately 72,000 sq ft and cost about \$1.6 million. Contractors are Farnsworth & Chambers of Houston

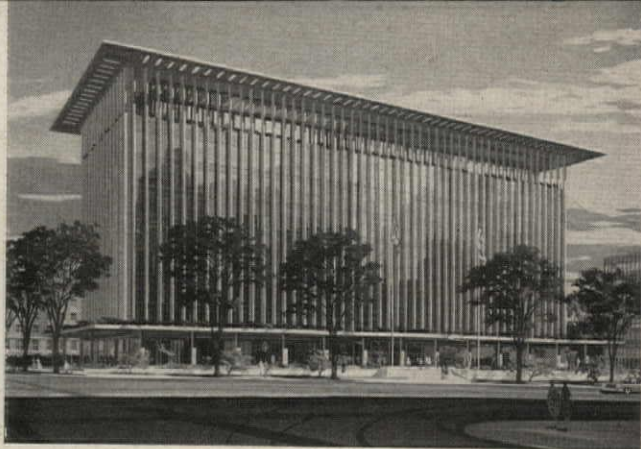
3. Construction will begin this fall, with completion expected about 18 months later, on the \$4.5 million, 14-story Center for International Education designed by Harrison, Abramovitz & Harris. To be built across FDR Drive from the UN General Assembly Building by the Institute of International Education, the glass-façade structure will provide approximately 100,000 sq ft of floor space

3





4



5

4. 245 Park Avenue, to be constructed under the new zoning ordinance of New York City, was designed by William Lescaze. Its site the entire block on Park Ave. to Lexington, 46th to 47th Streets, the 55-story office building has no setbacks. Owners and builders: Park-Lexington Co., Inc. with Kleban Realty & Const. Corp.

5. National Geographic Society's new headquarters building in Washington, D.C. will be completed in the spring of 1963 at an estimated cost of \$7 million. Architect is Edward Durrell Stone. The 10-story building will have three parking levels below ground. Structural materials are marble, granite, glass, steel and concrete and masonry. Contractor is Charles H. Tomkins Company

6. Steel framework forms exterior walls of IBM building to be erected by Equitable Life Assurance Society of the U.S. in Pittsburgh's Gateway Center. Designed by Curtis & Davis, the \$5 million, 13-story building has adjacent two-story underground garage. Structural engineers: Worthington, Skilling, Helle & Jackson; mechanical and electrical engineers: Cary B. Gamble & Associates

7. \$20 million, 18-story office building will rise from elevated plaza over one of three blocks being developed on air rights over Chicago Union Station tracks. Architect is Skidmore, Owings & Merrill. With a transportation center, it will be first step in a 7½-acre multi-million dollar construction program. Builder: Diesel Construction Co.

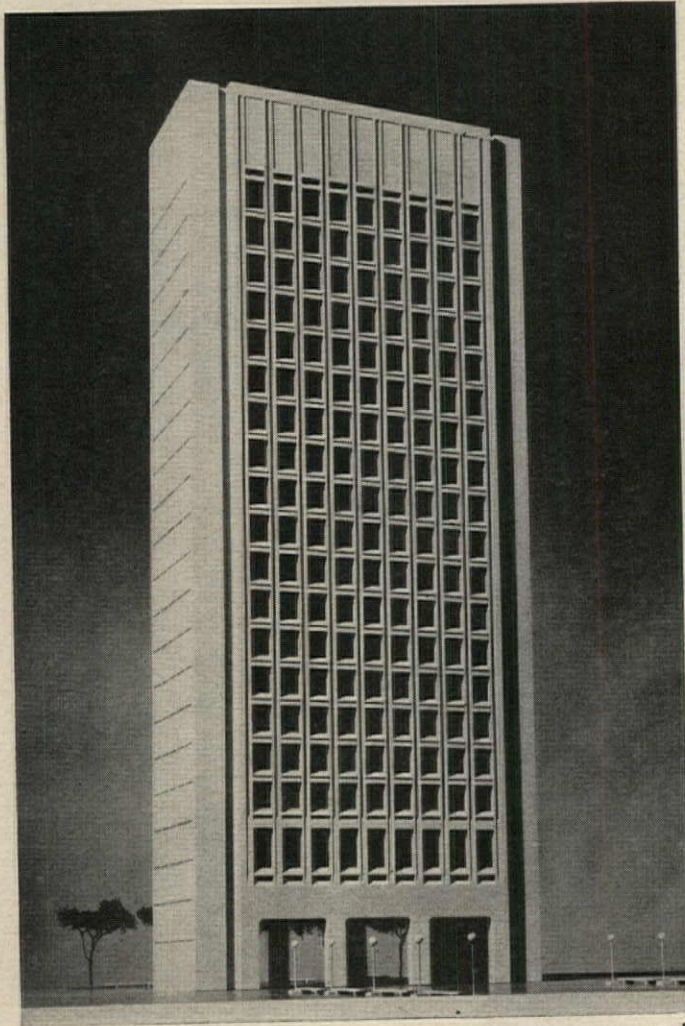
6



7



## Buildings in the News

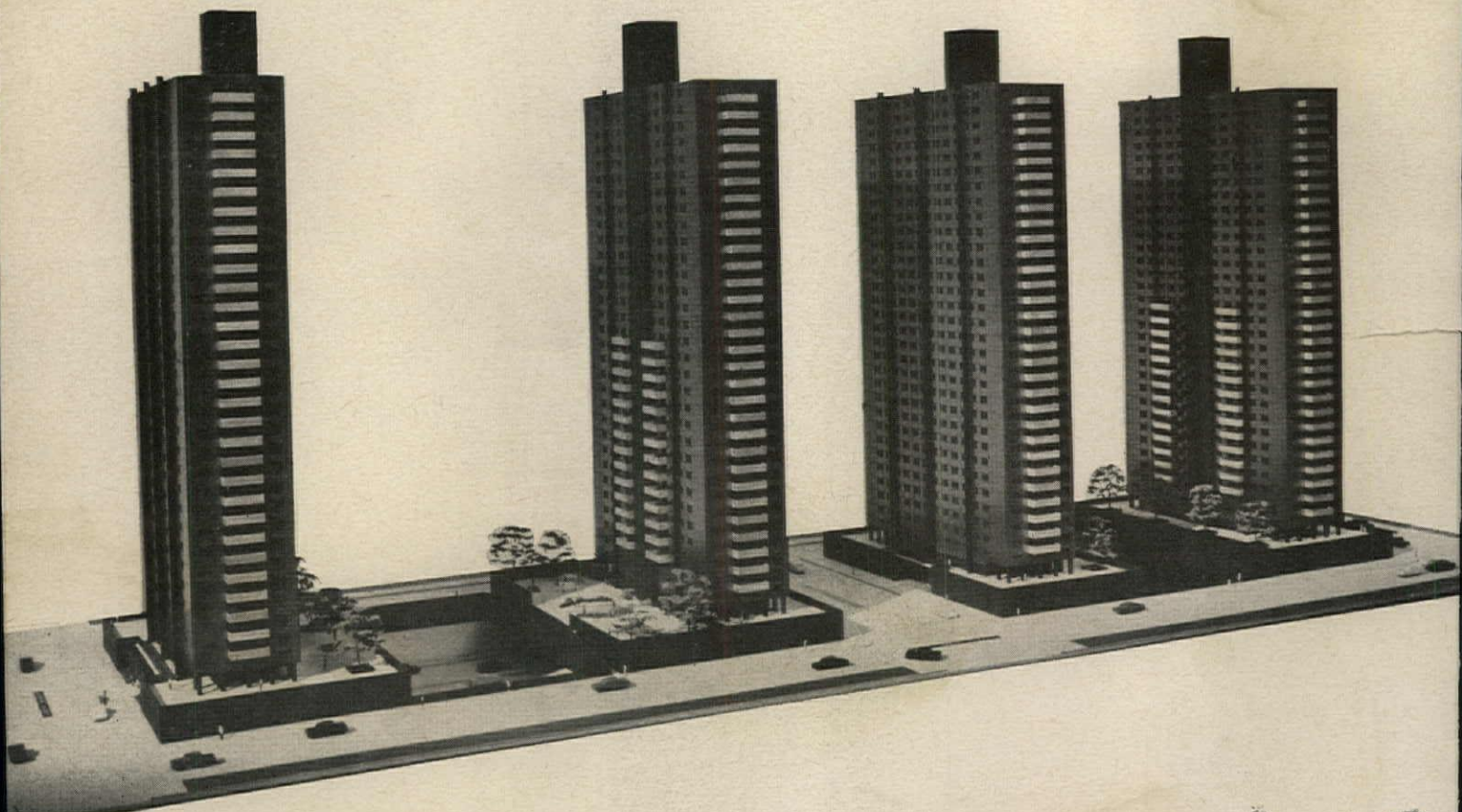


1. New design by I. M. Pei for the \$5 million Center for Earth Sciences for the Massachusetts Institute of Technology. Construction has begun on the 20-story reinforced concrete structure and will be completed by summer, 1963. Structural engineers are Severud-Elstad-Krueger Assoc.; mechanical design is by Syska & Hennessey. Contractor: Turner Construction Co.

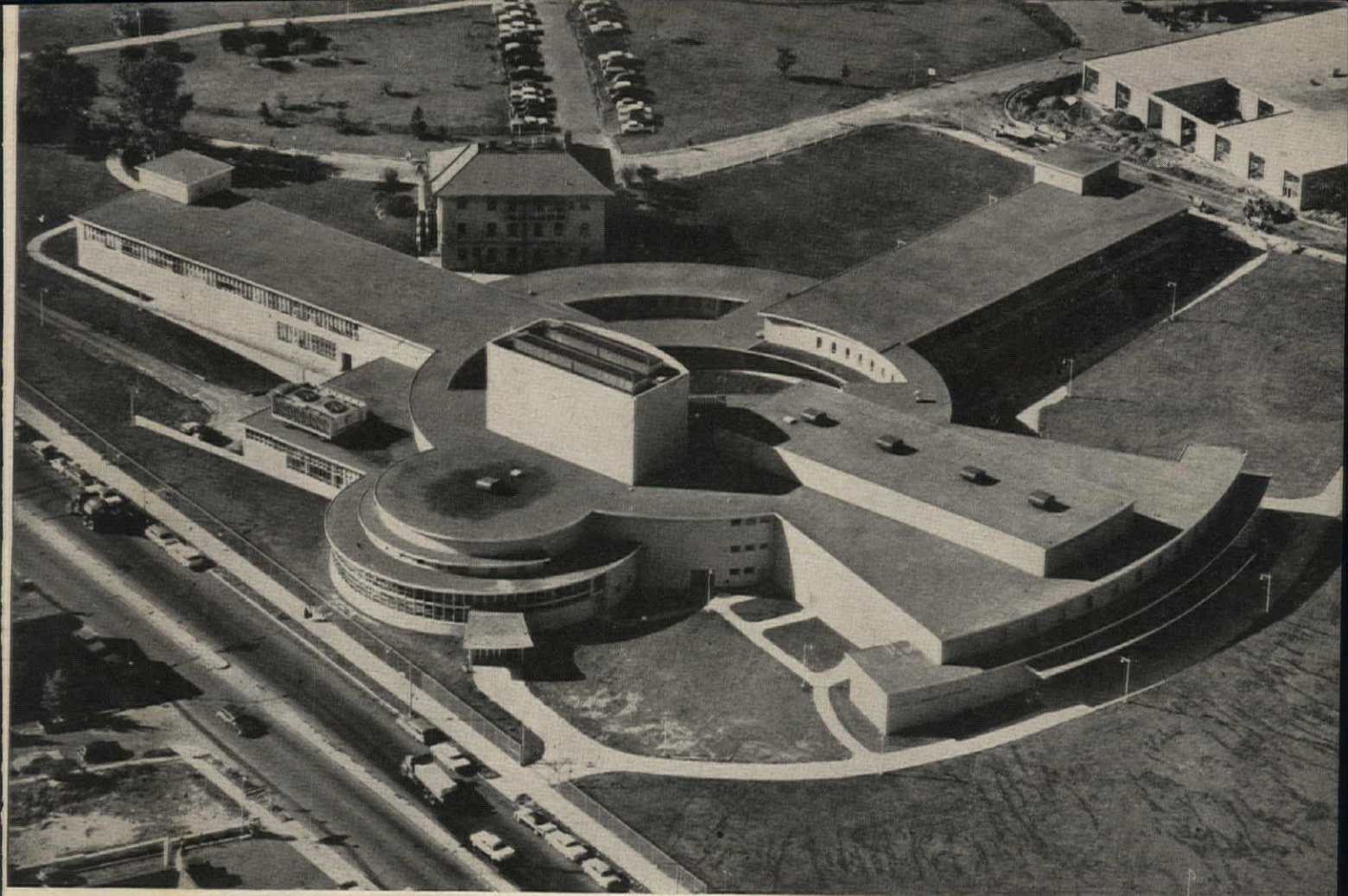
2. Washbridge Apartments, designed by Brown & Guenther, will use air rights over new George Washington Bridge expressway. The four 32-story aluminum-paneled towers, a middle-income housing project, will cost about \$19,620,000. Structural engineers: Farkas and Barron; mechanical: Kalen and Lemelson

3. Charles S. Golden Center of Music and Speech, Queens College, Flushing, N.Y., received the 1961 Queens Chamber of Commerce Outstanding Award Special Bronze Plaque. Five units, each faced with white brick, radiate from a center formed by a semi-circular open-air theater. Architects: Fellheimer & Wagner; builder, Psaty & Fuhrman, Inc.

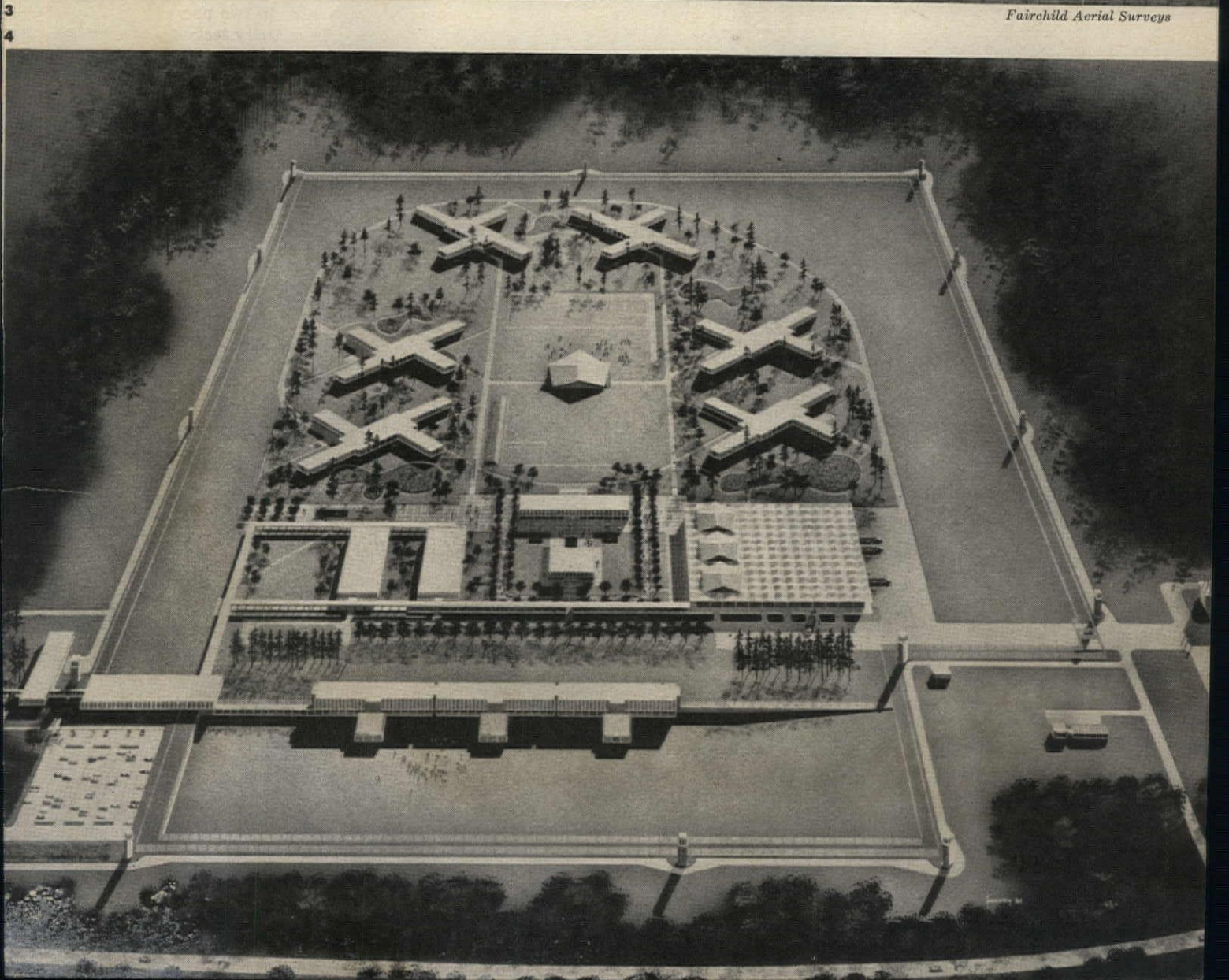
4. \$12 million Washington Corrections Center, new state institution for men, Seattle, designed by Bassetti & Morse Walker & McGough and Curtis & Davis, will include 15 major buildings, function in two parts: reception-diagnostic section and medium security section. Consultants: structural, civil—Worthington, Skilling, Helle & Jackson; mechanical—Lyle E. Marque & Associates; mechanical and electrical—Cary B. Gamble & Associates; landscape—Lawrence Halprin & Associates





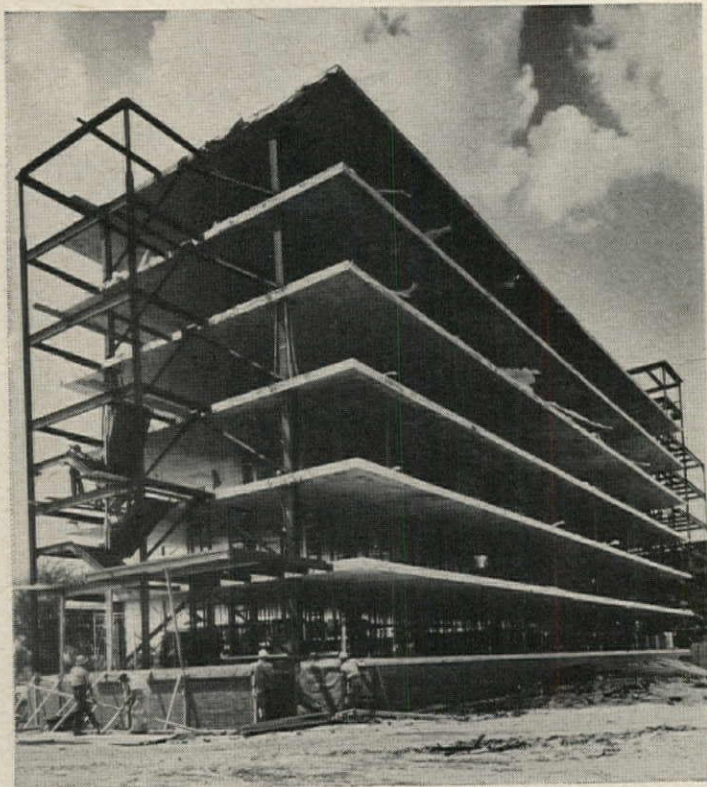


Fairchild Aerial Surveys



for architects, engineers and contractors...

# New Ryerson service on



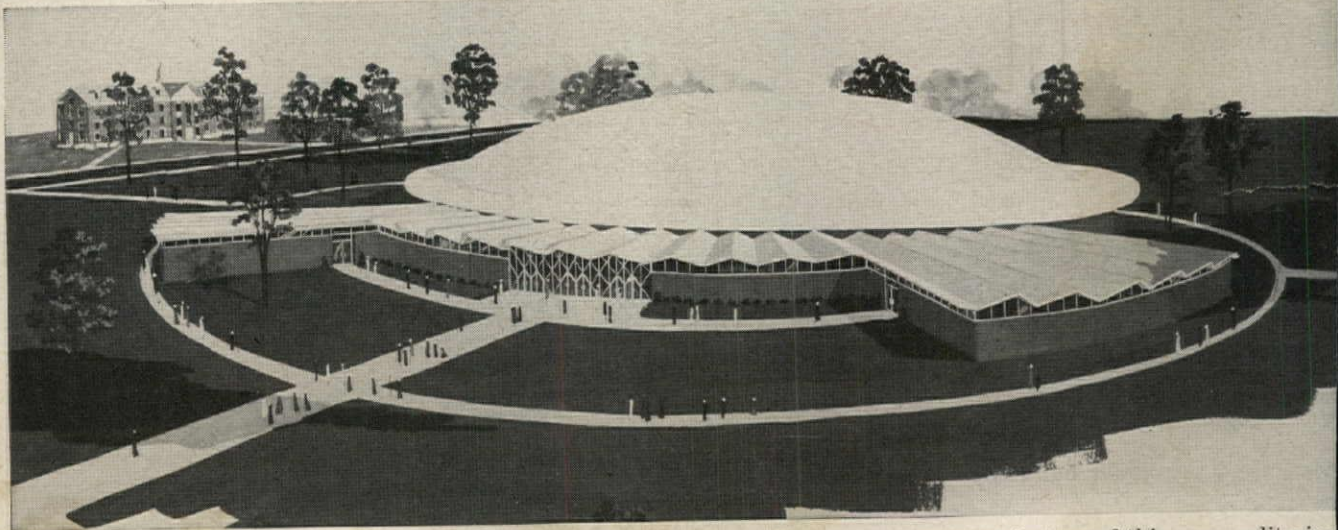
**Dormitory, Michigan State University**—28 slabs measuring 44' x 144' were poured and lifted into place in just 56 working days. Architect: Lewis J. Sarvis, Battle Creek. General contractor: Christman Co., Lansing. Lifting contractor: Great Lakes Lift-Slab, Chicago.

## WHAT THE SERVICE INCLUDES

Now Ryerson offers a unique service (initially covering the Midwest) on planning and building of lift-slab structures. This service includes:

- 1.** Cost data to help you compare the speed, economy and modern efficiency of lift-slab jobs versus alternate methods.
- 2.** Technical manuals on every aspect of lift-slab construction—from planning to detailing and specifying. These manuals, recently revised and expanded by a panel of nationally recognized engineering authorities, provide invaluable reference material for architects, engineers and contractors. No other compilation of data is as complete and up-to-the-minute. Here is a working guide that greatly simplifies the designing and engineering of lift-slab structures. Subjects covered include collars, columns, post-tensioned flat slabs, field procedures, equipment, specifications, etc.
- 3.** Consultation service by a staff of Ryerson specialists with architectural and engineering backgrounds—men experienced in lift-slab and post-tensioned construction.
- 4.** For the contractor, Ryerson can arrange for lifting services using the Youtz-Slick method, and provide a complete package of reinforcing and construction steels—including fabricated re-bars, post-tensioning assemblies, columns, collars, miscellaneous iron, etc.

On these pages are examples of a few current building projects employing the Youtz-Slick method of lift-slab construction. On *your* next job, we will welcome an opportunity to get down to specifics with you. Meantime, if we can furnish helpful information, we will be glad to do so.



**300-ft. concrete dome** (reported to be the largest of its type anywhere) is the dominant feature of this new auditorium in Anderson, Ind., for the General Ministerial Assembly of the Church of God. Dome was cast at ground level, contoured over a mound of earth. It was then post-tensioned with twelve 40-wire assemblies supplied by Ryerson—and finally lifted into place by the Youtz-Slick method. Dimensions: 250 ft. clear span, with 25-ft. cantilevers for a total span of 300 ft.; vertex of dome 68 ft. above floor level. Architect: Johnson, Ritchhart & Associates, Anderson. General contractor: Lewis Construction Co., Anderson. Lifting: Great Lakes Lift-Slab, Chicago; Sky Hook Lift-Slab, Overland Park, Kan.

# lift-slab construction

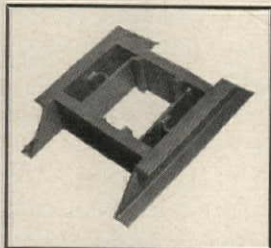
## THE LIFT-SLAB TECHNIQUE

**You can do better work for less money, down on the ground than you can in the air.**

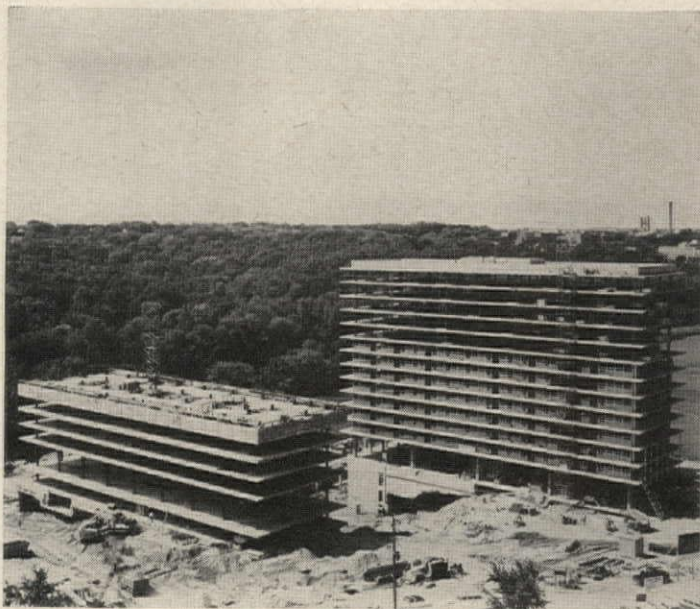
Adhering to this principle, the lift-slab method of construction enables you to pour all the slabs for a multistory building at ground level—one on top of another, separated only by a sprayed-on coating of plastic. The finished slabs are then lifted to the various floor levels by means of hydraulic jacks mounted on top of the building columns and connected to the slabs by alloy steel rods.

The lifting proceeds at a rate of about six feet an hour, and when the slabs are in place steel collars serving as shear heads transmit loads to the columns.

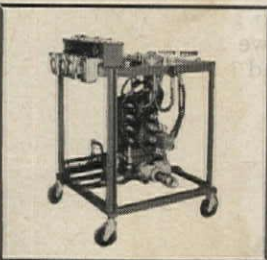
This method of construction is often the fastest and most economical for apartment buildings, dormitories, office buildings and parking structures. The present practical limit for the height of lift-slab buildings is about 20 stories. There is, however, no limit to the size of floors.



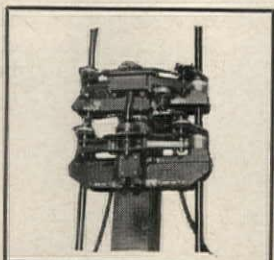
**Typical Collar** furnished by Ryerson for lift-slab projects. See Ryerson collar handbook for details.



**Huron Tower Apartments, at Ann Arbor, Mich.** Twin 15-floor apartment buildings. Owner: Huron Towers, Inc., Detroit. Contractor: Long Construction Co., Kansas City, Mo. Architect: King & Lewis, Detroit. Structural engineers: R. H. McClurg Associates, Inc., Detroit; Bob Campbell, Kansas City, Mo. Lifting contractor: Skyhook Lift-Slab Corp., Overland Park, Kans.



**Central Console** for controlling the hydraulic jacks mounted on columns, and for programming a slab lift.



**Hydraulic Lifting Jack** developed by REDCO of Overland Park, Kans., for the Youtz-Slick lifting method.




**Parking structure in Oshkosh, Wis.**, is the first of its kind in the Midwest to be built with lift-slab construction. Owner: City of Oshkosh. General contractor: William Warner Construction Co., Oshkosh. Architectural and engineering work: A joint venture by Sandstedt-Knoop-Yarbro, architects, Oshkosh—and Charles Nagel and Associates, Inc. architects and engineers, Milwaukee. Lifting Contractor: Great Lakes Lift-Slab, Chicago.

## POST-TENSIONING AND LIFT-SLAB NATURAL PARTNERS

Slabs can be made lighter, stronger and virtually deflection-free by the post-tensioning method of prestressing concrete. Thus the lift-slab method and post-tensioning become natural partners providing safer, stronger buildings at lower cost.

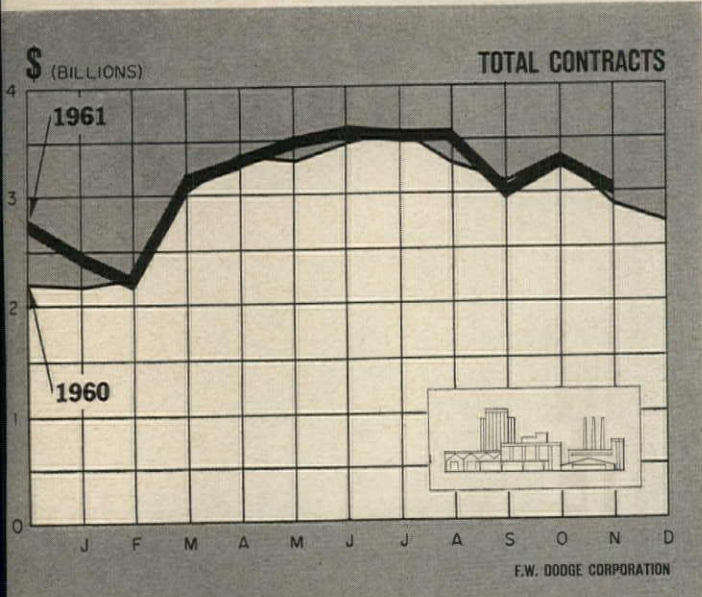
# RYERSON

JOSEPH T. RYERSON & SON, INC., MEMBER OF THE  STEEL FAMILY

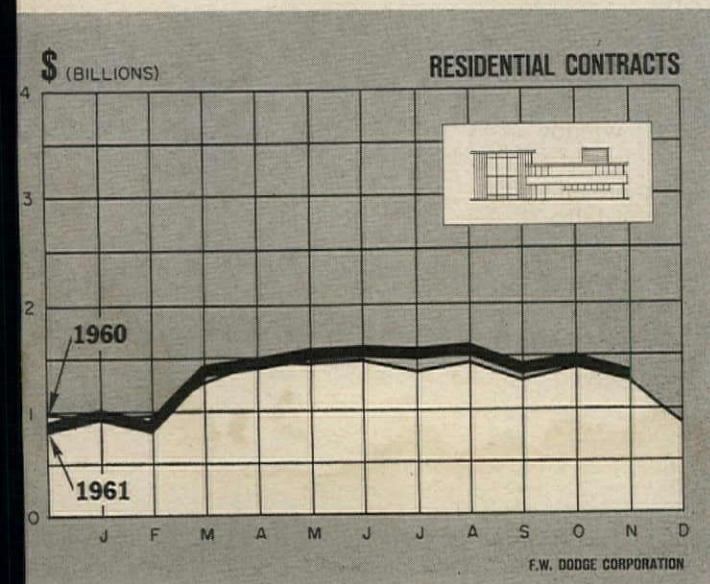
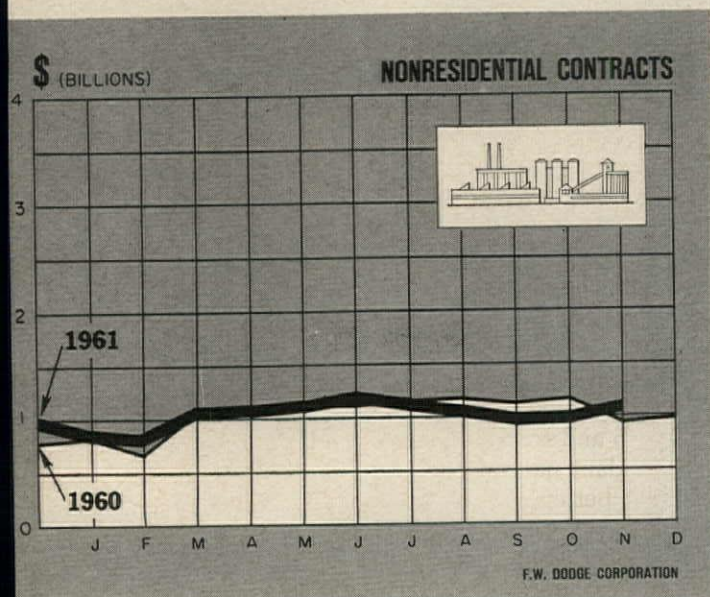
Re-Bars and Accessories • Post-Tensioning • Lift-Slab Service • Spirals • Wire Mesh • Open-Web Joists • Sheet Steel Piling • Structural Shapes and Tubing • Inland 4-Way Safety Plate • Stainless Steel • Aluminum Building Products • PVC Water Stops • Expanded Metal • Grating, etc.

# Current Trends in Construction

## SCHOOL OUTLOOK "MOSTLY FAIR"



Total contracts include residential, nonresidential, heavy engineering contracts



THE SCHOOL CONSTRUCTION picture at the turn of the year could be described as "mostly fair with some high cloudiness." On the bright side, contracts for educational and science buildings reached a new all-time high in 1961. A total of \$3,015,010,000 in school contracts were awarded during the year, slightly above the previous peak of 1960. This means a substantial amount of actual school building activity in the months to come. On the other hand, the dollar volume of bond approvals for educational facilities, an early indicator of both future contract and actual construction levels, slackened considerably last year. School bond issues are meeting new voter resistance, according to some observers. Also, the question has been raised as to whether expected tightening in the money market during 1962 might not depress school bond sales and thus adversely affect new construction.

WHILE THE SCHOOL *bond* outlook is not particularly encouraging, it isn't all black, either. Firstly, a reduction in approvals from the record level of 1960 is hardly surprising and does not necessarily presage a continuing downward trend. In the college sector, rejection of one large proposal in November heavily influenced the outcome for the year. As for the money market, studies of the Investment Bankers Association indicate that school bond sales have been relatively insensitive to changes in interest rates, and that periodic tightening in credit conditions has not seriously affected school plant expansion programs in the short run.

THERE ARE, of course, some potent demand factors acting to buoy school construction this year. These include the press of increasing enrollments, particularly at the secondary school level, and the backlog of school classroom need. An annual survey, conducted by the U. S. Office of Education each fall, last reported a "shortage" of 127,000 public elementary and secondary classrooms needed to relieve overcrowding and replace unsatisfactory facilities. While the given figure may be questioned, there is no doubt that shortages still do exist in many areas. On balance, we expect school construction to be a sustaining force in nonresidential building this year, with total school contracts showing a modest gain of about three per cent over 1961.

SOME VOTER RESISTANCE there will always be no matter what level of government finances improvements in school systems. But the long-run trend appears to be increasing awareness of the importance of the educational process and more willingness to do something about it. This does not necessarily mean rampant government spending. It may instead mean even more attention to the possibilities of economy through architectural innovation. Such ideas as joint occupancy—combining a school and rentable offices in the same building, proposed for a commercial high school in New York; the development of soundproof, movable partitions for expanding or contracting classrooms and other space to allow fuller utilization of space: these and many other ideas may be used effectively to blunt objections to the cost of education.

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

# SOMEDAY...



Sacred Heart Parish School, Bangor, Michigan  
Architect, Trend Associates, Kalamazoo, Michigan

MOST  
SCHOOLS  
WILL BE  
BUILT  
WITH

## LO-TRAN 12.5 WINDOW GLASS



### MAXIMUM GLARE CONTROL

Glare control and "brightness balance" is achieved when you specify LoTran 12.5 neutral grey window glass into your school designs. Years of glass research has afforded Houze LoTran 12.5 unique properties which absorb and reflect solar energy. Yet LoTran 12.5 admits abundant natural daylight so that students see better, work better, feel better. LoTran 12.5 is specified in schools to reduce the contrast between outdoor and indoor brightness to create a decent physical environment. This elimination of glare and the provision for "balanced brightness" provides visual comfort and increases efficiency in classroom tasks. There is no distortion of outside colors when viewing through LoTran because its neutral grey tint actually defines colors.

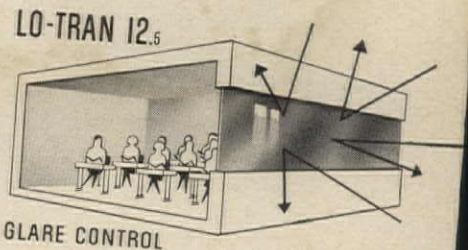
### YOUNG MINDS ARE MORE ALERT, ATTENTIVE IN SCHOOLS WITH BALANCED BRIGHTNESS

LoTran 12.5 is the only glare control window glass that conforms to the specification of the National Council on Schoolhouse Construction. LoTran is a product of Houze, America's oldest and largest producer of sunglass lenses. LoTran's 12.5 light transmission rating falls well within the control factor required of the very best sunglass lenses.

### 30% MORE ECONOMICAL

Due to its growing acceptance throughout the nation, LoTran 12.5 window glass now costs 30% less than any other grey glass of comparable density. In fact, LoTran 12.5 gives more effective glare control and solar energy reduction per dollar than any other window glass today. The increasing use of LoTran in more and more school installations demonstrates that its lower transmission of light and solar heat holds down costs in additional fenestration fixtures and in the initial cost and operation of air conditioning.

LO-TRAN 12.5 IS OF VALUE not only for schools but is developed for visual requirements in all types of institutional, industrial, commercial and residential buildings. Spectral comparisons of LoTran and competitive glass transmissions and information are available on request.



# HOUZE GLASS CORPORATION

PIONEERS IN COLORED GLASS TECHNOLOGY  
POINT MARION, PENNSYLVANIA

# 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

ATLANTA

NEW YORK

PERIOD	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
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
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
November 1961	364.8	343.1	405.4	431.5	403.6	257.3	250.8	276.0	284.4	274.3
	% increase over 1939					% increase over 1939		% increase over 1939		% increase over 1939
November 1961	195.4	180.3	210.2	223.5	210.2	198.1	201.8	190.2	192.0	189.6

SAN FRANCISCO

ST. LOUIS

PERIOD	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.6	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
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
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
November 1961	313.5	299.3	329.5	347.7	331.7	311.5	292.3	350.5	368.4	354.2
	% increase over 1939					% increase over 1939		% increase over 1939		% increase over 1939
November 1961	184.5	179.7	177.6	190.2	178.7	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.



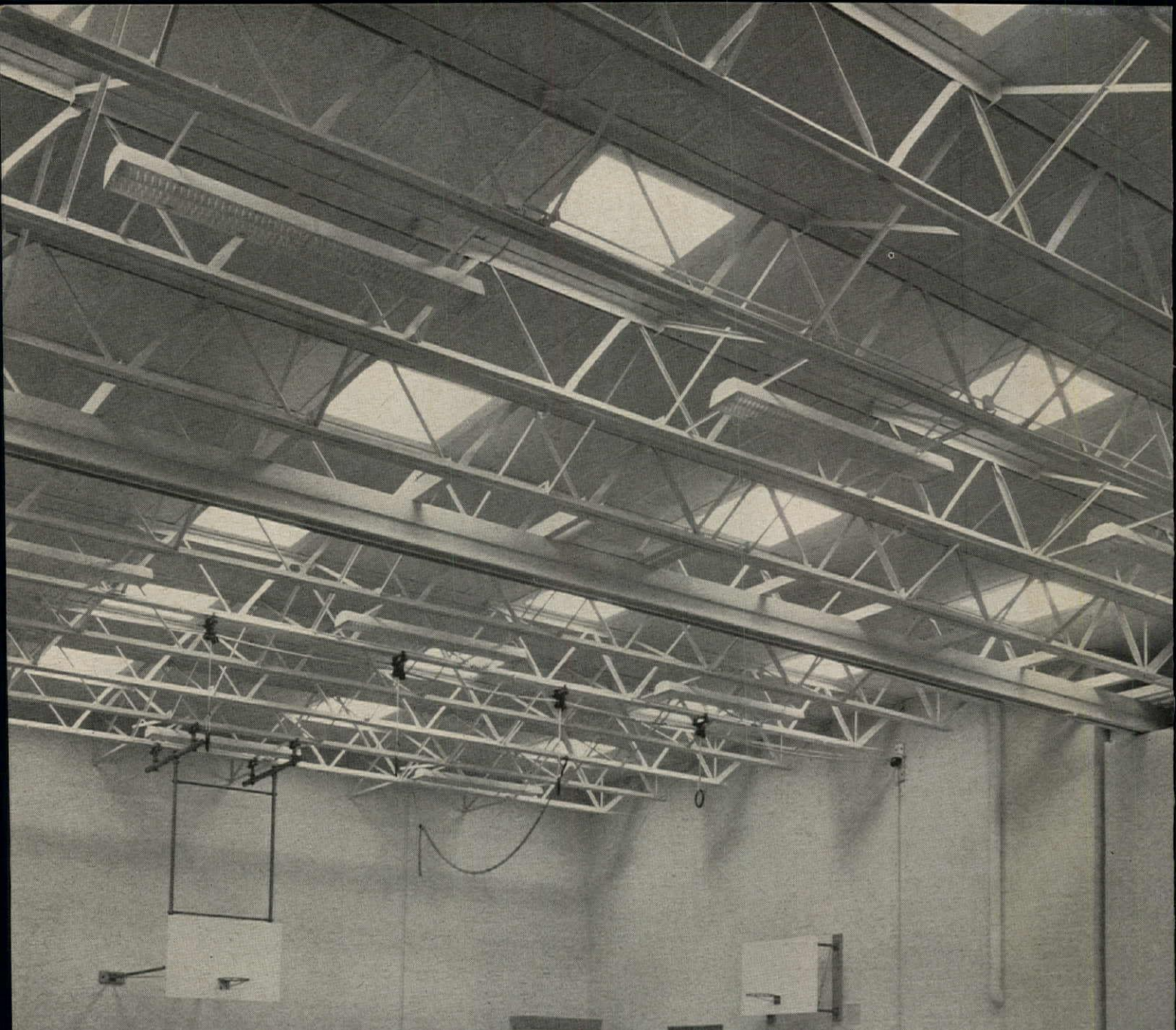
## New Architectural Uses for Aluminum Grating

Here . . . new applications for aluminum grating . . . exacting installations where quality equal only to BORDEN'S will do:

- 1 This shows BORDEN aluminum grating used in a system of drain trenches throughout Mellon Square Park, Pittsburgh, Pennsylvania.  
*Architects: Mitchell and Ritchey, Pittsburgh, Pennsylvania*
- 2 BORDEN pressure-locked type grating, of gold-anodized aluminum, forms the facade of this dramatic new structure. The Congregation Beth El Synagogue, South Orange, New Jersey.  
*Architects: Davis, Brody and Wisniewski, New York, New York*
- 3 BORDEN pressure-locked aluminum grating fabricated as foot scrapers for use at a school in East Orange, New Jersey.  
*Architect: Emil A. Schmidlin, East Orange, New Jersey*
- 4 BORDEN pressure-locked aluminum grating used for maintenance-free fencing at J. L. Hudson's Northland Shopping Center, Detroit Michigan.  
*Architect: Victor Gruen & Associates, Detroit, Michigan*
- 5 Sunshades of BORDEN pressure-locked aluminum grating permit passage of light and air while screening strong sunlight at the Lone Star Gas Company Office Building, Dallas, Texas.  
*Architect: George L. Dahl, Dallas, Texas*

## BORDEN METAL PRODUCTS CO.

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



North Attleboro (Mass.) Jr. High School. Architects: Haldeman & Jacoby, Brockton, Mass.

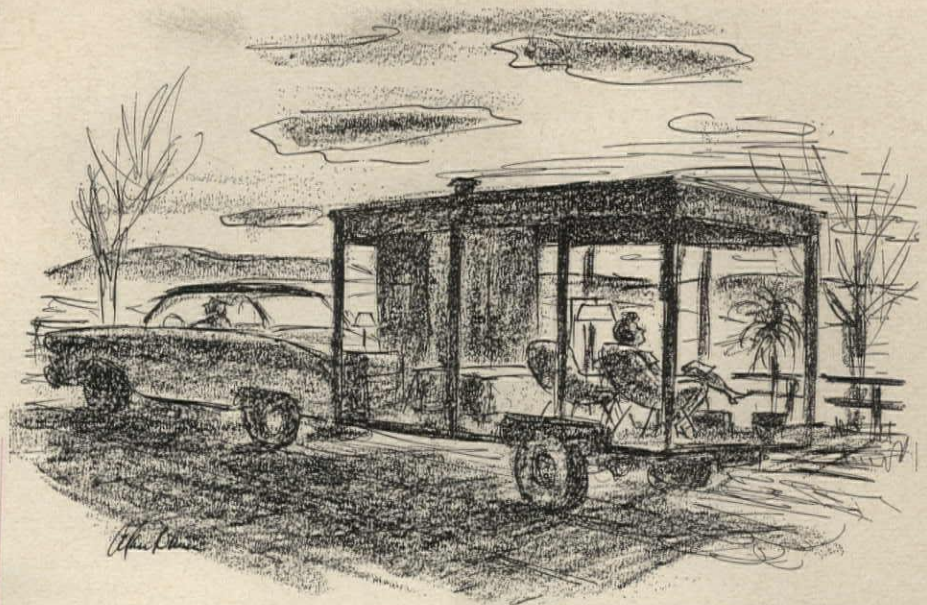
**... GUARANTEED AIRTIGHT, WATERTIGHT, PERMANENTLY**

Twenty-eight self-flashing Twin Dome® acrylic skylights illuminate this 5,074 square foot gymnasium without risk of heat gain, heat loss, or condensation. This first totally-proven, permanently-sealed dome-within-dome design is guaranteed watertight and airtight. It maintains a constant 0.57 U-factor. In all, 187 low-silhouette Twin Dome units bring evenly-diffused, glare-free daylight into all classrooms and corridors, as well as the gymnasium. ■ A complete range of 19 self-flashing and curb-mounted sizes enables the architect to blend Twin Dome units with any roof or building design. Choice of clear, white-translucent or dense white inner and outer acrylic domes permits control of light levels. Twin Dome units are shatterproof, weatherproof and maintenance-free. The self-flashing model can be installed in 15 minutes. ■ For full details, see Sweet's Architectural File 20a/Wa or write Cyanamid.



**WASCO  
SKYDOME®  
ACRYLIC SKYLIGHTS**





—Drawn for the RECORD by Alan Dunn

## World Conference Planned On Shell Structures

An international conference on shell structures will be held in San Francisco, October 1-4. The conference is presented by University Extension, University of California, Berkeley; the Building Research Advisory Board of the National Academy of Sciences—National Research Council; and the International Association for Shell Structures.

Papers dealing with specific experiences in shell design and construction are invited, briefs to be submitted before March 1. For information, write Professor A. C. Scordelis, Div. of Structural Engineering and Mechanics, Univ. of Calif., Berkeley 4, Calif.

## Calif. Competition: First Phase Winners

From 197 entries in the first part of the competition for the design of the Governor's Mansion in California (see AR, Nov. p. 276), the following architects have been selected to enter the competition's second phase: Louis Angelikis and Paul Bailly of Angelikis and Bailly, Architects, Los Angeles; J. U. Cloudsley and Jack F. Whipple of Cloudsley and Whipple, Architects, Stockton; Martin Del Campo and Donald J. Clark of Del Campo and Clark, Architects and

John K. Miller, San Francisco; William Guy Garwood, Palo Alto; Donald Goodhue and Addison Gordon Hall of Hall and Goodhue, Monterey; William K. Goodwin Jr., San Francisco; Raymond Kappe, Los Angeles; Herbert D. Kosovitz of Kosovitz and Knox, San Francisco; Pierre Lafond, Santa Barbara; Worley K. Wong, Allen Don Fong, H. W. Namitz and Terry Tong of Cambell and Wong, San Francisco.

Designs in the second part of the competition will be submitted and the winner announced this month.



Fabian Backrach

New York City has named for the first time an architect to the City Planning Commission. He is Harmon H. Goldstone, A.I.A.

## Committee Planned For Shelter Design

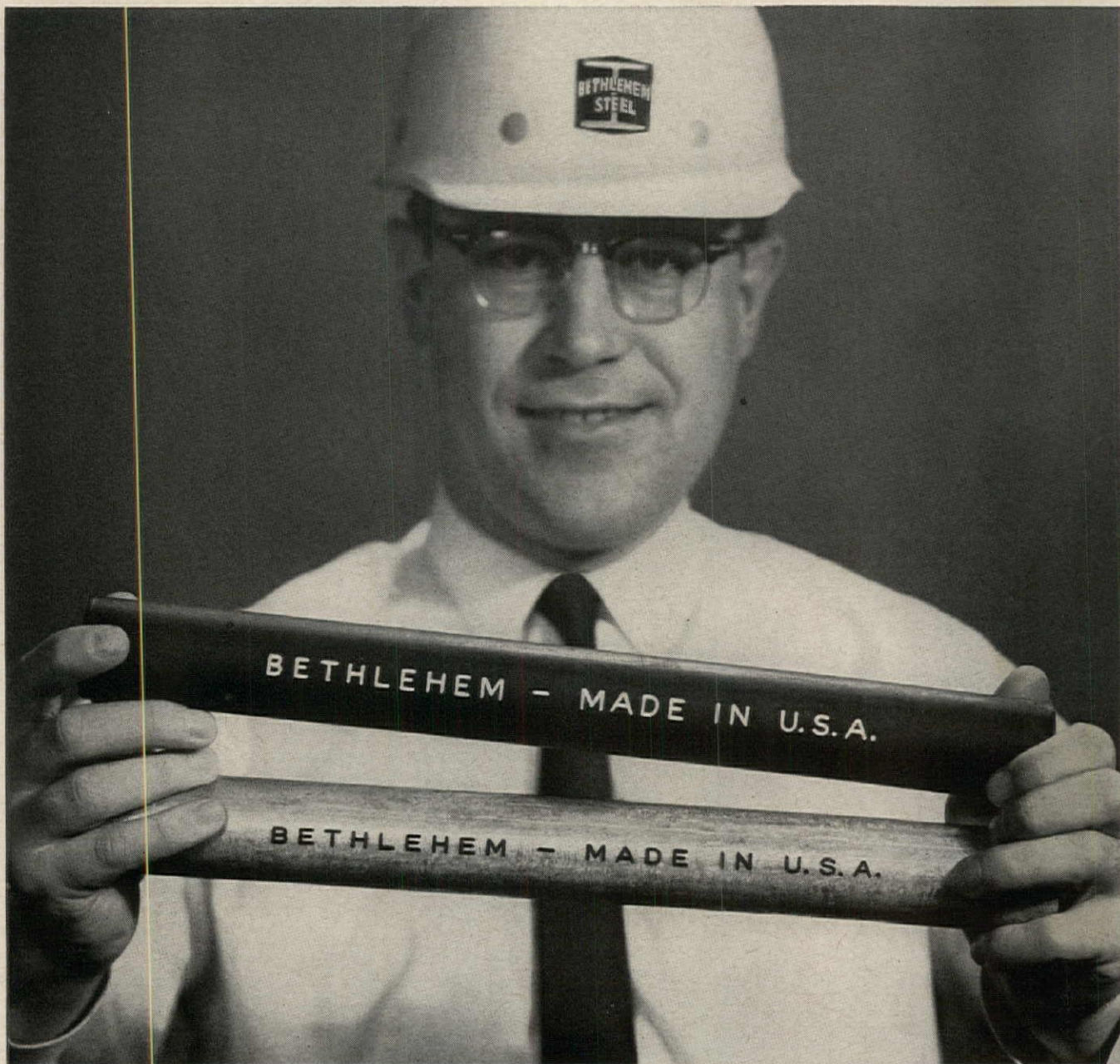
The American Institute of Architects is one of five professional organizations voluntarily assisting the Office of Civil Defense in carrying out construction details of its shelter program. A design and construction task committee is now being organ-

ized with two representatives from each of the groups—the A.I.A., American Institute of Planners, Engineers Joint Council, National Society of Professional Engineers and Associated General Contractors of America. A meeting with representatives from the groups and officials from the Dept. of Defense was held in Washington, D.C. in December, called by President Philip Will Jr., F.A.I.A., Chicago, president of the A.I.A.

Objectives of the new committee as outlined by the A.I.A. are: 1) to render detailed and technical advice on the impact of the vast shelter program on the building industry; 2) to facilitate fast and effective communication between the Office of Civil Defense and the architects, planners, engineers and contractors who do the work; and 3) to stimulate adequate shelter construction on private initiative without federal grants.

*Fallout Protection, What To Know And Do About Nuclear Attack*, a Department of Defense, Office of Civil Defense publication for the general public, is available at any U.S. Post Office. The projected publication for architects and engineers containing new information on technical requirements for family shelters and information on the submission of shelter designs was expected to be out shortly.

continued on page 26



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# Meetings and Miscellany

continued from page 23

## \$25,000 Ruberoid Competition To Have Urban Renewal Theme

"Improved Human Environment through Urban Renewal" is the theme for the 1962 Ruberoid/Matico Annual Architects' Competition. The \$25,000 design competition, the fourth, is open to all registered architects, architectural assistants and students of schools which are members or associate members of the Association of Collegiate Schools of Architecture.

The site of the competition is a theoretical city whose former reason for growth—textile mills—has vanished. The city now has a blighted area of mixed factories and residences and a growing population based economically on a new industry—electronics. The city is expected to become the heart of an expanding area. A master development plan for the community has been prepared.

Rather than stipulate a list of quantitative land uses and controls, this competition frees the architect-planner to create his own program and design. Entries must have as their goal the development of the site area into the "heart of the city" by providing all major facilities and appropriate environment for living, working, culture and recreation in balanced quantities for the people within its boundaries and also provide a variety of activities to benefit those throughout the region as a whole. Entries must provide residences for at least 5000 families, including housing for the elderly, offices, shopping areas, a community college, expansion of an existing hospital and full recreational facilities.

Head of the jury is Edmund N. Bacon, executive director of the Philadelphia City Planning Commission. Other members are: Vernon Demars, chairman, Dept. of Architecture, University of California; James H. Scheuer, president, Renewal and Development Corp., New York City; William L. Slayton, commissioner, Urban Renewal Administration, Housing and Home Finance Agency, Washington, D.C.; and Harry Weese, Harry Weese & Associates, Chicago. B. Sumner Gruzen, Kelly & Gruzen, is professional advisor.

Registration forms with all details are available from The Ruberoid Co., 733 Third Ave., New York 17, N.Y., or from any of the company's sales

representatives or distributors. All entries must be in the hands of the Architectural League of New York, 115 E. 40th St., New York 16, not later than June 29, 1962.

## Scholarships

Architects between 23 and 30 who have had at least 1½ years architectural office experience, are American citizens, residents, not recipients of other traveling scholarship grants are eligible to compete through the design of an architects' headquarters building for the \$3000 biannual LeBrun Traveling Scholarship. Rendering of the building is due by March 7. For information write W. Miller Wilcox, chairman, LeBrun Committee, N.Y. Chapter, American Institute of Architects, 115 E. 40th St., New York 16, N.Y.

The \$5000 Rotch Travelling Scholarship is open to American citizens under 31 years of age whose record includes study or experience in Massachusetts. Write William G. Perry, Secretary, Rotch Travelling Scholarship Committee, 955 Park Sq. Bldg., Boston 16 before March 1. Applications are due March 19.

University of Pennsylvania Graduate School of Fine Arts offers a number of graduate fellowships in architecture, landscape architecture, city planning and fine arts. Apply to the Dean, Graduate School of Fine Arts, Univ. of Pa., Philadelphia 4 by March 1.

## Edmund Purves Joins Architectural Firm

Edmund R. Purves, F.A.I.A., former executive director of the American Institute of Architects, has joined and is now an associate with the Washington, D.C. firm of Chatelain, Gauger and Nolan, Architects and Engineers.

## FDR Commission Approves Memorial Competition Design

The Fine Arts Commission, Washington, D.C., held a hearing on the Franklin D. Roosevelt memorial design on Jan. 17 and postponed the decision on the design until its next

meeting to take place this month.

Earlier the FDR Memorial Commission voted in favor of the design submitted in the national competition (AR, Feb. 1961, pages 12-15) by William F. Pederson and Bradford S. Tilney of New York. The design, which proposes a cluster of eight perpendicular tablets carrying famous words of President Roosevelt, was approved with the addition of a statue of Mr. Roosevelt, to be in or outside the cluster or before one tablet.

At the Fine Arts Commission meeting, Ralph Walker, architect member, asked a series of questions which received answers from Francis Biddle, chairman, FDR Memorial Commission.

Mr. Walker asked why the design would enhance the reputation of Mr. Roosevelt, why it must be "contemporary," and why it must be made of concrete. Mr. Biddle replied that the President's words and the design will be "living symbols . . . and bring back the memory of his greatness."

Mr. Biddle said concrete is not altogether satisfactory, but it is cheaper. He said some consideration is now being given to use of marble facing if enough money can be raised.

Contemporary design was chosen, according to Mr. Biddle, because it reflects a "period that has been established so firmly we can say that it is American" and Roosevelt himself was "very contemporary."

Praise for the design came from Pietro Belluschi, dean of architecture at M.I.T. and jury chairman for the design competition, who said it "is the first monument . . . where the expression is not derivative but truly creative." Philip Johnson called the proposed memorial "the epitome of mid-20th century art."

Opposition came from John Harbeson, president of the National Academy of Design, who said it is not worthy of a memorial to Roosevelt and called it "disorganized . . . ugly forms . . . and not a symbol of greatness."

Paul Jennewein, president of the National Sculpture Society, backed Mr. Harbeson, calling the form of the design "abstract." Admiral Neil Phillips, representing the Committee of One Hundred on the Federal City said his group opposes the memorial for "wrong time and wrong place" rather than esthetic reasons. A memorial should not be built until 50 years after a man's death, he said.



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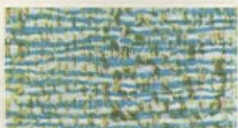
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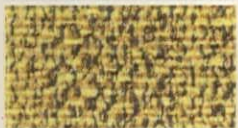
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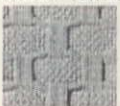
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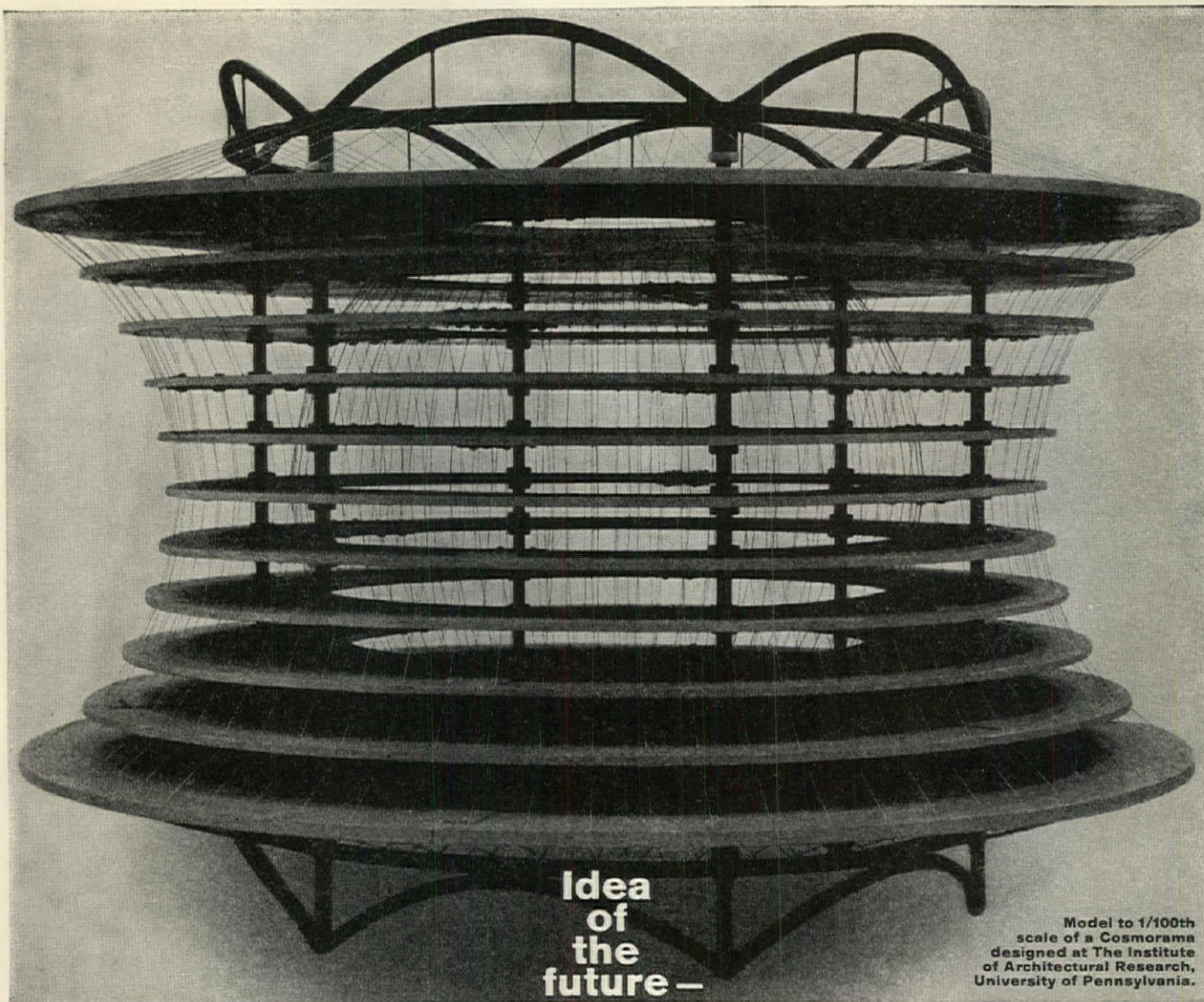
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Model to 1/100th scale of a Cosmorama designed at The Institute of Architectural Research, University of Pennsylvania.

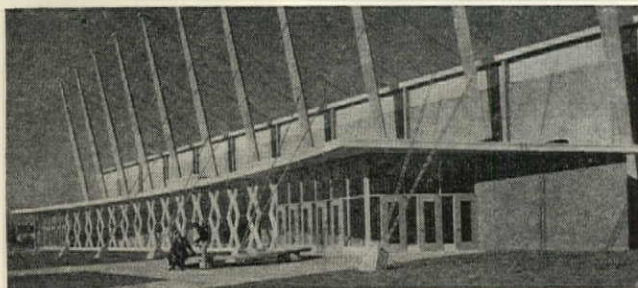
Like to take a trip through space without ever leaving Mother Earth? This model of a Cosmorama, which would simulate space travel for 40,000 spectators much as a planetarium simulates views of the heavens, gives an idea of how it might be done in the not-so-distant future. The completed building would be 30 stories high, with the inner hollow sphere 330 ft in diameter.

However imaginative the idea of the Cosmorama may seem, its construction is practical in the extreme. It is based on the principle of the suspension system. This principle, pioneered by Roebling, is being utilized by

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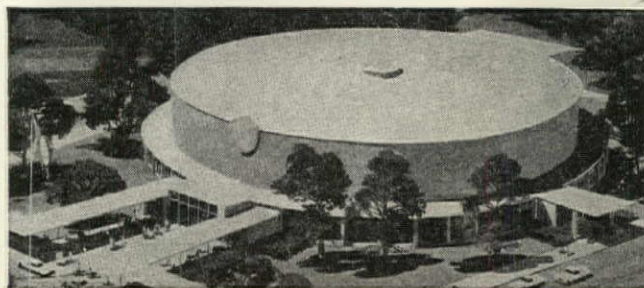
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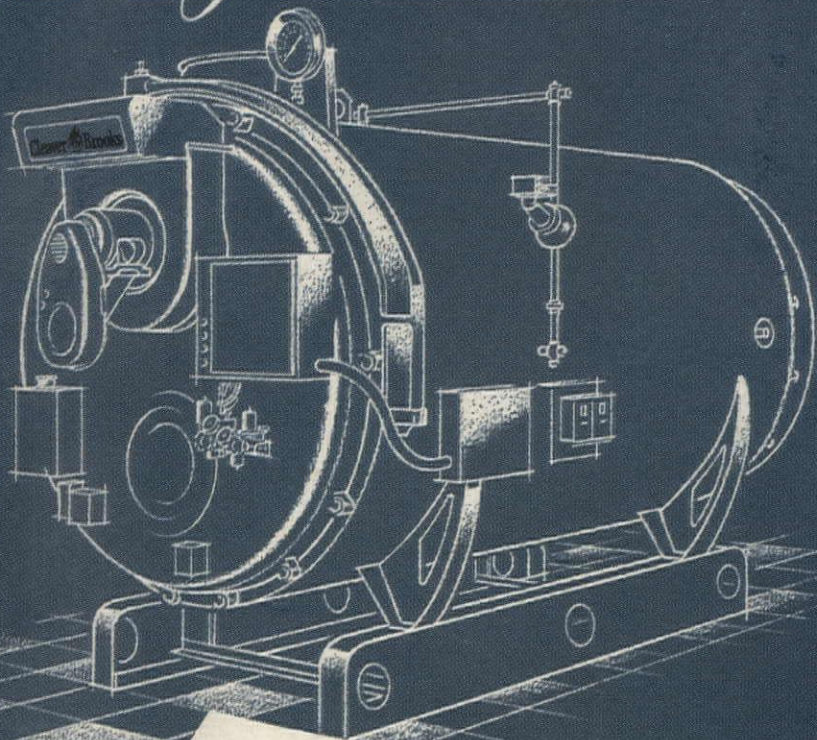


Utica Memorial Auditorium, N. Y. Architects: Gehron & Seltzer, N. Y. City. Associate Architect: Frank C. Delle Cese, Utica. Consulting Engineer: Dr. Lev Zetlin, N. Y. City. Contractor: Sovereign Construction Company, Ltd., Fort Lee, N. J. Roof Supporting Structure, Including Cables, Furnished and Erected by Roebling.

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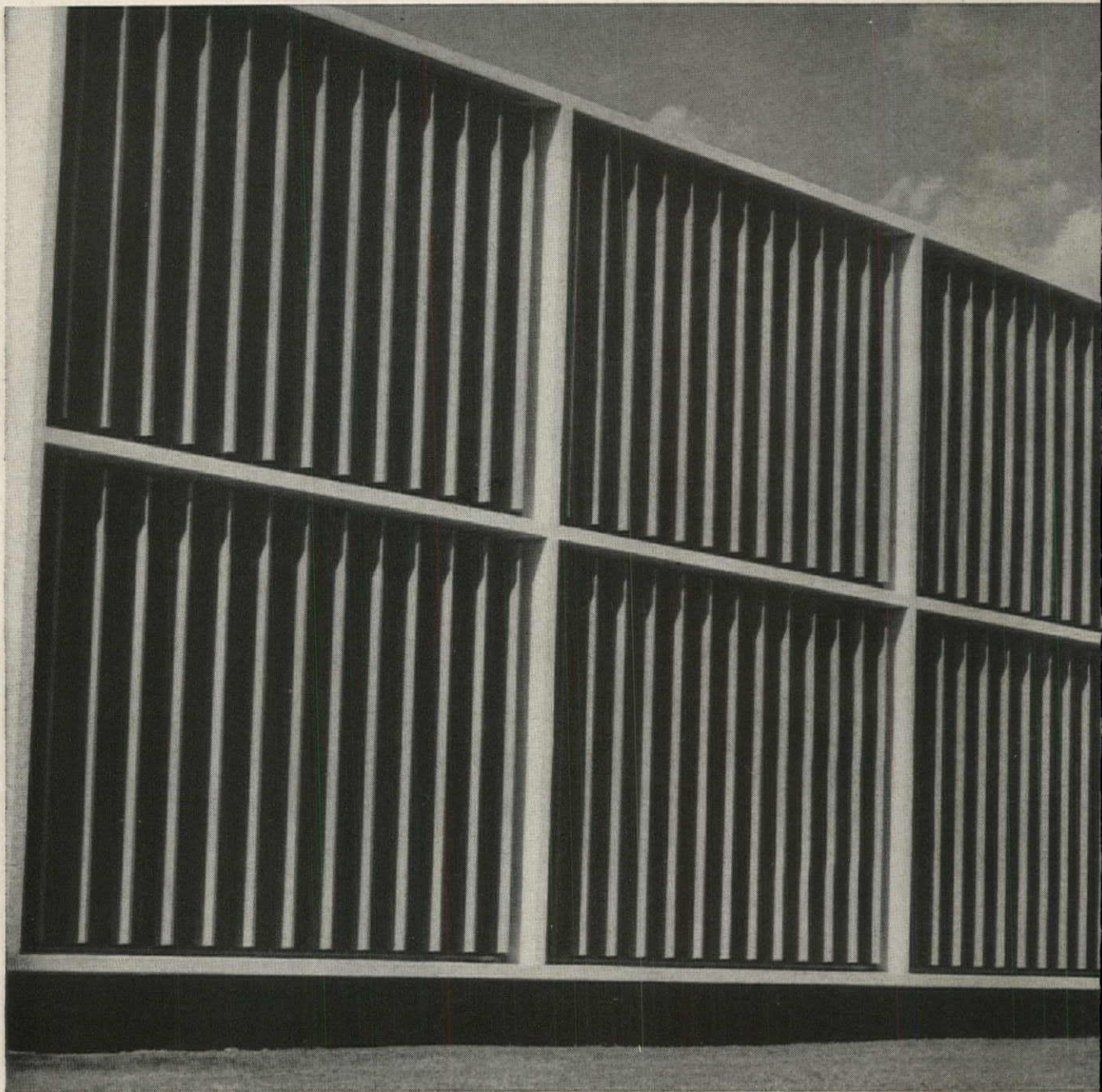
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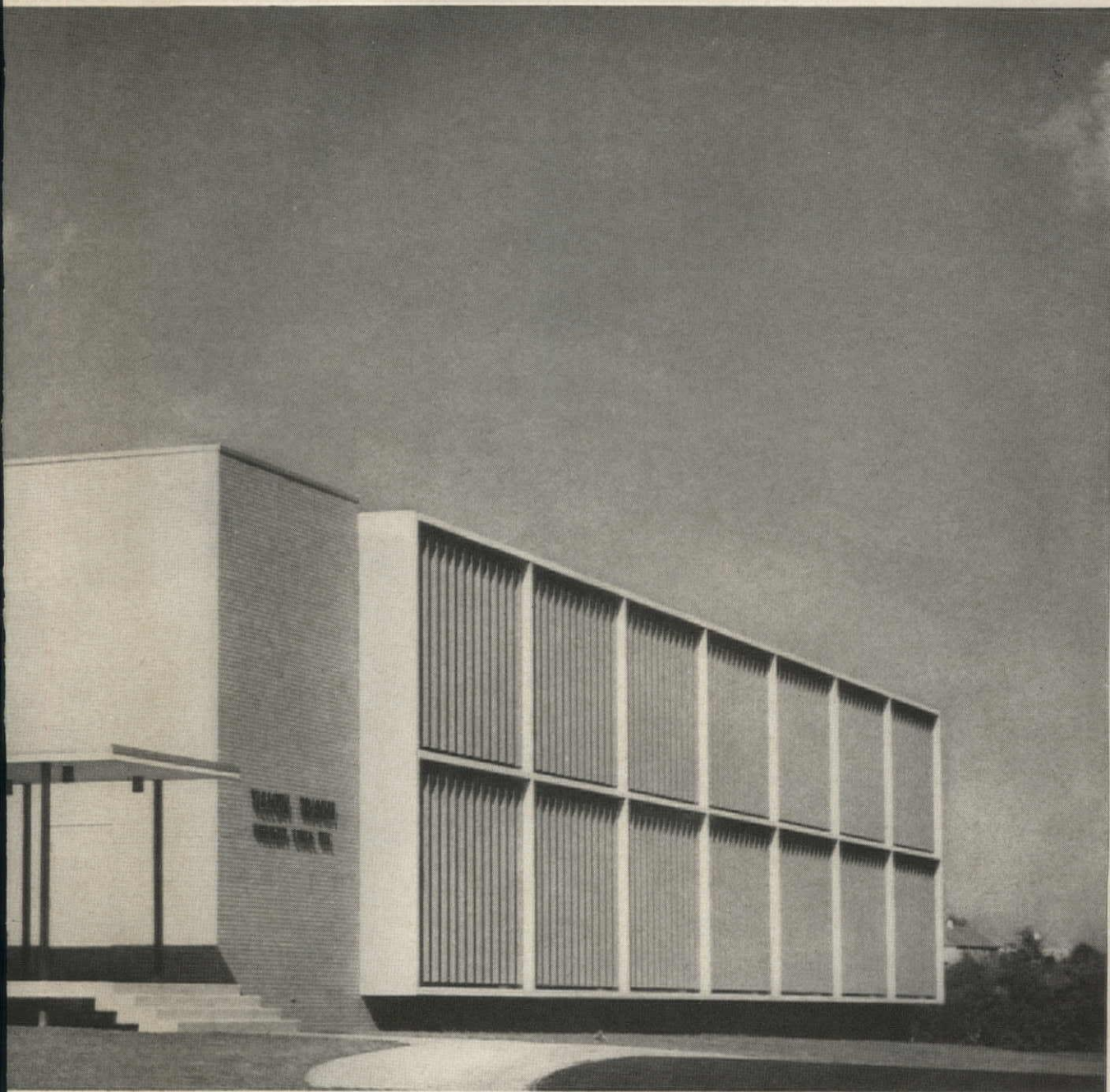
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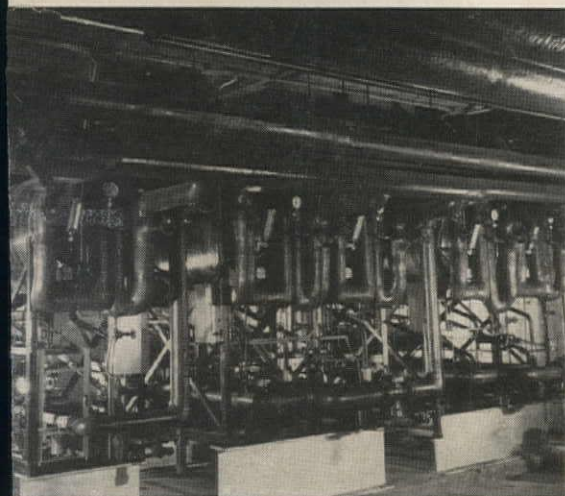
*Architect: Folger & Pearson;  
Mechanical Contractors: Troug & Nichols.*





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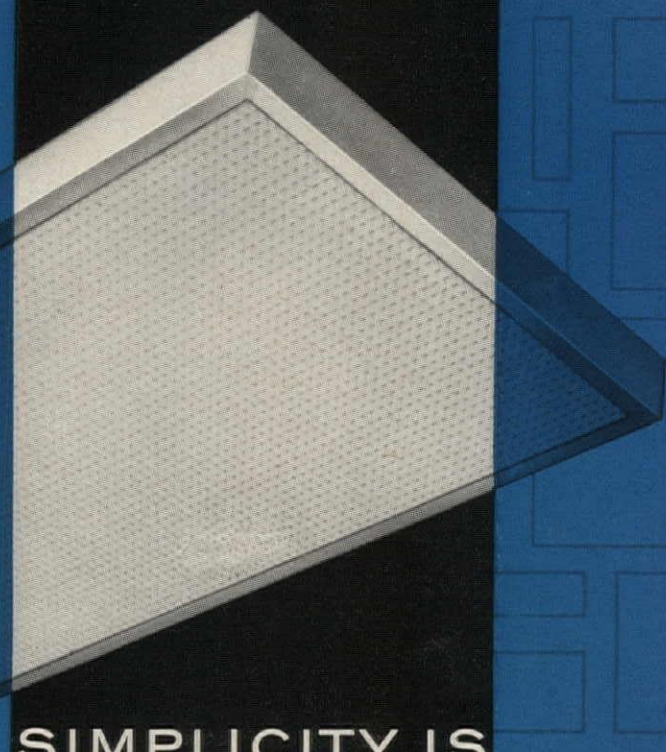
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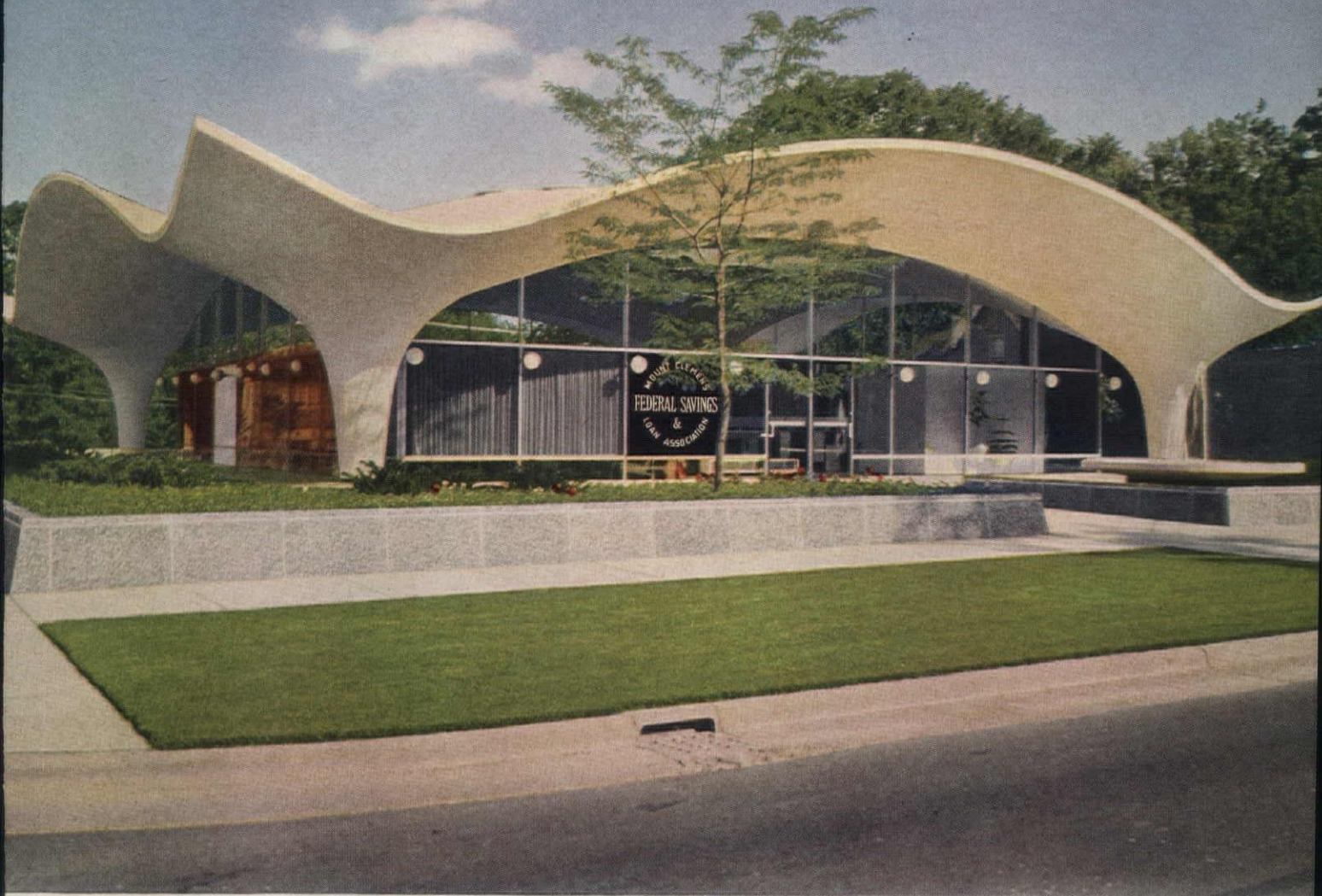
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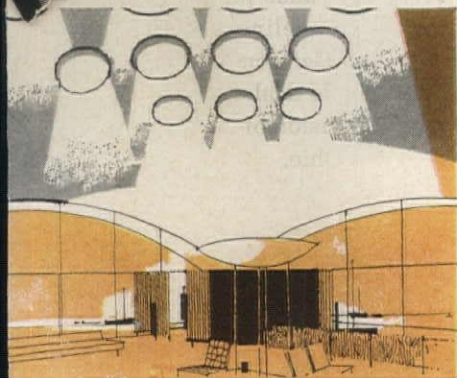
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Mount Clemens Federal Savings and Loan Assn., Mount Clemens, Mich. Architect: Meathe, Kessler and Assoc., Inc., Grosse Pointe, Mich. Photo by Baltazar Korab.

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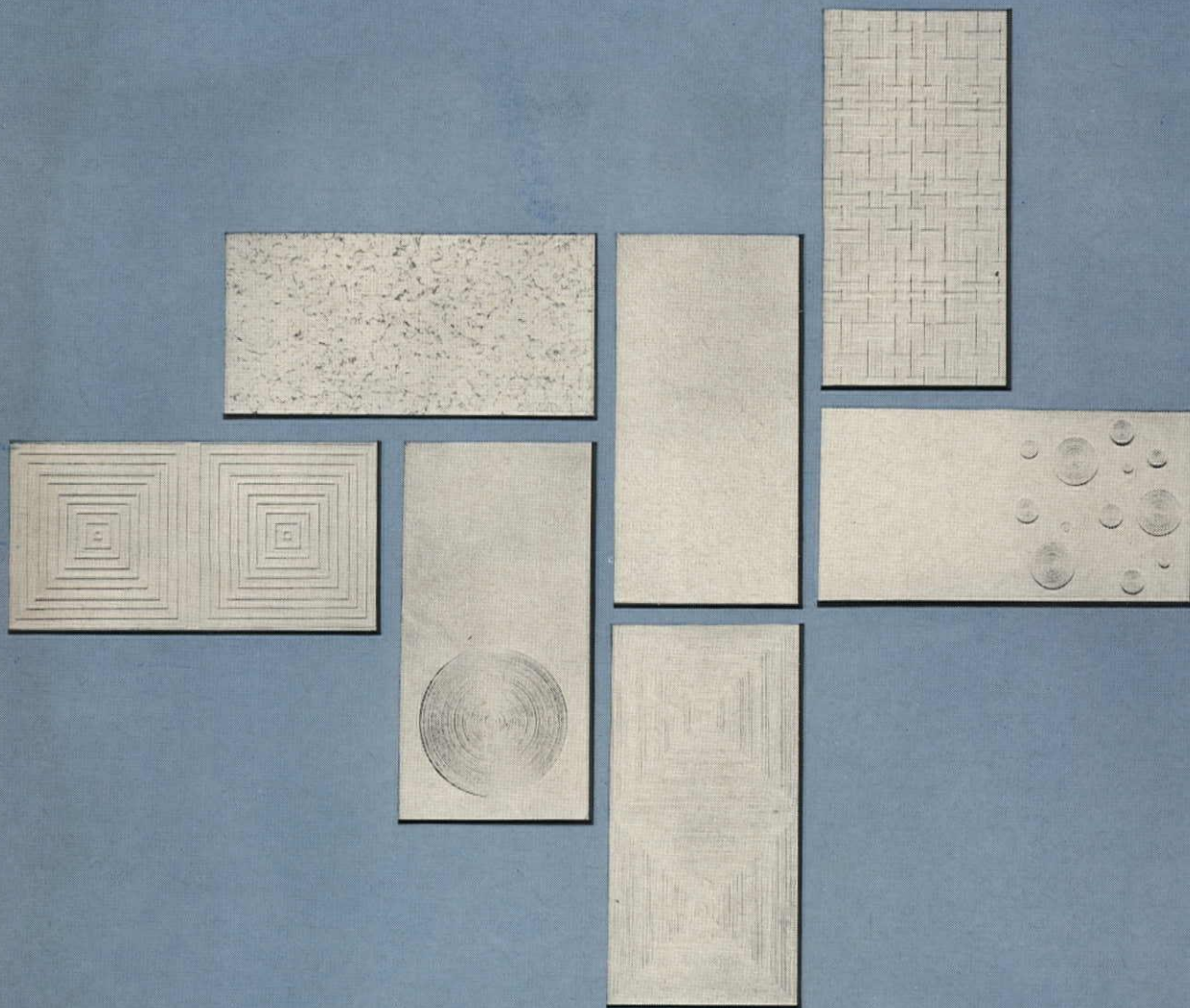
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# Required Reading

Hare Window, Paderborn Cathedral, 16th century  
—from *Sculpture on Buildings*



## The Modern Dilemma

ARCHITECTURE AND THE ESTHETICS OF PLENTY. By James Marson Fitch. Columbia University Press, 2960 Broadway, New York 27. 304 pp., illus. \$7.50.

The *architecture and esthetics* of Mr. Fitch's title are American, although, he points out, American architecture and esthetics have from the beginning been "acquisitive," relying on imported forms and ideas. The *plenty* of the title is not the American ability to pay for consumer goods, but rather a multiplicity of materials, forms, designs, engineering devices.

Mr. Fitch does not maintain that such multiplicity is bad. He does say that it is extremely confusing to designer and consumer alike, and that, on evidence currently visible, its applications have been detrimental to architecture, esthetics and the human being. The engineer, whose field is so enormous and who can apparently do anything as long as cost is not counted, has been forced to specialize, and has been allowed to concentrate on numbers to the exclusion of the people for whom all this "comfort" has been designed. The architect, embarrassed by an all but terrifying richness of available materials and forms (at the same time that architectural philosophy has veered back to formalism), worries about the esthetics of his work, and leaves the engineer to worry about the function of the building, no one to worry about the functions of the tenants. The industrial designer is so far removed from the user of his product that he must rely on objective prefer-

ence surveys in order to do his work, and finds it next to impossible to inform his design with real and personal concern for the user. The consumer is left to choose from a bewildering array of goods, often without understanding at all their worth or their operation, and with no rebuttal except boycott. All this, the reality of the dream of plenty!

Such a summary makes Mr. Fitch seem more pessimistic than he is. He does find mitigating pleasures in the American architectural scene. And one can assume that if he cares enough to write, and if he expects others to care enough to read, he cannot feel that all is lost. But neither can he prescribe or predict. It remains to be seen whether or not the application of social responsibility and common sense can pull American design back into the world of real people. It remains to be seen whether some of the new nations just now industrializing can accommodate mass production to esthetics. And it remains to be seen whether there needs to be, or can be, "a reconstruction not only of human society but of human consciousness as well."

## At Home with the Mighty

GREAT HOUSES OF EUROPE. Edited by Sacheverell Sitwell. G. P. Putnam's Sons, 200 Madison Ave., New York 16. 320 pp., illus. \$22.50.

A short time's immersion in the pages of this large-format book takes one a long way from the age of the split-level ranch-type house—as far as the split-level ranch-type house can get from the "Orders," from

Veronese frescoes, from inlaid marble floors, or from Rococo gilt-plaster.

There are 40 "houses" included here, ranging from Renaissance palazzi through English country manors, from German Baroque creations through royal residences in almost every country on the Continent. The texts accompanying each building were contributed by a number of writers; the photographs, which are handsome, were specially taken by Edwin Smith.

One not very curious but possibly significant fact makes itself felt in these photographs: houses ought to be lived in. The classic palaces full of such anachronisms as light bulbs, telephones and gardening tools seem immeasurably more like "great houses" than those left pure and empty. A recent off-Broadway comedy featured a character hired by the family to come in once a week and "eat up the food." Maybe it wasn't such a crack-brained notion. Maybe some of these houses are going to waste—not just as housing, but as architecture—for lack of a few homely signs of vitality.

## The Arts Allied

SCULPTURE ON BUILDINGS. By Urs Boeck. Universe Books, Inc., 381 Park Ave. South, New York 16. 30 pp., plus 208 plates. \$12.

In his preface, the author deplors the 19th century practice (inherited by us) of seeing sculpture separate from architecture. He also regrets the 20th century practice of seeing both architecture and sculpture in two-dimensional photography.

*continued on page 53*





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Scientific tests show that panels made with 100% LUCITE acrylic sirup retain 98% of their original gloss after 2,000 hours in the Atlas Weather-Ometer. After three years of exposure in South Florida, acrylic panels show no appreciable change in color and a maximum loss of light transmission of only 11%. ■ On the other hand, "modified", "light stable", or other conventional panels fade severely after only 1,000 hours in the Weather-Ometer. They lose much of their gloss and they suffer a loss in light transmission of 30% to 60% in South Florida tests. ■ Be sure to specify panels made with 100% Du Pont LUCITE acrylic sirup. For more information, mail the coupon at right.

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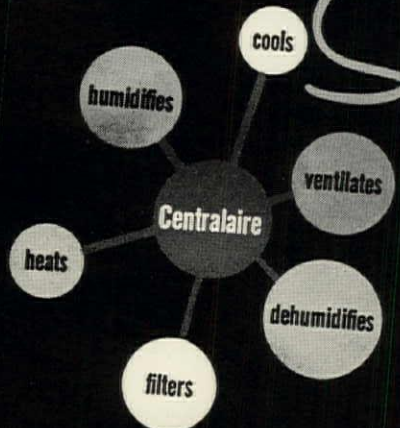
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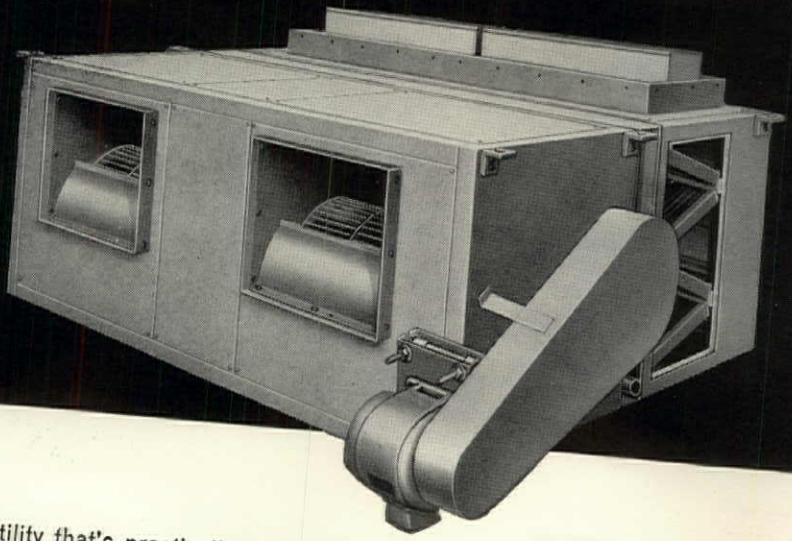
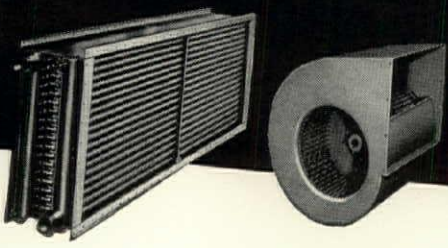
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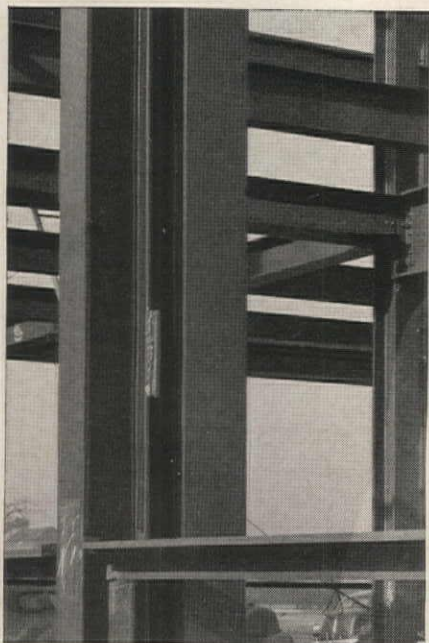
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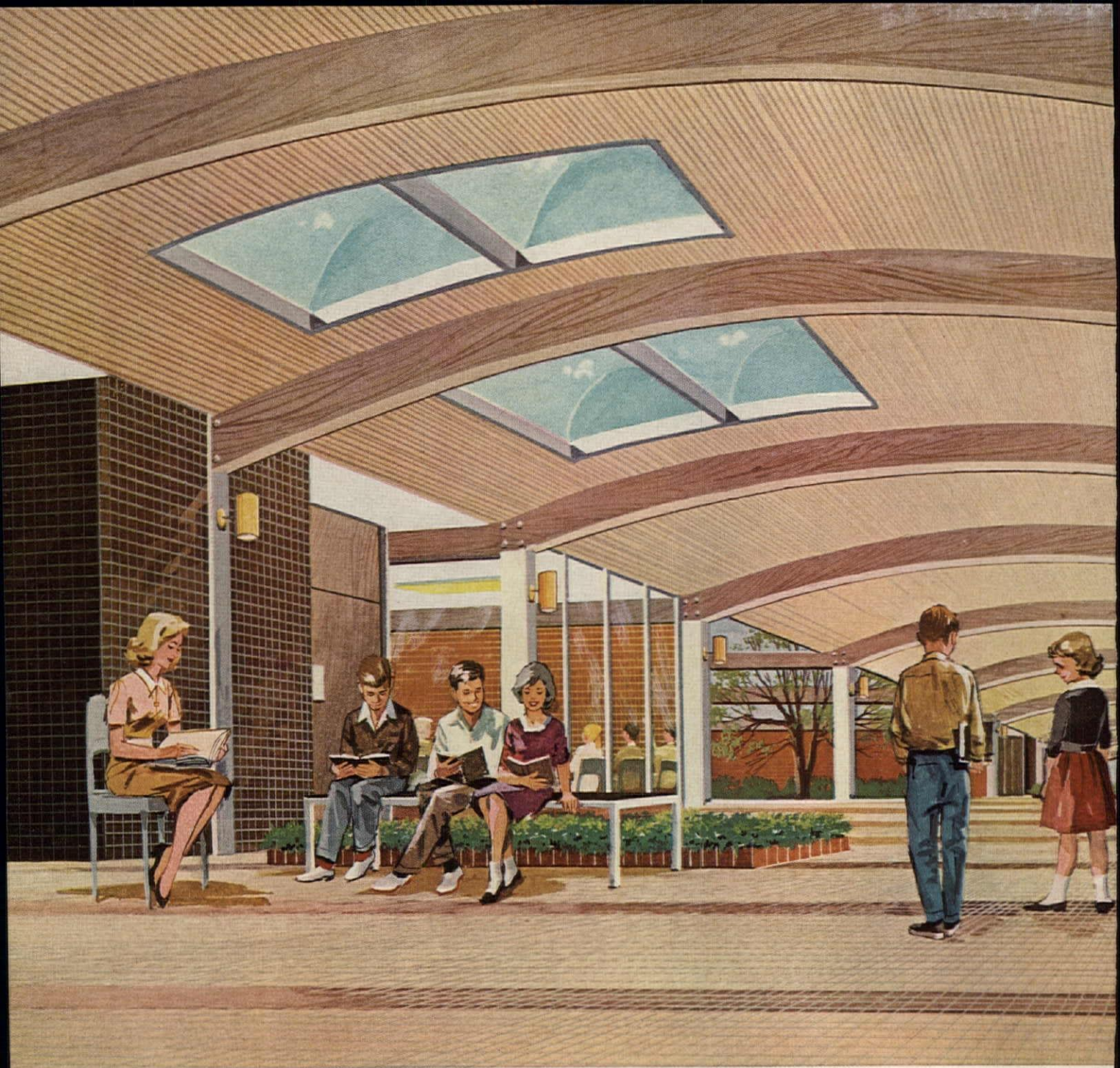
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clients will like the lifelong bonus of minimum maintenance costs that comes with every Ceramic Tile installation.

*The Modern Style*

## Required Reading

continued from page 42

### The Arts . . .

Though he is forced to employ photography, Dr. Boeck has emphasized the importance of structure and texture in the alliance of the two arts, and has shown virtually all his illustrations *in situ*.

It is not surprising that most of these have come from periods, such as the Gothic and the Baroque, that found plain architecture somehow inadequately expressive. There are, nonetheless, some 20th century examples, among them walls sculptured by Henry Moore, Le Corbusier's Modulor relief at Marseilles, and the "analogous atlantes" in Candela's Church of the Virgen Milagrosa.

The plates—208 of them—occupy most of the book. They are splendid. But one wishes that the captions might have been more detailed and might have appeared nearer the illustrations.

### Received and Noted

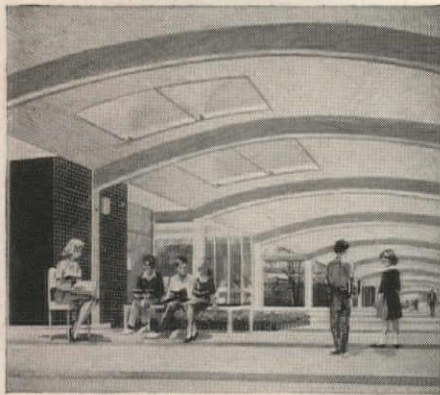
PLANNING ATOMIC SHELTERS: *A Guidebook for Architects and Engineers. Edited by Gifford H. Albright. The Pennsylvania State University Press, University Park, Pa. 196 pp., illus. \$10.*

Based on research sponsored by the U.S. Naval Civil Engineering Laboratory, this book bases its contents on the assumption that "integrated convertible shelters can be incorporated within conventional spaces, without decreasing the efficient performance of normal functions or creating windowless monstrosities."

THE ARCHITECTURAL REQUIREMENTS OF PROTESTANT WORSHIP. *By Victor Fiddes. The Ryerson Press, 299 Queen St. West, Toronto, 2B, Ont. 119 pp., illus. \$5.*

A readable definition of the demands of liturgy, theology and community (both historically and functionally) on the form of the Protestant church, looking with suspicion upon contemporary efforts to invest church buildings with emotionalism and a "dim religious light."

continued on page 62



Design for a modern school corridor by Caudill, Rowlett & Scott

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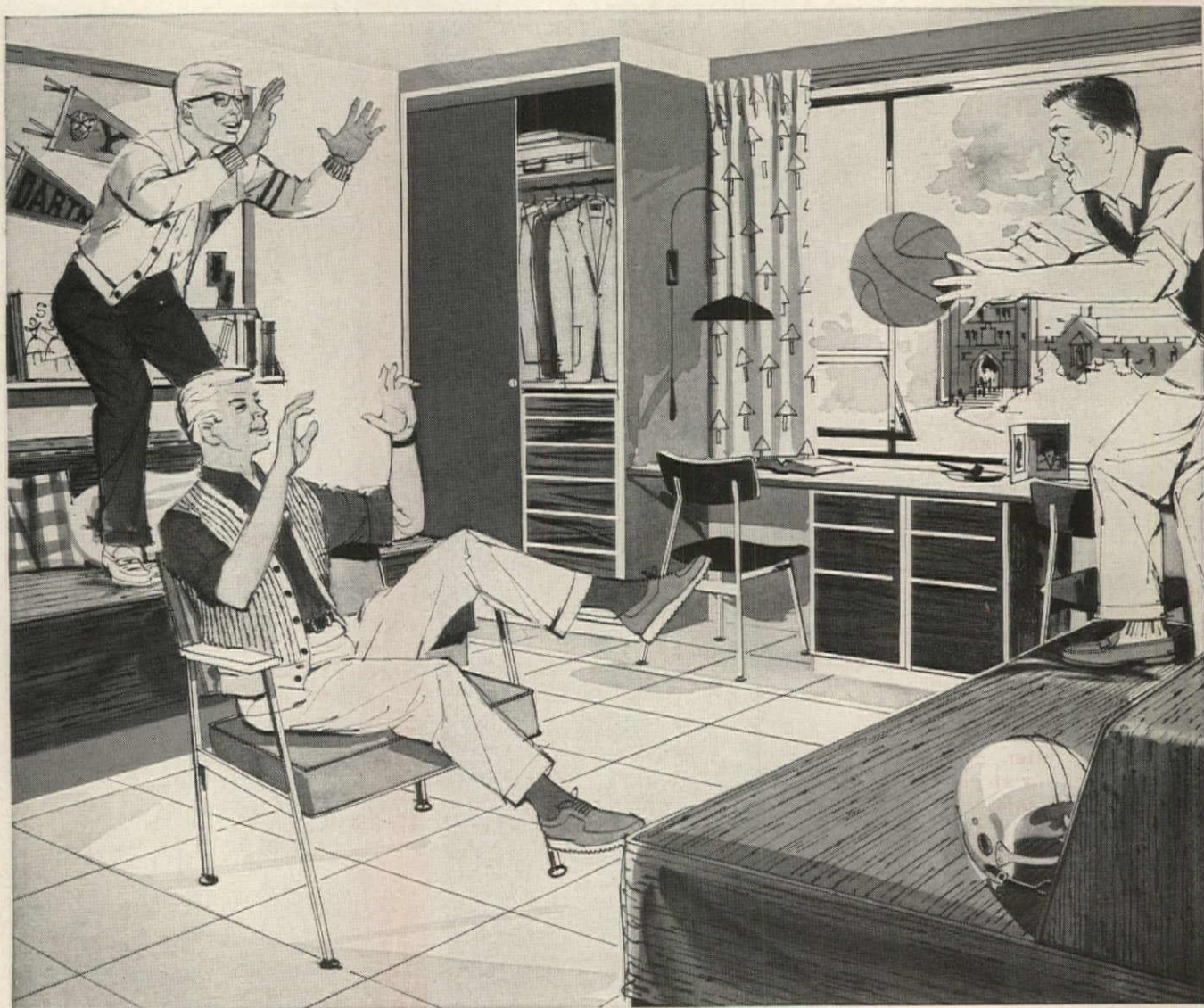
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AIA FILE NO. 12-H  
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## ARCHITECT'S GUIDE TO Nickel Stainless Steel Flashings

... design principles & details

... specification data



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Now, for the first time, architects, engineers and specifications writers can get complete, up-to-date information on the design, specification, fabrication and installation of nickel stainless steel flashings. It's all here in this new 24-page booklet.

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without sacrificing performance. The text is illustrated with twenty detail drawings taken from actual installations.

**Yours for the asking.** "Architect's Guide To Nickel Stainless Steel Flashings" will be off the presses soon. To get this valuable booklet on your reference shelf, simply drop us a postcard today.

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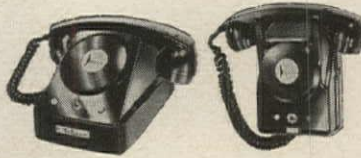
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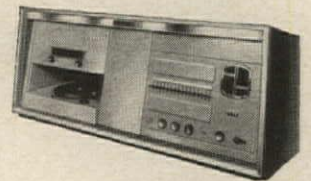
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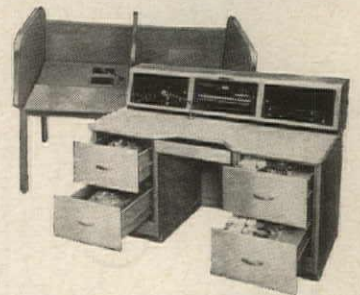
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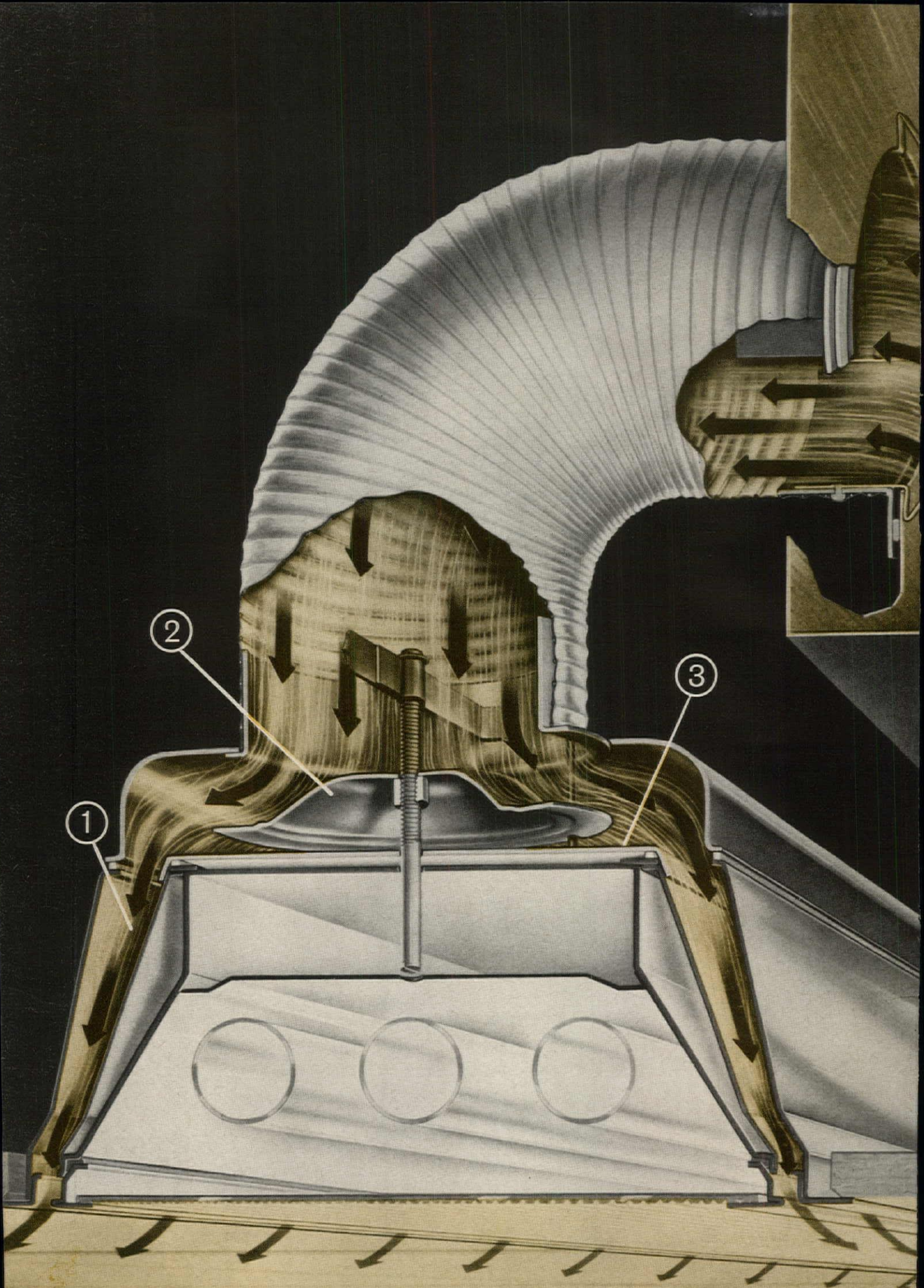
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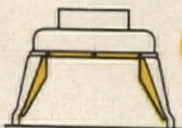
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Before you specify any air-handling troffer

## Take another look at Lumi-Flo advantages



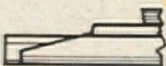
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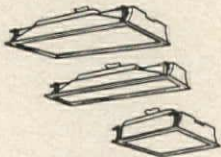
**3** SHALLOW DEPTH GIVES YOU MORE  
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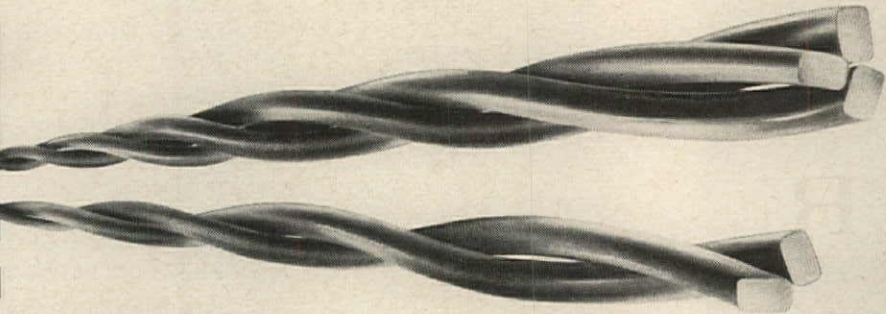


## Architects, Engineers! You Can Profit From Exchange Of Ideas By The Prestressed Concrete Industry

There is an attitude in the *Prestressed Concrete Institute* not prevalent in many other similar groups. At the 9th Annual Convention in Denver, engineers, designers, producers and educators gave each other details of their engineering advancements. It happens in every meeting whether in Denver, Berlin, Miami—and it will take place in Rome next year. What does this mean to architects and engineers

interested in designing to attain equal or greater structural strength with less concrete and less steel?

It means that this group which shares its knowledge and experience for the mutual benefit of the industry is better prepared to give full support in the employment of this new concept in design and construction.



New steels are born at Armco

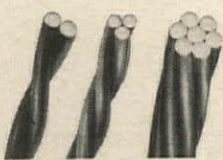
### Strength Factor of Prestressed Concrete Increased By Union's Research Laboratory

The rapid growth of the Prestressed Concrete Industry has been called glamorous. But the developers of this industry well know that architects and engineers do not base specifications on glamour.

The collective efforts of the industry is directed at giving you greater design freedom. Some new trends are: Double Wall T-panels for storage buildings and docks, wider coverage units, hollow core prestressed slab and many others. Also the effort is directed at finding new markets, new applications and, most importantly, technological development of greater strength factors.

A remarkable advancement in this field comes from the research and development center of Union Wire Rope, Armco Steel Corporation.

### Still Readily Available UNION'S ORIGINAL Tufwire



Tufwire for post-tensioning—Tufwire Strand—widely used since the beginning of prestressing in America will continue to be manufactured in unlimited quantities. It is available in coils, wooden reels and the New Tuf-Pak.

I-T-62

### New Union Tuf-Lock\* Strand Locks Itself in Concrete—Increases Bond Strength up to 100%

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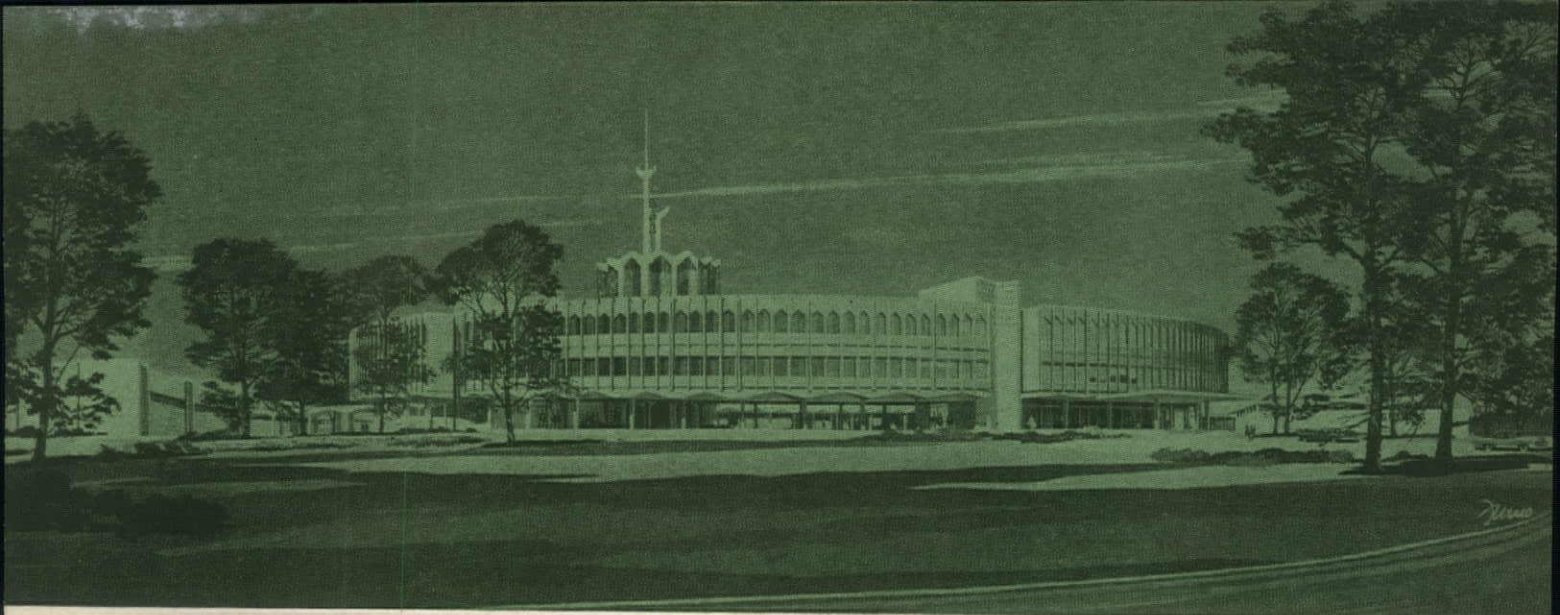
**FREE Brochure** provides information on the physical properties of all Union prestressing products, including the increased bonding qualities of new Tuf-Lock Strand. Also gives methods of shipment including the new Tuf-Pak which makes possible shipment of longer lengths. Write **Union Wire Rope, Armco Steel Corporation, 2312 Manchester Ave., Kansas City 26, Missouri.**

\*Pat. Applied for



Union Wire Rope





The offices and publishing facilities of the American Baptist Convention's new national center are combined in an enormous—yet graceful—circular building. *Architect*—Vincent G. Kling, FAIA; *Contractor*—Turner Construction Company. Windows by General Bronze have been skillfully detailed to enhance the design's serenity. GB has long been recognized for its ability to translate architectural needs into efficient, trouble-free window systems.

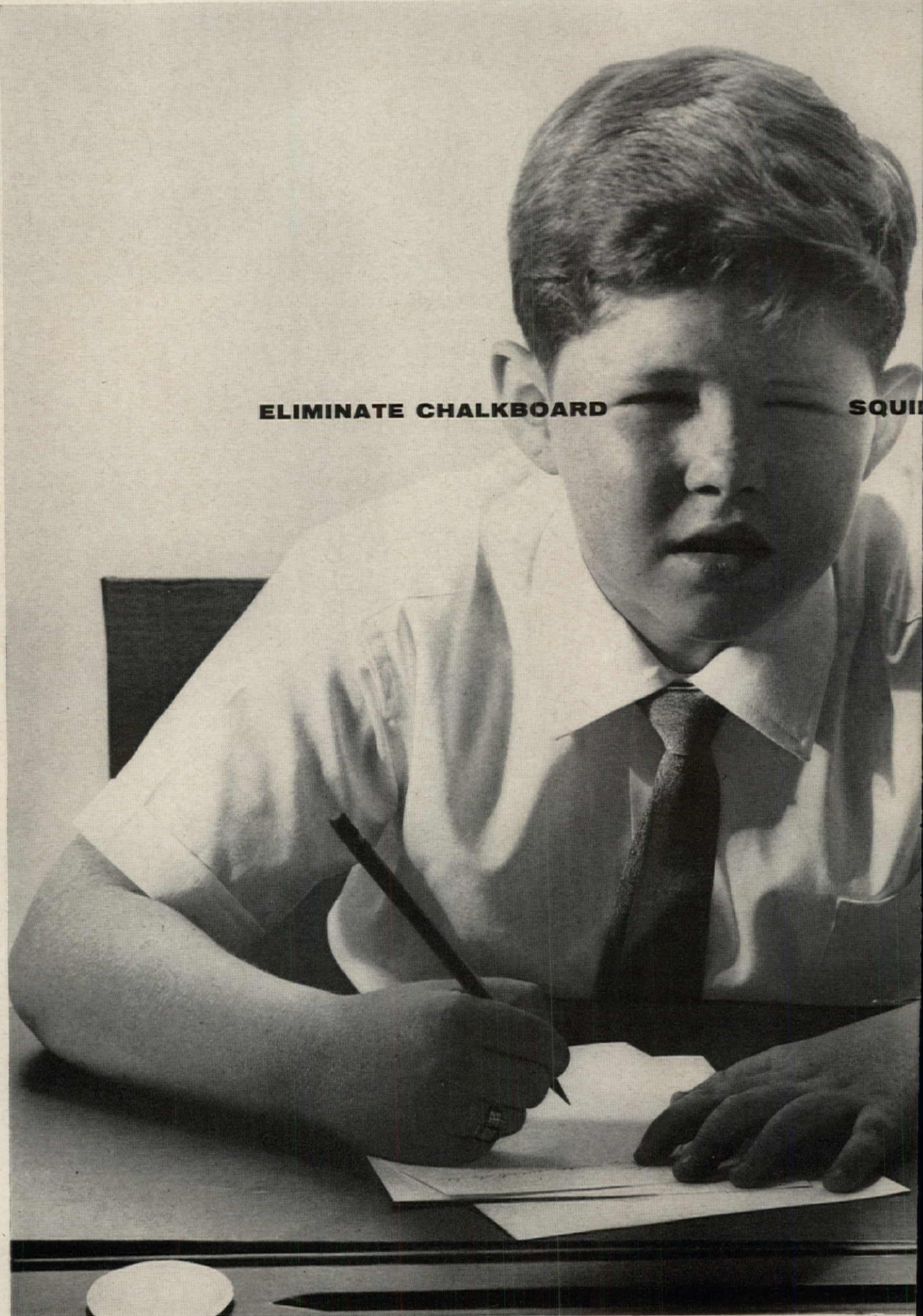
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Princeton University's Engineering Quadrangle dictated an entirely different window architecture. Here, General Bronze worked with *Architects* Voorhees, Walker, Smith, Smith & Haines and *Contractor* William L. Crow Construction Company. For custom-engineered windows—and for curtain walls, architectural metal work, entrances, revolving doors, call on General Bronze Corporation, Garden City, N. Y. Sales Office: 100 Park Avenue, New York, N. Y.





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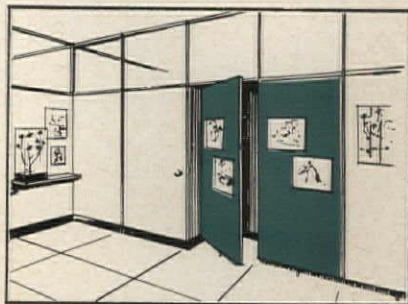
washings, too! Colorlith's asbestos-cement structure takes chalk easily, thus permitting full, unbroken lines for easy readability. And, Colorlith is available in three eye-pleasing colors—Spruce Green, Cameo Brown and Charcoal Gray. Extensive research and testing have proved these colors the most restful to the eyes.

Because of its unique composition, Colorlith retains its excellent properties over the years. For full details on this high-quality chalkboard, write to J. B. Jobe, V.P., Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario. Cable address: Johnmanvil.

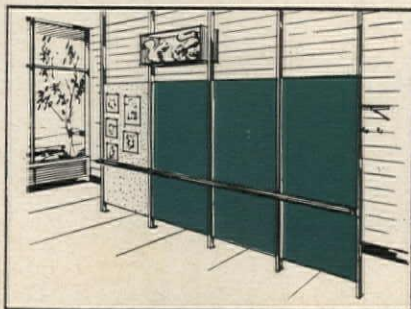
## ADDITIONAL CLASSROOM USES FOR COLORLITH CHALKBOARD



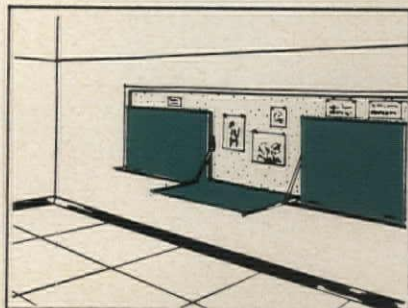
PARTITIONS



DOORS



WARDROBES



CONVERTIBLE UNITS



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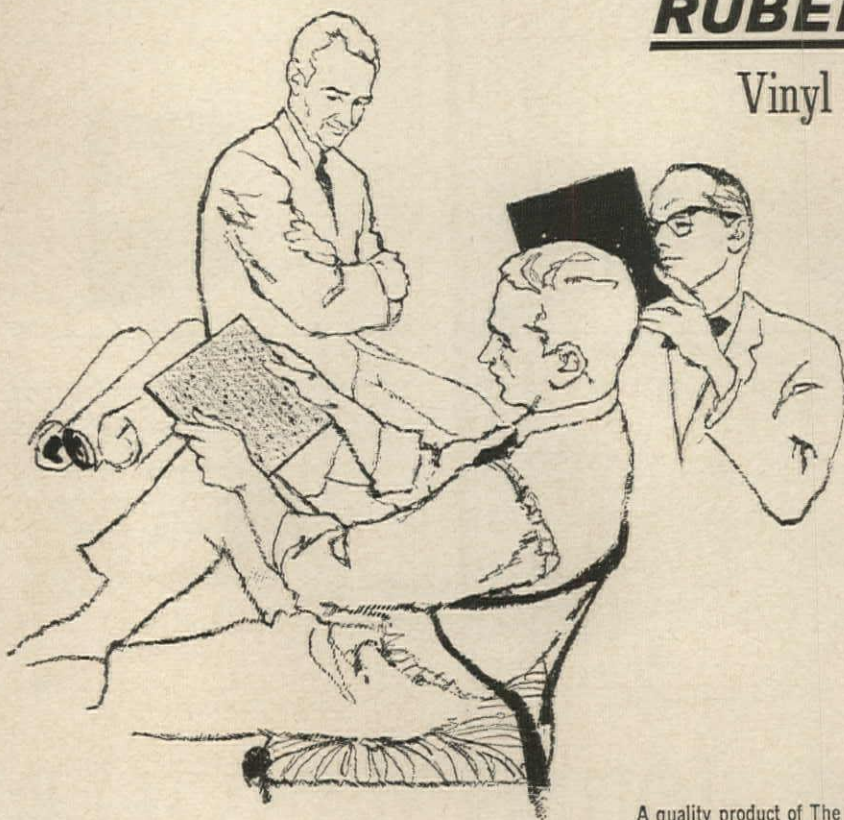
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57 colors—9 x 9— $\frac{1}{8}$ ,  $\frac{3}{32}$  and standard gauge.

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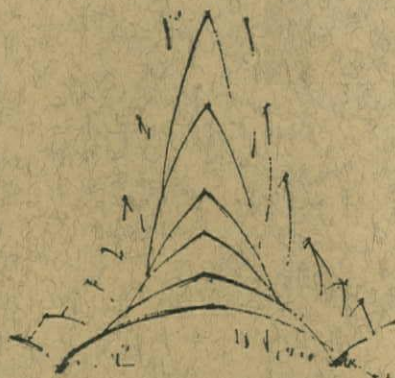


## *New Ideas of* VICTOR A. LUNDY

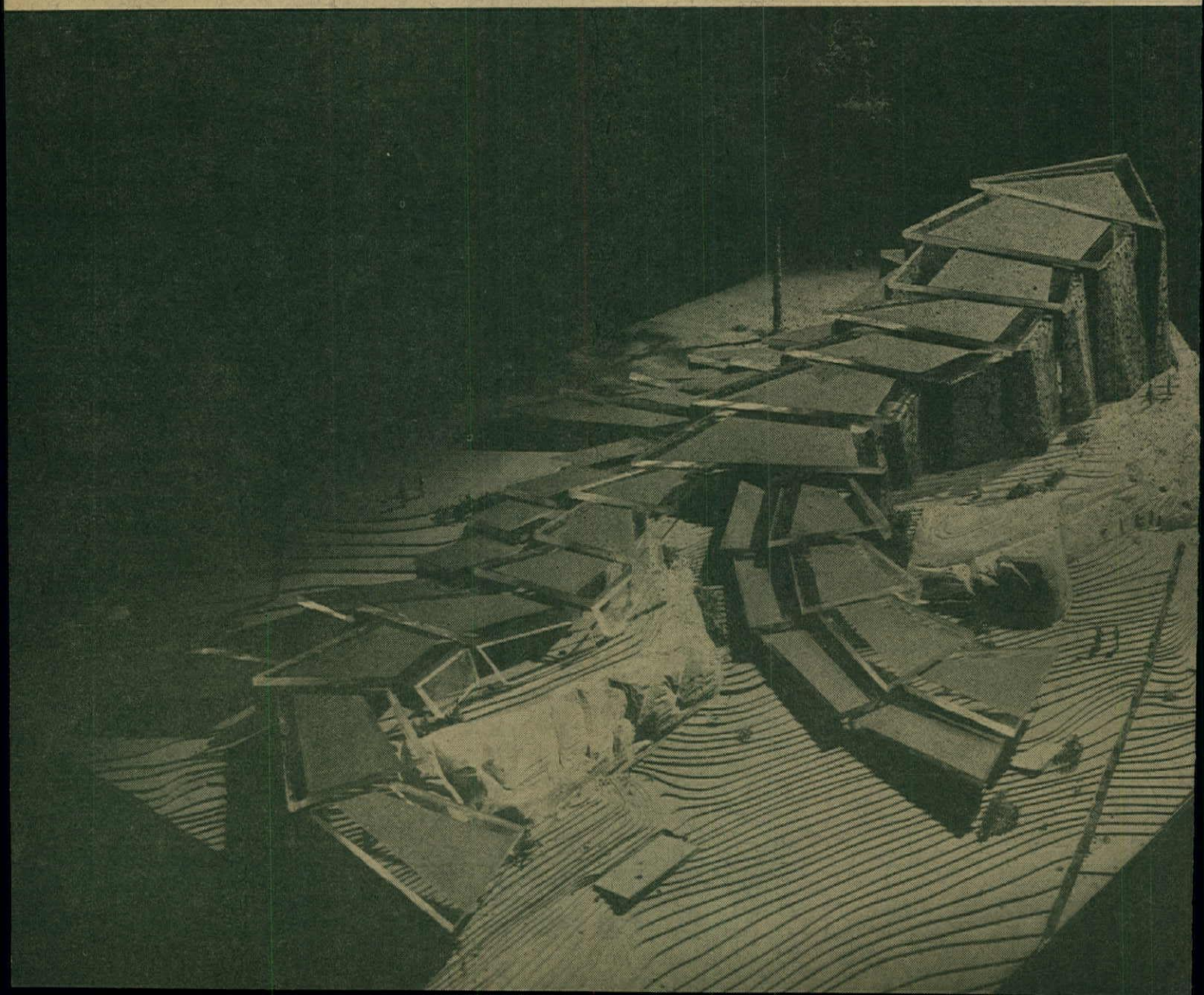
*Architect Victor Lundy's five latest projects reveal the architect as a gifted, creative designer who draws (and paints) uncommonly well. His sketch books are filled with drawings of people, animals, places, sites, architecture, details, design ideas, random notes, project concepts, etc. A few sample sketches are included in this portfolio to supplement the projects in witnessing, at least in part, Lundy's ceaseless and wide ranging search for expressive form. Asked to explain how he designs, Lundy explains: "For me, architectural creation is not a consciously intellectual process—which does not mean it is not intellectual. I feel my way into problems, and keep working inexorably on them in some way or other, mainly by doing. I think with pencil or brush or charcoal; by attacking the emptiness of the paper—or by sculpting the entire building in clay; molding, pushing, worrying it into existence. From the start, the concept is in three dimensions; sometimes it begins with fragments or vague impressions, and builds slowly—at other times I seem to get it all at once. It is a tug of war between working from the outside in while at the same time working functionally from the plan requirements outward; a pushing and pulling to mold the building into its final image.*

*"Design on a project never stops, but continues through the last day of working drawings and details, changing and improving. One learns more about a project every day—in detail when you work with the structural and mechanical engineers, who are most effective when taken completely into the architect's confidence early and made an integral part of the creative team. Sometimes complications may develop because of the nature of compartmentalizing the work to satisfy contractual relationships, but the usual conventional method of dividing the work must bend before better ways of doing things and improvements to the building itself. Such improvements usually develop in all their refinement the longer one works on the project.*

*"My buildings tend to have a strong, easily recognized image, because I try to make architecture say something boldly, clearly, simply. The great ideas in art are not covered over with complicated layers of intellectualism. If one is too conscious of the clever workings of the complex creative mind he may lose sight of what he is meant to see. The great artists are primitives, and what they say touches on fundamental ideas common to many men."*



The model photo at top and sketch above show the design concept for a church in Orlando, Florida. Lundy: "The unfolding concrete arches form arcades. Roofed over in white, they will be like the petals of a giant tropical flower."



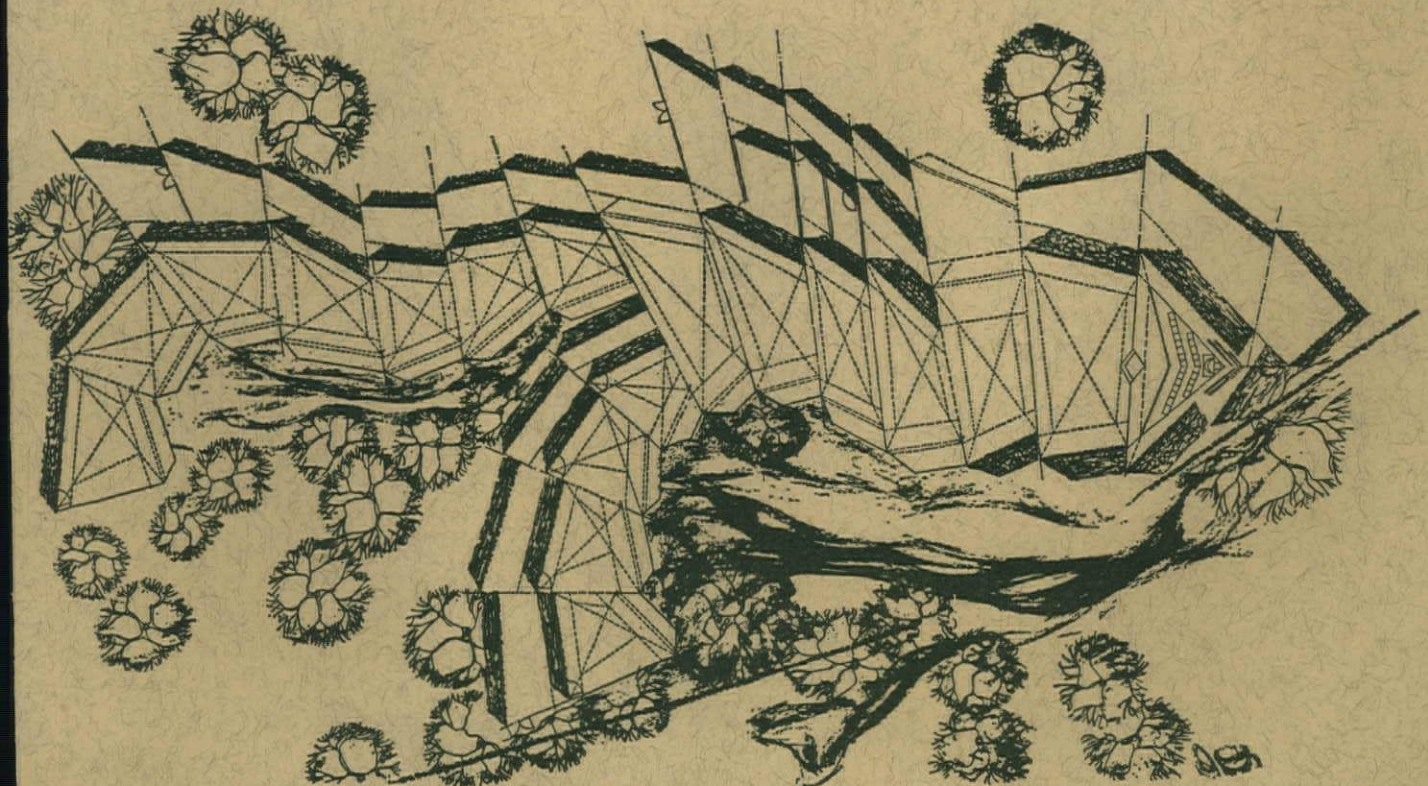
## *New Ideas of Victor A. Lundy*

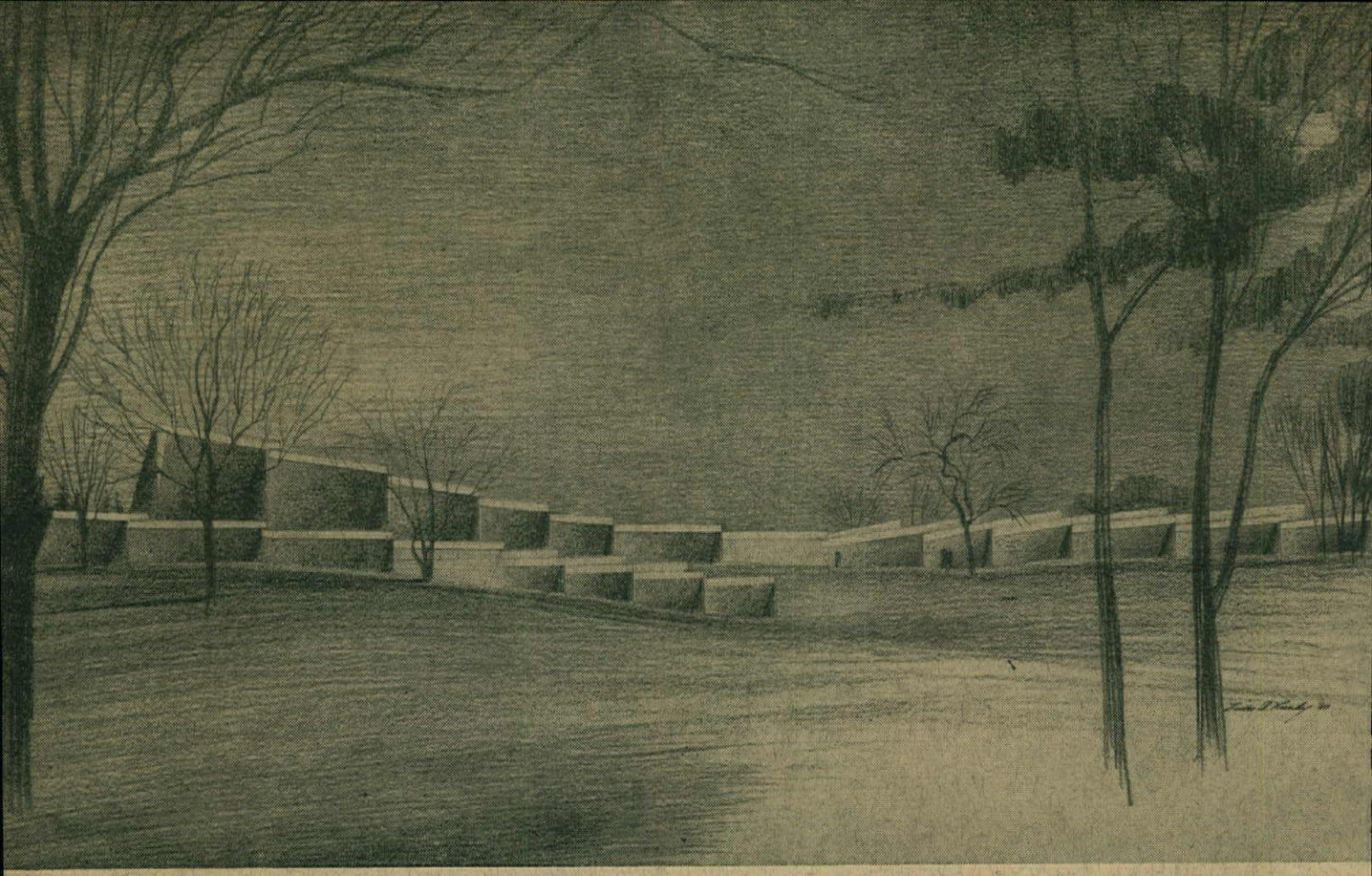
Westminster Unitarian Church  
East Greenwich, R.I.

Lundy: "The site is a unique one, revolving about an interesting rock formation (see sketch) that rises high to form the edge of a plateau with an attractive view of the surrounding Rhode Island countryside. The site demands fulfillment of the Unitarian insistence on man's relation to nature. Therefore the building nestles into the hill, using the stone floor in terraces where that idea will work. Instead of demanding continuing attention from the occupants, the building has to provide space to exist both 'in' what's happening and 'out of' what's happening.

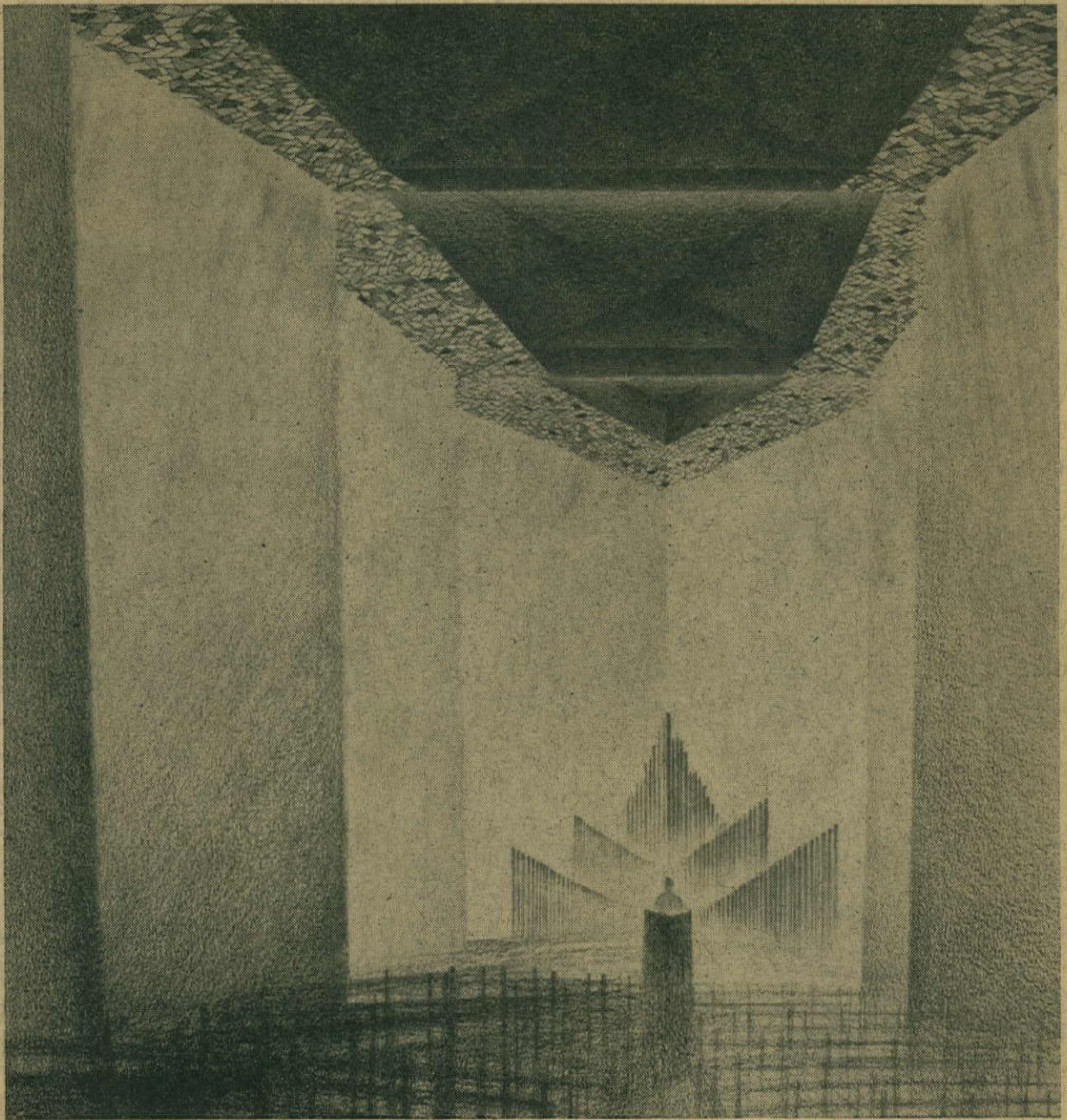
"The building complex suggests that it grew step by step—as it indeed will—and that it is not a finite, closed form, but open-ended, and can be added to without destroying its integrity."

*In plan: the three segments next to the sanctuary prowl at the hilltop form the nave, joined by movable partitions to four segments housing the parlor and parish hall. Offices, kitchen, etc. comprise the flanking element. Two strings of segments forming classrooms meander down the slope*





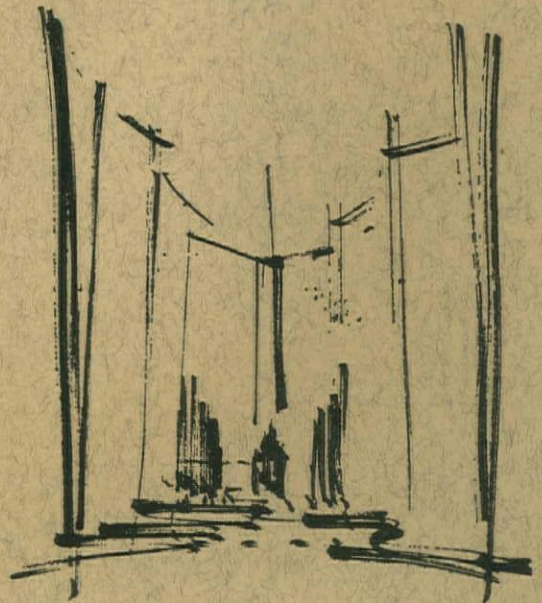


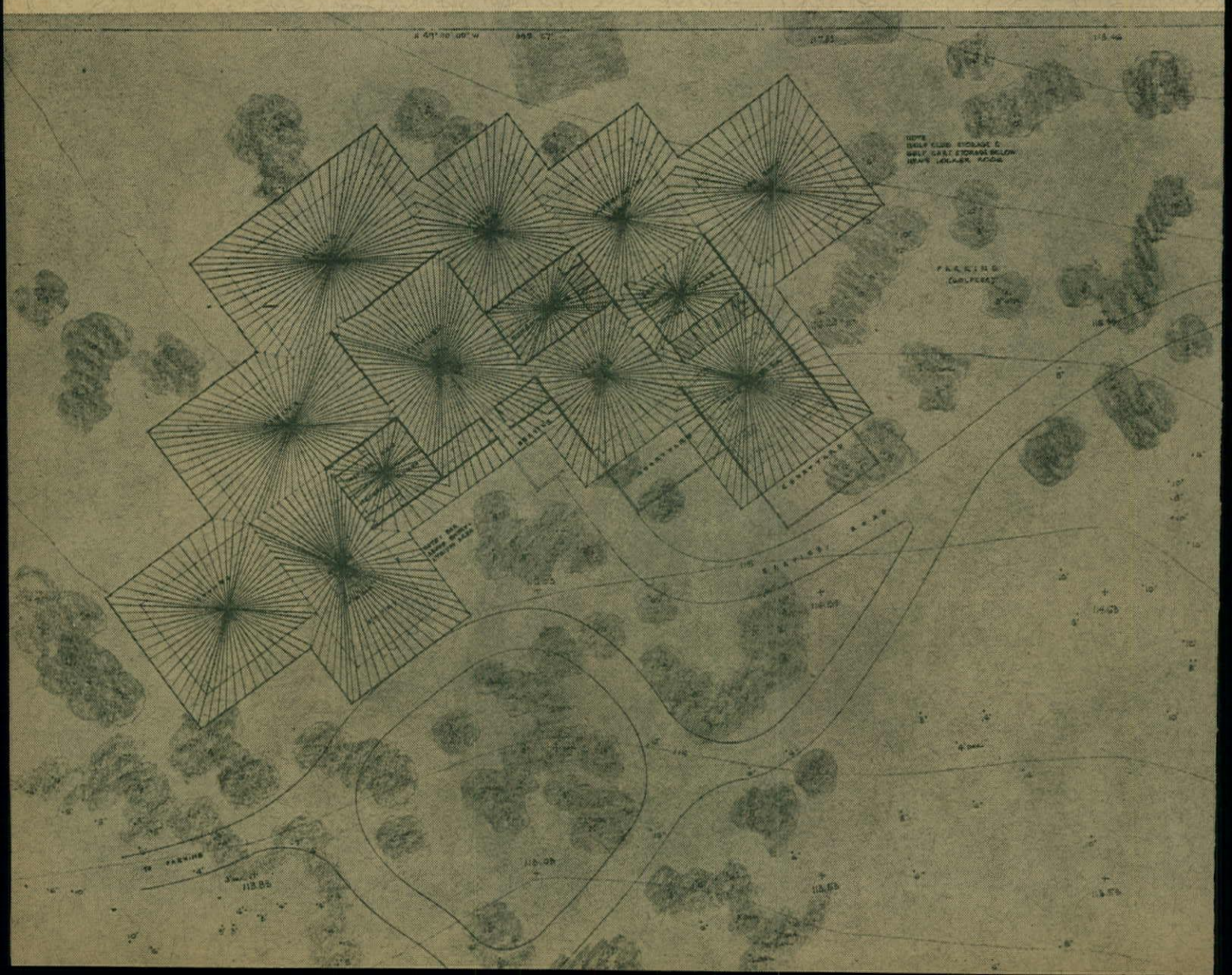


### East Greenwich Unitarian Church

"The rock ledge presents interesting possibilities for use as the actual floor in some cases, or the inclusion of outcroppings in spaces for walls or for other purposes. New England materials will be used: stone and wood, at home with the rocks and trees. Tilt-up walls of concrete and stone, wedge shaped, allowing triangular slivers of light on the stone floors. There are skylights at the edges so each masonry wall is completely released by light, vertically and horizontally. Each space will have its own roof element and structural definition, to form a series of vaulted chambers with a sense of natural growth like a chambered nautilus. Wood truss roofs with shiplapped natural fir boards, defining and articulating each space in an almost ship-like manner.

"The site is not finite, nor is the building. It will present different aspects as one views it from different points. The meandering plan wanders naturally on the site, giving the building a life of its own."



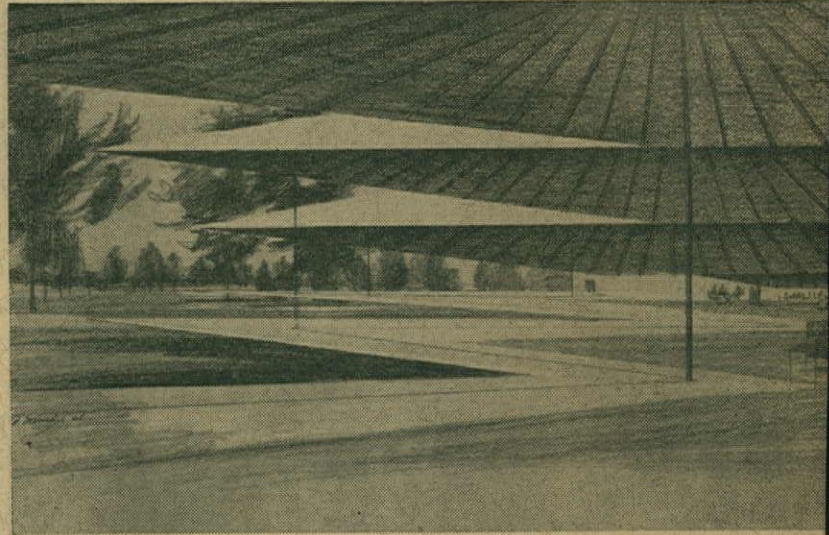


## *New Ideas of Victor A. Lundy*

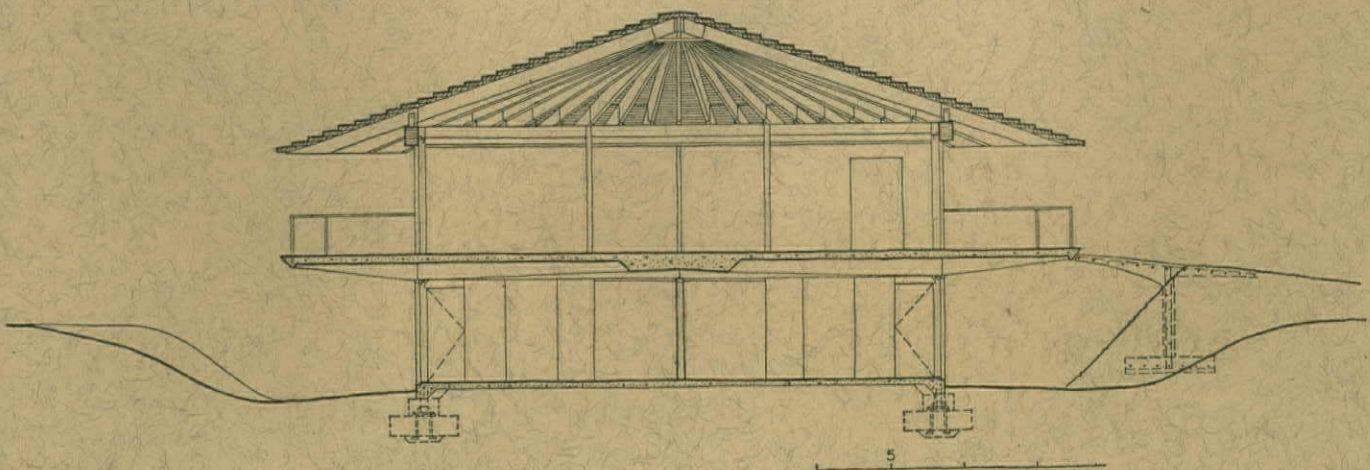
### The Bay Hill Club, Orlando, Fla. Country Club and Golf Club

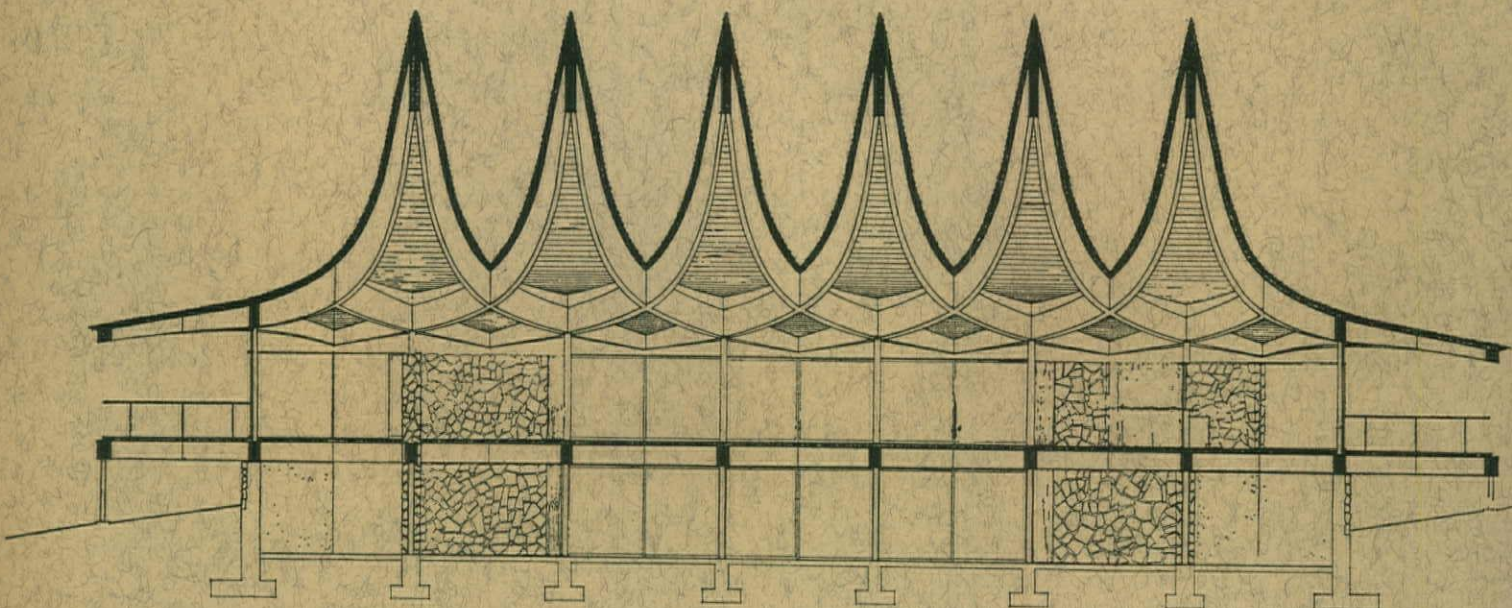
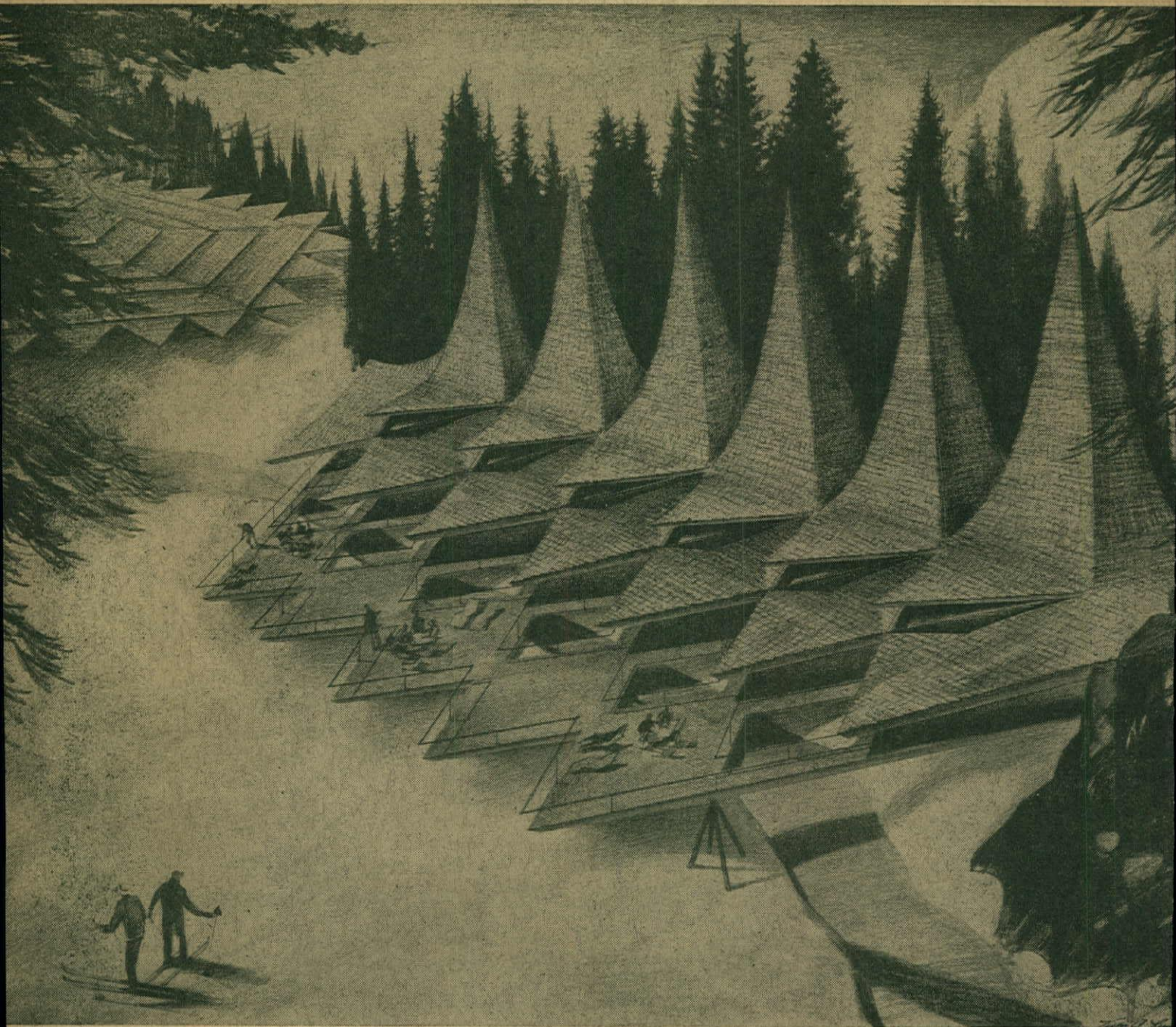
Lundy: "Since the site is beautiful, with equally favorable views in every direction, the first step was to procure a detailed survey of the area reserved for the clubhouse, with each tree carefully located. The plan was worked carefully through the trees, taking advantage of the clearings that were there. Note that the zig-zag front faces the course, so the maximum number of people can see the golfers. The plan is malleable in nature and can grow as needs require, with each element articulated and possessing its own roof structure, a radial system of laminated wood beams which come together in a peak at the center. As the plan develops, the eaves of the various elements will join, so that as one moves from space to space—through dining areas, cocktail lounge, lobby-lounge, locker rooms, etc.—a series of connected and articulated areas and roofs will unfold, joined together in a natural, meandering, informal way.

"The exterior of the roof will be white, stepped delicately for scale, with the underside of warm colored natural wood. There will be great overhangs and shade shelters; the whole will be perched on a concrete base and supported by delicate steel uprights. The reinforced concrete platforms—see section below—are also developed in a radial structural system, and will float lightly over the terrain so it can continue undisturbed."



"The meandering plan is appropriate to construction in stages. The building will grow and develop naturally as needs arise, and as owners and architect learn more about actual working requirements. Working drawings for the first unit (section below), which houses pro shop and locker rooms, sets the tone architecturally for the remainder of the project."



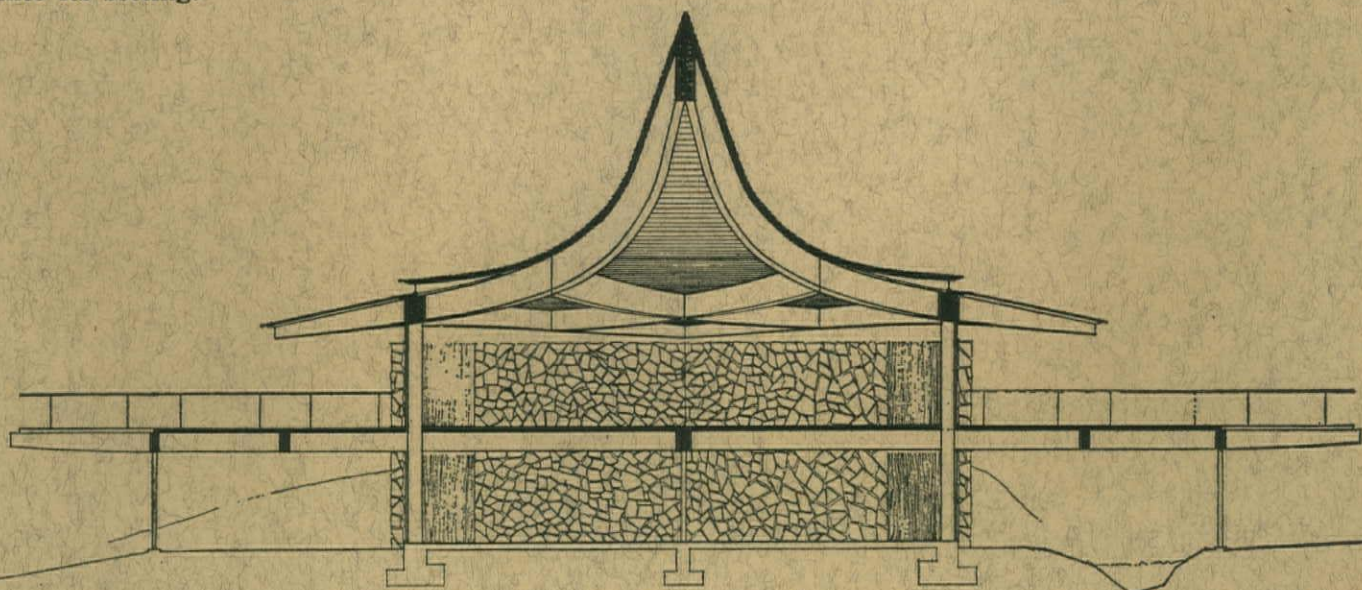
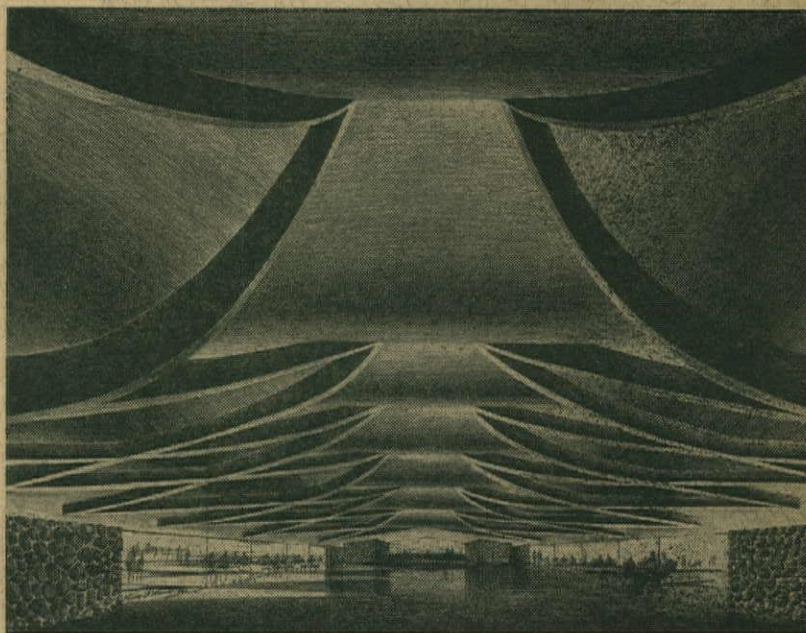
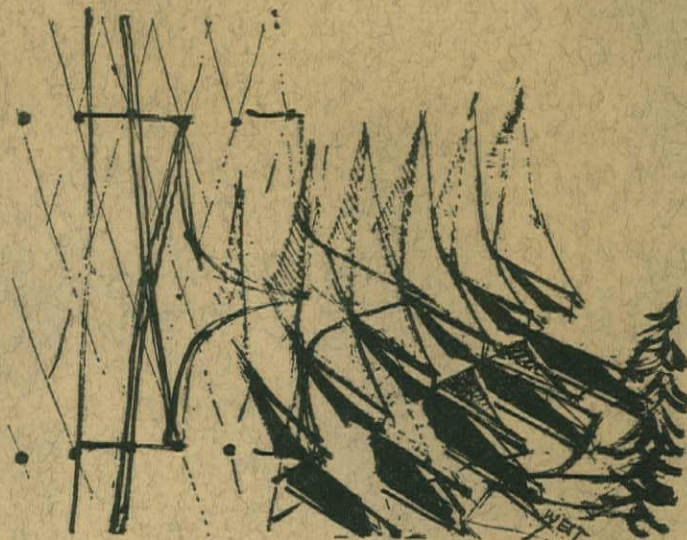


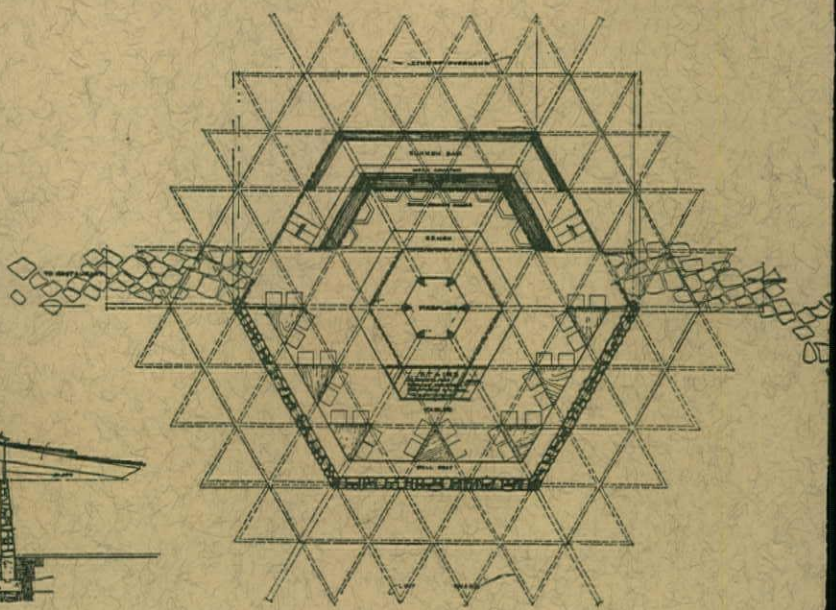
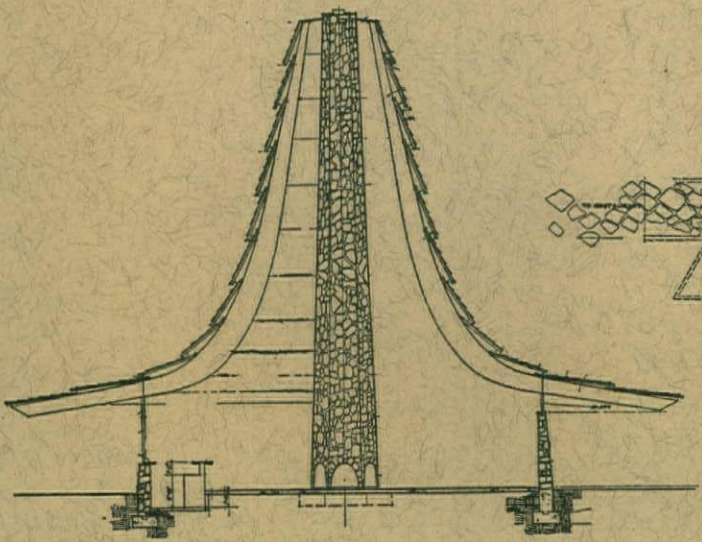
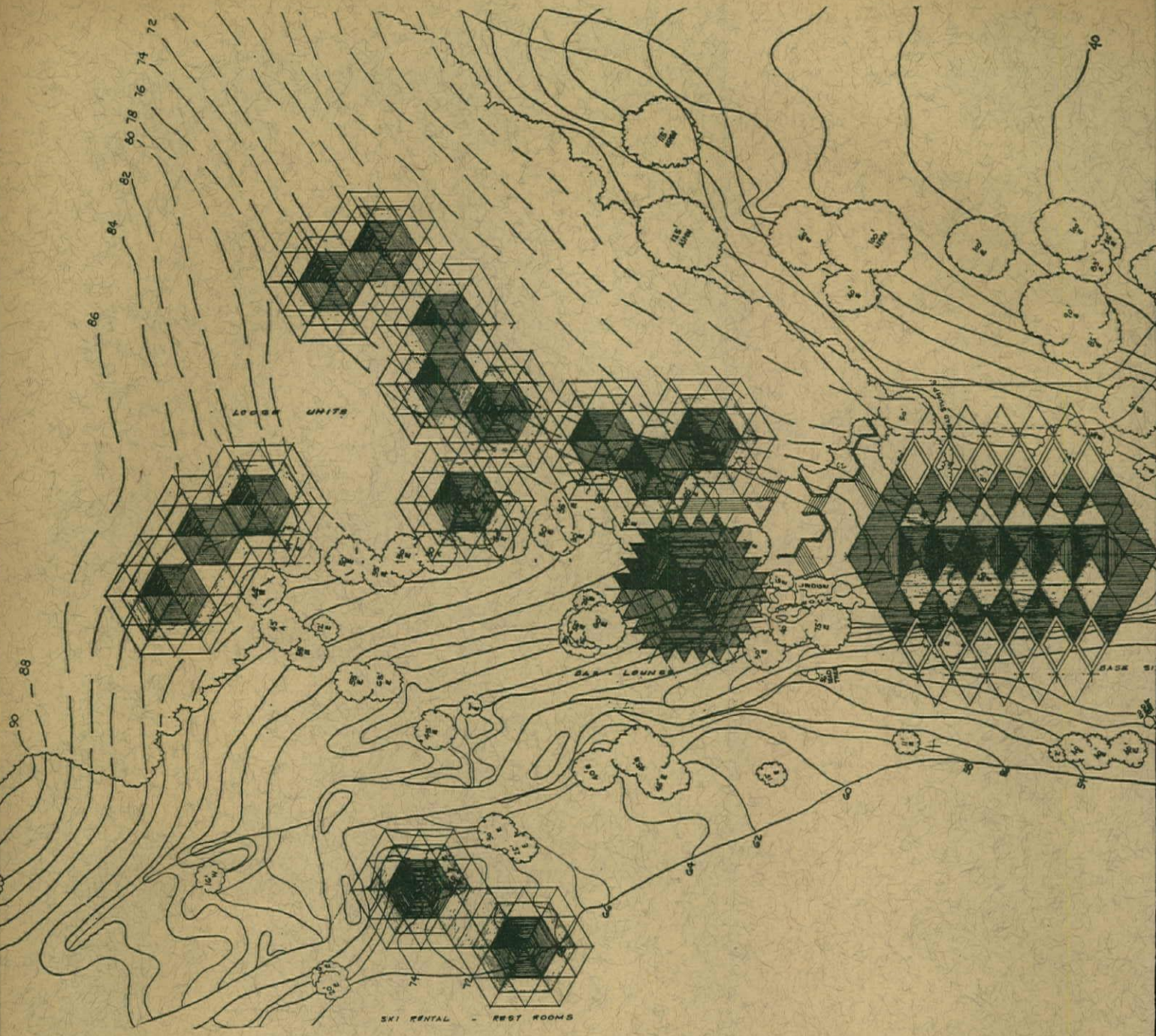
## *New Ideas of Victor A. Lundy*

### Sierra Blanca Ski Center Lincoln National Forest, N.Mex.

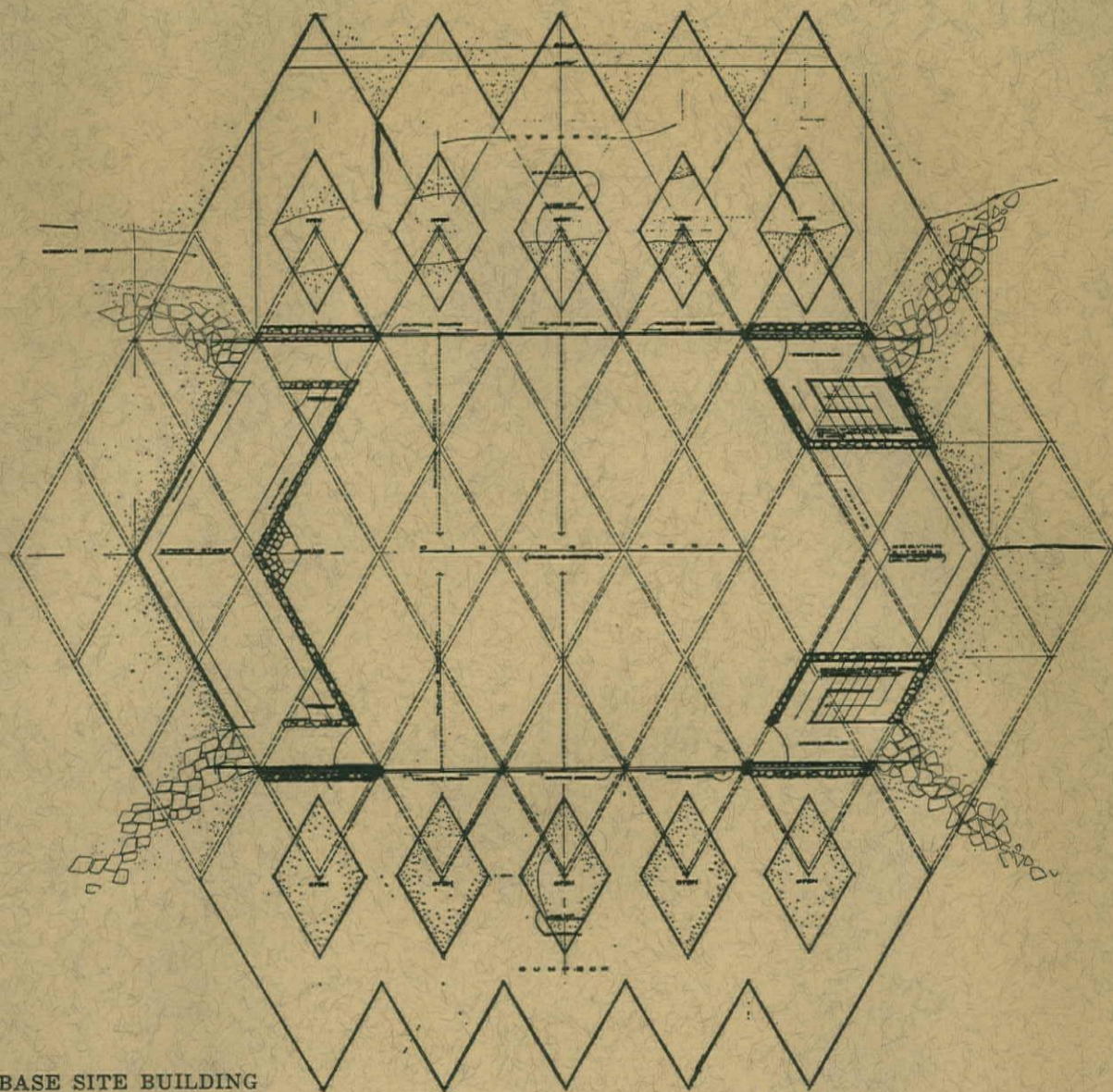
Lundy: "In designing the Ski Center for the Sierra Blanca Recreational Area I felt that a bold and very positive statement was necessary if it were to make an impression in this overwhelming and beautiful landscape. My idea was not to compete with the environment, but to complement it. Thus, the forms of all the structures—in both plan and elevation—echo the natural forms all about; ski patterns zig-zagging in the snow, icicles, dark pine trees rising to jagged points overhead. The silhouette of the base site building (these two pages) echoes the adjacent trees; its roof form suggesting 'architectural pines.' I hope it will make a memorable landmark, equally at home in summer or winter, a notable place to come back to after a day of skiing.

"All of the structures will have built-in wind bracing because of the triangular truss patterns that will compose the roof framing. Double tongue and groove decking or pine rounds will be used over the supporting laminated timbers to form the finished ceilings and roof deck in one operation. Roof covering throughout the center will be thick-butt cedar shakes, which will team with the random masonry walls of rugged fieldstone construction to create a combination of natural materials appropriate to the site. The idea is to blend the complex gracefully into its setting."





BAR-LOUNGE BUILDING



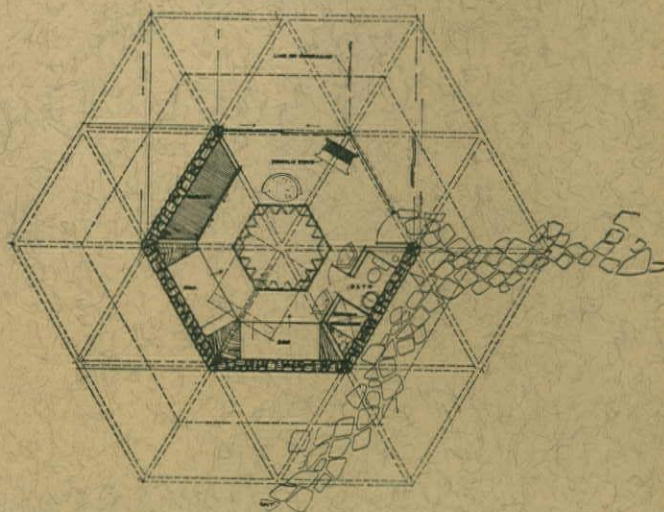
BASE SITE BUILDING

### Sierra Blanca Ski Center

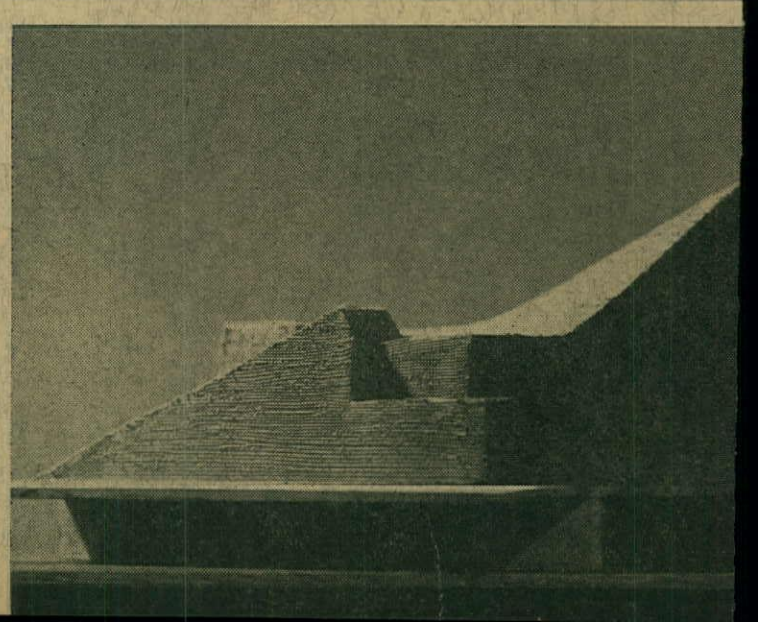
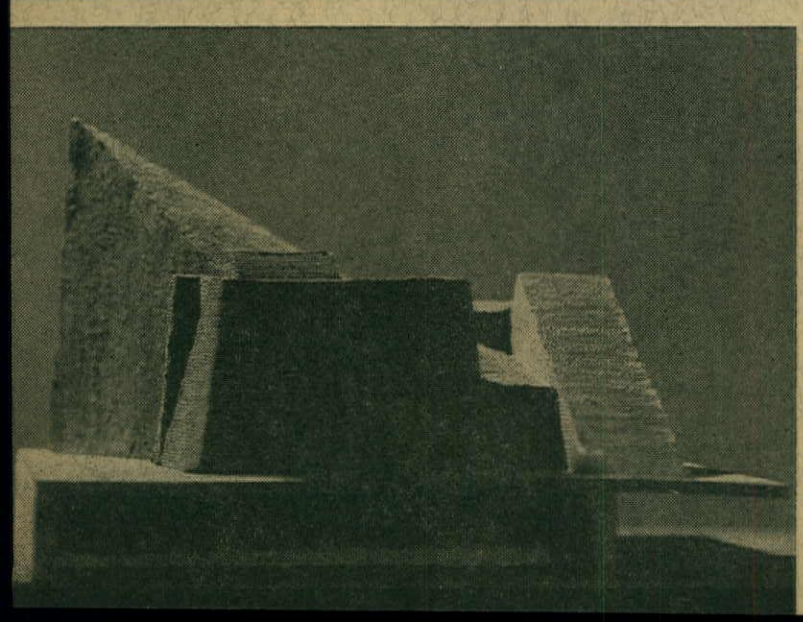
"The criss-cross system of laminated beams supporting the various roof structures allows for architectural expression, but in addition is a logical engineering answer to wind pressure. Note how the theme of triangles, hexagons, etc. is echoed throughout the scheme in slightly different ways and variations, in much the same manner as a theme is developed in music.

"The site plan shows that the entry for visitors lies between the Base Site building and the Bar-Lounge Unit; providing easy access to either, and a natural way of separating different types of users. An underground link connects the two, and houses also the toilets, mechanical equipment space, and storage areas. Note (above and site plan) how the restaurant is planned to work with its sundeck terraces on both sides of the ridge. The view is equally beautiful both ways, and the criss-cross plan will form interestingly shaped islands for groups.

"The bar-lounge building (left page) will doubtless become a focal point, and will feature a great central fireplace in addition to a sunken bar facing over the slopes. The hexagonal lodge units (right) will wander naturally through the trees either as individual units or as clusters."



LODGE UNITS





## *New Ideas of Victor A. Lundy*

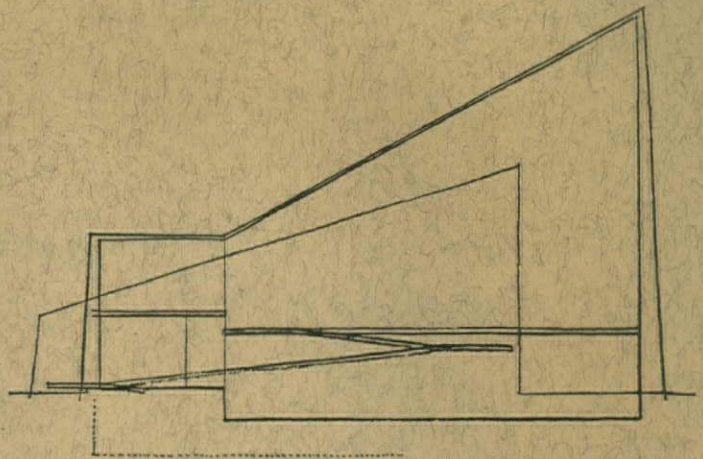
### Church of The Resurrection East Harlem, New York

Lundy: "The site is an 80 by 100 ft lot, hemmed in by old tenements in one of New York's seamiest neighborhoods. The congregation—which meets now in storefront ministries—has an extremely low budget, in contrast to its belief and faith, which appear boundless.

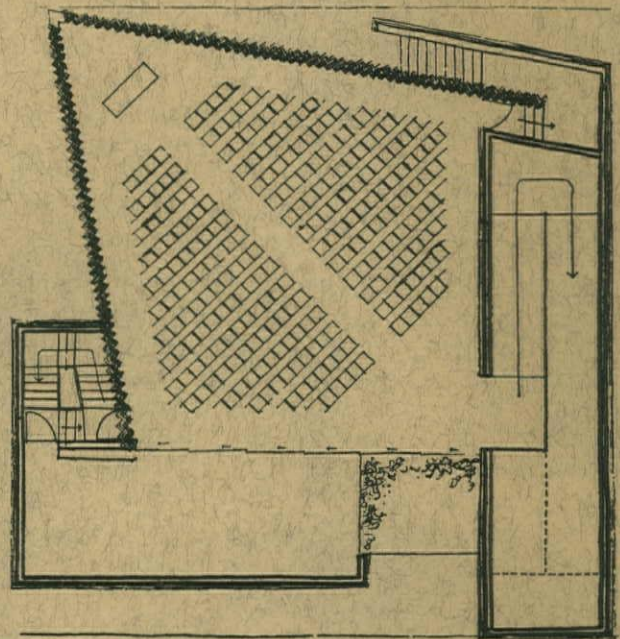
"The building must look well both from the street and from above, from the inevitable high-rise renewal apartments that will one day surround it. Thus, it is a bold and highly disciplined sculptural image that can be added to without destroying its strength.

"The two-story scheme locates the sanctuary on the upper floor, since the only dimensional freedom was upward, and some height could be gained this way. This idea led to the concept of a long, easy ramp as transition from the street; the creation of an artificial hill or mountain, up which one slowly climbs in enclosed space to burst finally into the glowing, upward-reaching spaciousness of the sanctuary.

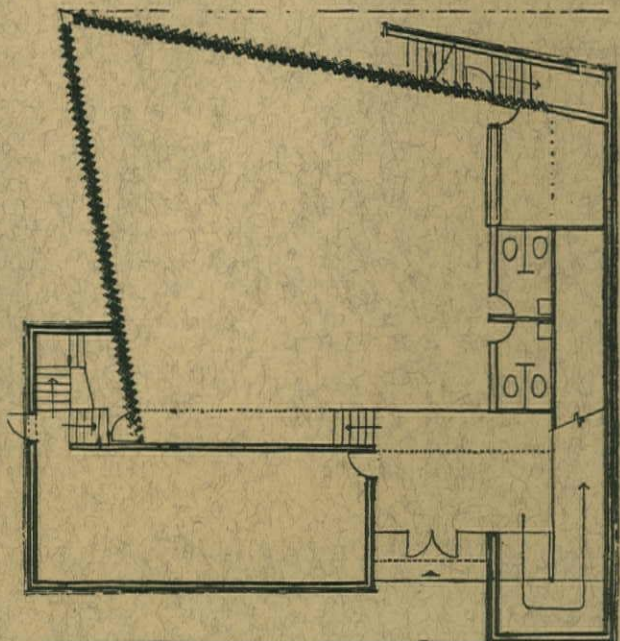
"The building will be of steel or concrete frame, with exterior brick walls, which will be stacked in a vertical pattern with the interstices filled with colored glass. The second floor classroom space may be used also for overflow or special choir; the ground floor fellowship hall (divisible into classrooms) lies under the sanctuary, with offices and nursery located under the second floor Sunday School space."



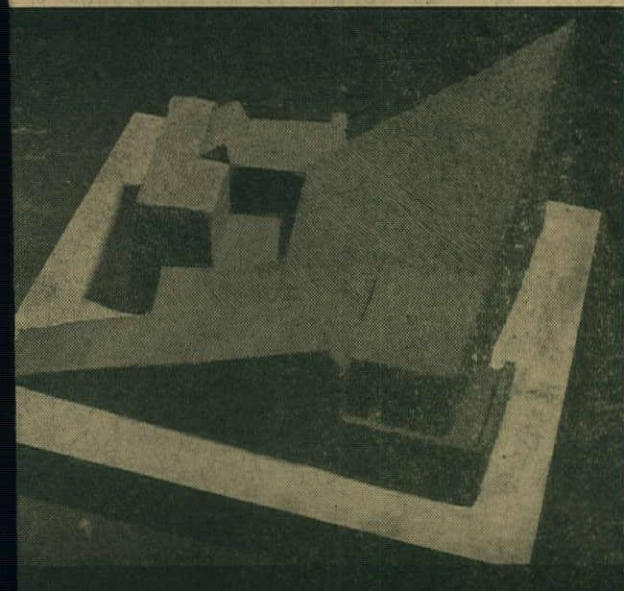
SECTION

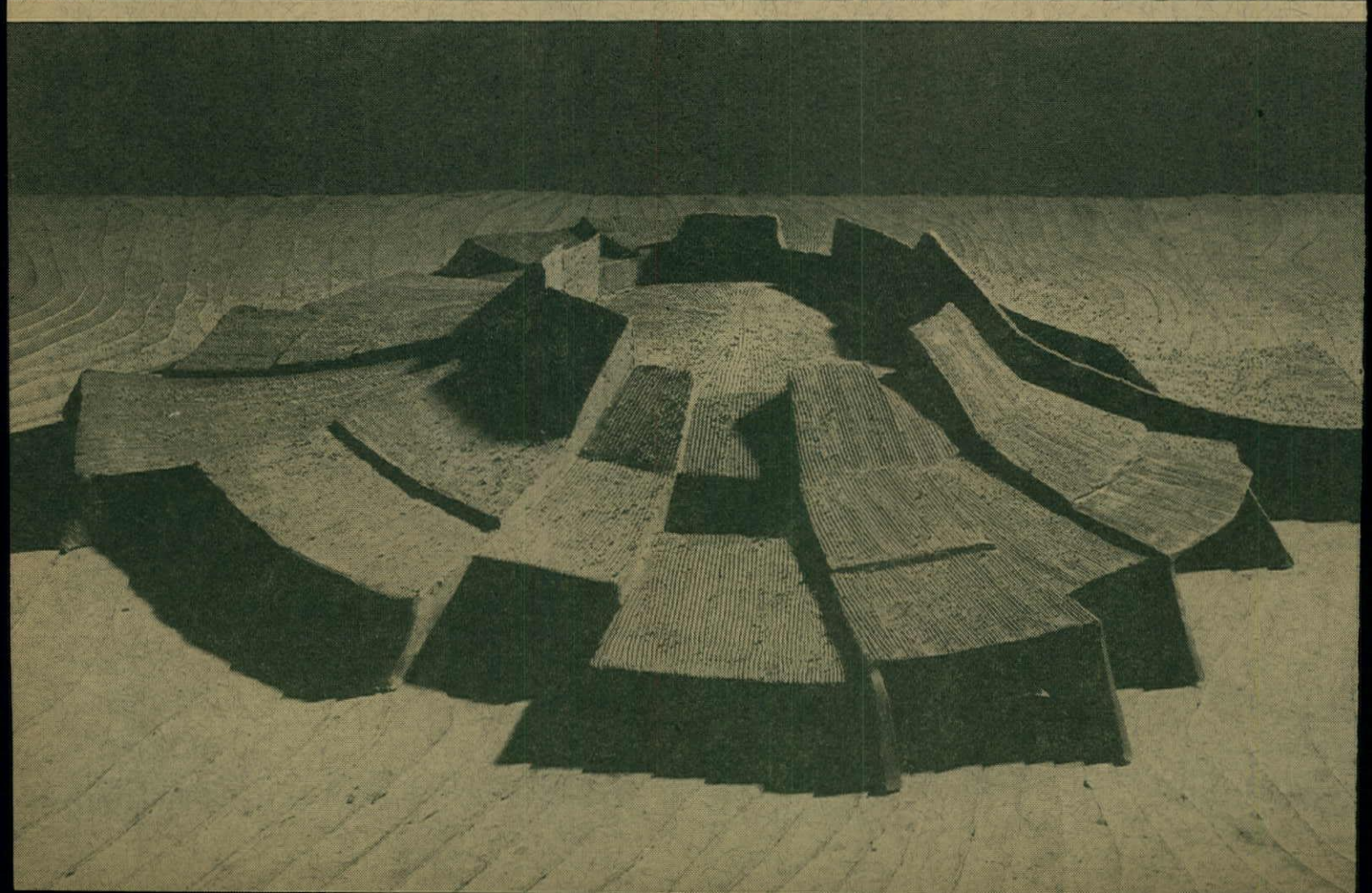


UPPER FLOOR



GROUND FLOOR





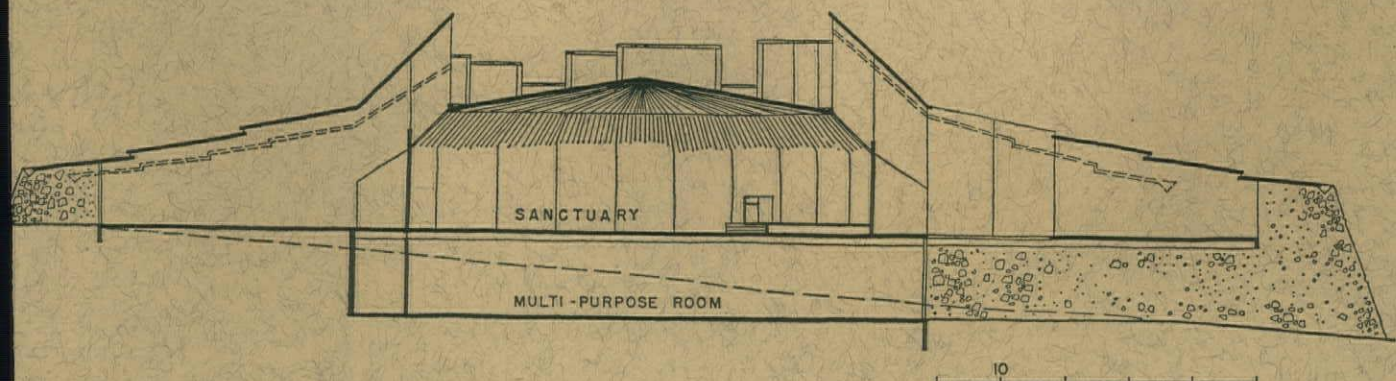
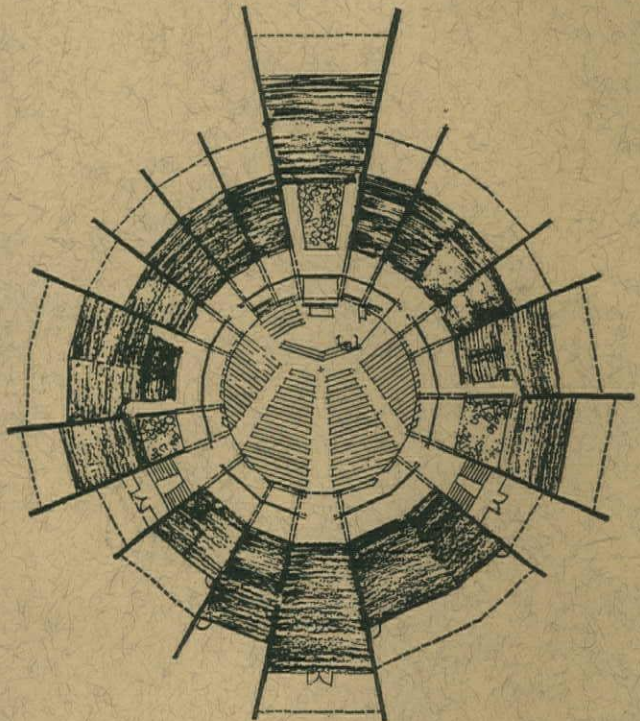
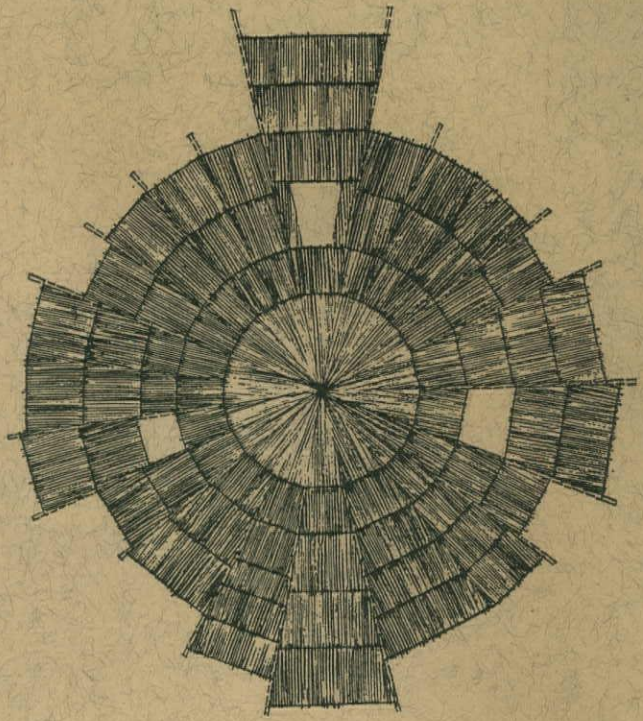
## *New Ideas of Victor A. Lundy*

### First Unitarian Congregational Society, Hartford, Conn.

Lundy: "The site lies on a gently sloping hillside overlooking Hartford, approached from on up the slope. It gives one the feeling of being able to see it from all directions and to see out from it in all directions. The concept is that many points of view draw together and become united in the center. One may start in one of many directions to reach the unity of the center; a unity of equality. The congregation specifically asked for a 'closed' sanctuary; one that directs attention inward rather than outward.

"From outside, there is a sense of being able to enter from any direction; which is so. The building rises towards the center, the high points forming a ring of reverse skylights which will throw colored light backwards upon the white walls of the sanctuary. A delicate ceiling tapestry of radiating thin wood members will further diffuse the light; see cross section below.

"Two orders discipline the scheme: the order of plan, and the order of height. The sanctuary is at the center, ringed by a circular ambulatory—with three small interior courts at approximately the third points for visual relief. These separate the chapel (back of the altar), and define play spaces for children. Radial spaces contain Sunday School rooms, offices, toilets, etc. The lower floor centers on a central multi-purpose room, ringed by ancillary spaces. The order of height simply allots scale and importance to specific spaces in relation to their functional significance, i.e., chapel highest, then lobby, library, children's rooms by age, etc."

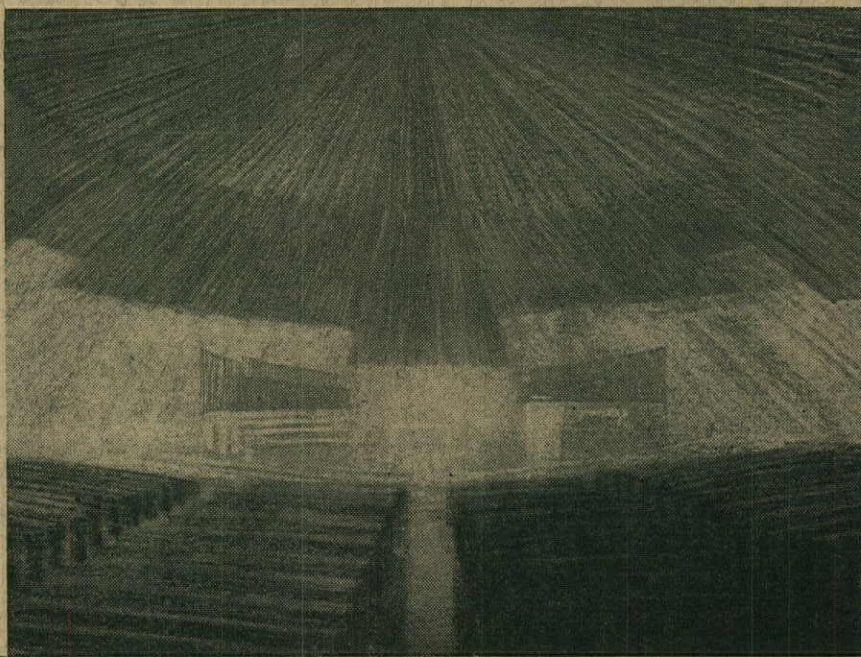
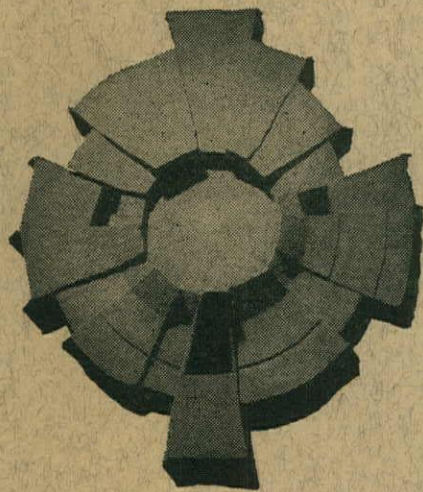




many pts. of view - many  
starting directions to  
reach the unity of the  
center -



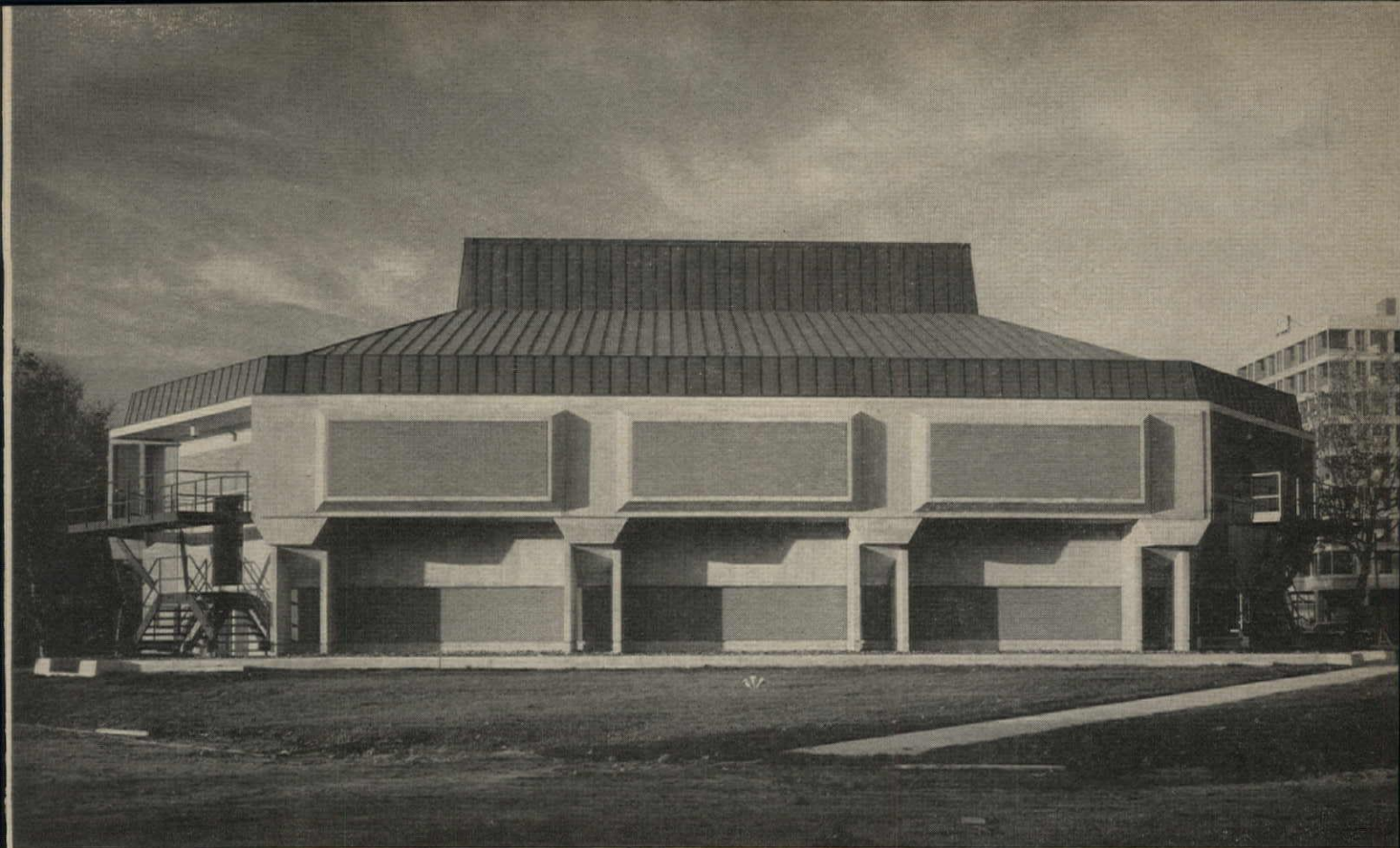
\* nothing in the center  
to make any thing more  
important than another  
No steeple -



### Hartford Congregational Church

"The concrete radial walls start low on the periphery, grow out of the ground, and leap up to become cantilevers that support the sanctuary roof. A system of light beams 16 or 18 ft apart will run concentrically and carry the 4 by 6 double tongue and groove wood decking. A thin 'eyebrow' skylight will occur at every beam, worked in conjunction with the partitions below, and arranged so that extensions of the decking will hide the light source. With the lights on at night, there should be an interesting effect created by the random bands of light—like stepping stones. To preserve the ceiling tracery effect, the sanctuary roof beams will be placed on top, with a radial lacework of thin wood members as ceiling. All roof surfaces will be covered with thin cedar shingles."





All photographs by Baltazar Korab

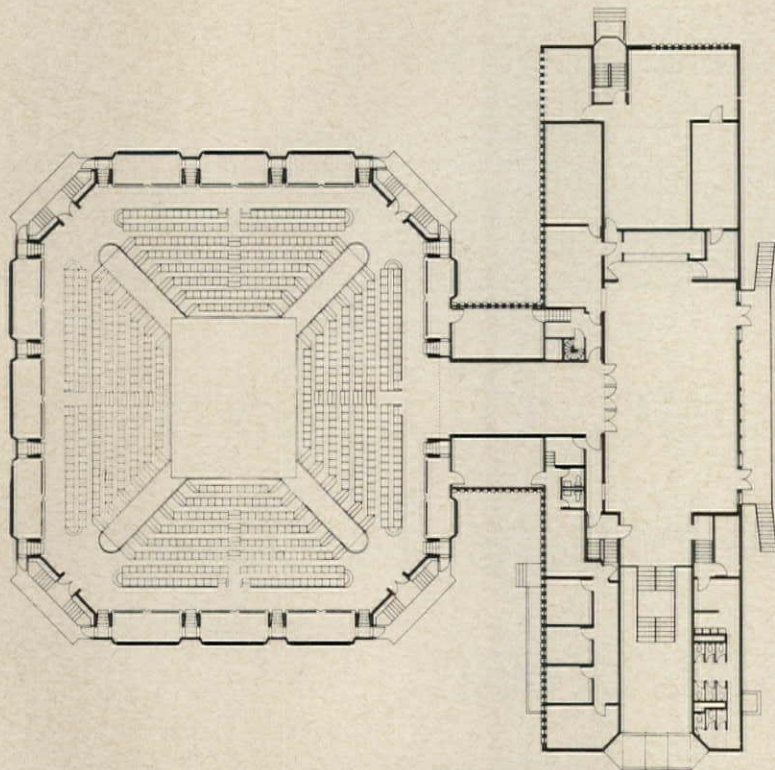
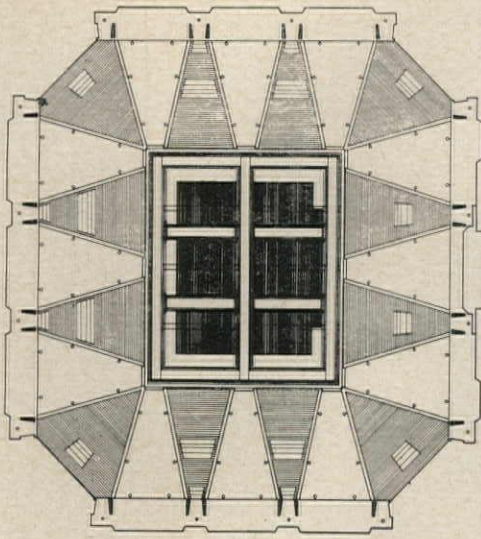
## New Image, Old Plan for Arena Stage Theater in Washington, D.C.

“Theater in the round” or the arena stage is the oldest setting for drama, beginning in primitive tribal ceremony, refined and given three sides in the Greek form and elaborated in the Elizabethan apron stage.

Architect Harry Weese integrates a rectangular stage surrounded by four tiers of seats within an octagonal structure which proclaims in vigorous terms the singularity of its plan and function

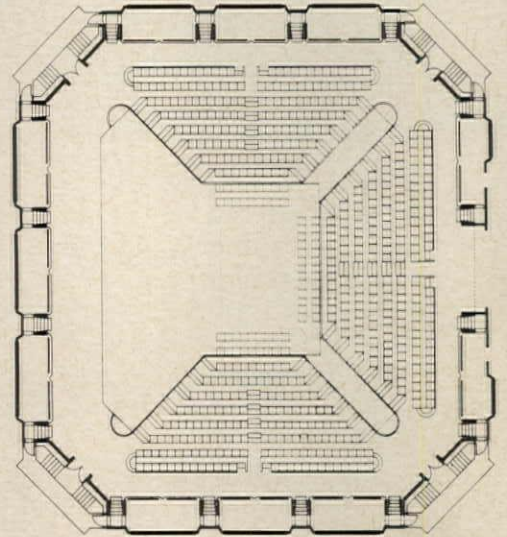


Main entrance to theater is in separate element which includes foyer, lounge, offices, dressing rooms, and workshops

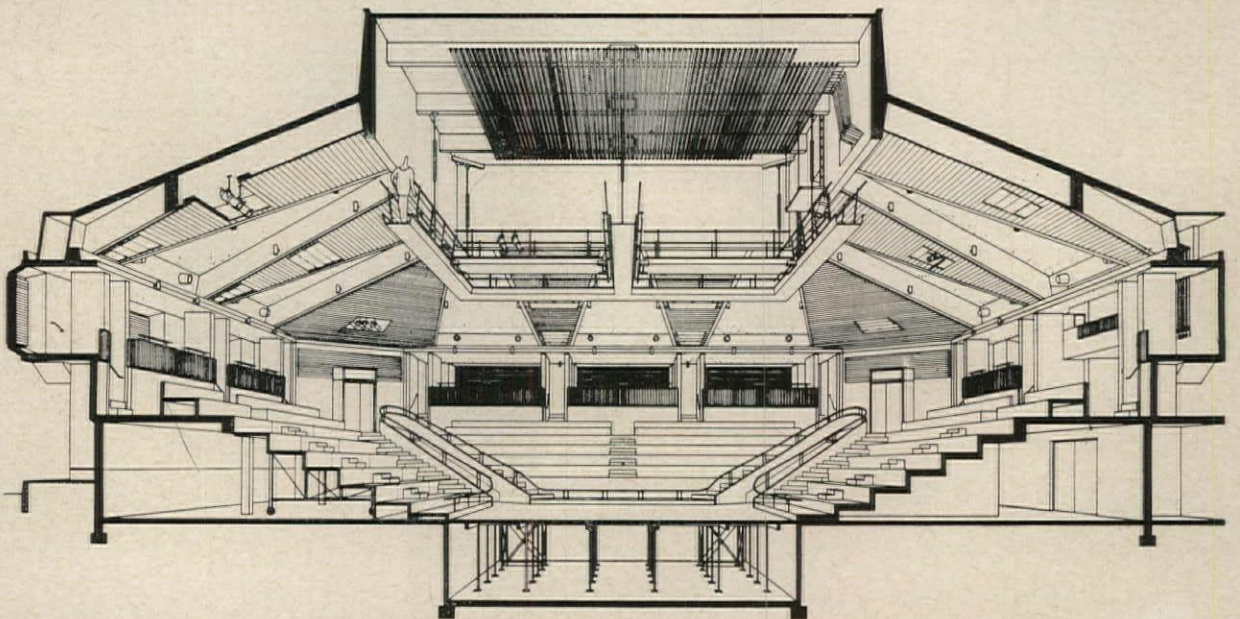


Drawing at top of page shows ceiling plan and indicates lighting pattern, catwalk and grid. Plan directly above is drawn at level of perimeter aisle at top of seat tiers. Actors enter through passages at each of four corners of the stage at stage level

Structure is of reinforced concrete bush hammered where exposed, and gray Roman brick masonry. The auditorium structure consists of a fireproofed steel truss compression ring rectangular in shape with struts to a steel H-beam tension ring located over the ceiling of the perimeter boxes. Concrete columns carry the loads to footings. The boxes and the perimeter aisle are cantilevered from the coupled concrete columns; the tiers are cast in place. The auditorium is protected from outside noises by a minimum of 4 in. of concrete or the equivalent



Plan above shows tier removed to form three sided arena. It folds into sections 8 to 10 ft long and 38 in. deep, rolling beneath the perimeter passageway. The stage (see section below) is trapped and divided into sections 3 by 6 ft any one of which may be raised or lowered separately or in combination with another. Catwalk grid suspended over stage in sectional drawing can be seen in photograph on page 124





*Above:* aerial view shows clear articulation between arena theater itself and the structure which contains the elements which serve it, including main entrance at right. *Below:* steps in entrance lobby lead to lounge which opens onto a wide corridor which in turn connects with a perimeter aisle at the level of the top of the seat tiers (see plans and section on opposite page)

NAME: *Arena Stage*

LOCATION: *Washington, D. C.*

ARCHITECTS: *Harry Weese & Associates*

STRUCTURAL ENGINEER: *Frank Kornacker*

MECHANICAL ENGINEERS:

*Samuel R. Lewis & Associates*

CONSULTANT ACOUSTICAL ENGINEERS:

*Bolt, Beranek & Newman, Inc.*

CONTRACTOR: *John Tester & Son*

"I did not want to waste time arguing with an architect about the respective values of the proscenium versus the arena stage. I made up my mind on that issue a long time ago and have set my stakes with that form which reunites the audience and the play in the same 'room', where historically they used to be and where they belong in today's world." Thus spoke Zelda Fichandler, producing director of Arena Stage, in announcing the selection of Harry Weese to design new quarters for her distinguished repertory company, which for almost eleven years has been producing first rate plays in a first rate manner for audiences in Washington, D.C. She added: "Harry Weese was my first choice for the job because for one reason, he has never designed a theater before, and for another, his buildings showed me that he is a genius at expressing in terms of architecture the nature of the activity going on inside."

For this client, who knew her own mind, Weese has produced a handsome structure, both simple and spare, creating an ambience which suggests to an audience that magic is made, after all, in a working place.

Recently finished at a cost of \$850,000, it occupies an excellent site in the new Southwest Development area, near Washington Inlet.





Suspended over stage is an arrangement of catwalks for supporting and servicing lighting instruments, with spaces in between used for flying set pieces. The total catwalk system can be adjusted from 18 to 27 ft above the stage and it overlaps the stage proper by 6 ft on all sides. Plug-in boxes are located at junctures of catwalks for minimum cable runs. The requirements of lighting the stage, and flying set pieces made it necessary to allow 10 to 12 ft of clear space between the catwalk system at its maximum height above the stage and the grid above it. A permanent set up of 50 line locations on the grid allows sufficient flexibility for flying set pieces



Fire escapes occur at each of the four corners of the auditorium. Building rests on a gravel filled podium providing a texture contrast with bush hammered concrete surfaces

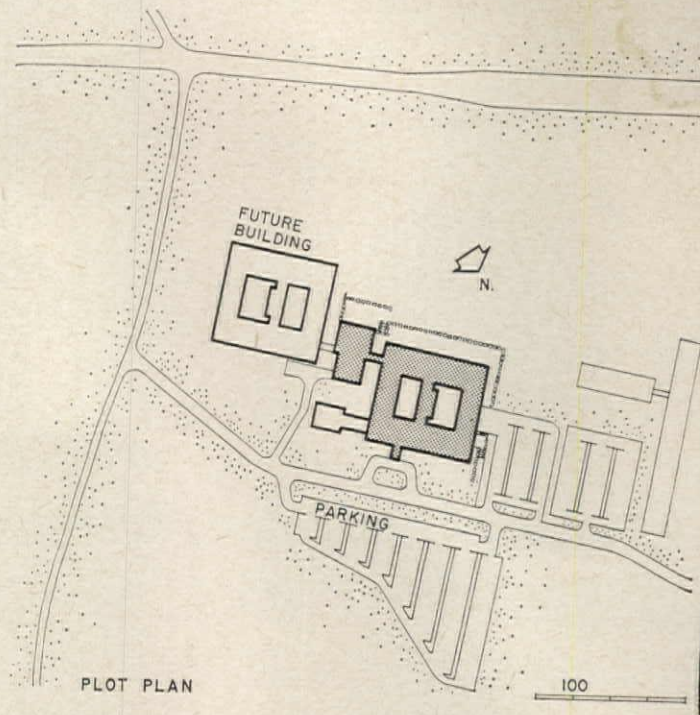
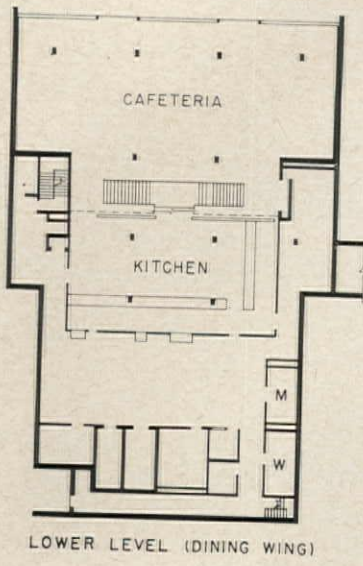




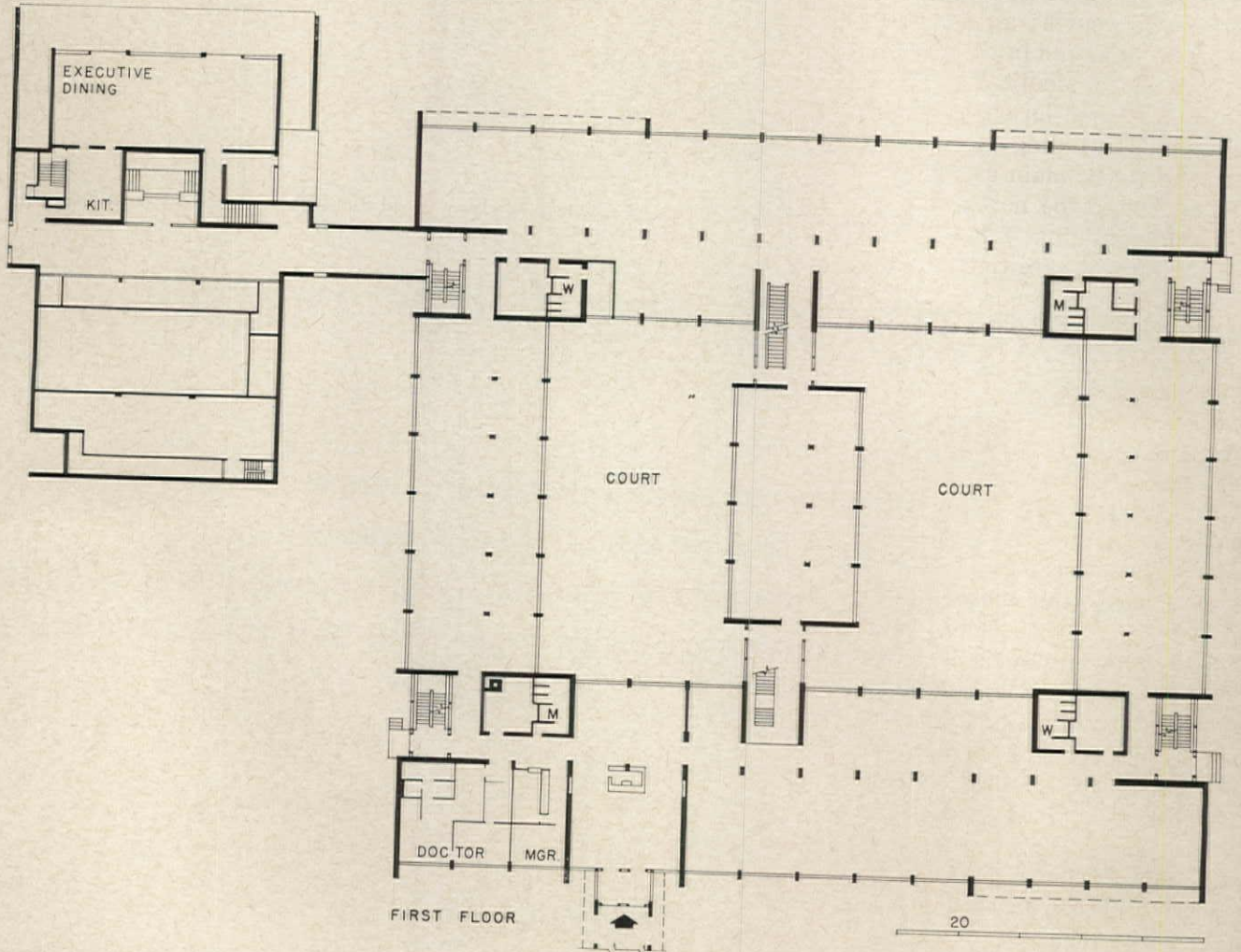
All photographs by Joseph W. Molitor

# Semi-Rural Office Building Pampers its Occupants

Constructed for the Raytheon Company  
by architects Anderson, Beckwith and Haible,  
this recently completed building for executive management takes advantage  
of its generous country site to provide modest but important amenities



Corridor at first floor level connects with a stair up to executive dining and down to the cafeteria



NAME: *Executive Office Building*

OWNER: *Raytheon*

LOCATION: *Lexington, Massachusetts*

ARCHITECTS: *Anderson, Beckwith and Haible*

STRUCTURAL ENGINEERS:

*Severud-Elstad-Krueger Associates*

MECHANICAL ENGINEERS:

*Delbrook Engineering Inc.*

MECHANICAL CONSULTANT: *Carl M. F. Peterson*

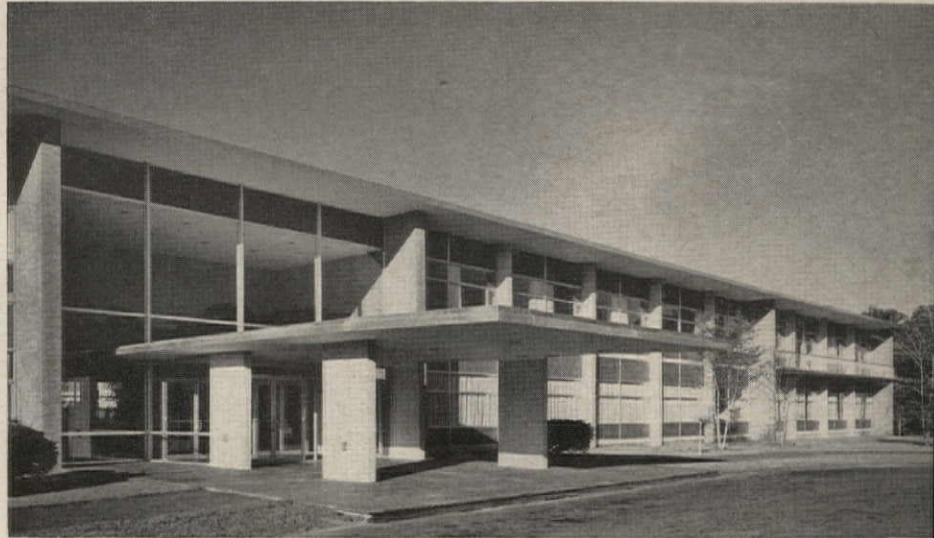
ELECTRICAL ENGINEER: *Edwin P. Mahard*

ACOUSTICAL CONSULTANTS:

*Bolt, Beranek and Newman*

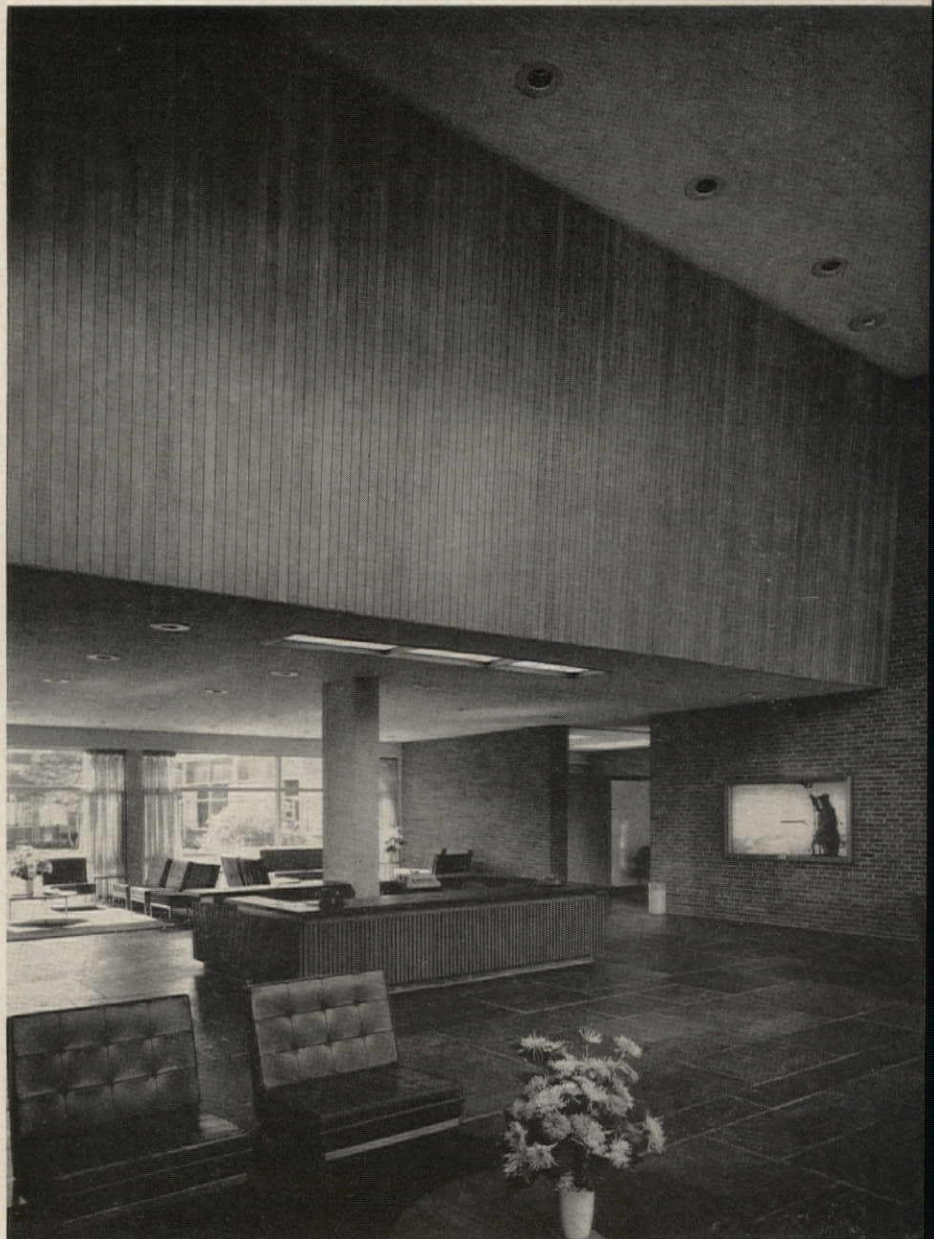
LANDSCAPE CONSULTANTS:

*Sasaki, Walker and Associates*



Main entrance. Exposed concrete surfaces are bush hammered

Two story entrance lobby overlooks courtyard beyond



The Raytheon Company, which makes the Sparrow and Hawk missiles, has been obliged to consider terrestrial as well as celestial space. The company chose its ground near Lexington, Massachusetts, in the best available spot adjacent to a major new clover-leaf interchange on one of the main highways into Boston, in a sparse residential area slated for growth. The land acquired accommodates a two story administrative building of reinforced concrete which surrounds two courts; an executive dining and cafeteria link, and in the future, another unit for research identical in shape to the first. (See plot plan on opposite page). The driveway to the building extends from a secondary road to the main entrance and parking lot located to the north at the opposite side of the building from the highway. Drives and parking are thus kept out of the view of the executive offices, conference room, employe's cafeteria and executive dining room, which overlook a grassy slope stretching to the highway to the southwest. All offices and general spaces overlook either courtyard or country. Passing motorists see a well scaled unpretentious building on a platform of grass which gently turns into a mowed field beyond the retaining wall.

Since the building plan permits cross ventilation for each wing, moveable sash is used to advantage in the spring, fall and even winter. A cooling system is provided for summer. To help achieve a building character suited to residential surroundings and to avoid the institutional look, the roof was kept clear of mechanical equipment. The cooling tower is located on a hill 600 ft away.

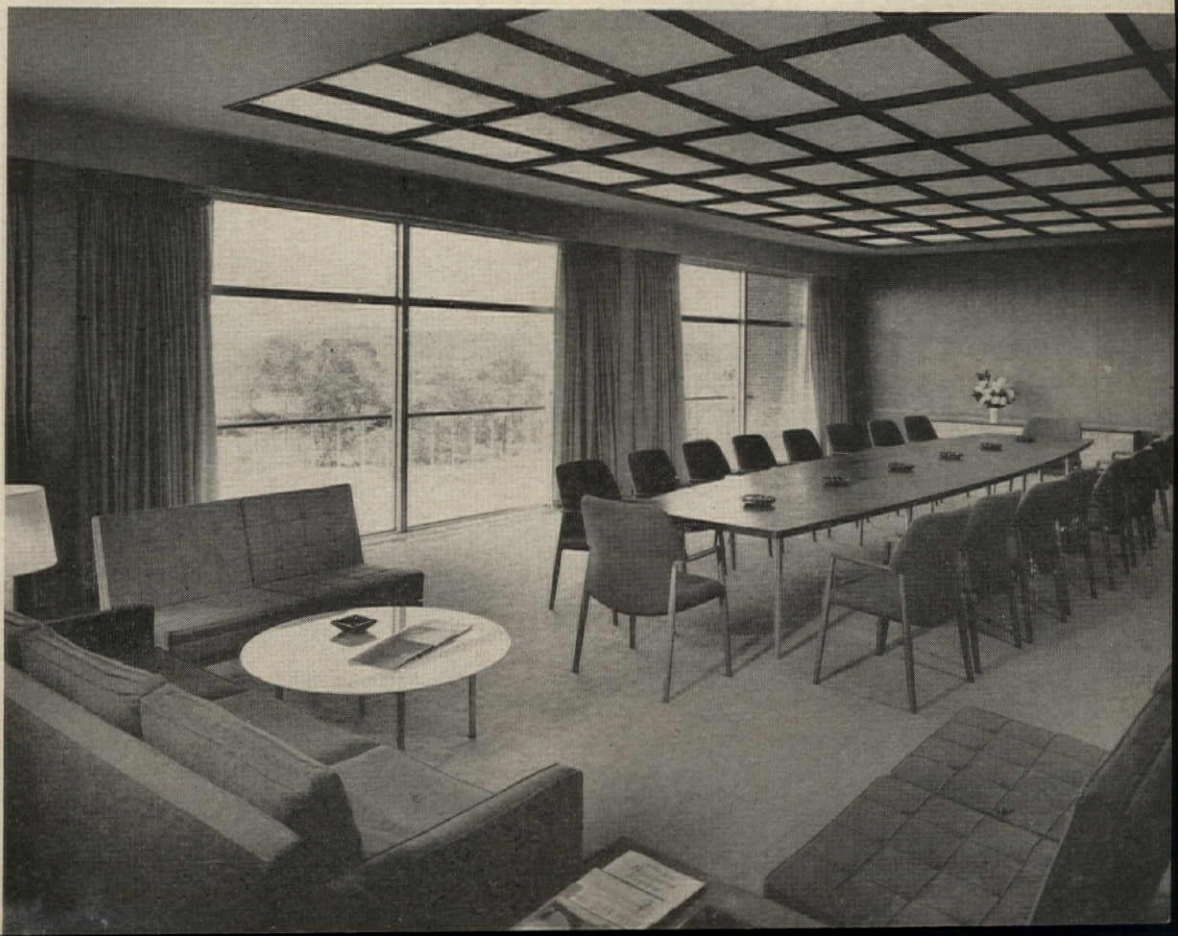
Because afterthoughts, casually installed, near a building interior, soft drink, cigarette, and other vending machines became forethoughts, and are neatly grouped within special corridor niches.



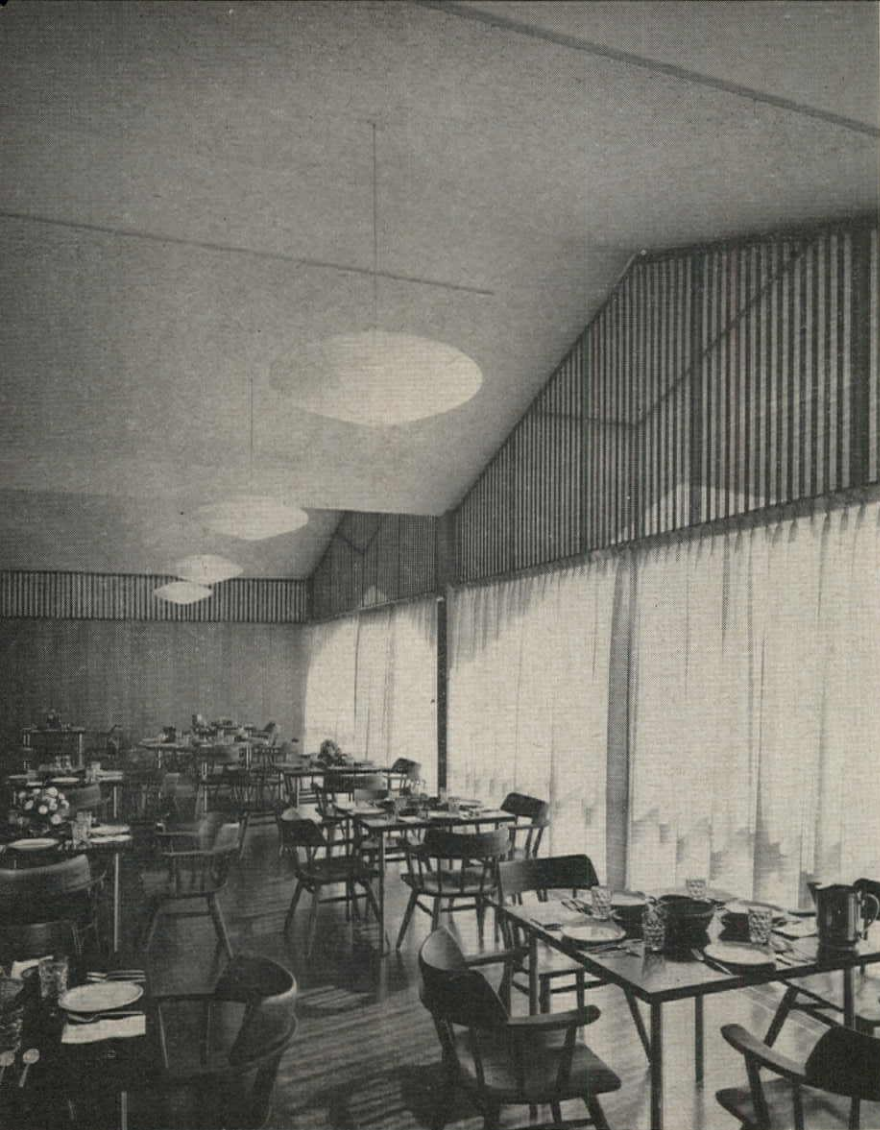
One of two courtyards. Spandrels are panels of insulated gray slate. Face brick is a warm pink. The multi-colored aggregate exposed as a result of the bush hammering was carefully selected for color and size from local sources



*Above:* executive office. *Below:* conference room. Luminous ceiling panels in both rooms are of a thin plastic laminate sheet which combines acoustical and luminous properties. It was developed by Bolt, Beranek and Newman, the buildings acoustical consultants. The material contains a clear core sheet of rigid vinyl plastic, faced on both sides with porous cellulose film. The core is about 10 millimeters thick and is perforated with holes about  $\frac{1}{16}$  in. diameter,  $\frac{5}{32}$  in. on center. The architects used the material in a custom teak grid. Its white matt surface has a parchment like quality



*Office Building for Raytheon*



*Above:* executive dining room. Striped curtains are of English cotton, handloomed in Mexico. *Below:* stairway to cafeteria. Kitchen is beyond



Dining wing at right

A THREE-LEVEL  
HOUSE WITH A  
NEW ENGLAND  
QUALITY



*Henry Wood*



ARCHITECT: *Herbert L. Bogen*

OWNERS: *Mr. and Mrs. Philip J. Friedlander*

LOCATION: *Lexington, Massachusetts*

CONTRACTOR: *Hans Tobiason*

HEATING ENGINEER: *Leo Brissette*

## The Friedlander House

An expansively comfortable New England quality has been deftly sustained in this large contemporary house. Family "togetherness" and individual privacy each have appropriate spaces in the three-level arrangement of the plan, and further add to its livability.

The family for whom the house was designed is a fairly large one: parents, four girls, one boy, and a housekeeper. The entire upper floor of the house is allocated as a children's zone; the son has his own wing and bath, while the girls share a large bath which even includes a beautician's sink. Each room on this floor is made more spacious by high, pitched ceilings formed by the slope of rafters and roof braces.

The middle, or main floor of the house is the adult and family zone. The master bedroom, bath and study are isolated in a separate wing; living, dining and screened porch areas form a large space at a scale appropriate for either the family group or for large gatherings. The entrance hall and stair area are arranged so that the children, in moving between levels, do not disturb the adult living areas.

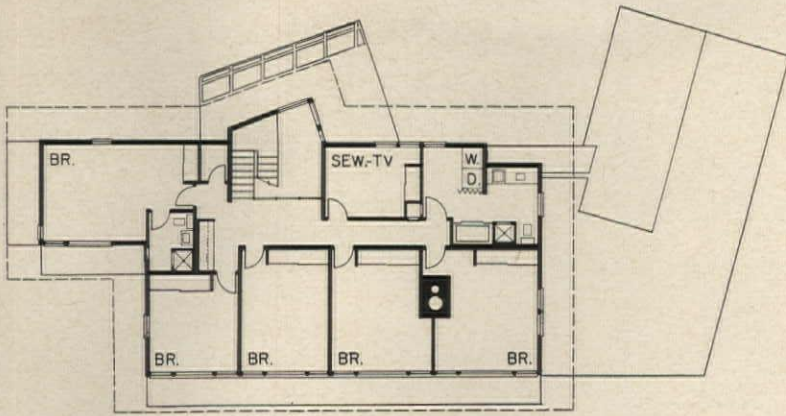
The lower, semi-basement level includes a big play room off the yard, bedroom and bath for the housekeeper, hobby and work space, heater room and storage.

Materials are simple and well detailed throughout. Exterior clapboards and overhangs give long horizontal lines to visually lower the house.

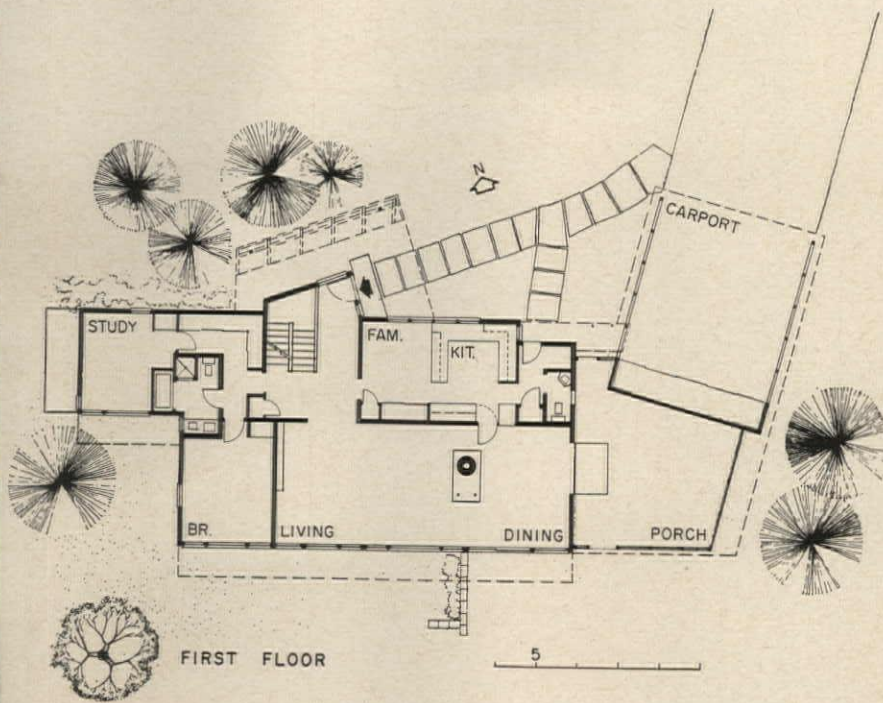
*Don Bourne*



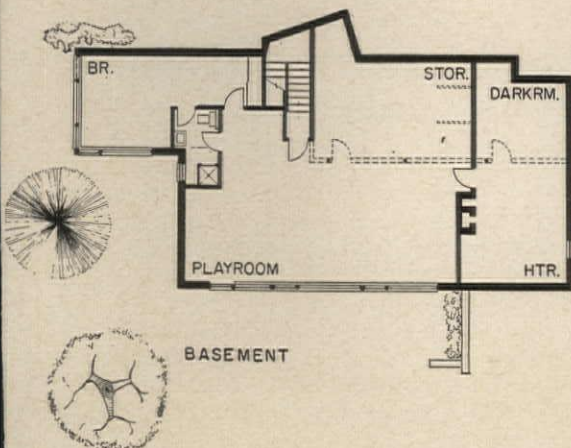




SECOND FLOOR



FIRST FLOOR



BASEMENT

Henry Wood





Don Bourne



### The Friedlander House

The large, spacious character of the house is emphasized in all its areas. The entrance hall (photo above) is a big two-story space, with a handsomely constructed wooden staircase connecting the three levels of the house.

The kitchen (left) is large and attractive enough to include an area for family dining; there is a separate area for more formal dining adjoining the living area

# PHYSICAL EDUCATION

A STUDY BY PERKINS & WILL ARCHITECTS CHICAGO

## FIELD HOUSE BUILDING TECHNIQUES: (TO NAME A FEW, NOW AVAILABLE ...)

### WHAT ARE THE AIMS?

- PHYSICAL FITNESS
- BODY BUILDING (CORRECTIVE)
- MUSCULAR COORDINATION
- GOOD POSTURE, GOOD HEALTH HABITS
- TEAM SPIRIT.

- all for as many students as possible!

### FOR CALISTHENICS — MANY P.E. NEEDS

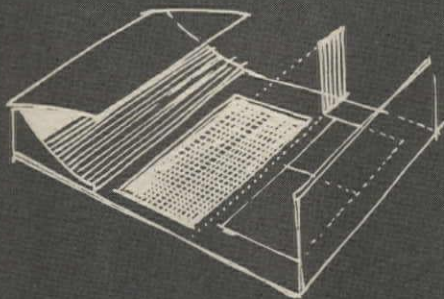


HIGH CEILING GYMS AREN'T REQUIRED

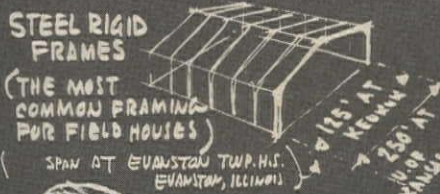


LOW CEILING EXERCISE AREAS WORK WELL.

### SOME OTHER PHYSICAL EDUCATION POSSIBILITIES —



THE FIELD HOUSE —  
MAKES GOOD SENSE FOR PHYS. ED. —  
FOR SPECTATOR GAMES  
FOR OTHER COMMUNITY EVENTS.



### STEEL RIGID FRAMES

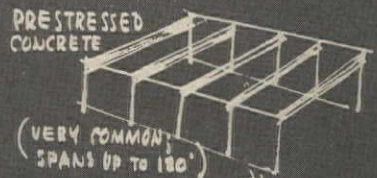
(THE MOST COMMON FRAMING FOR FIELD HOUSES)

SPAN AT EVANSTON TRUP. H.S. EVANSTON, ILLINOIS



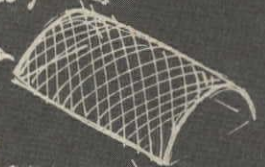
### STEEL CABLE SUPPORTED ROOF

(SPAN: 300' AT RALEIGH, N.C.)



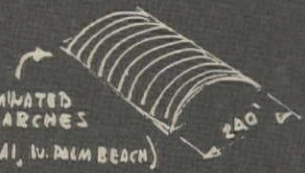
### PRESTRESSED CONCRETE

(VERY COMMON SPANS UP TO 130')



### STEEL ARCH

(224' SPAN AT CORPUS CHRISTI CIVIC AUDITORIUM)



### GLUED-LAMINATED TIMBER ARCHES

(FOR JAI ALAI, IN PALM BEACH)



### FOR TUNDS:

CABLE-SUSPENDED FOLDED-PLATE ROOF

(MANY RECENT MANDARAS ...)



### ALUMINUM DOME

(145' DIA. AT HAWAII)



### GLUED-LAMINATED TIMBER RIB DOME

(300' DIA. AT MONTANA STATE COLLEGE)



### BOLTED PLATES OF STEEL

(DOME AT LONGVIEW, TEXAS — 300' DIA.)  
\$4 PER SQ. FT.



TENT-LIKE MAST + CABLES (176' DIA. FOR GRAIN STO. AT CROOKSTON, N.D.)



### STEEL DOME

(FIELD HOUSE AT CAPITOL HILL H.S., OKLAHOMA CITY — 200' DIA.)



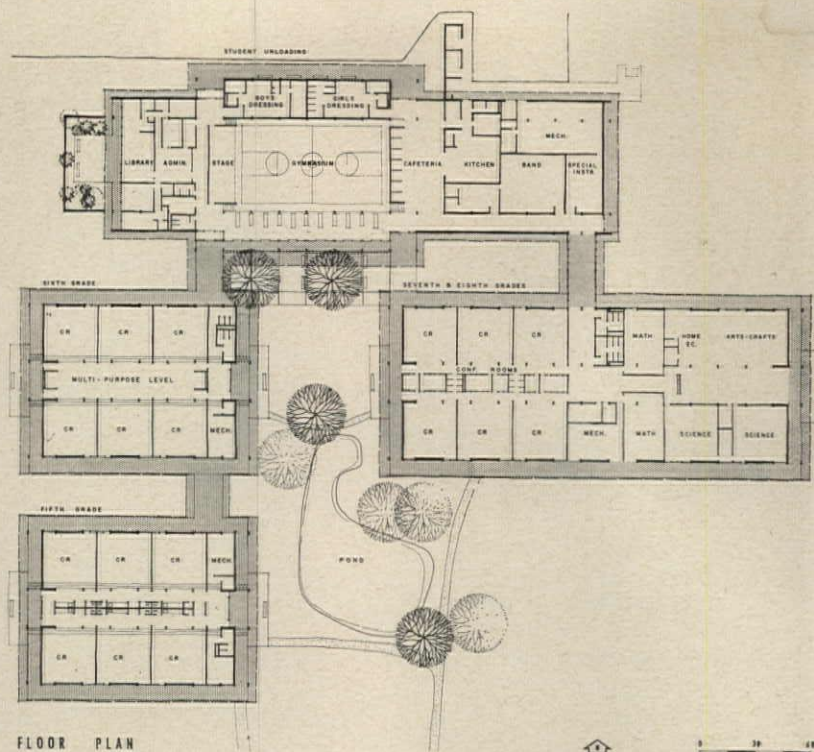
### AIR-SUPPORTED FABRIC

(ONE IS IN USE IN EVANSTON!)

# SCHOOLS

## New Ideas Pose Cost and Efficiency Challenge for Standard Basketball Gym

The traditional "box gymnasium" is being seriously contested by a lot of close scrutinies (such as the condensed sketch study by Perkins & Will shown above) at its real worth in training students. Stimulated by some of President Kennedy's statements, and the probable increase of fitness programs, new schemes ranging from open play sheds to big field houses are being studied to give better physical education at reasonable cost. A number of them are presented in this study.



FLOOR PLAN

MACKINAW SCHOOL



## CAUDILL'S TWO MIDDLE SCHOOLS ARE COMPLETED

*Mackinaw and Chippewa Schools, Saginaw Township, Mich. Caudill, Rowlett & Scott, Architects. Associate Architects: Daniel W. Toshach (for Chippewa), and Spears & Prine (for Mackinaw). Collinson Construction Company, Contractor*

Looking even more handsome than their sprightly design sketches (see ARCHITECTURAL RECORD, January 1961), these two schools set in motion a highly interesting educational experiment. First indications are that this concept for a separate "middle school" for grades 5-8, to act as a transition between primary and high school, is a very successful one.

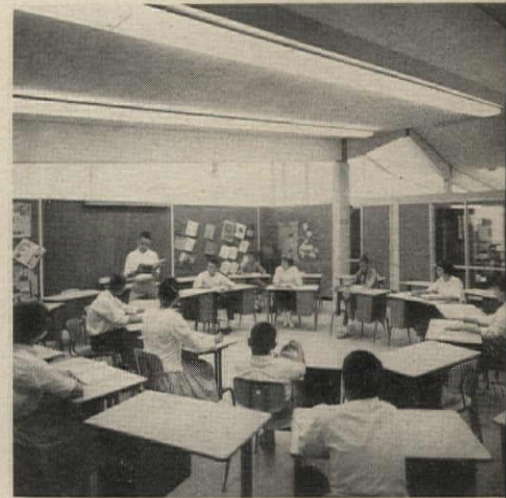
Some of the architectural "experiments" in the schemes have had equally interesting results. The major one was a cost comparison test between a "centralized" plan scheme (Chippewa), and a more spread-out or "decentralized" plan (Mackinaw). The

two offer almost identical facilities and program. As built, the decentralized scheme cost about 3 per cent more than the other, or \$14.07 per sq ft for 62,441 sq ft (Mackinaw) as compared with \$13.37 per sq ft for 63,657 sq ft at centralized Chippewa. Each school can house 650 pupils, bringing per pupil costs to \$1352 at Mackinaw, \$1309 at Chippewa.

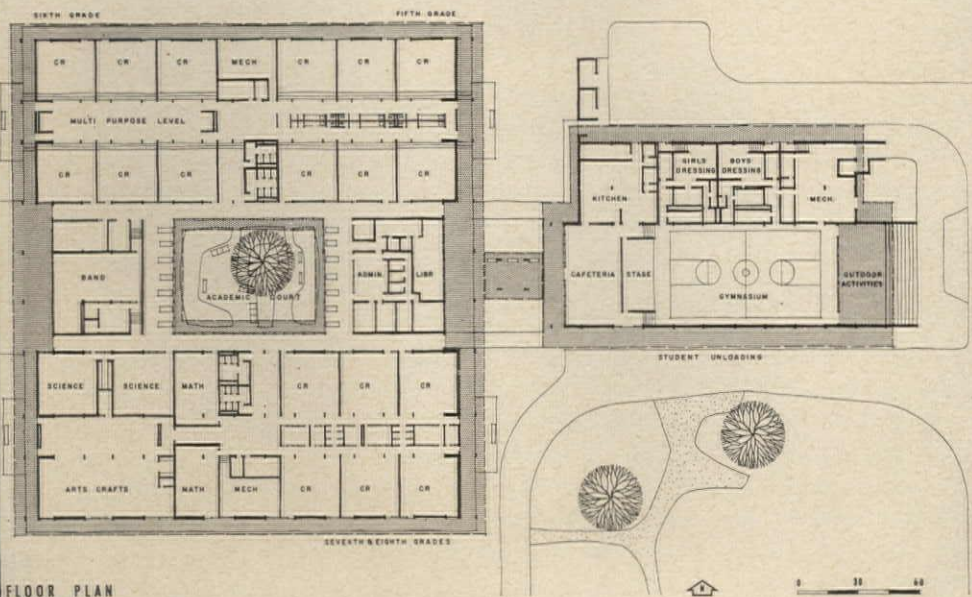
"Open end" classrooms, with a raised "demonstration stage" corridor has proved popular with the teachers and pupils. Individual study carrels, conference rooms, and "team" planning has solved the problem of quiet and noisy activity going on simultaneously. However, it has been said that "it is likely that some further acoustical treatment will be done to minimize the transfer of sound across the mall space and the conference and carrell spaces." Gyms in both schools are countersunk to preserve a consistent roof line with the rest of the buildings.



Bradford-LaRiviere, Inc.



CHIPPEWA SCHOOL



FLOOR PLAN

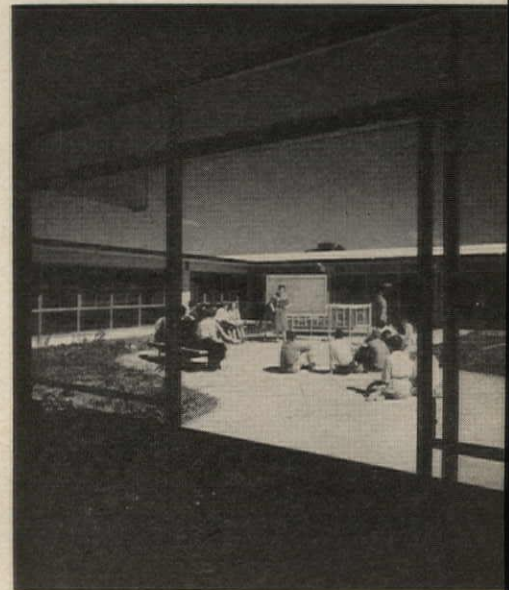


CHART I. PROGRAM SUBJECTS FOR PHYSICAL EDUCATION

Grade	Physical Education Program	Intramural	Interscholastic	Health Education
<b>KINDERGARTEN</b>	Fundamental skills (walking, running, etc.) Play (hopscotch, stunts, tumbling) Swings, slides, climbing Dramatization (dancing, singing, etc.) Games and creative exercises	None	None	None formal
<b>ELEMENTARY</b>	Physical fitness Crafts Dramatization and mimetics (story plays, etc.) Play (group and self-directed): baseball, endball, batball, kickball, soccer, hopscotch, climbing, swings and sliding Rhythmic activities Trampoline, track and field Stunts (tumbling, etc.) Swimming (diving, water safety, etc.) Winter sports (depending on climate)	Baseball, batball, kickball, endball, volleyball (varying from little, mostly play days, to full program) Swimming and aquatic	Ranges from "none" to special events for "gifted" upper elementary pupils	Usually in conjunction with science. Varies in number times per week 1-2, 30 minutes each
<b>JR. HIGH</b>	Team sports: football, soccer, basketball, baseball, volleyball, softball, field hockey, handball, speedball, touch football, etc. Individual sports: tennis, golf, badminton, shuffleboard, table tennis, bowling, archery, deck tennis, horseshoes Swimming: diving, water safety, aquatics Physical fitness and calisthenics (exercises) Camping Rhythms and dancing Mimetics Winter sports (depending on climate)	Extensive most schools including team and individual sports, track and field	Not emphasized this level. Limited to team and individual sports, track and field	Usually in conjunction with science
<b>SR. HIGH</b>	Team sports (as listed above) Individual sports (as listed above) Swimming: diving, water safety, and aquatics Stunts: tumbling, trampoline Track and field Rifle and target practice Camping Boxing and wrestling Rhythms and dancing Girls: cheerleading and varsity Boys: cheerleading and varsity Games of high organization: emphasis on strategy and knowledge of rules and perfection of skills Crafts Mimetics Winter sports (depending on climate)	Extensive team and individual sports, track and field, swimming and aquatic, winter sports	Extensive—especially team sports as football, basketball, baseball, individual sports as tennis, bowling, archery, track and field, swimming and aquatics, winter sports	Varies in schools from 1/2 unit course for all who do not take biology, to 5 classes per week—1 semester per year

## SEARCH FOR A SOLUTION: PHYSICAL EDUCATION

By N. L. Engelhardt Jr.  
Partner, Engelhardt, Engelhardt and Leggett  
Educational Consultants

As with many aspects of the school curriculum, physical education, recreation, athletics, and the sports program are being subjected to much scrutiny. Two major questions being asked are: Is youth being given sufficient physical education to prepare it for its responsibilities? Is the cost of physical education facilities, which may amount to 30 per cent or more of the total school building program, in proper proportion to its educational value? There are no universally accepted answers to these questions and, as a result, there is wide variation in programs throughout the country. Architects could help considerably in a reconsideration of the types of facilities needed to obtain a broader physical education curriculum requiring less of the total school

building funds available. The widely-heralded basketball gymnasium is certainly wasteful in terms of a large part of the program, but it is difficult to find cases where costs have been reduced by more functional design of spaces.

There are three parts to the physical education and recreational program in public schools: physical education and health, intramural sports, and interscholastic athletics.

Physical education is essentially a basic part of the regular curriculum in which all students participate. No boy or girl is left out, even those with physical handicaps. The program is customarily carried on during the regular school day, and a full class period is allotted to each group. Associated

CHART II. PHYSICAL EDUCATION AND RECREATION PROGRAMS IN THE WILLIAMSVILLE, NEW YORK, CENTRAL SCHOOL SYSTEM

**1. WHO TAKES PART IN THE PHYSICAL EDUCATION PROGRAM?**

All students in grades 1-12 are required to take physical education. The only exceptions are those with Doctor's excuses and those must be renewed each semester.

**2. AMOUNT OF TIME IN PHYSICAL EDUCATION AND HEALTH PROGRAMS.**

**A. PHYSICAL EDUCATION:**

- Elementary level: a. Primary Grades: 1 period per week (30 minutes long)—co-ed classes
- b. Intermediate Grades: 2 periods per week (45 minutes long)—separate classes for boys and girls.
- Junior High level: 5 periods per week (50 minutes long) 3 gyms, 1 swim, 1 lecture
- Senior High level: 3 periods per week (50 minutes long) 2 gyms, 1 swim.

**B. HEALTH EDUCATION:**

- Elementary level: School nurses and Physical Education staff work informally throughout the year. In the intermediate grades a formal health class is held one period a week by the class room teacher.
- Junior High level: No formal health classes at the present time.
- Senior High level: A half unit course in health is taught in the Sophomore year for all students who do not take biology.

**3. ACTIVITIES INVOLVED IN THE PHYSICAL EDUCATION PROGRAM:**

**A. PRIMARY GRADES:**

- a. Elementary skills of body control.
- b. Creative exercises, dramatization and mimetics.
- c. Rhythmic activities of simple construction.
- d. Games of low organization.
- e. Opportunities for self-directed play.

**B. INTERMEDIATE GRADES:**

- a. Body mechanics and Physical Fitness.
- b. Rhythmic Activities.
- c. Begin lead-up skills for games of high organization.
- d. Games of low organization—stunts and tumbling, apparatus, trampoline, track and field.
- e. Lead-up skills for individual sports.

**C. JUNIOR HIGH LEVEL:**

- a. Body Mechanics and Physical Fitness.
- b. Rhythms.
- c. Activities of low organization—more advanced skills in stunts and tumbling, apparatus, trampoline and track and field.
- d. Games of high organization—more high organization and skills in team and individual sports.
- e. Swimming—basic strokes and fundamentals of diving.

**D. SENIOR HIGH LEVEL:**

- a. Body Mechanics and Physical Fitness.
- b. Rhythms and Dancing.
- c. Advanced work in self-festing activities: Stunts and tumbling, apparatus, trampoline and track and field.
- d. Games of high organization: perfection of skills, game strategy, teamwork, knowledge and understanding of rules.  
Team sports: Girls—field hockey, basketball, softball and volleyball.  
Team sports: Boys—football, soccer, basketball, volleyball and softball.  
Individual sports: tennis, golf, badminton, shuffleboard, table tennis, archery and bowling.
- e. Swimming: Perfection of strokes and fundamentals of diving, water safety, synchronized swimming for the girls.

**E. TESTING PROGRAM:**

Physical Fitness testing program given each year to all students in grades 5, 8, and 11.  
Various testing programs on activities taught.

**4. SIZE OF CLASSES:**

Wide range of class size (25 all the way to 60) in grades 1-9, Senior High—average 35.  
Most classes in the system meet by grade level. Senior high level all meet according to grade level.

**5. INTRAMURAL ACTIVITIES:**

- a. Elementary level: Very little—some play days.
- b. Junior high level: Girls—limited intramural program (team sports/individual sports—large participation in bowling.)
- c. Junior High level: Very limited program.
- d. Senior High level: Girls—Extensive intramural program in all team sports and individual sports as follow-up of the regular class room program.
- e. Senior high level: Boys—No intramurals.

**6. COMMUNITY RECREATION:**

- a. School facilities used in the summer by the town recreation department.
- b. School facilities used in the summer and winter by the adult education department.
- c. Recreation activities—badminton, tennis, football, baseball, swimming.
- d. Adult education activities—badminton, volley ball, basketball, apparatus and swimming.

CHART III. TOTAL RECREATIONAL AND PLAY SPACE SUGGESTED FOR HIGH SCHOOL

Activity	Area Required (Sq. Ft.)	Number of Games in Progress at One Time	Total Area Required (Sq. Ft.)	Maximum Number of Pupils Accommodated	
				Boys	Girls
Baseball	62,500	2	125,000	36	—
Football	57,600	1	57,600	22	—
Soccer	49,500	2	99,000	44	—
Field hockey	54,000	2	108,000	—	44
Basketball	3,600	2	7,200	—	20
Tennis	2,808	15	43,120	40	20
Softball	25,600	2	51,200	20	20
Volleyball	1,800	3	5,400	16	32
Handball	680	4	2,720	16	—
Croquet	1,800	1	1,800	—	8
Clock golf	576	1	576	—	8
Horseshoes	500	4	2,000	16	—
Hand tennis	640	4	2,560	—	8
Paddle tennis	880	2	1,760	—	4
Touch Football	28,800	2	57,600	44	—
Dodge ball	2,000	1	2,000	—	30
Tag games	1,400	1	1,400	—	30
Ring games	625	1	625	—	30
Totals			570,561	254	254

with physical education are classes in health education held in regular classrooms for lecture, demonstration, and discussion work.

The sports program, frequently known as the intramural program, is a practical phase of the physical education program. In this program students have an opportunity to practice and use the skills they have been taught in physical education. This is usually in the afternoons and involves team sports. The athletic program, involving interscholastic sports, gives a limited number of students an opportunity to represent the school in competition with other schools. This requires afternoon, evening, and sometimes weekend practice and competitive games.

Some communities provide physical education in regular classes once a week, some provide none at all, others offer the subject five times per week. The relationship between physical education and athletics varies tremendously. In some cases, they are merged into one program, in others there is a complete dichotomy in which athletics is largely an afternoon program, physical education being carried on during the academic day. Some programs include health and physical education, involving at least one

health class per week. There is considerable variation in the point of view towards varsity athletics on the high school level, with many considering it secondary in importance and concentrating largely on opportunities for all students rather than simply those who are competent to carry on the varsity team program. With this wide latitude, there is much opportunity for exploration and development in terms of the facilities to be provided.

**NATURE OF THE PROGRAM:** The nature of the program can perhaps best be shown on chart I. While it is unlikely that any school will offer all the games, exercises, or sports indicated on the chart, all of the schools sampled offer a full schedule which includes the major activities. The physical education and recreation program in the Williamsville, New York, public schools for grades one through twelve is an excellent example of the range and goals of the program for the students (Chart II).

**FACILITIES:** The gymnasium has always been thought of as the basic facility within the junior and senior high schools. In the elementary school multi-purpose

### GYMNASIUM

Official basketball court, 50' x 94', with 3' to 10' unobstructed space on each side. High school court 50' x 84', often divided by folding partition to provide two teaching stations. Spectator space usually required may be foldable. Allow 2.5 sq. ft. per person. Row spacing, 22". One row 16' long will seat 12 persons. Preferred arrangement has 6 to 8 rows. If possible avoid having more than 12 rows. Depth of foldable seating when closed: 3 to 14 rows..... 2' 8"  
12 to 20 rows..... 4' 6"

### Details:

recessed drinking fountain and cuspidors at each end of gym; outlets for record player and public address system; for girls' gym, protected piano alcove.

### AUXILIARY GYMNASIUM

No spectator space. Area usually 3000 to 4000 sq. ft. Ceiling height 20 ft. May have court for: basketball, handball, squash, etc.

### FIELD HOUSE

Indoor space for track, softball, touch football, etc. Floor is tanbark, sand, etc. One section may have permanent wooden floor or provision for use of portable floor and bleachers.

### ALL PURPOSE ROOM

Area approximately 1500 sq. ft. ceiling height, 14 to 16 ft. Used for wrestling, boxing, tumbling apparatus work, rhythms, dancing.

### CORRECTIVE ROOM

Classroom size, wall mirror, bars, other small equipment used for remedial work.

### HEALTH EDUCATION CL. ROOM

Need science demonstration desk, water and service outlets.

### REST ROOM

For small groups of students who cannot participate in strenuous physical education program. Ample sunlight, quiet select location

### BASIC INDOOR TEACHING SPACES FOR PHYSICAL EDUCATION

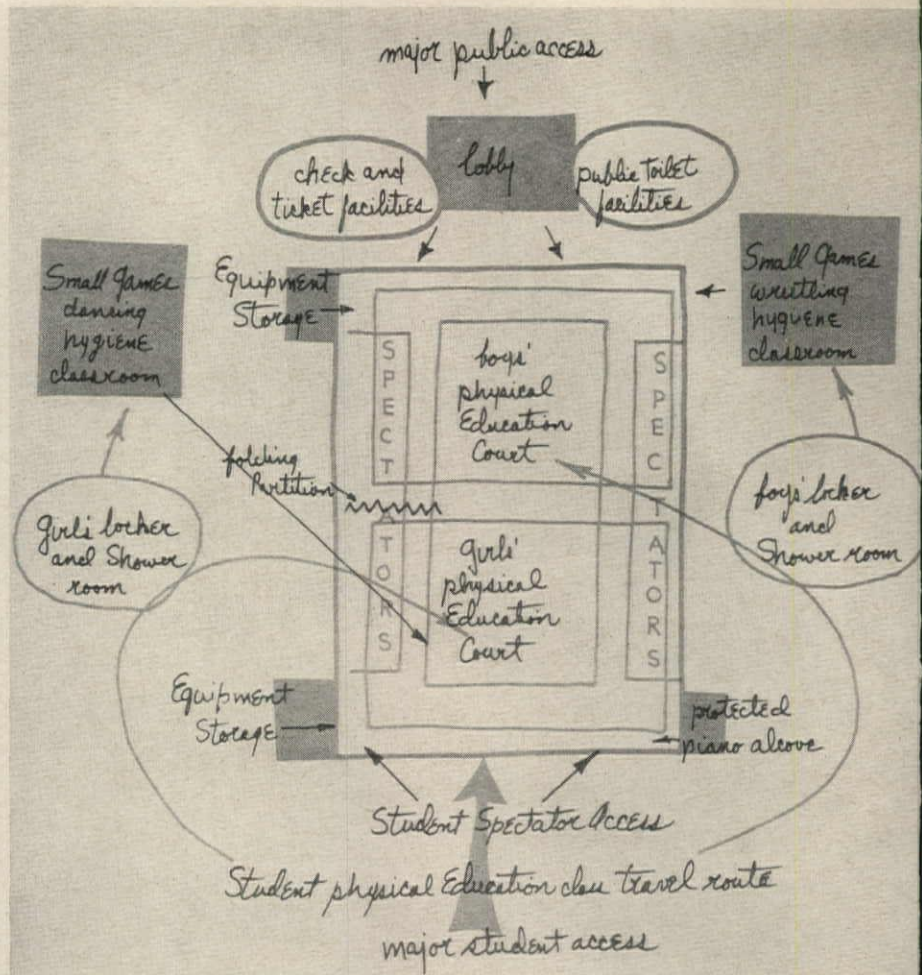


DIAGRAM OF SPACE RELATIONSHIPS  
HIGH SCHOOL INDOOR PHYSICAL EDUCATION SPACE

## SEARCH FOR A SOLUTION. *By N. L. Engelhardt Jr. (Continued)*

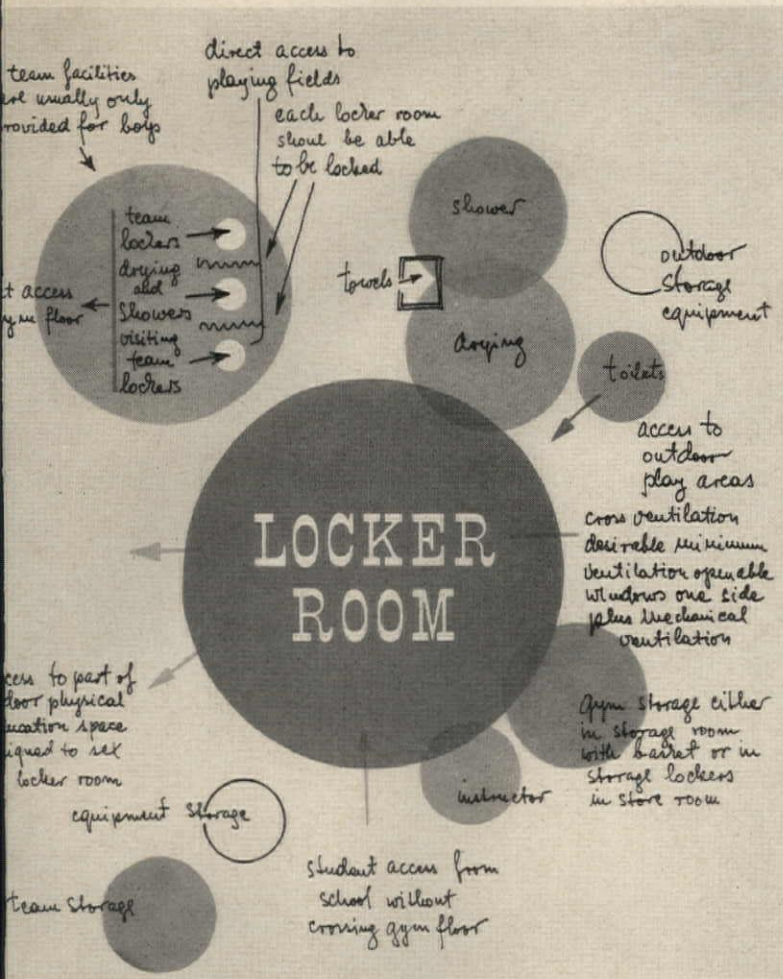
rooms, combination auditorium-gymnasiums, combinations for cafeteria, assembly, and play all have been tried. At the elementary level, it has been found that a separate playroom is most satisfactory. The trend toward merger of sports and physical education programs indicates that there is need for greater variation in the nature of the facilities than can be provided in a single gymnasium, especially at the junior and senior high school levels. This has led to the development of shelters, field houses, swimming pools, rifle ranges, and auxiliary areas for a variety of sports. Offering a variety of opportunities for youngsters to engage in the sport of their choice frequently indicates the need for different types of flooring, as in the field house type of structure.

Another factor in the problem of facilities is the amount of time allocated during the day to the physical education-sports program. In the public schools, it has been customary to allow one period during the academic day, between approximately 8:30 A.M. and 2:30 P.M., for physical education, permitting the teams to use the facilities after school. In inde-

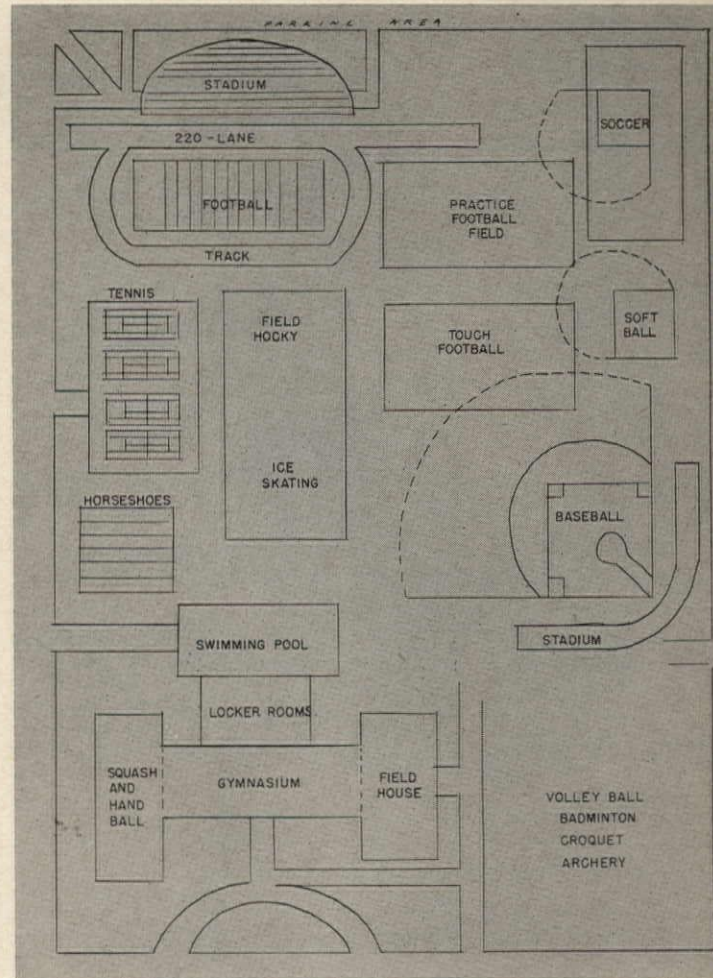
pendent schools, there is a contrary tendency to assign the morning hours to a full academic program, with an afternoon sports program. Some educators now feel that this latter arrangement would be a very helpful solution to the public school problem, although the load on the facilities would become extremely heavy since all students would be involved at the same time. There is much to be said for utilizing the morning hours for studies in English, mathematics, science, foreign languages, and social studies; best results in these fields are obtained during the earliest part of the day. Also, by assigning physical education and sports to the afternoon, there would be more time available for the program, and time allowed for dressing and showers could be extended. In the present 45- or 55-minute period time for the latter is often much too limited.

The solution to the administration of the afternoon program is largely an architectural one. Since the student load would be concentrated, additional facilities would be required; and the question arises of how to use these facilities during the morning





SPACE RELATIONSHIPS FOR STUDENT LOCKER FACILITIES FOR HIGH SCHOOL PHYSICAL EDUCATION



SCHEMATIC OF OUTDOOR AREAS FOR HIGH SCHOOL PHYSICAL EDUCATION

when no physical education program is in operation. Further thought must be given to the possible dual use of such spaces for effective utilization.

There is a notable trend toward the use of swimming pools for classes, evening adult education, and on weekends for recreation groups, young children, or civic groups.

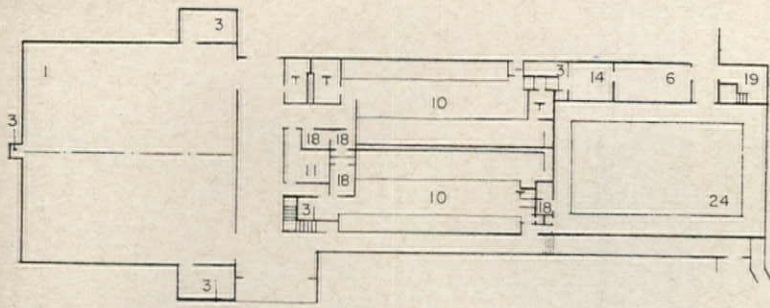
To meet the additional requirements of the new physical education programs, the following guidelines have been established, and certain standards have been adopted covering these facilities.

**GYMNASIUM:** This is the basic indoor physical education space. A large wooden floor area, providing two basketball courts and one large game court. Often divided by an expensive folding door to provide two teacher stations. Spectator space is required in most communities. Usually the floor area is around 100 by 100 ft, including spectator space. Interscholastic sports serve two purposes: One, to rally the student body around a common aim; and, two, to satisfy the community need for spectator sports in adult as well as youth attendance. The first has value education-

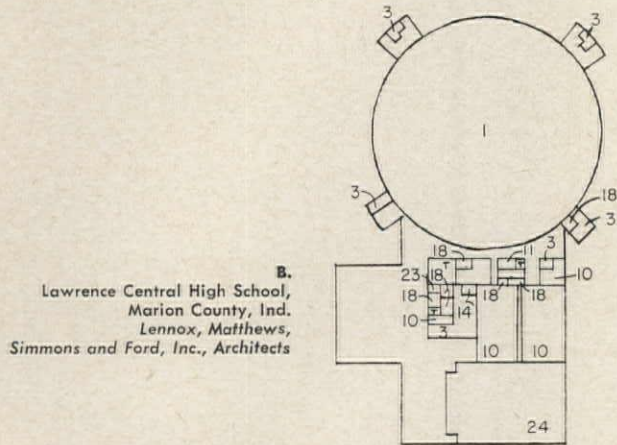
ally in that it does tend to develop a unified school. The second has questionable educational value and should properly be charged to community rather than school activity. It does little for the majority of youths and its value, even from the point of view of those who play on the varsity team, is doubtful.

**SWIMMING POOL:** In arriving at the required size of a pool, it is necessary to consider school enrollment, peak load, community use, summer recreation program, requirements for water sports, and Board of Health regulations. In New York State, for example, an allowance of 25 sq ft of pool area should be made for each bather in the water at any one time. Minimum length of 75 ft recommended. Since official width of lanes is 7 ft, pool width should be a multiple of 7, or a minimum of 35 ft. Minimum depth of 10 ft in diving area if only one-meter boards are to be used, 12 ft for three-meter board. Unobstructed ceiling height of 20 to 23 ft above water level, for one-meter or three-meter boards.

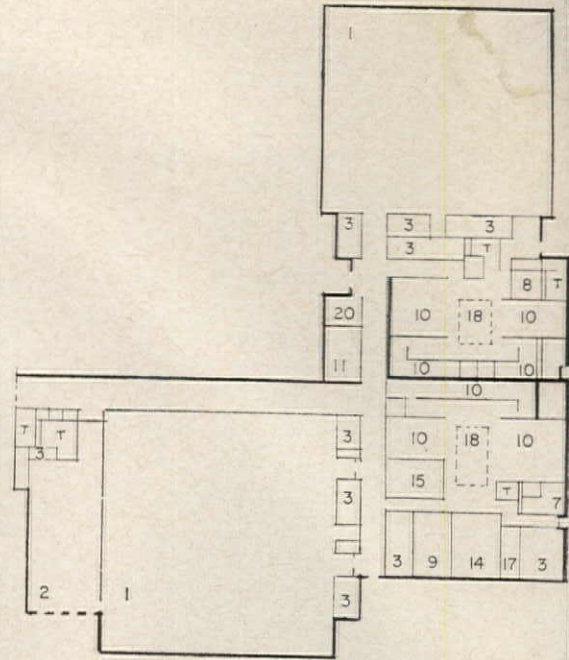
**ALL-PURPOSE ROOM:** Depending upon program, one or more rooms of approximately 1,500 sq ft, with 14 to



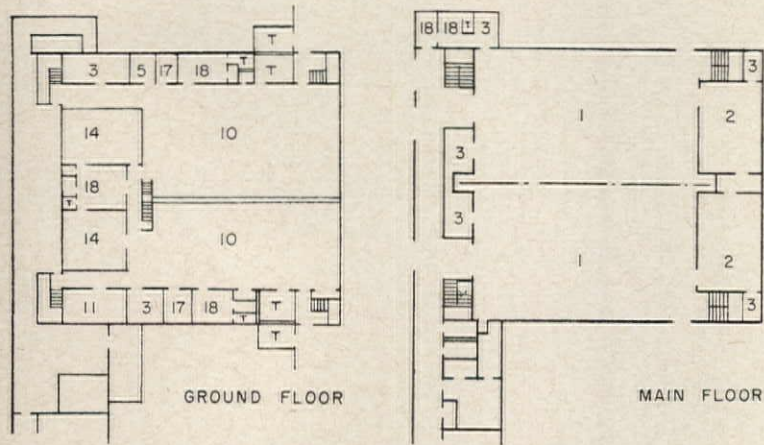
A. Shaker High School, North Colonie, N.Y.—Henry L. Blatner, Architect



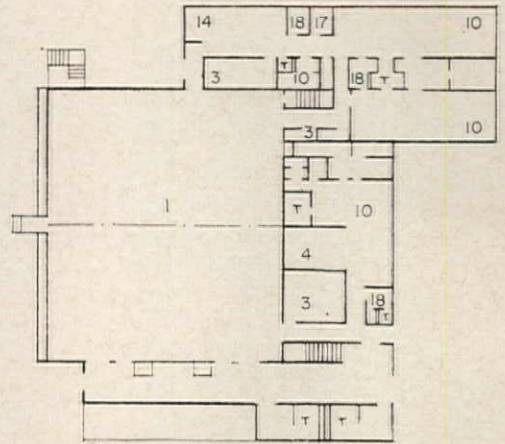
B. Lawrence Central High School, Marion County, Ind.  
Lennox, Matthews,  
Simmons and Ford, Inc., Architects



D. West Essex Junior-Senior High School,  
Caldwell Township, N.J.  
David Ludlow, Architect



C. Concord-Carlisle High School, Concord, Mass. Warren H. Ashley, Architect



E. Kirkwood High School, Kirkwood, Mo.  
Wm. B. Ittner, Inc., Architects

## SEARCH FOR A SOLUTION. By N. L. Engelhardt Jr. (Continued)

### LEGEND

1. GYMNASIUM
2. CORRECTIVE GYM
3. STORAGE
4. BASKET RM.
5. TOWELS
6. EXERCISE RM.
7. MALE INST. DRESS. RM.
8. FEMALE INST. DRESS. RM.
9. UNIFORM DRYING
10. LOCKER, SHOWER, DRY
11. LAUNDRY
12. SOCCER TEAM RM.
13. TRACK TEAM RM.
14. HOME TEAM RM.
15. VISITING TEAM RM.
16. FOOTBALL TEAM RM.
17. FIRST AID
18. OFFICE
19. SERVICE
20. MECH. EQUIPMENT
21. LOBBY
22. HEALTH RM.
23. WHIRLPOOL
24. POOL

The table illustrates the many variations that do exist in the amount of space devoted to physical education. In one case, 9.2 sq ft per pupil were allowed for actual teaching stations; in another case, 20.2 sq ft. The difference reflects the opportunities that are given to the students in this subject area, measured largely by the number of periods per week the student takes physical education.

Auxiliary spaces in the physical education unit, including locker rooms, generally represent about 40 to 50 per cent of the total sq ft area. The larger buildings are usually more efficient in this respect, and, as a result, the percentage may decrease. Comparing gross areas, the number of sq ft per pupil in high schools ranges usually from 90 to 130 sq ft. Physical education may represent a range of 15 to 25 per cent of the total sq ft area of the building.

The influence of the nature of the program on the cost of facilities is obvious. For example, a three period a week program for 1,500 students, based on six hours a day utilization, will require five, and possibly six, teacher stations. On the other hand, if 1,500 students take physical education only one period a week, only two teacher stations are required. Since physical education space is higher in cost than the average facility within the school in terms of unit cost per square foot, it is likely that these facilities will run between 20 and 30 per cent of the total cost of construction

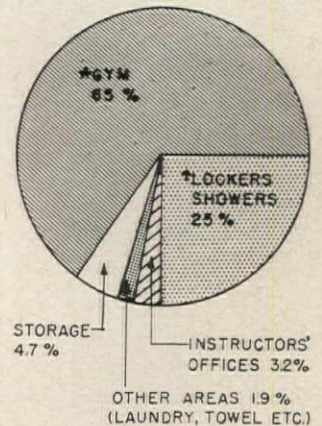
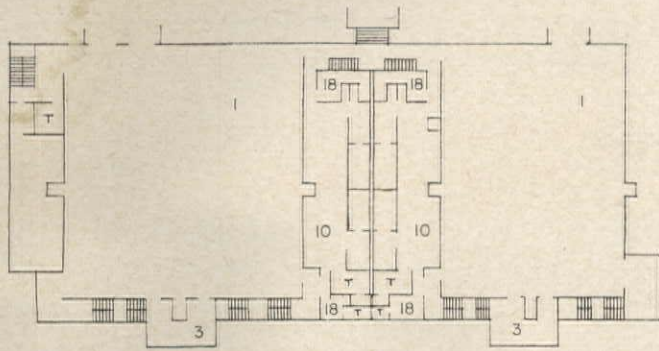
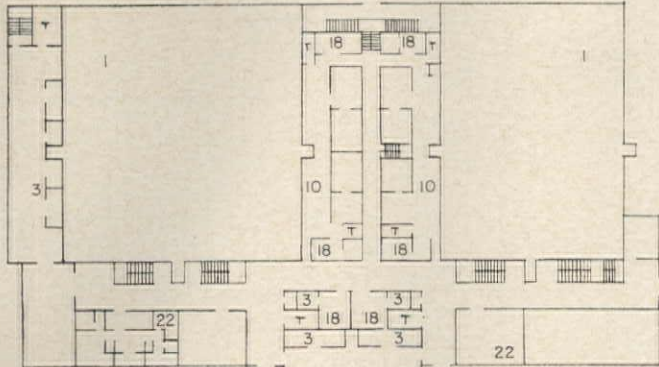


CHART IV: Division of Educational Area in Physical Education Facilities (Based on eight schools above)

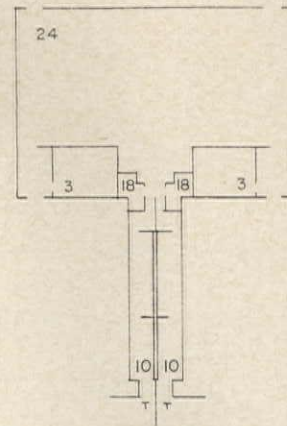
\*GYM—Reg Gymnasium(s) Exercise Rm., Corrective Gym, Training Rm., Swimming Pool  
†LOCKERS & SHOWER—Locker, Shower, Drying Areas, Team Rms., Team Showers, Swimming Pool Showers



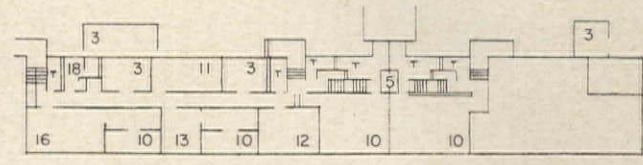
GYMNASIUM FLOOR LEVEL



GROUND FLOOR LEVEL

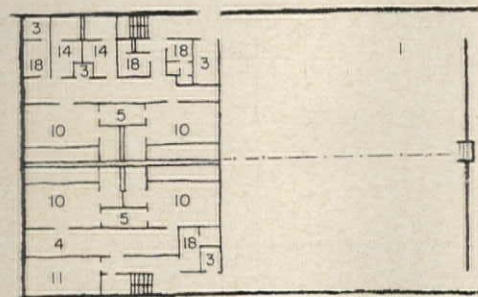


POOL FLOOR LEVEL

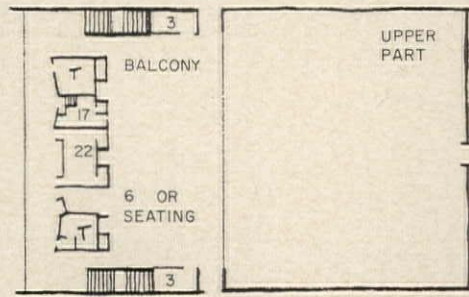


POOL FLOOR LEVEL

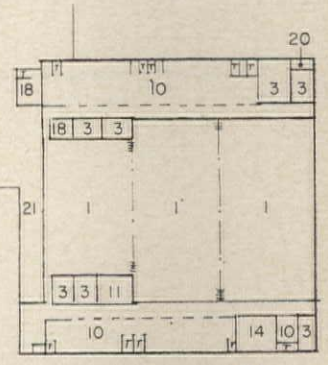
F. White Plains High School, White Plains, N.Y. Perkins and Will, Architects



LOWER LEVEL



UPPER LEVEL

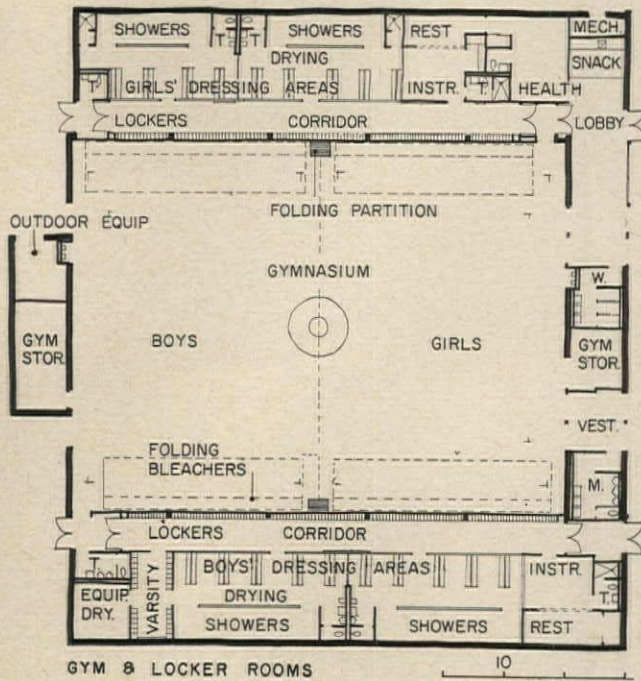


H. Mohanzen Junior-Senior High School  
East Rotterdam, N.Y.  
Warren H. Ashley, Architect

G. Newark High School, Newark, Ohio. Perkins and Will, Architects

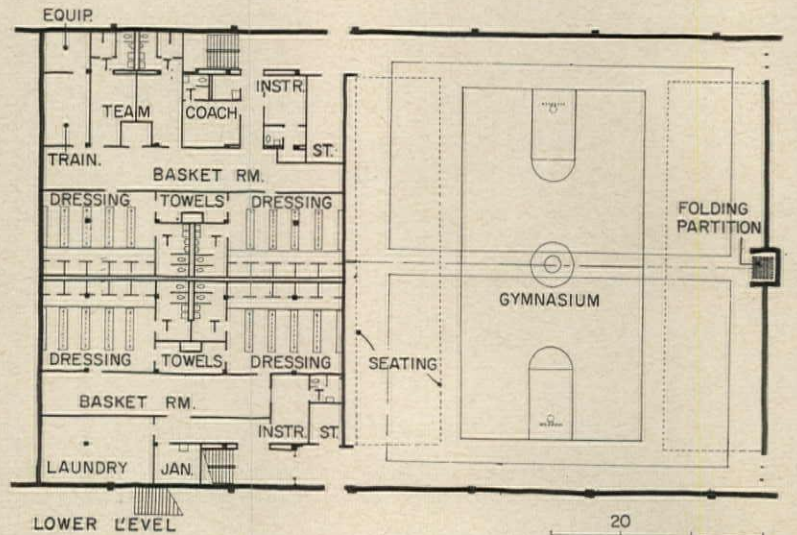
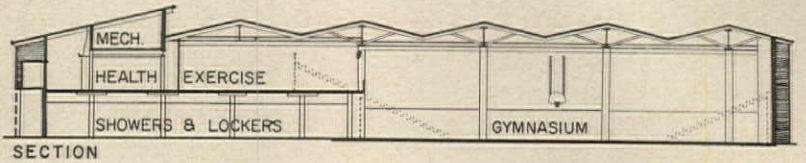
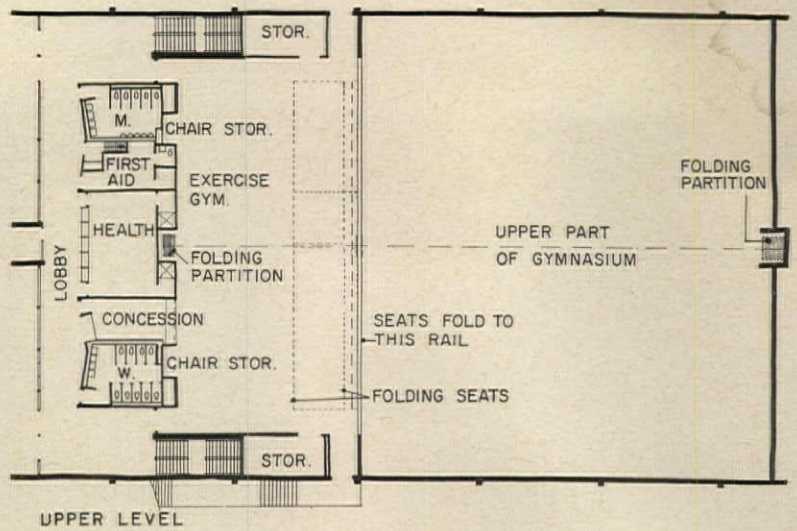
CHART V: COMPARISON OF PHYSICAL EDUCATION AREAS IN EIGHT SCHOOLS

SCHOOL (All areas in sq. ft.)	(A) No. Colonie N. Y. Jr.-Sr. H. S.	(B) Lawrence Ind. H. S.	(C) Concord-Carlisle Mass. H. S.	(D) West Essex N. J. Jr.-Sr. H. S.	(E) Kirkwood Mo. H. S.	(F) White Plains N. Y. H. S.	(G) Newark Ohio H. S.	(H) Mohanzen N. Y. Jr. H. S.
Pupil Capacity	1502 pupils	1809 pupils	1166 pupils	1623 pupils	949 pupils	2378 pupils	1586 pupils	1315 pupils
Boys' Gymnasium	partitioned	folding bleacher	partitioned	separate	partitioned	separate	partitioned	partitioned
Girls' Gymnasium		partitioning		10460		10640		
GYMNASIUM TOTAL	8268	28731	9579	8040	10200	8390	13547	12080
Exercise Room	940	—	(2) 1900	2000	balcony 1760	—	—	—
Corrective Gymnasium	—	—	—	—	—	2630	balcony 2114	—
Training Room	—	—	—	—	—	—	370	—
Therapy Room	50	200	—	—	—	—	—	—
Boys' Locker and Shower	3497	3820	2850	2760	2600	3180	2200	2646
Girls' Locker and Shower	3870	3580	3640	2580	1970	3180	2180	2893
Team Rooms	460	1370	(2) 1280	(2) 1030	(2) 1060	(4) 2110	674	550
Other Locker and Shower	—	—	—	—	—	sw. pool 1500	—	—
Gym Storage	660	530	550	(4) 1800	875	910	(3) 761	280
Outdoor Storage	—	—	—	325	—	360	—	480
Other Storage	520	770	490	580	102	—	—	650
Instructors' and Coaches' Office	(3) 470	(4) 570	(4) 1070	(4) 970	(3) 330	(9) 1494	(3) 670	(2) 610
Department Office	—	210	225	—	—	(2) 460	—	—
Laundry and Uniform Drying	300	180	370	840	—	420	555	230
First Aid	—	—	(2) 230	160	83	—	312	—
Towel Room	—	160	200	—	—	—	350	—
Swimming Pool Total	5100	7825	—	—	—	6726	—	—
Swimming Pool Size	36' x 75'	42' x 75'	—	—	—	42' x 75'-1"	—	—
GRAND TOTAL	24132	47946	22384	31545	18980	42000	23733	20420
Sq. Ft. per Pupil: Gross Area	16.0	26.5	19.2	19.4	20.0	17.6	15.0	15.5
Total Educational Area	14,308	36,556	11,479	20,500	11,960	28,386	16,031	12,080
Sq. Ft. per Pupil: Educational Area	9.5	20.2	9.8	12.6	12.6	11.9	10.1	9.2



Boonsboro High School  
McLeod & Ferrara, Architects

Above: A scheme for "open plan" locker facilities  
Right: A plan using high-ceilinged gym space to provide extra levels for other physical educational activities.



Newark High School, Newark, Ohio  
Perkins & Will, Architects

SEARCH FOR A SOLUTION. *By N. L. Engelhardt (Continued)*

16 ft ceiling heights. Used for wrestling, boxing, tumbling, apparatus work, rhythms, dancing.

**FIELD HOUSE:** An inexpensive enclosure of a large area without a finished wooden floor. Designed for indoor playing of outdoor activities, such as track, softball, baseball, touch football, lacrosse, etc. Sometime, a portion has a permanent wooden floor, or a portable basketball floor, with portable steel bleachers from the football field to make a large spectator area. Floor may be tanbark, sand, etc.

**AUXILIARY GYMNASIUM:** A device to reproduce a big gymnasium on a small scale without spectator space. Provides about 3,000 to 4,000 sq ft of area, with 20-ft ceiling. It is really another basketball court. Better to provide spaces for a wider variety of games—handball courts, squash courts, and the like—or use all-purpose rooms.

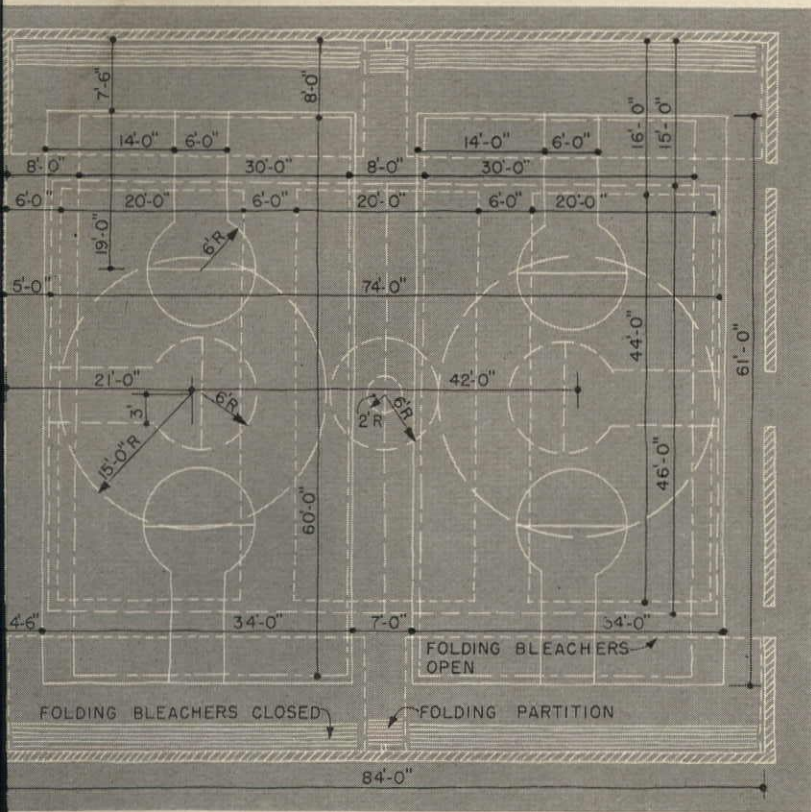
**SHELTER:** May be large unenclosed space covered by a

roof, or attached to building, covered, with a wall omitted. Wall may be enclosed in future. Usually designed to save money. Has been found to be most effective in elementary school program. While it may be valuable in southern climates, its use is generally not feasible in the north where temperatures drop to zero and below. This is the time of year when physical activity should be at its peak.

**CORRECTIVES ROOM:** A classroom-sized space for remedial work. Wall mirror, bars, and other small equipment needed. Not effective unless used as a teacher station.

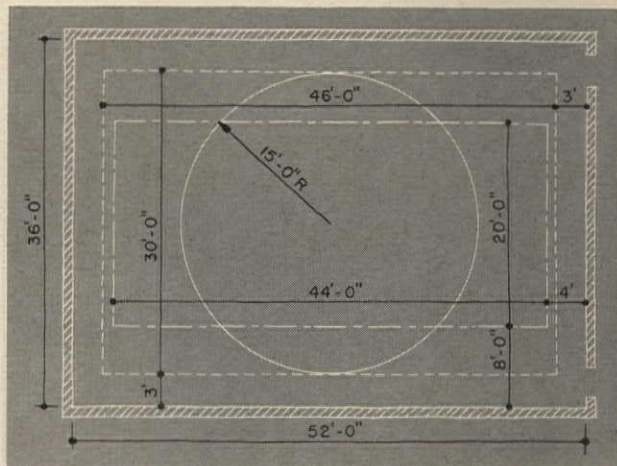
**HEALTH EDUCATION ROOM:** In many states, the physical education program includes direct classroom instruction in health. Such a room resembles a general science laboratory and requires a science demonstration desk, with water and service outlets.

**REST ROOMS:** There is always a small group of stu-



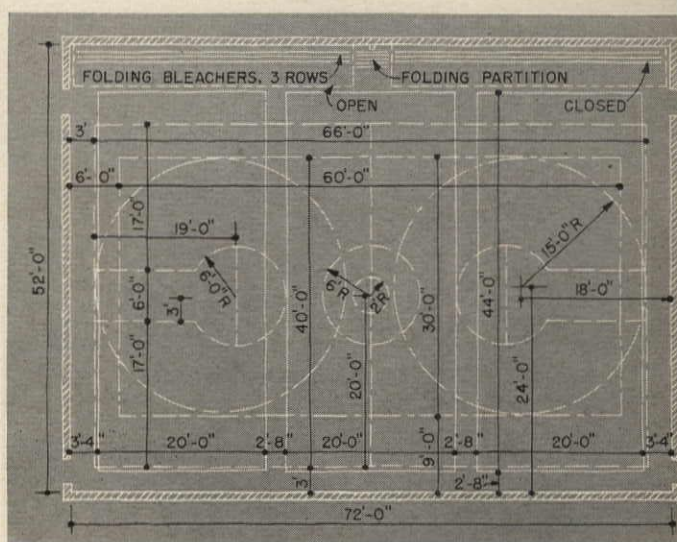
**PHYSICAL EDUCATION UNIT FOR LARGE ELEMENTARY SCHOOL**

- 2 Teaching stations each 42 x 70 ft—2 in (folded bleacher space deducted)
- 2 30 x 60 ft official court areas for volleyball, Newcomb, etc.
- 2 20 x 44 ft official court areas for badminton, paddle tennis, etc.
- 2 30 ft circle areas for dodge ball & circle games
- 1 46 x 74 ft official interschool basketball court (J H S age)
- 2 34 x 61 ft non-official courts for instruction & intramural basketball
- 7 rows of bleachers each side of gym for approximately 650; bottom row only to be opened for intramural & recreational activities, seating 120



**AUXILIARY PHYSICAL EDUCATION UNIT**

- Volley Ball, Newcomb, etc. -----
- Badminton, Paddle Tennis, etc. -----
- Dodge ball and circle games -----



**PHYSICAL EDUCATION UNIT FOR SMALL ELEMENTARY SCHOOL**

- 2 small teaching stations, each 36 x 50 ft (folded bleacher space deducted)
- 1 40 x 66 ft intramural basketball court
- 1 30 x 60 ft court area for volley ball, Newcomb, etc.
- 2 20 x 44 ft court areas for badminton, paddle tennis, etc.
- 2 30 ft circle areas for dodge ball & circle games
- 3 rows of folding bleachers on one side of gymnasium

**Dimensions of typical gymnasiums**

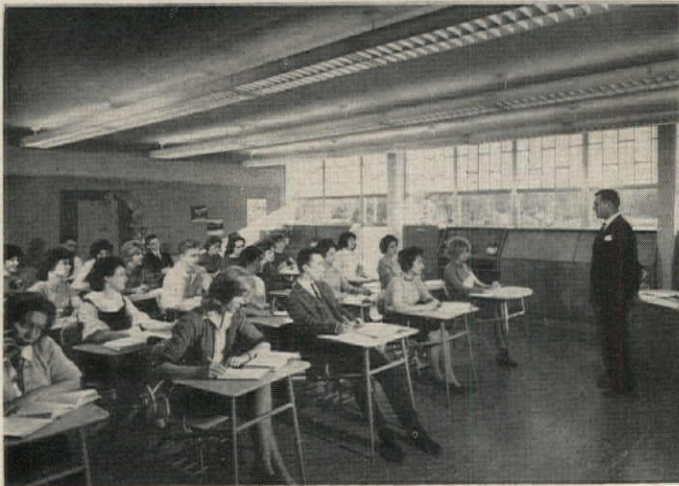
dents who cannot engage in a strenuous physical education program, for varying lengths of time. The school should provide a rest space, at least for the girls, and in the larger schools, for boys and girls. A quiet, secluded location with ample sunlight for sunbathing, will help the school to adapt to individual needs.

**OUTDOOR AREAS:** In the elementary school there should be grassed and paved play areas with suitable buffer zones, if possible, between primary and upper grades. Equipment will consist of jungle gyms, swings, slides, etc. In the high school plans for a greater variety of games will require more elaborate areas. The areas required and the number of pupils who can be accommodated in each are in Chart III.

**LOCKER AND SHOWER ROOMS:** The trend in the locker-shower area is away from the compartmentalized locker room, shower room, drying room, and instruc-

tor's office. An open layout eliminates congestion and provides more effective supervision. Another factor to be considered in design of locker rooms is provision not only for the regular physical education classes during the school day but also for the extra heavy load that comes in the afternoon when intramural teams all attempt to use the locker room at the same time. An open room, without individual lockers, does provide a great degree of flexibility. Maximum supervision by the instructors is important in locker rooms. The provision of a glass-enclosed office in the center of the room which permits quick supervision of all points in the room has proved to be very successful. Such an office should have visibility of the lockers and of the shower and drying spaces as well.

It should be possible for the instructor to supervise these areas without having to enter them.

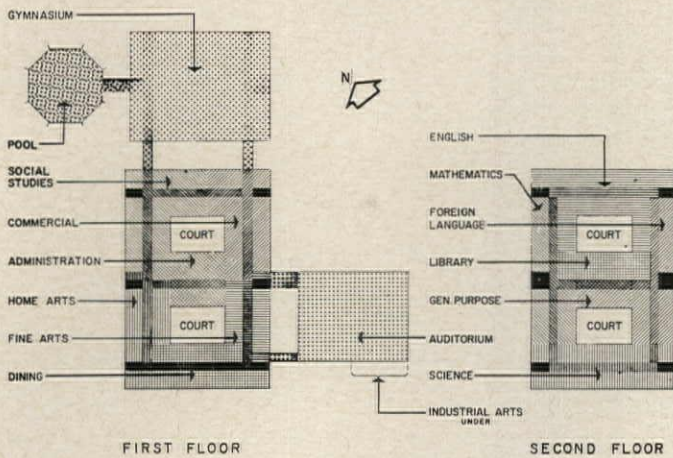


## SCHOOL LINKS STUDENT AND COMMUNITY USES

*Rippowam High School, Stamford, Conn. Urbahn, Brayton and Burrows, Architects. Fraoli, Blum & Yesselman, Structural Engineers. Muzzillo & Tizian, Mechanical Engineers. John C. Mason, Food Equipment Consultant. Michael Kodaris, Acoustical Consultant. George L. Hickey, Contractor*

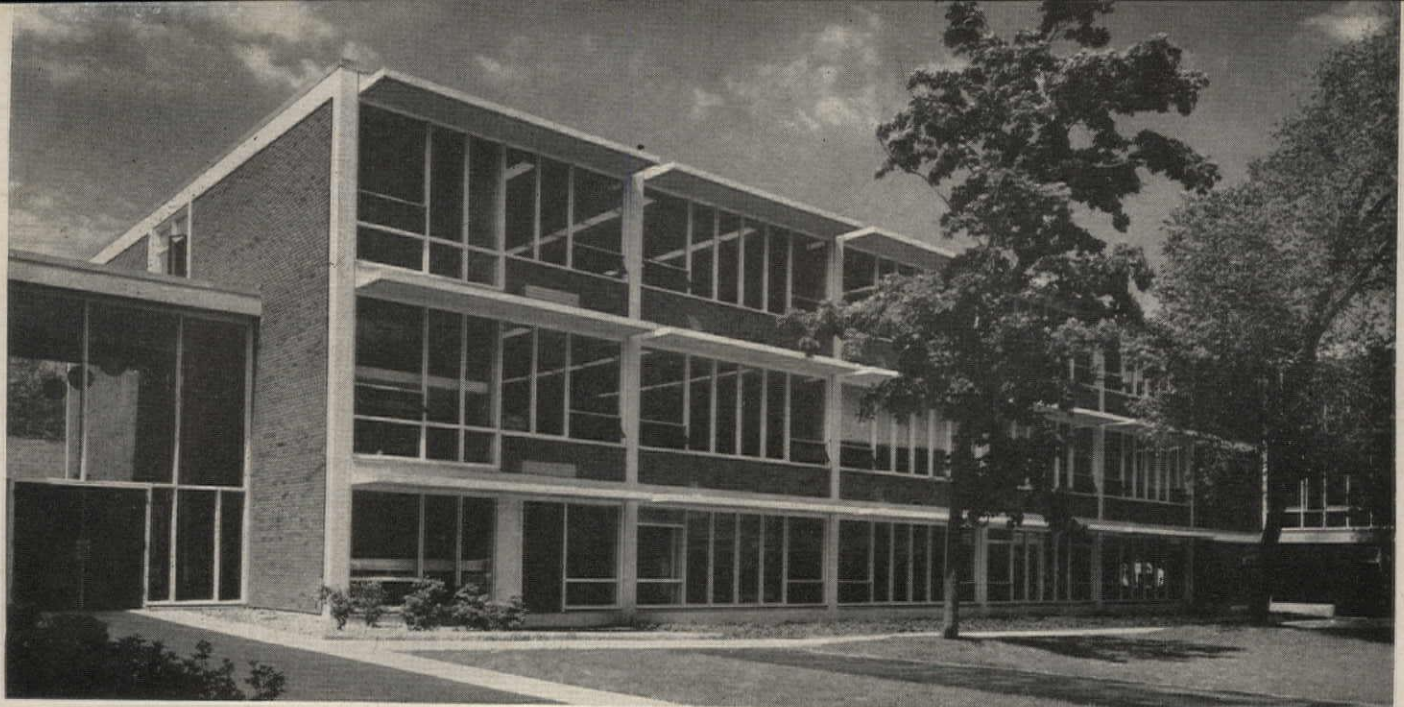
This large, 88-classroom high school was designed to provide for a very progressive educational program, and to add to facilities for general community use (gymnasium, auditorium, certain classrooms, and, when built in the future, a swimming pool). To minimize interference with student activities by community use, the physical education and auditorium areas were isolated in wings by themselves.

Provision for expanding enrollment by 50 per cent to 2,400 students was incorporated in the original plan: without additional construction, the areas could be obtained by moving some interior walls, and by moving toward a large and small group system of teaching. The structure is of steel frame, with exterior walls of glass vision strips and reinforced glass fiber plastic panels in the classrooms, moss-green ceramic brick for the gym and auditorium.



Maris © Ezra Stoller





Louis Reens

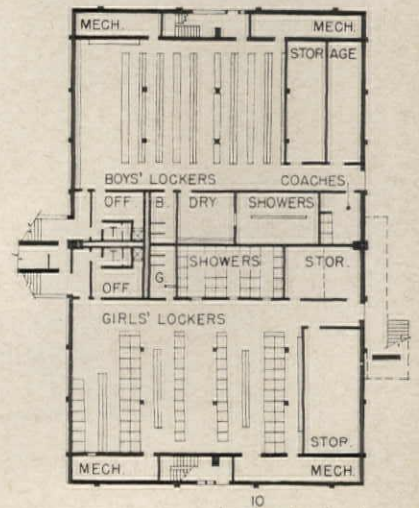
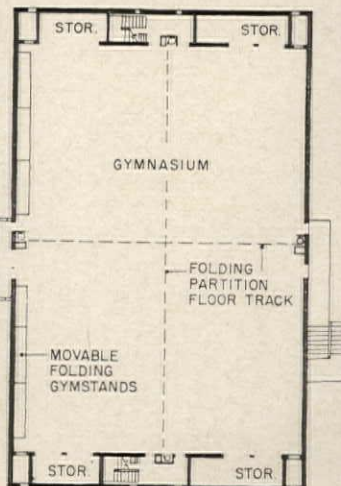
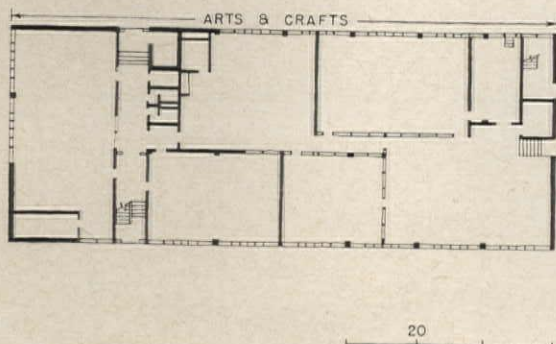
## A NEW WING HELPS REVITALIZE AN OLDER SCHOOL

*Addition to Levi Warren High School, Newton, Mass. The Architects Collaborative, Architects (Norman Fletcher, Partner in Charge; Herbert Vise, Job Captain). Goldberg, LeMessurier and Associates, Structural Engineers. Don Adamson, Electrical Engineer. Tocci Brothers Construction Company, Contractor*

Additions, such as this handsome new wing for a more traditional white-trimmed brick school, are the obvious answer to providing more adequate or up-to-date programs in many existing school plants.

In this case, a "T"-shaped extension was planned to add gymnasium facilities, 8 classrooms, 12 special rooms, cafeteria and library. The addition is connected to the old building by a glazed bridge. The building is a simple, three-story structure with exposed concrete frame, slab overhangs, and brick panels set in the frame. Classroom ceilings are exposed rib concrete construction with fluorescent lights hung in the troffers. The building cost \$862,500, or \$14.50 per sq ft, for 59,734 sq ft.

The gym is planned for 1200 students, with its space divisible into four teaching stations by means of four motorized coil wall doors. Lockers are below.

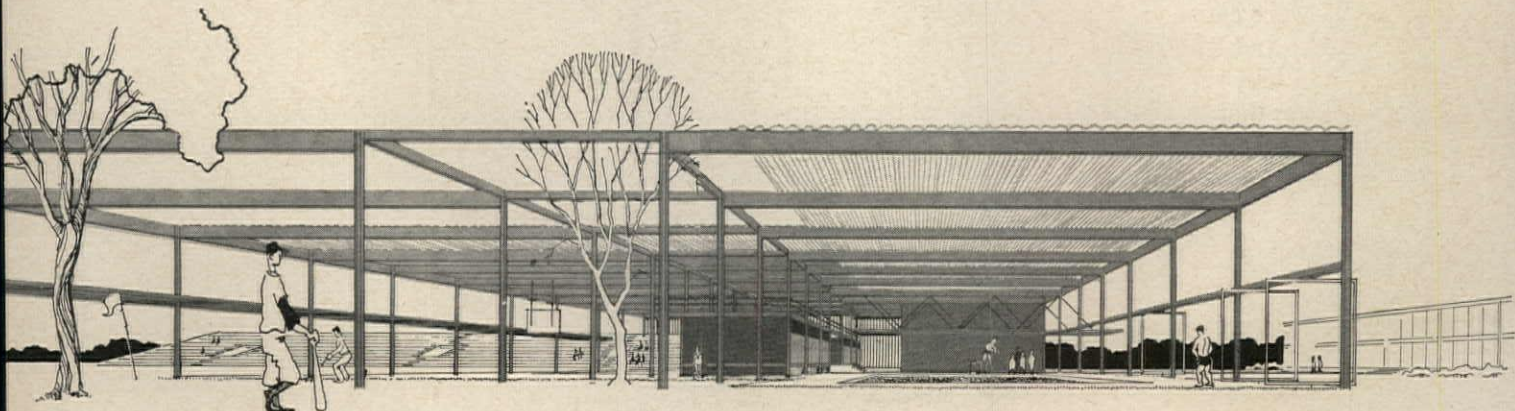
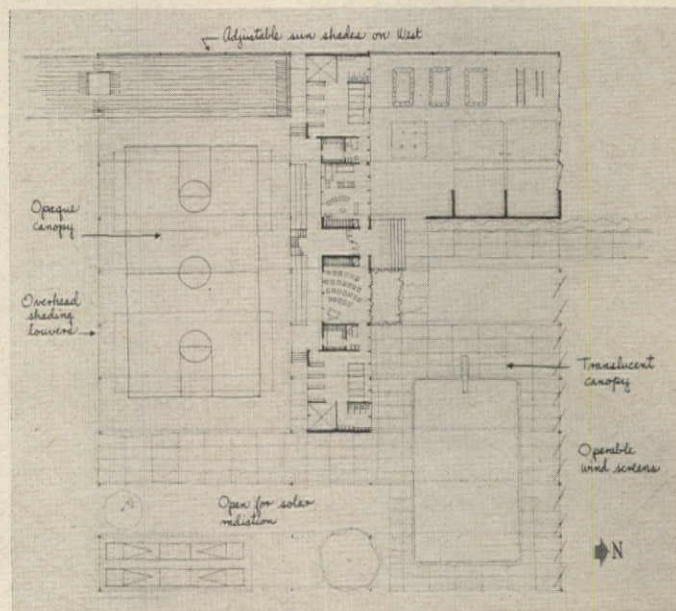
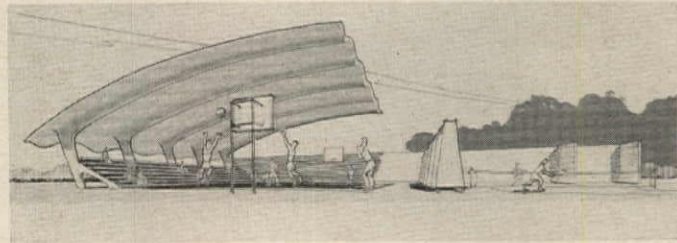
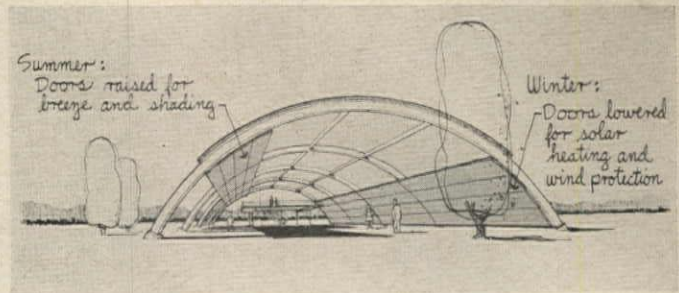


# PLAY SHEDS OFFER LOWER COST POSSIBILITIES

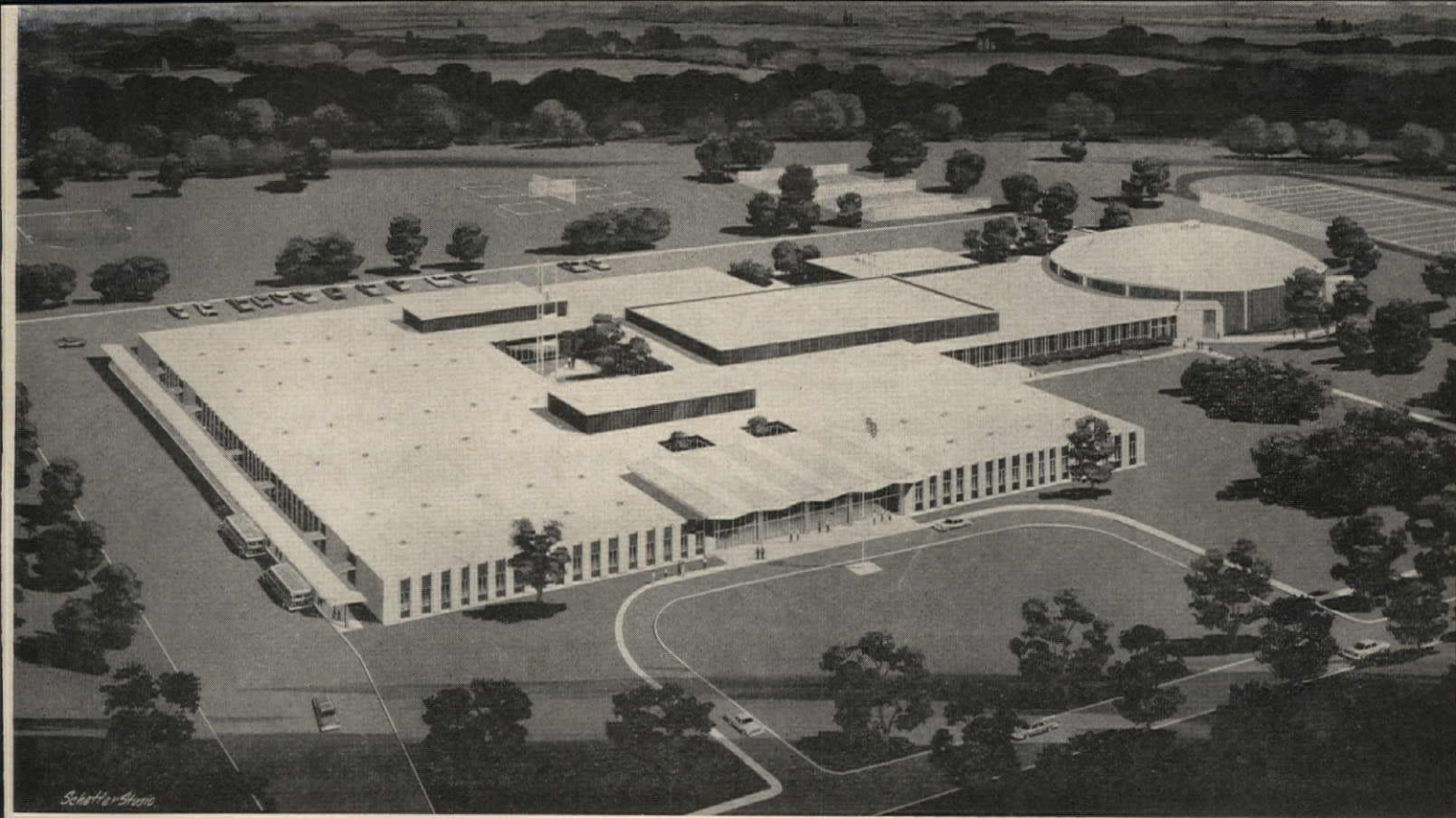
An old device is assuming a growing new role as a possible—or partial—answer to the problem of improving inadequate physical education facilities at reasonable cost. This is the limited shelter or play shed. A research study of the feasibility of their use in public schools has recently been conducted by the Architectural Research Group of the Texas Engineering Experiment Station. This group, under contract with the Texas A. & M. Research Foundation, College Station, Texas, and supported by a grant from the Educational Facilities Laboratories, Inc., has published their findings in a handsome brochure titled "Shelter for Physical Education", available at the above address.

The study assumes a fairly broad view of what a "play shed" might be: "Limited shelter as an expression may be many things; it may be a lean-to, protecting the hunter from the rain and wind, or it may be the Squaw Valley Arena, housing the Olympic games. Basically, it is considered in this study as being any outdoor space that uses natural or man-made devices to protect the human being from the extremes of the natural elements."

In their conclusions, a number of possibilities are sketched (three of which are shown here), along with many technical aspects of climate and human comfort as applied to P.E. programs. The general summary is that "the elementary school program seems to offer the best opportunity to exploit the limited shelter approach" but that the high school program "poses more challenges and at the same time is the most rewarding when economic and program benefits are concerned." Degree of use and variability of climate form final economic factors.







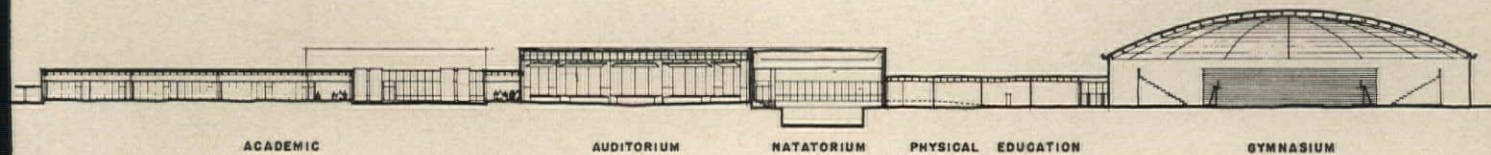
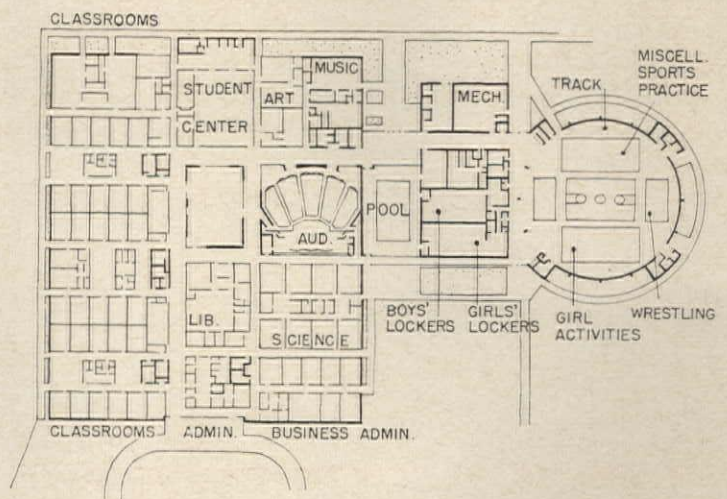
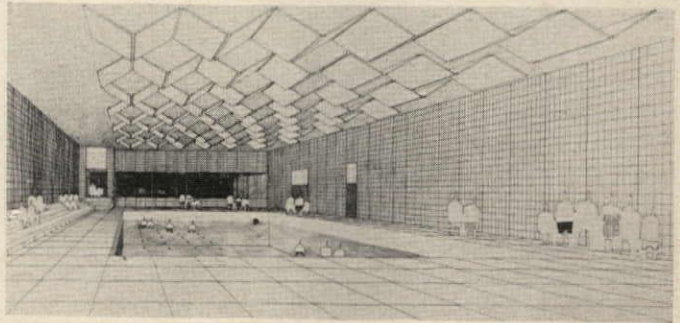
Schiffelers

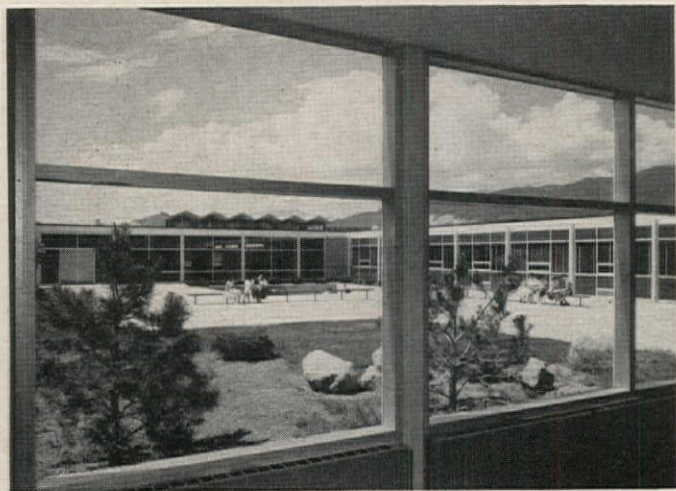
## CIRCULAR GYM OFFERS FIELD HOUSE BENEFITS

*Lawrence Central Senior High School, Marion County, Indiana. Lennox, Matthews, Simmons and Ford, Inc., Architects and Engineers. Edwin Estell, Superintendent. Englehardt, Engelhardt and Leggett, Educational Consultants*

Unusually ample physical education facilities have been incorporated in the plans for this large high school, indoors and out. These range from a swimming pool to the physical education "center", and a big circular gym. The gym is a circular, domed space, with a built-up roof of marble chips with insulation on wood decking. Bleachers, seating 3,600, are of the roll-away type, and permit the full use of the floor area for physical education purposes. Provision has been made for a wide variety of activities as well as for interscholastic basketball.

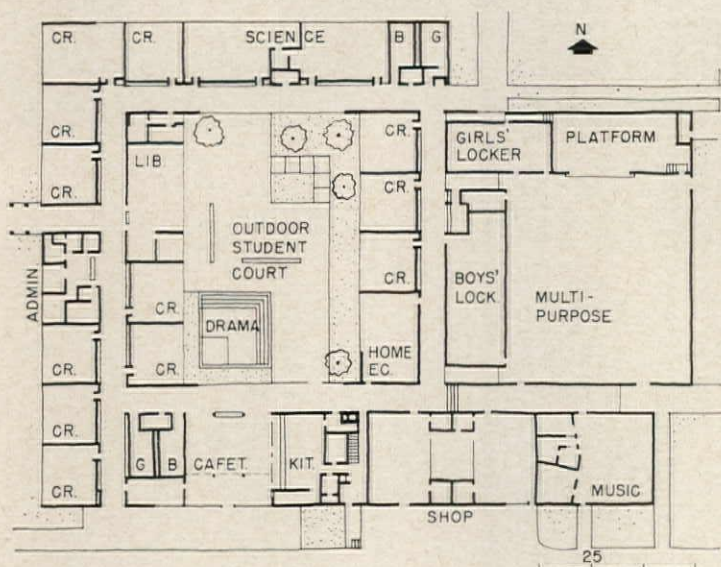
With the exception of these physical education spaces, the entire school is air conditioned. All classrooms are grouped into "little school" areas, which are in turn grouped into a major academic area. Interior classrooms were considered to offer major advantages in light and temperature control. For greater educational use, the auditorium has all seats within a maximum distance of 65 ft.





## SOPHISTICATED SCHOOL WITH PROVISIONAL MULTI-USE GYM

*Air Academy Junior-Senior High School, U.S. Air Force Academy, Colorado Springs, Col. Edward L. Bunts & F. Lamar Kelsey, Architects. John E. Bunts, Structural Engineer. Marchall & Johnson, Inc., Mechanical Engineers. Swanson-Rink & Assoc., Electrical Engineers. M. W. Watson, Inc., Contractor*



This trim steel and brick school, designed to be in harmony with the other academy buildings, creates a well-planned and pleasant environment for learning, reasonable maintenance, and construction within a limited budget (\$810,755 for 54,919 sq ft or \$14.76 per sq ft). The building accommodates 594 pupils in grades 7-12, with class rooms for the two lower grades separated in plan from the upper ones. Traffic flow and segregation of various noise levels is also well planned.

Gymnasium facilities, for the present, are provided for in a general multi-purpose room, flanked by locker units. A separate gymnasium will be added later.

The construction includes poured concrete foundations, exposed steel frame, open-web steel joists, concrete roof and floor slabs, steel arches over gym. Curtain walls are aluminum and porcelain enamel steel. A new classroom unit has recently been added to the right of the entry; the gym unit is being designed.



*Guy Burgess*



# Architectural Engineering

## The New AISC Specification for Steel

Biggest news in structural steel for buildings at the moment is the new American Institute of Steel Construction Specification, announced last month. The Institute and its 26-man advisory committee of engineers and educators point out that the new Specification not only will permit more economical and imaginative use of steel, but also will allow simpler analyses of structures requiring less time and effort from the designer. Major advances covered by the AISC Specification include: 1) four new high-strength steels; 2) composite design; 3) plastic design; 4) new design provisions for plate girders; 5) more precise column design, high-strength bolts and tubular or "box-type" steel members; 6) the combination of steels of different strengths in novel assemblies and 7) prestressed steel. The first AISC Specification was written in 1923; the last revision was in 1945, when welded and bolted design were incorporated. The present specification is completely new, combining the results of intensive research with established theory. Samplings of comments from the committee: William J. LeMessurier, consulting engineer from Boston—" . . . most important changes . . . have resulted from an effort to be logical, consistent and faithful to the accumulated research and theoretical knowledge of steel structures. This in itself is a revolution which will cause most of the textbooks to be rewritten . . ." Professor E. H. Gaylord, University of Illinois—"The more realistic appraisal of the strength of structural elements, which modern concepts of plastic analysis afford, [will provide] more reasonable, yet adequate, factors of safety. The new Specification recognizes the designer who wants freedom to take advantage of more advanced methods of analysis and design. Several 'permissive' clauses allow certain departures from the older inflexible and often outdated rules . . . This feature will make the Specification more acceptable to many engineers, and valuable in exciting the interest of engineering students in more sophisticated methods of analysis."

## The Computer to Operate Air Conditioning?

Within two years, automation will take over the mechanical and electrical phases of commercial and public building operation, according to John E. Haines, vice-president of Minneapolis-Honeywell Regulator Company. He predicts that computers will read data from a building's mechanical equipment, analyze it, then make the needed adjustments and corrections. If a pump breaks down, he says, the computer will automatically turn it off, start a substitute, then tell the building's engineer what should be done to fix it. Even now, a data-acquisition system in a new headquarters building for Tennessee Gas Transmission Company in Houston will automatically check 400 points throughout the 33-story skyscraper and punch information on a tape.

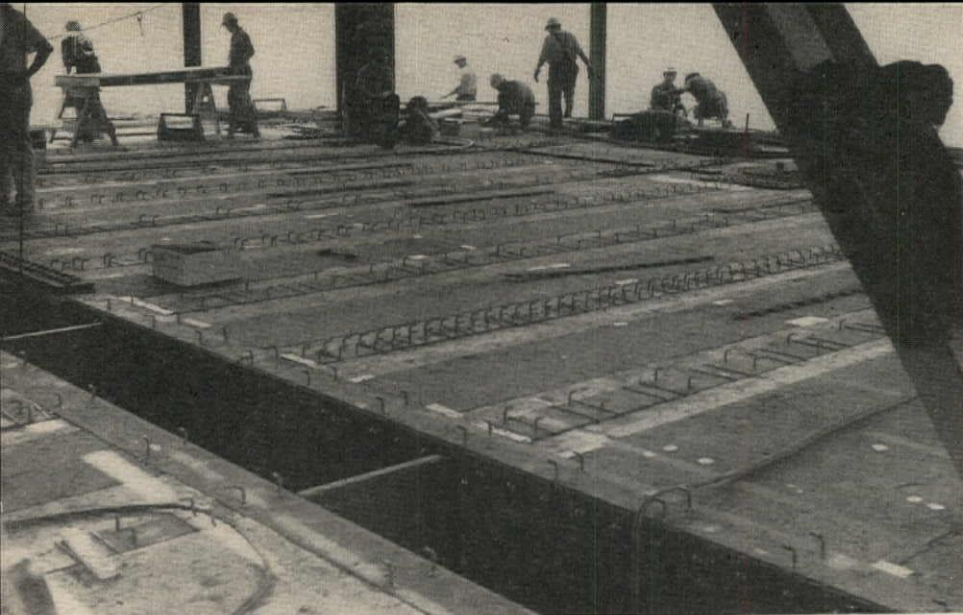
By feeding information on fuel costs, wages, outdoor temperatures and other variables, a computer can say whether it is cheaper to shut down the air conditioning at night or let it run, indicate the most economical temperature and humidity settings to maintain, and tell when equipment should be overhauled.

## Plastic Pipe for Drainage Approved by FHA

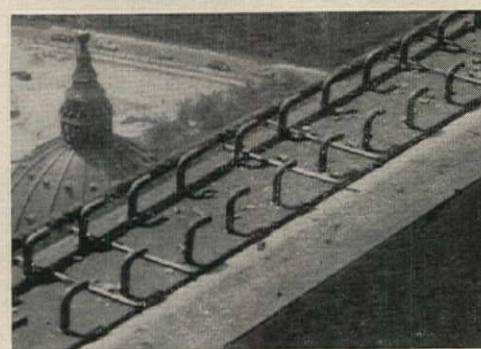
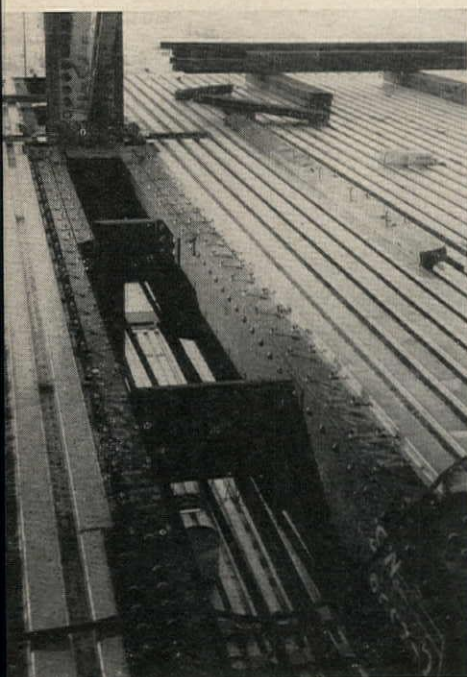
Recent Federal Housing Administration approval of plastic piping for the plumbing drainage system within the house will go a long way in encouraging approval of such materials by local and area building code groups, in the opinion of William Demarest, Director of Plastics in Building, Manufacturing Chemist's Association, Inc. FHA approval embraces the use of ABS (acrylon-butadiene-styrene) plastics for drainage and vent pipe and drainage fittings in houses. It is believed that approval of other plastic materials for these applications will follow. It is estimated that this plastic application will save a home buyer about \$90 for a 6-room house.

## This Month's AE Section

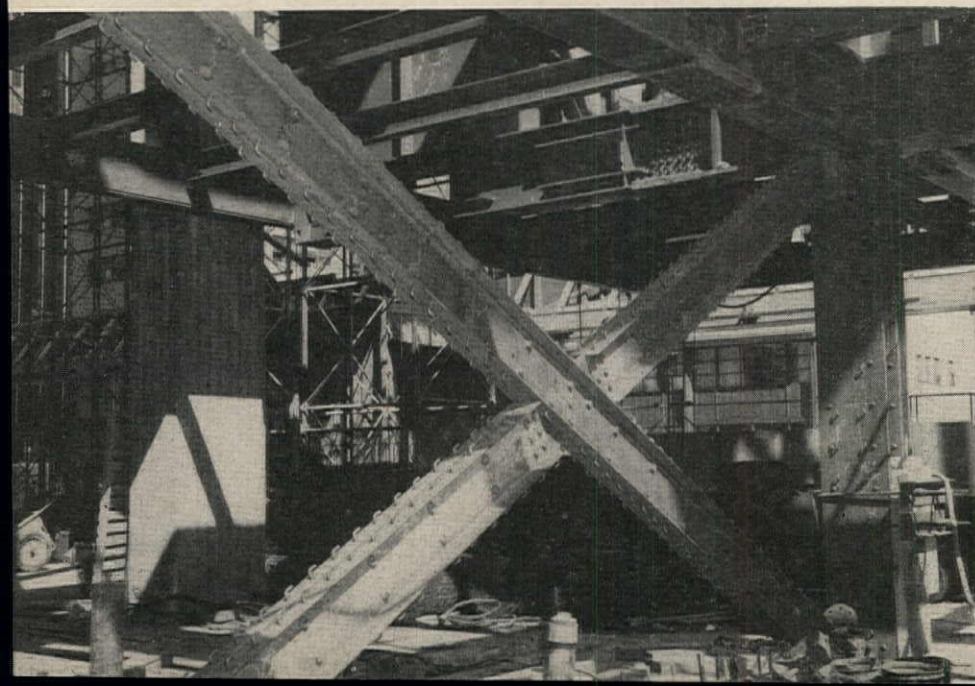
*COMPOSITE CONSTRUCTION ON A HUGE SCALE*, p. 152. *LIGHTING THAT COMPLEMENTS ARCHITECTURE*, p. 156. *A SPRAYED-ON CURTAIN WALL*, p. 160. *BUILDING COMPONENTS: Standardization in Steel Doors and Frames*, p. 165, *Products*, p. 167, *Literature*, p. 168.



Above: Hundreds of 2¼-in. high shear connectors have been welded to steel framing on an upper mechanical floor. Full advantage can be taken of composite action because concrete floor slabs are used at mechanical levels. Below, right: "L" type shear connectors are welded to top flanges of steel; note closeup



Above, left: Typical floors have cellular metal decking. Space between 82-ft double girders is filled with 3000 psi lightweight concrete; shear connectors tie girders to this core. Below: steel wind bracing is tied to concrete encasement by means of shear connectors welded to both upper and lower flanges of steel



Place Ville Marie Development, Montreal, Quebec

OWNER-DEVELOPER:

*Webb & Knapp (Canada) Ltd.*

ARCHITECTS AND PLANNERS:

*I. M. Pei & Associates*

ASSOCIATED ARCHITECTS:

*Affleck/Desbarats/Dimakopoulos/*

*Lebensold/Michaud/Sise*

*Henry N. Cobb, Partner in Charge*

STRUCTURAL ENGINEERS:

*Brett-Ouelette-Blauer Associates;*

*R. R. Nicolet, Project Engineer*

STRUCTURAL CONSULTANTS:

*Severud-Elstad-Krueger Associates*

MECHANICAL & ELECTRICAL ENGINEERS:

*Jas. Keith & Associates*

MECHANICAL & ELECTRICAL CONSULTANTS:

*Cosentini Associates*

GENERAL CONTRACTOR: *The Foundation Co. of Canada, Ltd.*

## HOW COMPOSITE IS USED

Structural steel—reinforced concrete "composite" systems in buildings can be divided into two categories:

a) COMPOSITE FLOOR SYSTEMS. This covers all conventional beam and slab framing as well as new applications such as metal deck floors designed to take full benefit of the concrete fill.

b) BRACING AND STIFFENING MEMBERS designed on the basis of interaction of steel and concrete. Although definite behavior under load and precise stress pattern at the contact surface cannot always be established as exactly as under item "a", a certain minimum shear transfer is nevertheless, guaranteed.

While there is a natural physical bond between steel and concrete (making possible reinforced concrete and bonded prestressing) it is special mechanical shear anchors that have made possible the many new applications of "composite construction."

## COMPOSITE CONSTRUCTION ON A HUGE SCALE

It saves steel in the largest office building in Canada both by conventional application to beam and slab framing and by unusual techniques for wind bracing and main girders

Over 750,000 stud shear connectors were used in the Place Ville Marie project to provide composite action between structural steel and concrete for floor framing members, for wind bracing trusses, and for a series of transfer trusses located below ground level.

The main element of the Place Ville Marie Development is the cruciform-shaped Royal Bank of Canada Building, so shaped as to give a striking form to the building, and to provide daylighting benefits not possible in a square building of equal area. This building has 1,500,000 sq ft of rentable space in 40 stories.

The most conventional application is that of composite floor beams and girders. Advantages:

- 1) girder and beam depths are reduced,
- 2) dead load is less due to reduced girder and beam weight,
- 3) structural steel tonnage can be reduced.

A much less conventional application of composite construction is that of steel trusses encased in concrete to provide lateral bracing against wind and earthquake. This was a particularly serious problem due to the cruciform building's shape, height and wide column spacing.

The same technique was used in constructing shear walls for the three-story-high quadrant buildings, located around the base of the cruciform tower. A 25-ft column spacing plus a 25-ft cantilever of upper floors required this special treatment for lateral loads. Advantages:

- 1) trusses are rigidized,
- 2) truss size and cost is minimized.

The concrete-encased wind bracing in the core of the cruciform building had to be transferred by means of heavy trusses to the main building grid system below grade. These trusses, also encased in concrete, were tied compositely to the concrete by "L" studs. Advantages:

Studs insure a rigid truss system, interacting with the concrete.

### Connectors for Underground Floors

Structural steel girders and beams for the three floors immediately below street level (one floor shopping; two floors parking) as well as for the main plaza were designed for composite action. Most of the floor beams in the lower levels are provided with  $\frac{1}{2}$ -in. diameter, L-type shear connectors. Because of the extremely tight headroom conditions, the concrete cover over top of the steel averages only 2 to  $2\frac{1}{2}$  in., and the height of the connectors is limited to  $1\frac{5}{8}$  in. after welding. The saving in structural steel tonnage of the beam system is, nevertheless, approximately 10 per cent.

### Connectors for Mechanical Floors

Typical office floor construction is of metal decking covered by 3000 psi Haydite aggregate concrete. For mechanical floors, however, concrete slabs span between the steel beams. A lower mechanical floor is provided above the main lobby, and three upper floors below the main building roof. At these levels, full advantage is taken of composite action, because it was possible to locate the slabs completely over the top of steel due to more favorable headroom conditions. Thus a greater saving in structural steel is possible on these levels than in the below-street levels. Typical  $2\frac{1}{4}$ -in.-high connectors were used.

### Connectors for 82-ft Main Girders

The basic structural arrangement of the cruciform-shaped tower consists of "two-column" bents spaced 25 ft on center. The span between these columns is 50 ft, and the building floors are cantilevered approximately 16 ft beyond the column line. Because of this particular arrangement, it was necessary to take special steps to insure the stability of the "two-column" bents.

The main girders spanning 50 ft were made only 24-in. deep because of the over-all construction depth available. A double girder arrangement was selected to obtain the re-

quired area of steel within the section, to permit framing of the 16-ft cantilevers and to simplify the connections at the columns. The stiffness of these girders was increased by filling space between them with 3000 psi lightweight concrete, except for a horizontal void provided between columns by fiber tubes in the range of 12 to 15 in. o.d.; cantilevered portions of the girders were filled solid. Shear connectors were provided to guarantee proper bond between the concrete core between double girders and the girders themselves.

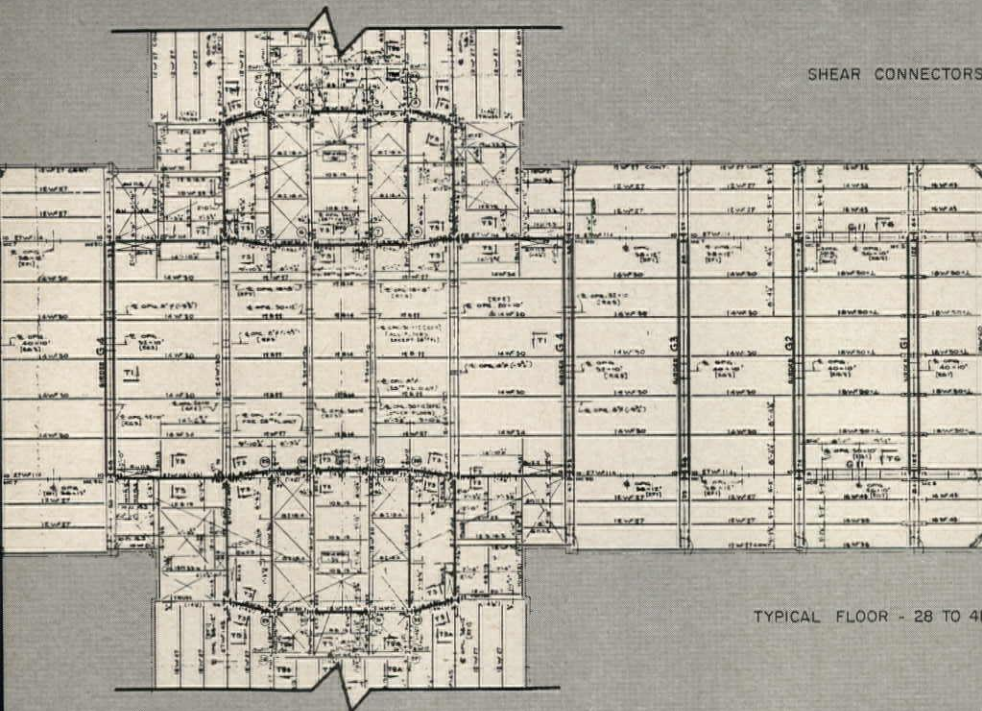
### Connectors in Core Area

The wind and earthquake forces of the building are resisted by frame action down to the 27th floor. Below that level, vertical bracing is provided around the elevator shafts, located in the core of the building. This bracing is encased in concrete below the second floor to form a system of shear walls.

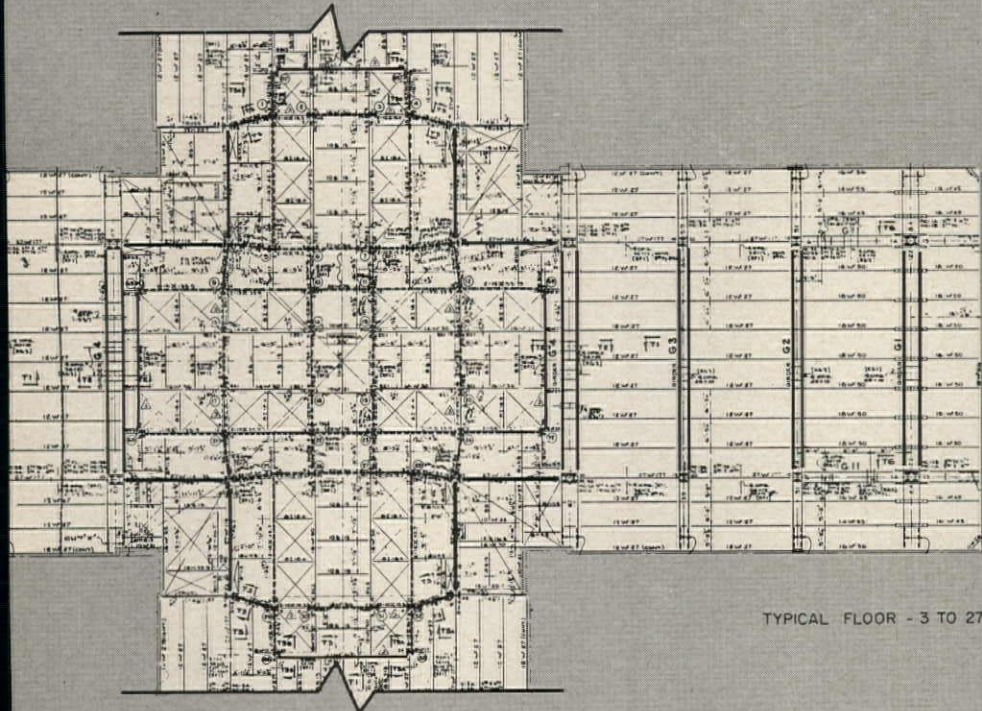
The main wind loads applied to the wings of the building are transferred to the core by means of each floor (essentially a plate) acting as a cantilever. Horizontal shear in the floor system is transferred to the vertical framing in the core through concrete floor slabs which are used in the core of the building and for portions of the floors adjacent to the elevator shafts. Shear connectors are provided to insure proper flow of stress from the concrete slabs to the main structural steel resistance elements.

The lobby of the cruciform building is 57-ft high. Due to this height the frame action of the "two-column" bents is substantially softened, and the resistance provided by the wings in the longitudinal direction is reduced. Therefore, the bracing system located around the elevator shafts has to channel most of the wind forces to the foundation. As was mentioned, this bracing system is encased in concrete below the second floor.

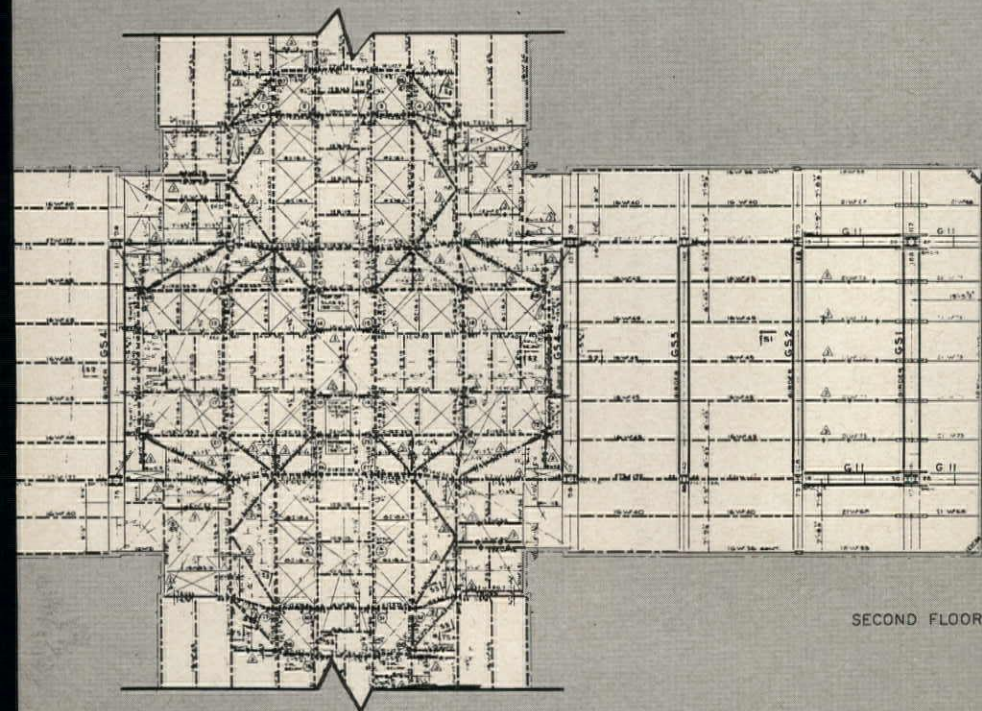
Proper interaction of the concrete shear walls and the wind bracing



TYPICAL FLOOR - 28 TO 41



TYPICAL FLOOR - 3 TO 27



SECOND FLOOR

system is provided by  $\frac{1}{2}$ -in. diameter L-type shear connectors. The second floor slab and the lower mechanical floor slab, both of which have to transfer substantially more horizontal shear than the typical building floors, are up to 13-in. thick, and are tied to the structural steel beams by stud shear connectors.

### Connectors for Transfer Trusses

The presence of Canadian National Railway tracks at the lowest level necessitated a structural transfer of the wind bracing system and the columns framing the elevator shafts to the main building grid. This was accomplished by heavy transfer trusses located between the shopping promenade level and the lower basement.

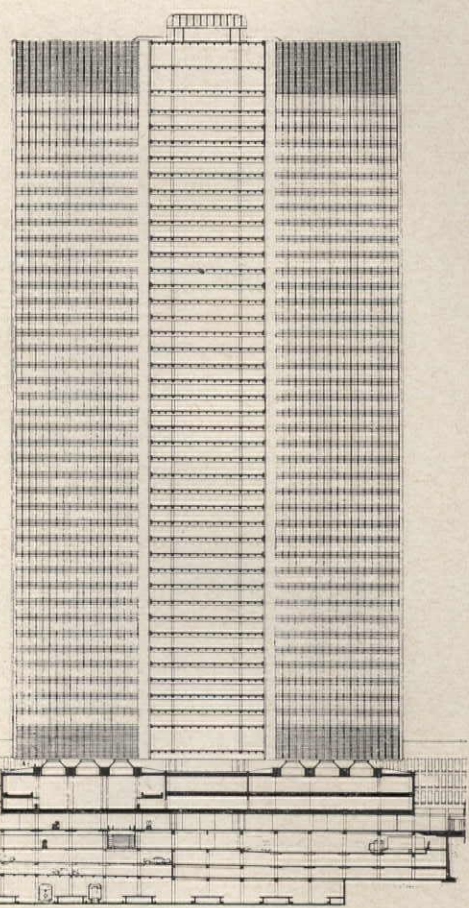
An offset complete bracing system was impossible because of track and platform location. Proper anchorage of the steel wind bracing system to the foundation, therefore, had to be provided by a system of heavy shear walls. The shear wall system begins as concrete encasement of the main bracing system (from second floor down to shopping promenade) and becomes the covering for the main transfer trusses (between promenade level and second basement). From the second basement the shear walls are reinforced concrete without structural steel bracing. To insure interaction for transmitting wind shear forces from the steel system to the concrete system, shear connectors were provided on the heavy transfer trusses and on the floor framing steel in the core area of the building at these lower levels.

### Push-Out Tests

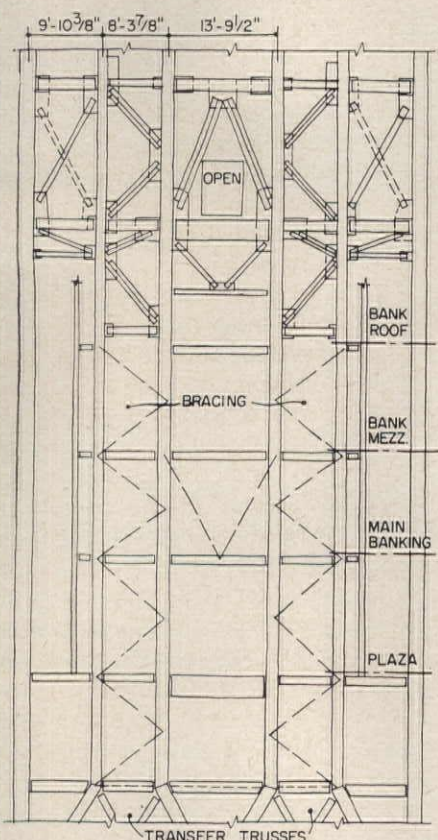
At the request of the owner, push-out tests were carried out by K. S. M. Products, Inc., manufacturers of the stud shear connectors, for the  $1\frac{1}{8}$ -in. high connectors, as well as for the  $2\frac{1}{4}$ -in. high connectors. The purpose of these tests was to establish a more precise value of allowable shear.

Heavy lines show which floor framing members have shear connectors (solid and dashed lines indicate different sizes and spacings). Wings have metal decking covered by 3000 psi concrete. Connectors of main girders in wings (double lines) tie concrete cores of girders and fill over decking to girder steel. Floor in center is concrete slab over steel. Extent of composite increases on lower floors because they must transfer more stress to the vertical wind bracing

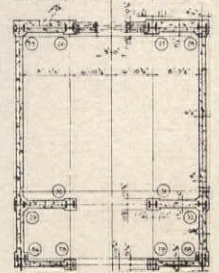
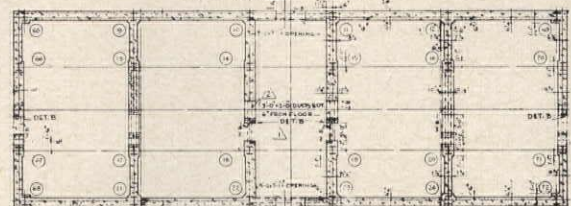
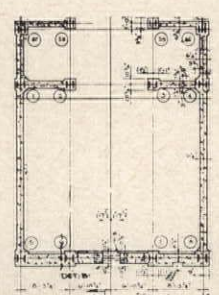
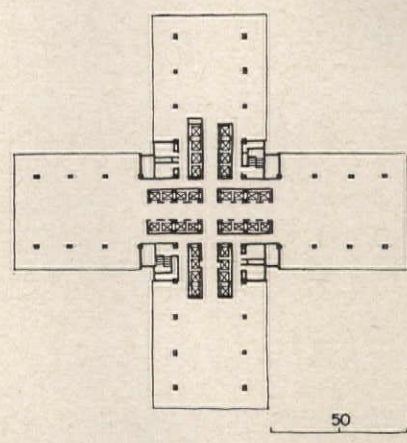
Wind bracing was a serious problem because of the shape, height and column spacing of the cruciform-shaped tower. Vertical wind bracing is provided from the 27th floor on down. Below the second floor this wind bracing is encased in concrete, forming a series of shear walls. Anchorage of the wind bracing system to the foundation is provided by the shear walls. From the lower basement floor to foundation level, the presence of railway tracks necessitated a transfer of the wind bracing system and the columns framing elevator shafts to the main building grid system below grade. Heavy transfer trusses, compositely designed, are used for this purpose, located between the shopping promenade and the lower basement. The drawings below show the main elements of the wind bracing system: typical portal frame, shear walls at second floor, and typical transfer truss. The section at right was taken through one wing of the tower, through two quadrant buildings and through the four below grade areas: one promenade level for shopping, two parking levels, railway tracks and platform level



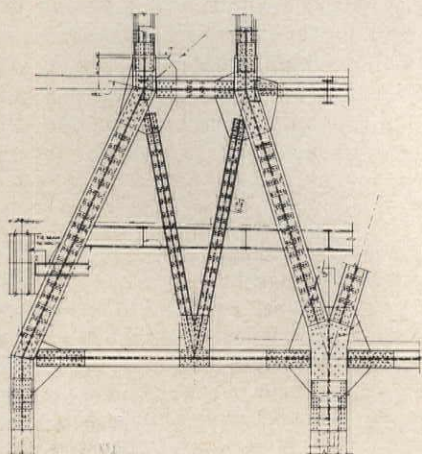
Section-Elevation of Place Ville Marie, Montreal, Quebec



Wind Bracing  
(a typical portal frame)



Shear Walls at Second Floor Level



Typical Transfer Truss



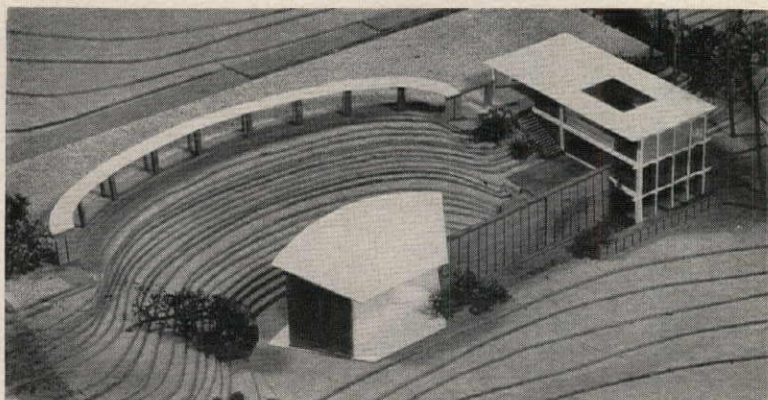
## LIGHTING THAT COMPLEMENTS ARCHITECTURE

Early collaboration between architect and lighting consultant produced designs esthetically appropriate, comfortable as well

*Eliot (Fellowship) House and Amphitheater, Mount Holyoke College, South Hadley, Mass.*

ARCHITECTS: *Carl Koch & Associates*

LIGHTING COORDINATION: *William M. C. Lam*



Neil Doherty

The project consists of an outdoor amphitheater in conjunction with a three-story fellowship house which serves as a religious and social center. The architects were faced with the problem of visually uniting these two diverse structures. One unifying element is the arcade. Lighting program for the amphitheater was to provide illumination of the arcade path and the bowl during intermissions without annoying brightness contrasts, and path lighting only during performances

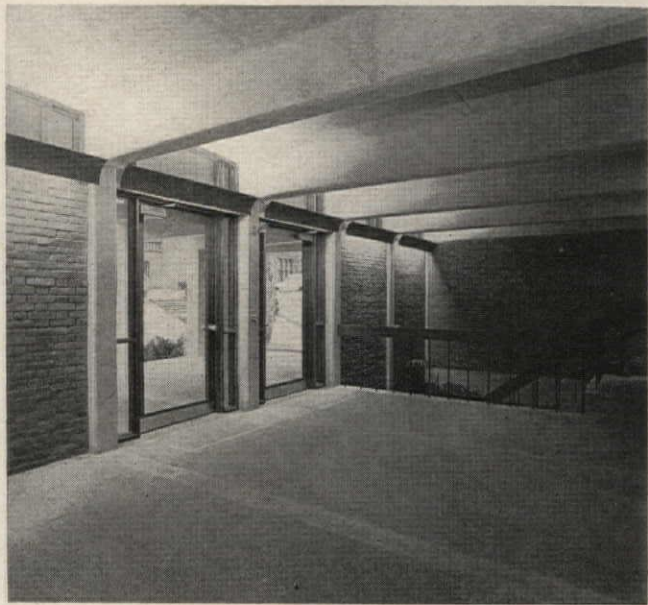
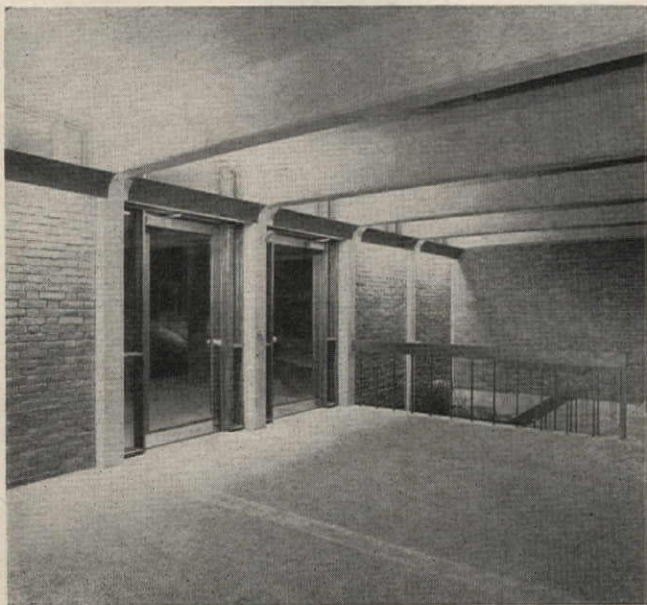
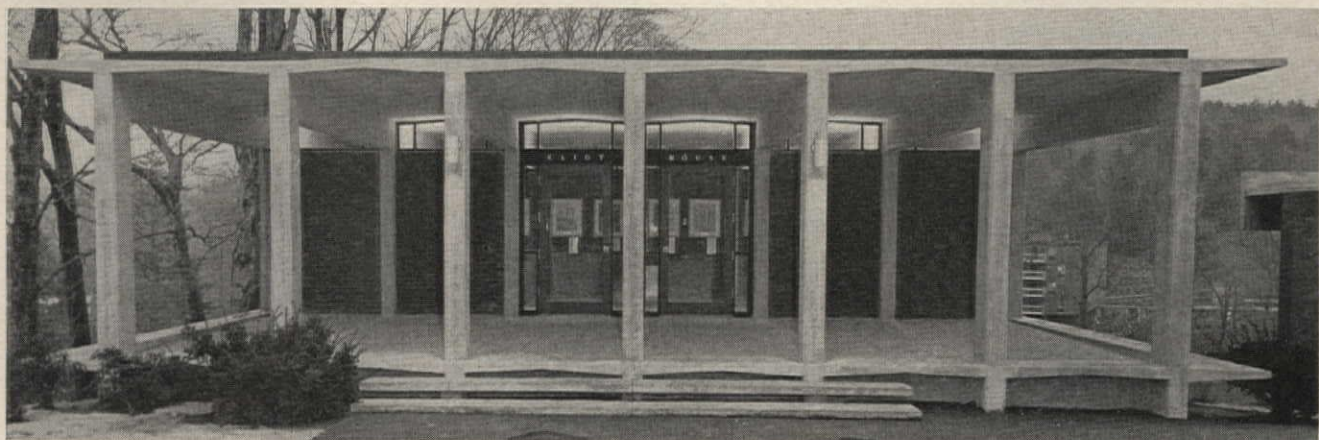
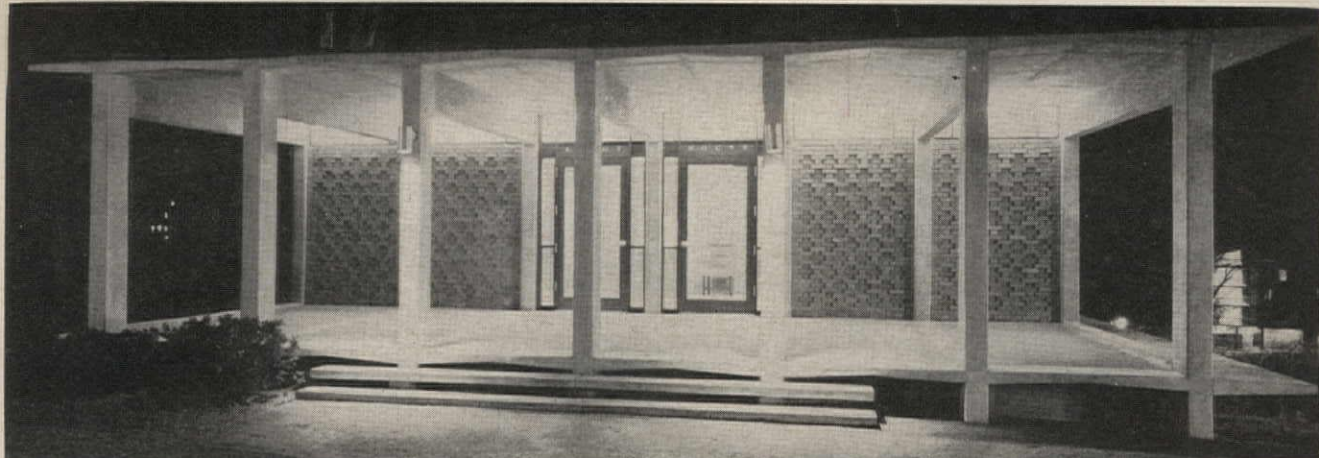
The lighting designs shown here are the realizations of a lighting program described in the fourth article of the RECORD's series on *Lighting for Architecture* by William M. C. Lam. One purpose of this article was to demonstrate the interdependence between lighting design and architectural decisions, including such matters as relating lighting to structure, integrating room surfaces and light sources, and so on.

This article pointed out that variety with consistency in lighting can be achieved by seeking out the common denominators that give the building its character, and relating the lighting to these common denominators. Here the common denominator was the exposed concrete framing, which is emphasized throughout by glass transoms over walls. Thus a first step in the lighting design was to study the various sources which would play up the structure, but yet not dominate it.

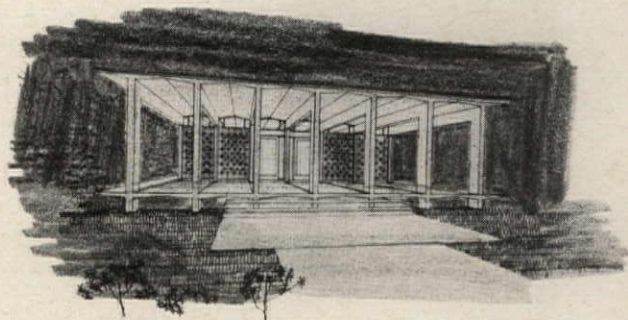
Since the fellowship house and the amphitheater are of diverse character, the lighting problems, of course, were completely different.



Photos by Photo International, Inc.

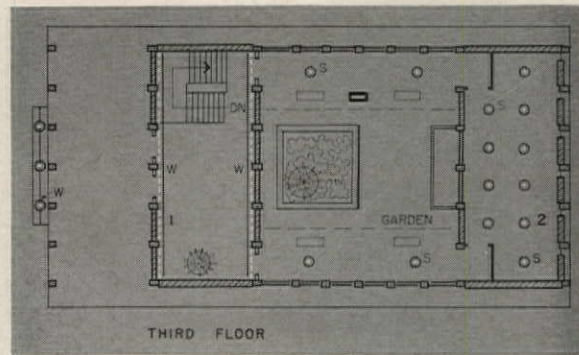
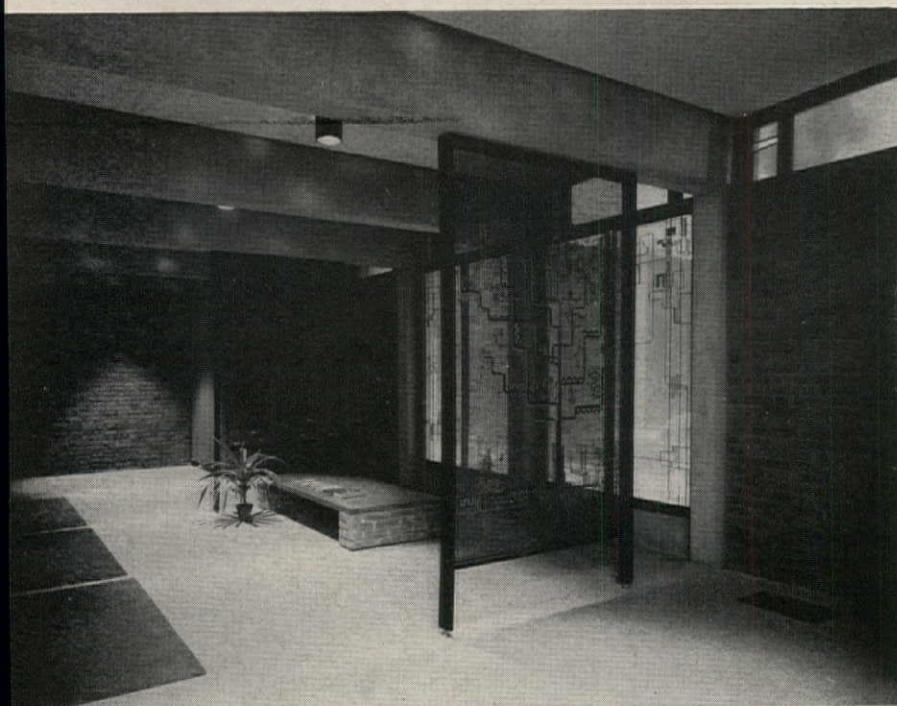


LOBBY AND PORCH. Lighting technique used in the lobby is open cove, coordinated architecturally with the horizontal mullions of the transoms. This open cove lights both the ceiling and the walls, and during the day minimizes the brightness contrast between indoor surfaces and the outdoors. Light reflected from the ceiling adds illumination to the walls and floor. The open cove spills light out through the transom to delineate the structure and provide sufficient light for circulation; yet there are no reflected images of lighting fixtures in the glass as might occur with other types of equipment. Downlights on the columns emphasize the position of walk and entrance. It is interesting to note that the lighting designer's prediction of relative brightness (in rendering right) is borne out in the photograph at top

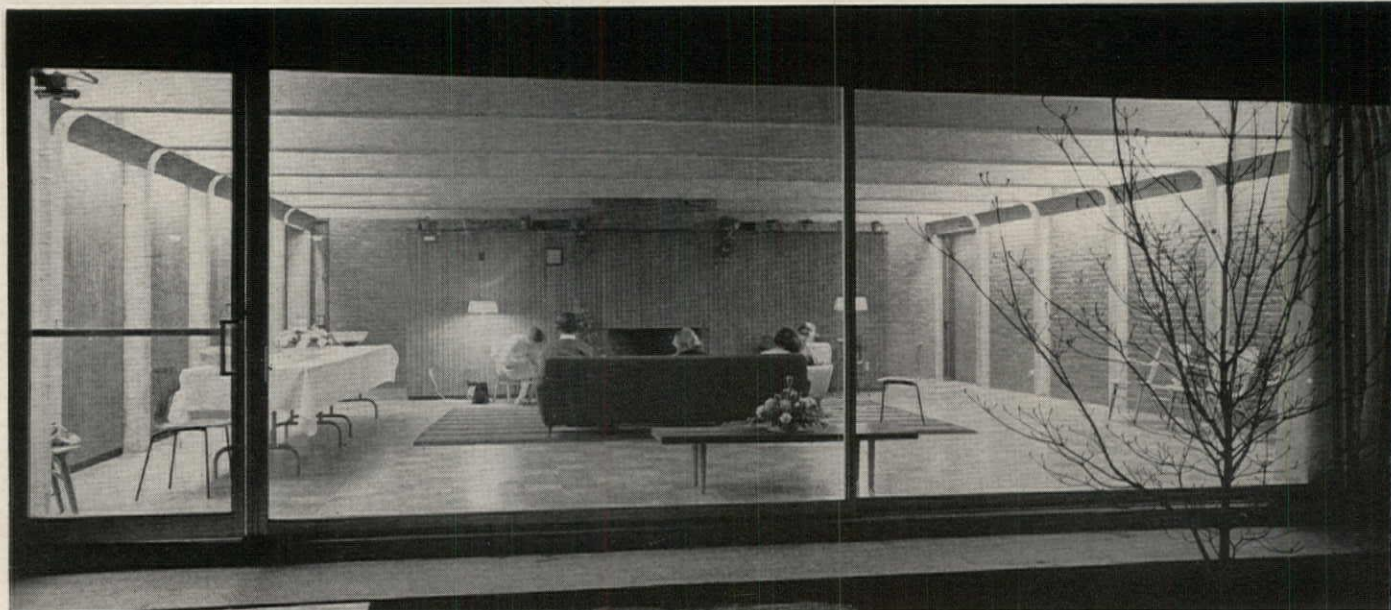


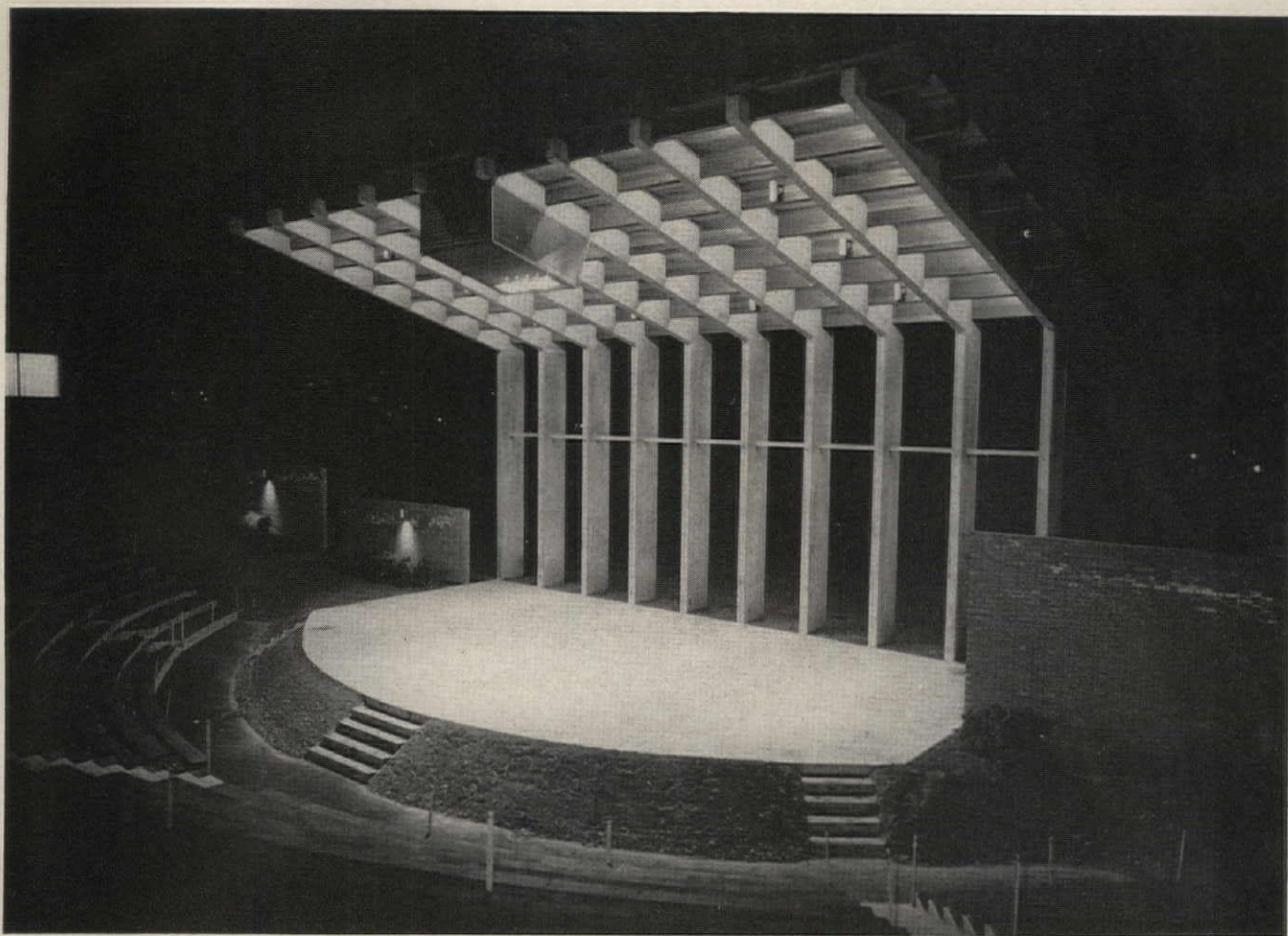


## Lighting That Complements Architecture

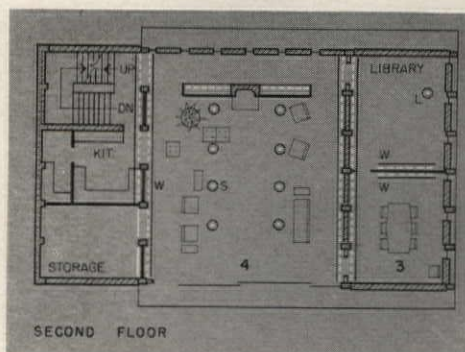
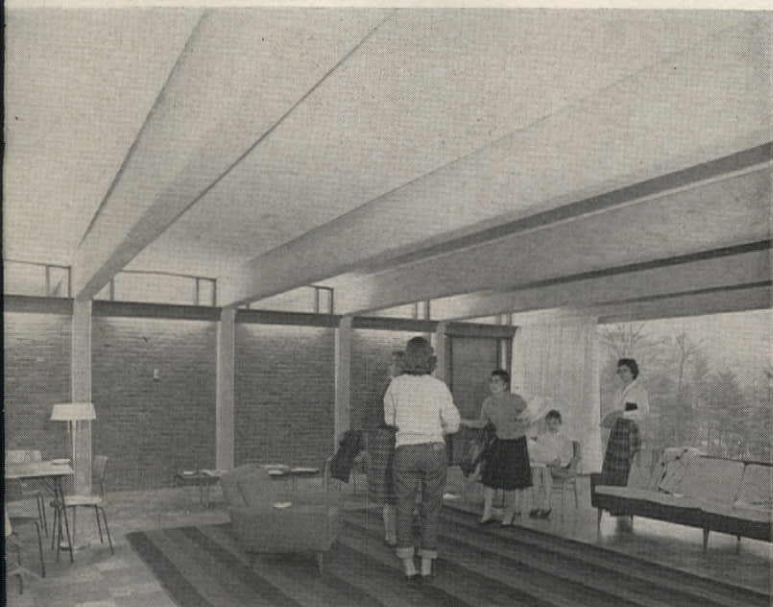
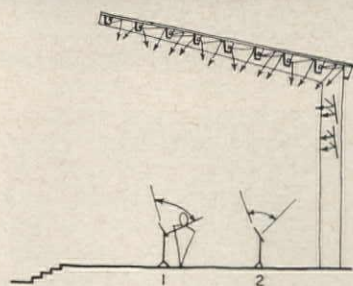


PORCH-LOBBY AND MEDITATION ROOM. Lobby (1 in plan) which is used for art exhibits and other displays is amply lighted by cove units. (Downlights on columns are turned off in top photo.) From the lobby one can go either down the stairway to the Fellowship Hall and then to offices on the ground floor, or through doors on both sides of the lobby into the Meditation Garden. The Meditation Room (2 in plan) has a different character of lighting than any of the other spaces. Transoms and a large window looking into the garden provide daylight on the west; stained glass allows dim light in on the east. The principal consideration involving artificial lighting was the choice between brightness patterns caused by either 1) two-directional cans on the walls giving a scalloped pattern or by 2) ceiling mounted downlights. It was decided to use downlights which would leave most of the walls free of light pattern



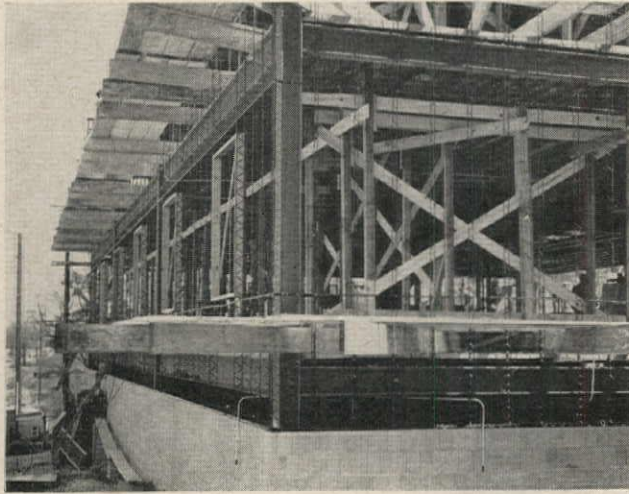


AMPHITHEATER SHELL. A principal use of the shell is for music performances, so the music must be lighted properly for performers, and there must be sufficient light on the performers so the audience can see them. This was accomplished by using shielded point sources in the cells of the redwood canopy which make it a large, luminous light source, casting almost shadowless light on the stage. Panels can be inserted between uprights for acoustical purposes, depending on the type of performance, and these will pick up light reflected by the canopy. Downlights in the cells provide greater focus on the performers. Loudspeakers as well as downlights are contained in the enclosure at the forward edge of the canopy. Acoustical consultants were *Bolt Beranek and Newman, Inc.*



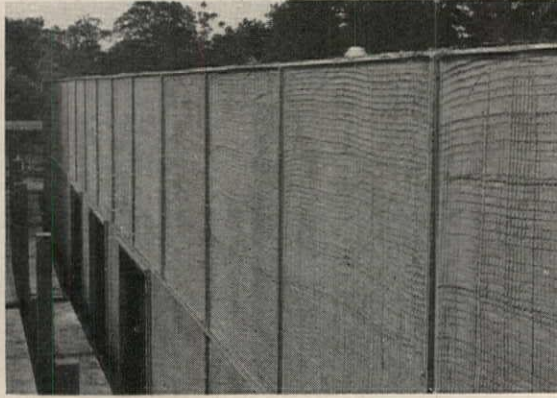
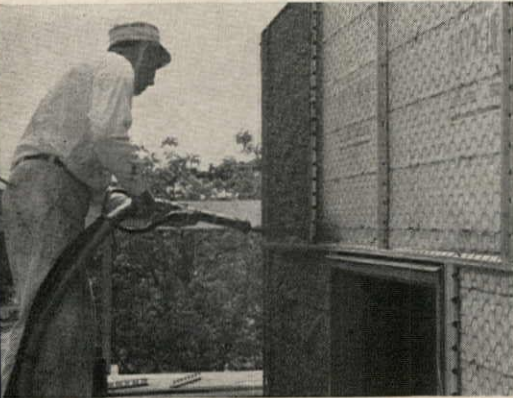
FELLOWSHIP HALL. As in most outside rooms with a large glass area somewhere, the most critical lighting problem was to partially balance a bright sky by increasing the brightness of room surfaces. This was achieved through use of the open cove units which light both walls and ceiling. Floor lamps provide accents and informality, and were used rather than downlight indicated on the plan (4)

# AND NOW A SPRAYED-ON CURTAIN WALL



Sprayed-on application of the exterior wall for a hospital addition at Eureka, Illinois gave fire-resistive construction at low cost along with attractive appearance. Basic elements of the system are open-web metal studs covered by paper-backed wire mesh lath, followed by sprayed-on, cement-based coats. A 1/2-in. thick scratch and brown coat is applied first; then a 3/8-in. finish coat of white Portland cement and marble chips are troweled on. Finished coat is washed off with a hose to reveal embedded marble chips. On the inside, a 3-in. coating of three parts perlite to one part cement is gun-applied. A 1-in. space is left between this material and the foil-backed gypsum board which is attached later to the steel studs. Architects: Foley, Hackler, Thompson & Lee, Peoria, Illinois

Photos by E. J. Kirwan, Keystone Steel & Wire Co.



1. Exterior wall after open-web steel studs are in place
2. Brown-scratch coat is gun-applied to paper-backed mesh lath
3. Brown-scratch coat, cured and ready for finish coat
4. Troweling on the Portland cement-marble chip finish coat
5. Finish coat is washed down to expose the marble aggregate
6. Interior coat is 3 in. of perlite and cement, 3:1 ratio
7. Close-up shows texture of exterior; expansion joint screeds
8. End wall and top story on front have been completed



Linen supplier provides  
key space-and-cost-saving  
service for University  
of Nebraska



Linen Exchange Center

In designing this 1,000 student dormitory, the architect provided convenient space and location for a linen exchange. This was an important consideration for the University of Nebraska because money spent to establish a laundry, equip, stock and operate it could be better used for other needed construction. And the problems of supplying bed linens, towels, staff uniforms, etc., were more efficiently solved by local linen supply rental.

Architects perform a valuable service in discussing linen provision details before completing building designs . . . because nearly every structure will require linen service! Your local linen supplier will be pleased to help by offering expert counsel on the economics of linen service, traffic, storage and related needs. Call on him for assistance. He is listed in the Yellow Pages under "Linen Supply" or "Towel Supply."

**FREE DESIGN GUIDES . . .**

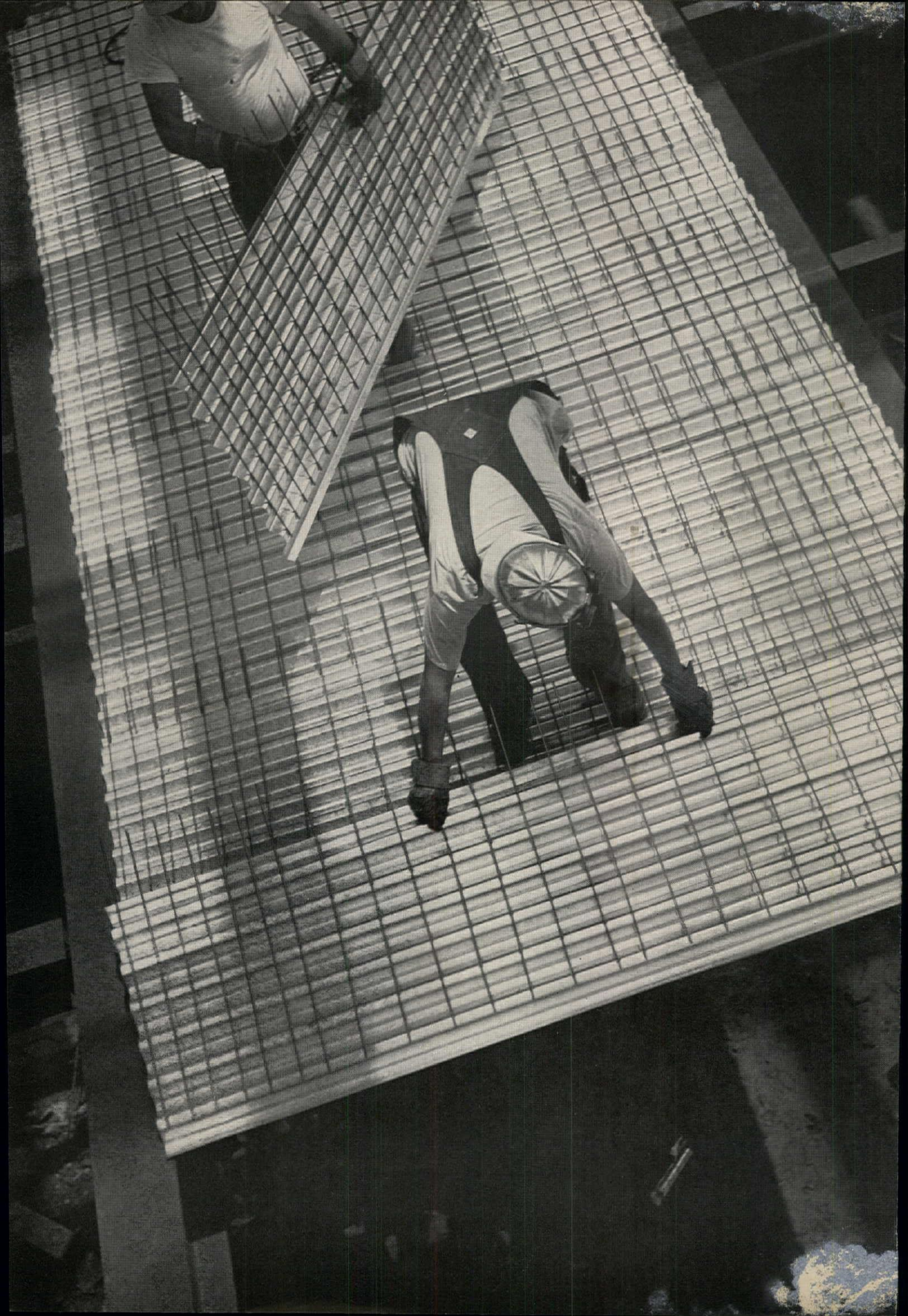
give case histories and suggestions for providing more efficient linen supply service in motels, schools, restaurants and hospitals. Write today.



**Linen Supply** Association of America

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





# Planning a Reinforced Concrete System? Figure Granco Cofar...

**fast... proven... economical**

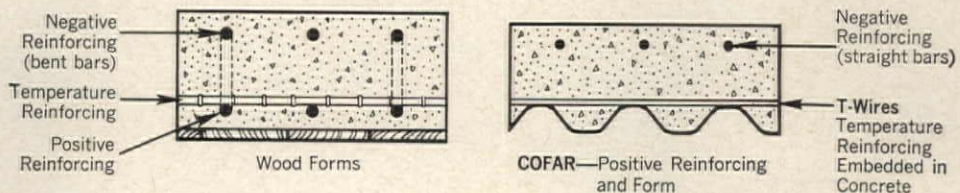
## HERE IS CONSTRUCTION SPEED.

As soon as the men (see photograph) place Cofar units they are providing:

1. Positive and temperature reinforcing
2. Form for wet concrete
3. Working deck during construction.

Cofar goes down fast. No wood forms. No bottom rebars. No temporary safety staging. Work stays on schedule. Less supervision and inspection.

## CONVENTIONAL SLAB VS. COFAR SLAB



## HERE IS DESIGN FLEXIBILITY.

One system satisfies a variety of load and span conditions throughout the entire building. One design procedure. Simplified drawings. With Cofar, T-wires welded across corrugations of the high-strength galvanized steel units assure horizontal shear transfer from concrete to steel. The T-wires are **embedded** in concrete. Cofar slabs are designed in accordance with A.C.I. principles for reinforced concrete. Conventional formulas apply. Cofar is the time-tested and job-proven reinforced concrete system: fire tested (up to 4-hour UL fire ratings), structurally tested (for static, repeated, concentrated and diaphragm loads). Best insurance rates available. Specify Granco Cofar with confidence—save time and money every step of the way. You get fast, dependable delivery of Cofar and helpful field service. Over 100 Granco distributors throughout the U. S.

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PAVEMENT JOINTS • FREE FLOW SUBDRAIN



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GRANCO STEEL PRODUCTS CO., 6506 N. Broadway, St. Louis 15, Mo. A Subsidiary of Granite City Steel Company



## IF THE NEW FLOOR DISCOLORS, WHOSE REPUTATION WILL SUFFER?

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

The new floor is beautiful. Everybody's happy. Happy, that is, until the floor begins to change color. The culprit? Improper maintenance. But how hard it is to convince others of this! When a new floor begins to look old, poor maintenance habits are usually the last to be blamed. "Should this type of floor have been specified in the first place?" ... "Was the floor laid correctly?" ... and countless other thoughts may be running through their heads.

This is why Huntington suggests you prevent future floor problems by specifying a simple and correct floor maintenance program before construction begins. Our representative, the Man Behind the Huntington Drum, will be happy to assist you, at no obligation. His experience and wide range of laboratory-tested products will come in mighty handy. You'll find his name, address and telephone number on the back of our insert in Sweet's Catalog, 13m/Hu, or write us.



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.

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TITLE \_\_\_\_\_

Tear out this coupon and attach it to  
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## STANDARDIZATION OF STEEL DOORS AND FRAMES

### HOW TO WORK WITH STANDARD DOORS AND FRAMES

*The following is based on material developed by Werner M. Leeser, Chief Engineer of Steelcraft Manufacturing Company. He is chairman of the Technical Committee of the Steel Door Institute and chairman of the Standards Committee on Metal Doors and Frames of the Department of Commerce*

Hollow metal doors and metal frames have been used for a number of years, and nowadays are available in standard or custom designs. Much progress has been made recently in improving the quality and extending the applications of standard metal doors and frames. Frames have been designed to be adaptable to a wide variety of wall materials and thicknesses. Major achievements have been made in the standardization of door and frame preparation for locks and strikes. Light- to heavy-duty doors are available, as well as all types of Underwriters' Label Doors.

One of the main goals of standard steel door and frame manufacturers is to design frames in such a way that a particular type of frame can be used interchangeably with as many different types of walls as possible. Because frames are usually required in the early stages of construction, ready availability must be of major consideration. While it is no particular trick to design and fabricate special frames for various thicknesses and types of walls, it is impossible to make immediate delivery on frames which must be specially made for the great variety of walls used in the building industry today.

The versatility of standard frames in being adapted to different wall types is illustrated in the drawings at right.

In this respect, the over-all jamb depth is actually of secondary impor-

tance, since the throat opening must be such that the walls for which the wall is intended will fit properly.

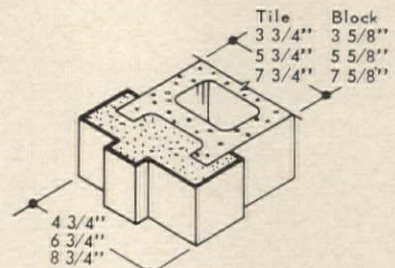
Most of the backbands on standard frames are formed at a right angle. Full return bends are not recommended because it is difficult to fill the joint between the hemmed edge of the frame and the masonry wall. On a standard wrap-around frame, this problem does not exist if the frame is properly grouted. Many building maintenance men claim that it is easier to repaint the frame with a 1/2-in. right angle backband than the frame with the hemmed edge.

A 1/2-in. backband suffices for plaster over masonry construction, since a 1/2-in. thick coat of plaster is considered sufficient. Over wood or steel studs, however, at least 3/4-in. plaster is generally used.

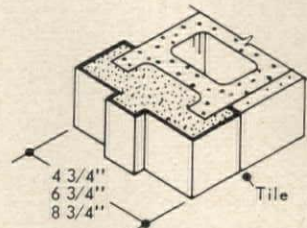
#### Grouting of Frames

In masonry construction it is very important to have the frames filled with grout, with the wall set well within the frame; this reduces movement of the frame. Standard door frame manufacturers ordinarily recommend that a tooled groove be used between the plaster and the door frame, which eliminates the feather edge. Any separation which may occur due to plaster shrinkage will be less obvious because the crack will be at the bottom of the tooled joint. The next painting will fill this hairline crack.

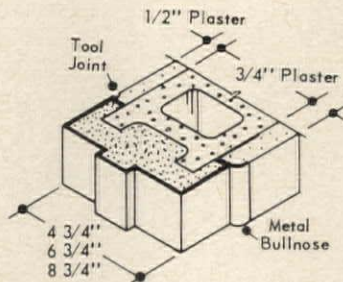
SINGLE WALL CONSTRUCTION



4", 6" or 8"  
BLOCK OR TILE

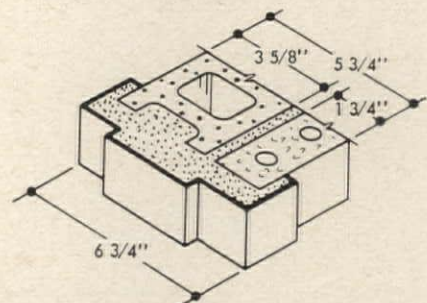


BLOCK WITH TILE  
WAINSCOTE ONE SIDE



BLOCK WITH 1/2" OR 3/4"  
PLASTER

SPLIT WALL COMBINATION



6" BLOCK AND TILE  
COMBINATION

#### FRAMES FOR MODULAR MASONRY WALLS

Details from *Steelcraft Technical Data sheet No. 101*

## Advantages of Knocked-Down Frames

Knocked-down frames have found growing acceptance with architects for the reason that they are quickly available from the manufacturer's or distributor's warehouse. Also they are economical since they can be manufactured on a production line. Further, the mitered corners are made rigid with mechanical fasteners rather than by spot welding which adds to the cost or by arc welding, which makes a nice joint, but has to be ground down. Another advantage is that there is less incidence of damage to knocked-down frames than to set-up frames.

## How Heavy Gage Frames?

Standard steel frames generally are furnished in 18-, 16- and 14-gage steel, depending on the size of door. We do not feel that the difference in strength between a 12-gage and a 14-gage frame is sufficient to justify

the use of the heavier frame. In fact, tests, experiments and actual use indicate that a 12-gage frame is probably over-designed. Baked-on paint and prepainting preparation insure sufficient corrosion resistance.

To take care of situations where the frame must be anchored below the finished floor, it is possible to use an adjustable base anchor which is dropped down to the rough floor; when the finished concrete is placed, the bottom of the frame sets on top of the finished floor.

## Types of Standard Steel Doors

Standard steel doors are produced in three basic designs: 1) triple box door made of a hinge stile, a strike stile, center panel and top and bottom channels; 2) rail and stile construction; and 3) pan construction made of two flush pans with vertical joints along the edges, either concealed or visible. The doors can be reinforced with metal stiffeners, verti-

cal or horizontal, or both; or by the use of a honeycomb core laminated to the inside.

## Label Doors

Underwriters' Label Doors and frames are available from the manufacturers of standard metal doors. There seems to be some confusion among architects concerning label door design, in regard to permissible types of hinges, locks, latches and closers, and also the allowable glass areas for different label doors. Here are several Underwriters' requirements, to illustrate how door design is affected: Surface hinges and door holders are not allowed. No glass is permitted in the 3-hr A label door or the 1½-hr D door. While only 100 sq in. of glass is allowed in the 1½-hr B door, as much as 1296 sq in. is allowed in the ¾-hr C label door. The reason for this, of course, is that their usage in relation to fire hazard is completely different.

## WHAT'S BEING DONE ABOUT HARDWARE

*First step toward some degree of standardization of hardware for steel doors and frames was the adoption of Federal Specification requirements for series 86, 160 and 161 locks. This standards work paved the way for standardization of door preparation for mortise and bored type locks which has been published as American Standards Association Standard A115. The significance and background on this standard is given below. This text is based in part on articles in the October-November 1961 issue of Architectural Beacon, published by Sargent & Company*

Here are several quotes from Justin Henshell, member of the ASA sectional committee of hardware standards, and partner in Leavitt & Henshell, Architects:

"The architect is always loathe to permit others to make design decisions for him and considers it his prerogative to determine dimensions in accordance with his over-all design. This view, while valid, is rapidly becoming untenable due not only to the flood of new products and design techniques introduced each year, but the increasing demands on the archi-

tect's time. He often finds that he can use well-developed standards to ease his burden by releasing him from many routine decisions and still ensure a quality custom design.

"The standardization of the location of hardware on hollow metal doors is a good example of potentially useful instrument for the architect that does not compromise his design freedom. Hollow metal frames usually arrive on the job early, sometimes even before the hardware schedule has been approved. Often changes in the hardware schedule are made after the doors have been ordered. It is hoped that these standards will help alleviate the resultant confusion."

In the last three years, standardization has played an increasingly important role in the field of hardware for metal doors and frames. Manufacturers of these doors and frames felt there was a needless variety in lock and flush bolt dimensions, causing them to maintain a large stock of dies to meet the many small variations in size.

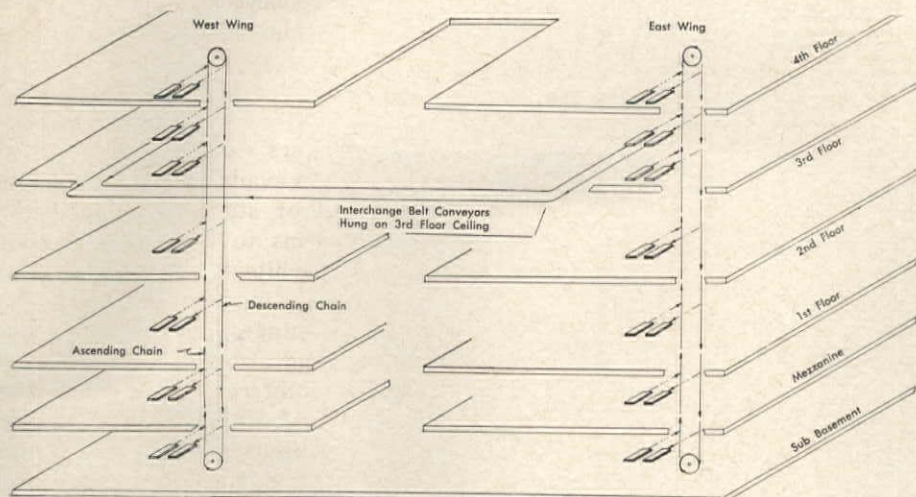
Because of this problem the National Builder's Hardware Associa-

tion approached the American Standards Association, Inc. in 1957 with the objective of developing standards for mounting dimensions of door locks and flush bolts. A sectional committee was organized. All segments of the industry were represented. Then in 1959 four standards were approved and issued by ASA. This standard, A115, covers door and frame preparation for mortise door locks, bored or cylindrical locks for 1¾-in. doors, bored or cylindrical locks for 1⅝-in. doors, and lever extension flush bolts.

Since 1960, four subcommittees have been working on: standardization of mounting dimensions, templates, hardware locations and procedures. The recommendations on a procedure for processing hardware schedules has been worked out and published jointly by the National Builders' Hardware Association and the American Society of Architectural Hardware Consultants.

Two problems currently being investigated include: what cross-bar height should be specified? What location should be recommended for push plate and pulls when used in conjunction with a dead lock?

## MAGNETIC ADDRESSING AIDS BOOK CONVEYANCE IN LIBRARY



A magnetic addressing system is used to deliver books to their proper destinations at the Minneapolis Public Library. The system provides automatic dispatching of books from any of 12 stations to any of the others—with one push of one button. Two six-story vertical conveyors and a horizontal transfer conveyor made by Standard Conveyor Co. are used.

To operate, an employee places a loaded hamper of books on the dispatch table and pushes the button for the desired floor in the desired wing. Each hamper has a strip of

four metal plates that become magnetized with a definite pattern of polarity, which makes up the address as determined by the pushbutton. The hamper passes by all stations until it comes to one where an address detector is satisfied by the proper sequence of polarities on the address tabs. The satisfied signal triggers a mechanism that pulls the hamper onto the unloading table.

Travel time varies from a few seconds to about three minutes between the stations farthest apart. The conveyor can handle all the books the

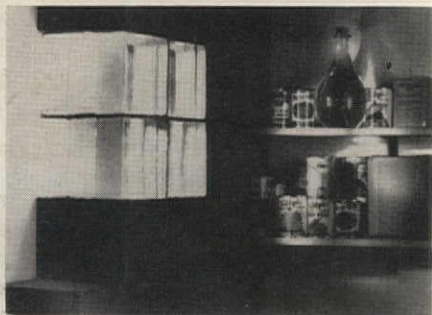


personnel are able to gather together and load onto it.

The system is useful with any complex conveyor system, where the material being moved must transfer between conveyors, because the destination intelligence can be carried with the material being conveyed, rather than on the conveyor itself. Thus, there is no need to re-address when transferring. The magnetic control means there are no moving contacts to wear out, and dirt does not affect it. *Maico Electronics, Inc., 21 N. Third St., Minneapolis 1, Minn.*

## Solid Glass Bricks for Shelters

Solid glass bricks are offered as a solution to the problem of providing daylight in fallout shelters without sacrificing radiation protection. The density, 149 lb per cu ft, is about the same as that of concrete. Since density is the key factor in stopping deadly gamma radiation, the glass bricks would give the same protection as an equal thickness of concrete. Nine inches of brick transmit 54% of available light. The bricks are made in two sizes: 5 in. sq by 2 $\frac{5}{8}$  in. thick, and 8 in. sq by 3 in. thick. *Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.*



## Water Purifier

A compact device will provide safe drinking water for 400 people for two weeks—even if the water is contaminated by fallout or harmful bacteria. Water itself doesn't become radioactive, but any dissolved or suspended fallout dust may be dangerous. The impurities are removed in four steps: coagulation and precipitation, filtration of precipitated matter, adsorption by activated carbon, and ion exchange to remove dissolved solids. *The Permutit Co., 50 W. 44th St., N.Y. 36, N.Y.*

## Ventilating Filter

A fallout-shelter ventilating filter has a rated capacity of 60 cfm and is designed for use with electric or hand-powered blower. It is threaded for mounting on 3-in. intake and exhaust pipes. The filter consists of Dacron encased in aluminum screen cloth. The cadmium-plated hood has a baked enamel finish. *Air-Maze Div., Rockwell-Standard Corp., 25000 Miles Road, Cleveland 28, Ohio.*

## Fallout Measurement Kit

A radiation measurement kit for fallout shelters contains a ratemeter to



tell what intensity of radiation is bombarding your body at any given moment, a dosimeter to record total radiation your body has received from the time you started using it, and a charger to re-set the two instruments to zero. Also included is an instruction manual. The kit is certified to meet or exceed Office of Civil Defense specifications. *Bendix Corp., Cincinnati Div., Cincinnati, Ohio.*

more products on page 174

### Commercial, Industrial Lighting

"Designs for 1962" is a 24-page illustrated catalog containing the newest lines of commercial-industrial lighting fixtures. Installation data and application suggestions are included. *Day-Brite Lighting, Inc., 6260 N. Broadway, St. Louis 15, Mo.\**

### Concrete Structures

Striking photographs of outstanding modern buildings show the variety of designs possible with today's improved concrete. *Permanente Cement Co., Kaiser Center, Oakland 12, Cal.*

### Folding Doors and Room Dividers

(A.I.A. 16M) A 16-page catalog lists *Straits* folding doors and room dividers for commercial, industrial, institutional, and residential uses. Specifications and construction features are included with style, pattern, and color data. *Clopay Corp., 1077 Celestial St., Cincinnati 2, Ohio\**

### Insulated Sliding Glass Doors

(A.I.A. 16E) A new line of insulated sliding glass doors is described in a six-page brochure. Specifications for both single and double-glazed versions are given. Brochure No. 96. *Cal-Tech Systems, Inc., Fullview Div., 5454 San Fernando Road, Glendale 3, Cal.*

### Underfloor Raceway System

(A.I.A. 31-C-62) Suggested specification for *Trenchduct* underfloor raceway system is given in a brochure which has illustrations of the ducts and assembly fittings. Catalog No. 12. *Wheatland Electric Products Co., 500 Logan St., Carnegie, Pa.*

### Keeping Dust and Humidity Out

Case histories of three clean room installations are described in a six-page brochure. Three kinds of environmental controlled areas (clean rooms, *Ultra-Clean Rooms*, and gray rooms) are discussed. *Unistrut Products Co., 1015 W. Washington Blvd., Chicago 7, Ill.\**

### Building Insulation

(A.I.A. 37-B) Cellular glass insulation, *Foamglas* and *Foamglas-Board*, is discussed in a 20-page catalog which gives detailed characteristics and varied applications with on-the-job photographs. No. FB-108. *Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.\**

### Water-Repellent Wood

(A.I.A. 19-A-3) Technical bulletin W-392 describes properties and possible applications of *Cellon*, a pressure treated wood which is water repellent. Tests of the material are given. The wood is supposed to remain unchanged from untreated wood in color and weight, and can be machined with conventional woodworking tools. *Wood Preserving Div., Koppers Co., Inc., 750 Koppers Bldg., Pittsburgh 19, Pa.\**

### Uses of Lead

(A.I.A. 12-H, 29-B, 39) Three brochures discuss using lead for roofing and flashing, plumbing, and to control sound and vibration. Detailed information and specifications are included. *Lead Industries Assn., 292 Madison Ave., New York 17, N.Y.\**

### Non-Skid Flooring

Non-skid surfacing for problem walk areas, stair treads, etc. is described in a four-page, illustrated brochure, which show typical applications and short form specifications. *Marbleoid Safe-T-Tread Co., Inc., 2040 88th St., North Bergen, N.J.*

### Church Cross Designs

A new 40-page book provides both a short course on the history of the cruciform and an aid to church designers and building committee members. More than 140 basic cross designs are given, along with short histories of their origins. *Overly Manufacturing Co., Greensburg, Pa.\**

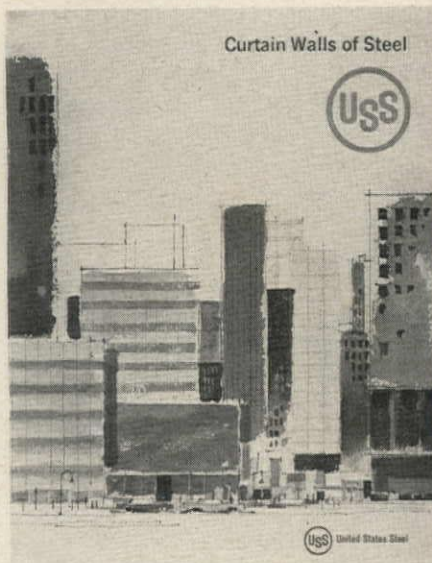
### Plate Glass

Manual TF-10 gives technical data on *Tuf-flex* tempered polished plate glass, including details on processing, tensile strength, expansion coefficients, and patterns and edge finishes. *Libbey-Owens-Ford Glass Co., 811 Madison Ave., Toledo 1, Ohio\**

### Safety Relief Valves

Safety relief devices for refrigerant and pressure vessels are discussed in a 16-page technical booklet which tells how refrigerating and air conditioning systems should be designed and protected in order to conform with ASA code requirements. *Henry Valve Co., Melrose Park, Ill.*

*\*Additional product information in Sweet's Architectural File  
more literature on page 208*



### Steel Curtain Walls

A 52 page booklet, "Curtain Walls of Steel" covers advantages and suggested design procedures. Finishes, physical properties, sections and joints and a portfolio of recent buildings illustrated in full color are included. *U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.\**



# WHERE OTHER FLOORS FAIL

... specify Summitville floor brick. Here is the answer to floor problems created by impact, abrasion, acids, oils, chemicals or constant sanitation maintenance using steam or high-strength detergents.

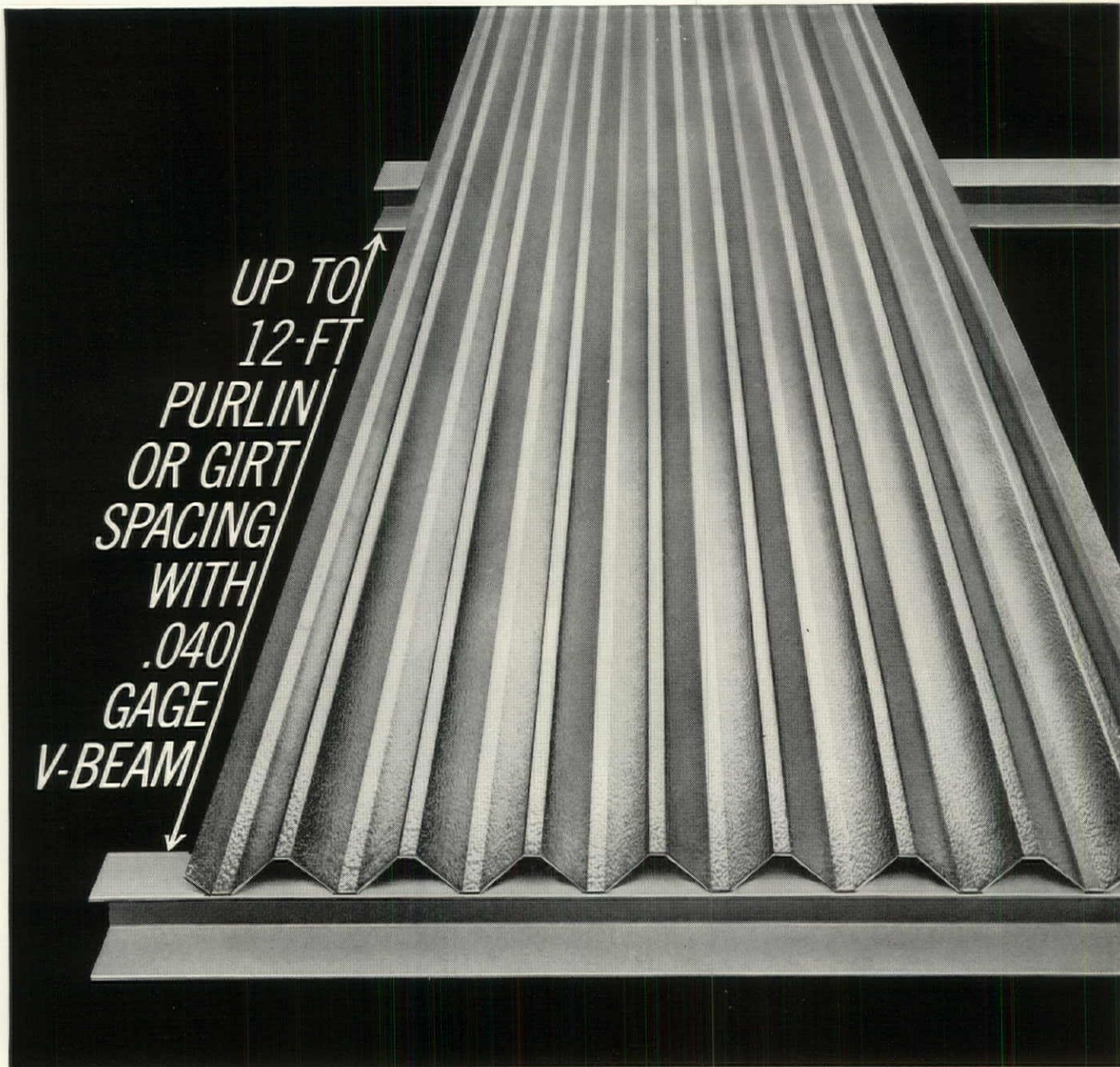
Summitville Floor Brick offers highest resistance to all these problems, and along with Epox-C-Ment for setting and grouting assures long life, and low maintenance in food processing plants, institutions and power plants.

Contact your local ceramic tile contractor for the full story or write to Summitville Tiles, Inc., Summitville, Ohio.



Size: 3 7/8" x 8" x 1 3/8" except for vertical fibre which is 4" x 8" x 1 1/2"

**SUMMITVILLE**  
Heavy-Duty Acid-Resistant  
**FLOOR BRICK**  
AND EPOX-C-MENT



# ALCOA V-BEAM ROOFING TAKES LESS FRAMING, LEAST CARE!

Roof with Alcoa® V-Beam and save! Made tough and thick, it spans wide-spaced purlins to save material. *Lightweight panels as long as 30 ft* cut building time and costs, minimize end laps for handsome good looks. Alcoa Aluminum—naturally long-lived—rarely needs maintenance despite weather, smoke and fumes.

In natural aluminum or any of 11 colorful Alumalure® finishes, Alcoa V-Beam Roofing and Siding now comes in *three* thicknesses, including new .032

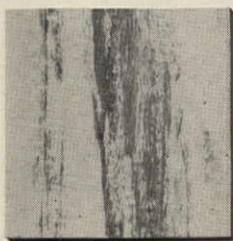
*gage* and .050 gage. For data, call your Alcoa sales office nearby, or write: Aluminum Company of America, 819-B Alcoa Building, Pittsburgh 19, Pa.

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ALUMINUM COMPANY OF AMERICA



New Harrelson Hall at North Carolina State College, Raleigh, N. C., designed by Holloway-Reeves and Associates, Architects; E. W. Waugh, Associate. R. L. Dresser, Raleigh, installed Amtico Vinyl Asbestos Floor Tile.



**Amtico** floors  
another fine building...  
easy-to-care-for  
**Amtico** Vinyl Asbestos  
Floor Tile used in  
unique college building

For both commercial and residential installations, this beautiful floor tile offers exceptional durability and easy maintenance, as well as excellent resistance to oils, fats, and chemicals. For installation on wood or concrete floors above-grade, on-grade, below-grade and radiant-heated floors. In standard 9" x 9" tiles in  $\frac{1}{16}$ ",  $\frac{3}{32}$ " and  $\frac{1}{8}$ " gauges. Choose from 75 handsome colors and designs. Renowned for quality, Amtico also manufactures complete, colorful lines of outstanding solid vinyl, rubber and asphalt floorings. See Sweet's Files for full information and specifications.



Harrelson Hall corridor shows attractive Amtico Vinyl Asbestos Floor Tile that typifies 85,000 square feet installed in curved floor plan. Principal color: Amtico AVA-204, featuring bamboo marbleization on white background.

*Amtico*  
**FLOORINGS**



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**AMTICO FLOORING DIVISION**, American Biltrite Rubber Company, Trenton 2, New Jersey, Dept. AR-22.

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INDICATE U. S. SCHOOL SYSTEMS  
MAY HAVE TO ACCOMMODATE  
65% MORE STUDENTS BY 1980.

*Will this lead to . . .*

# 365-day

*Here's why provision for  
future air conditioning  
should be included in the  
plans for every new school*

With almost every community in the country facing continuously increasing tax loads for new classrooms, the possibility of 12-month schools in the future cannot be discounted. Add to this that thousands of schools throughout the nation have summer sessions and that almost all of them are used for community and school-related activities, and the values of air conditioning become increasingly significant.

Nor can the benefits of air conditioning during the traditional school year be denied. The school building is cleaner, more comfortable, and more healthful. Absenteeism is lower. And *optimum* learning environment is established—pupil and teacher productivity is maximized.

Many communities already have built, or are building, air-conditioned schools. But others are not yet ready to take this step. The answer for these is to plan *today* for air conditioning *tomorrow*.

The cost of providing for future air conditioning is moderate. Modern unit ventilators now are available to accommodate air conditioning when it is added to the school in the future. Standard Barber-Colman unitized controls are your best choice for such installations. Unlike other types of controls,





# schools?

they do not need to be replaced when the air conditioning is installed, but can be easily and economically converted to handle it.

Schools are built to last for a long time. They must be planned with the future in mind — a future that promises to be an air-conditioned one.

Whatever part you may play in the planning and construction of new school buildings, it will pay you to thoroughly investigate unit ventilators and Barber-Colman controls designed to accommodate the economical addition of air conditioning at a later date.

For complete details, consult your local Barber-Colman Automatic Controls field office or write to the address below.

**BARBER-COLMAN  
COMPANY**

Dept. B, 1304 Rock Street, Rockford, Illinois

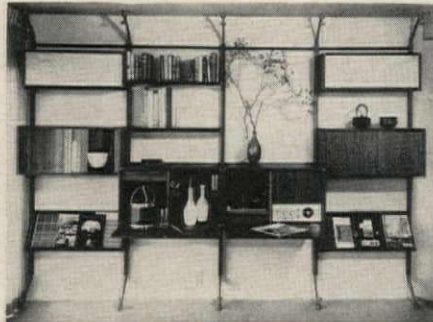


## Product Reports

continued from page 167

### Storage Walls and Room Dividers

*Multipole Systems* of storage walls and room dividers allow entire units to be moved without carpentry or alteration. The basic structural element is a pole of walnut and bronze



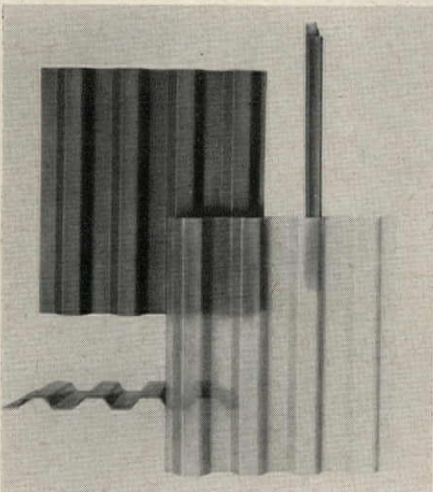
anodized aluminum that can be pre-adjusted by set screws for any ceiling height. The components are suspended by metal pins. *Brown-Saltman*, 5657 Wilshire Blvd., Los Angeles 36, Cal.

### Improved Steel

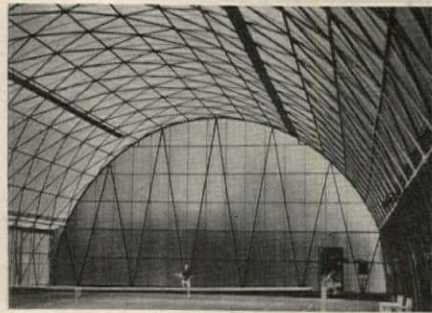
*Cor-Ten* low alloy steel is now available, retaining high strength, corrosion resistance and full weldability in thicknesses three times greater than that formerly available with these properties. With this steel building columns can be designed more economically instead of using lower strength steels which call for heavier sections or builtup columns with cover plates attached. *U.S. Steel Corp.*, 525 William Penn Place, Pittsburgh 30, Pa.

### Plastic Building Panel

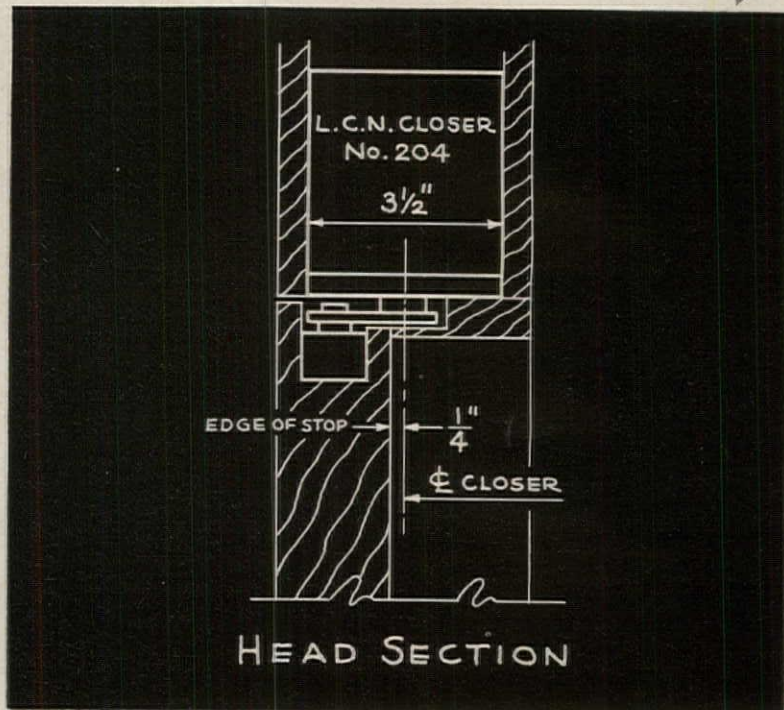
An incombustible plastic building panel, made by extruding polyvinyl chloride resins, is available in almost



unlimited lengths. The colored panels are light weight, resistant to moisture and corrosive chemicals. They are available either opaque or translucent, in flat or corrugated form. While these panels have been used in Europe, this is the first time they are available in this country. The picture shows a tennis court in Paris which is walled and spanned by panels of this type. *Barrett Div., Allied Chemical*, 40 Rector St., N.Y. 6, N.Y.



more products on page 178



### CONSTRUCTION DETAILS

for LCN Overhead Concealed Door Closer Shown on Opposite Page  
The LCN Series 200 Closer's Main Points:

1. Efficient, full rack-and-pinion, two-speed control of the door
2. Mechanism entirely concealed; arm disappears into door stop on closing
3. Hydraulic back-check prevents door's being thrown open violently to damage walls, furniture, door, hinges, etc. Door may open 180°, jamb permitting
4. Hold-open (optional) set at any one of following points: 85°, 90°, 100° or 110°
5. Easy to regulate without removing any part
6. Used with either wood or metal doors and frames

Complete Catalog on Request—No Obligation  
or See Sweet's 1962, Sec. 19e/Lc

**LCN CLOSERS, PRINCETON, ILLINOIS**

A Division of Schlage Lock Company

Canada: LCN Closers of Canada, Ltd., P. O. Box 100, Port Credit, Ontario

# SUPREME COURT OF LOUISIANA



Modern Door Control by

*LCN* Closers Concealed in Head Frame

SUPREME COURT OF LOUISIANA, NEW ORLEANS

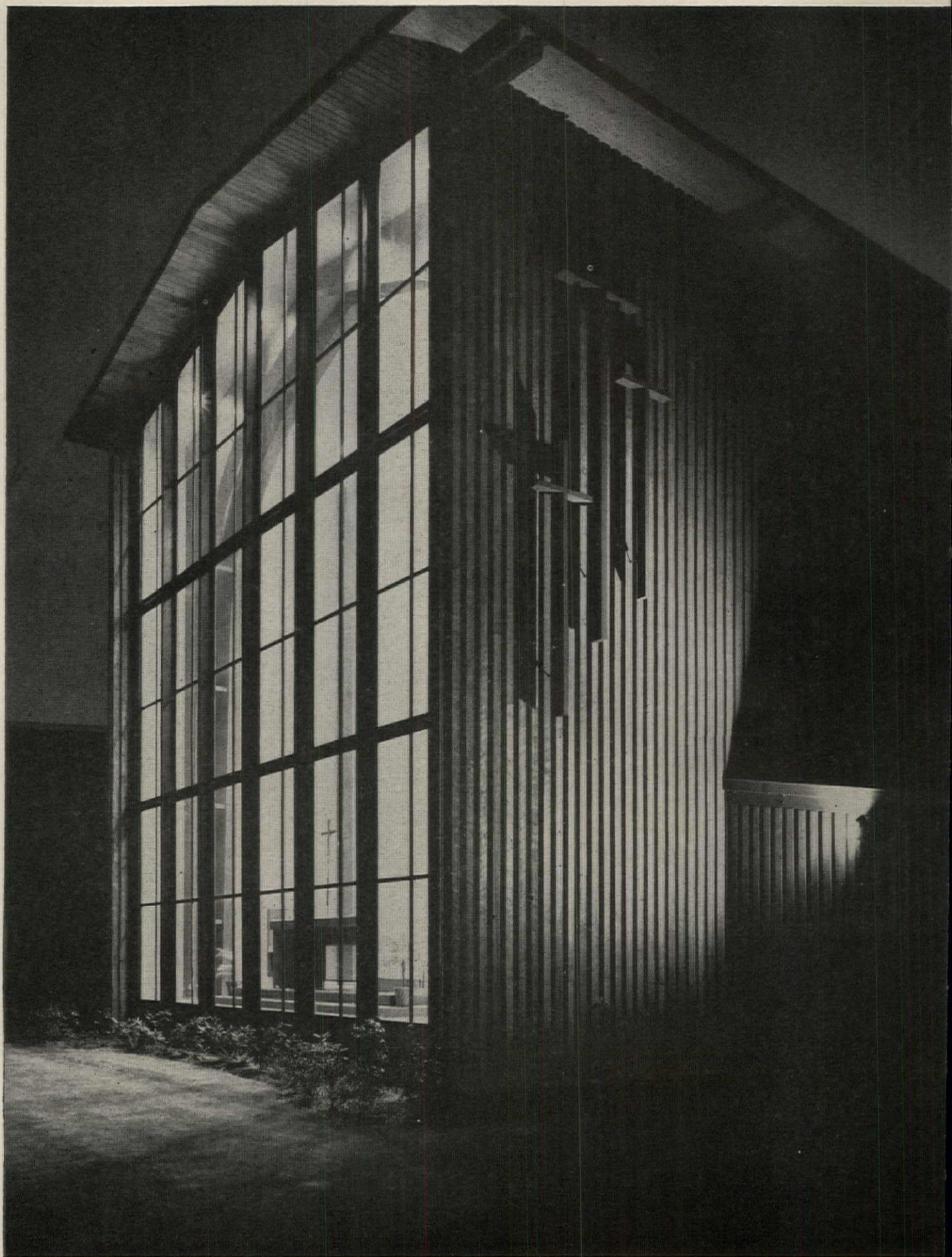
*Associated Architects:*

August Perez & Associates Goldstein, Parham & Labouisse

Favrot, Reed, Mathes & Bergman

LCN CLOSERS, PRINCETON, ILLINOIS

Construction Details on Opposite Page



Dramatically lighted from inside and out, this church's vertical grillwork exterior of wood reaches up into the night. The large wood-framed windows topped by the overhanging planked roof create an uncluttered setting for the Cross. Architect: Oliver W. Olson & Associates, A.I.A.

*For dignity with warmth in church design*

# Use WOOD... and your imagination



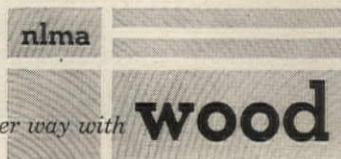
Massive laminated members supporting a planked ceiling uphold wood's strength and versatility. From pews to peak, wood's warmth is work. Architects: Bergstadt, Hirsch, Wahlberg & Wold, Inc., A.I.A.

Wood for worship is tradition. Yet it is never bound by tradition in working wondrous new forms in construction, beautifully different shapes in design. Laminated members that create expansive interiors tell well of wood's inherent strength. Wood-paneled walls and ceilings are physically comforting, naturally inspiring.

Abetted by wood's unique acoustical qualities, hymns and sermons carry with reverent authority to all corners of a church. Wood's many grains and tones are at perfect ease with all other materials, too. It becomes a part of any site or situation with incomparable stability, enviable economy . . . lasting compatibility and dignity. For more information on designing with wood, write:

**NATIONAL LUMBER MANUFACTURERS ASSOCIATION**

Wood Information Center, 1619 Massachusetts Ave., N. W., Washington 6, D. C.

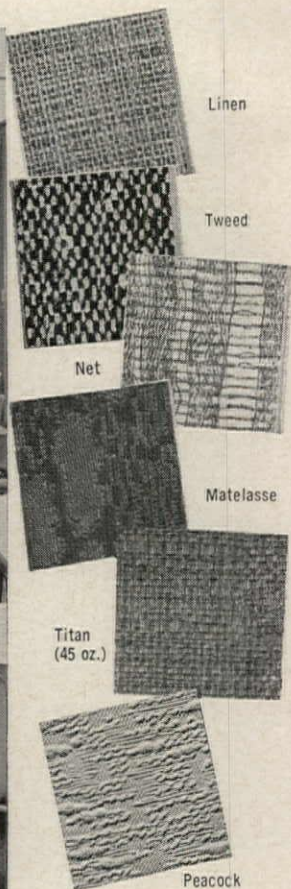
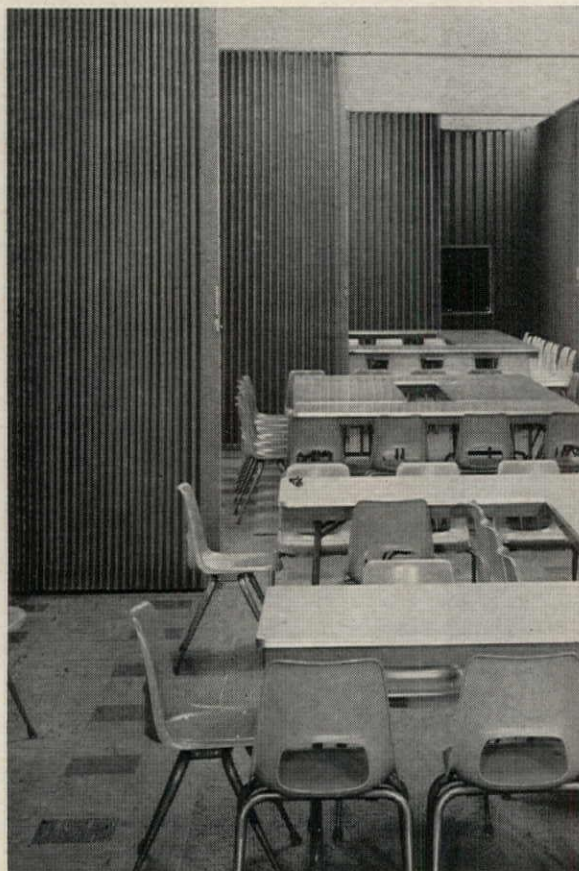


*find the better way with*

**wood**



Deepening laminated arches, tongue-and-groove walls, narrow-planked ceiling join to effect an invitation to worship. The simplicity of design suggests many of wood's economies; the variety of applications shows some of wood's countless advantages. Architects: Grant, Copeland, Charvenak & Associates, A.I.A.



# SUPER— Soundguard X8

## TOPS in SOUND REDUCTION

Super-Soundguard X8 is tops in a complete array of Foldoor partitions in the 8-1/2" profile line. Here is maximum sound reduction for a minimum investment. Heavy-duty steel frame and exclusive safety draw latch make the Super-Soundguard X8 ideal for school and church sound-space separation requirements.

Beauty is inherent in all Foldoor installations. Decorator fabrics available in a wide selection of colors and textures.



A dramatic new concept in customized grillework for institutions, offices, homes. Sculptured styrene, factory fabricated in a number of complete systems . . . ready to install. Limitless design possibilities — space dividers, screens, door accents, etc. Available in metallic or regular colors. For interiors and exteriors.

Practical and handsome, Foldoor fabrics meet the most rigid fire codes, shrug off wear, stay bright and beautiful for years to come.

See your Foldoor distributor for Super-Soundguard specifications, sound test results, and fabric samples—or mail this coupon.

**HOLCOMB & HOKE**  
**FOLDOR**  
FOLDING PARTITIONS AND DOORS

**HOLCOMB & HOKE MFG. CO., INC.**  
1545 Van Buren Street  
Indianapolis 7, Indiana  
Dept. C21

Please send complete information on:

SUPER-SOUNDGUARD Specifications     FILIGRILLE grillework     Have Job in planning, please call

NAME \_\_\_\_\_

FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

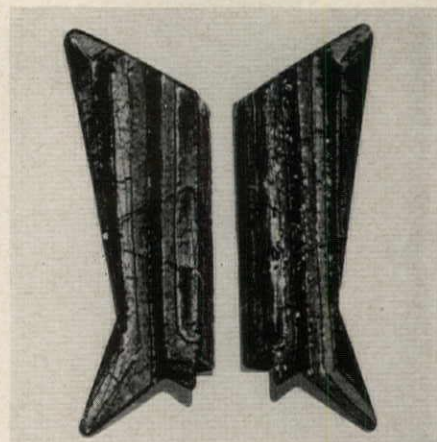
CITY \_\_\_\_\_ STATE \_\_\_\_\_

### Product Reports

continued from page 174

#### Decorative Door Handles

Door Handles of porcelain-enamel on steel are handcrafted and offered in



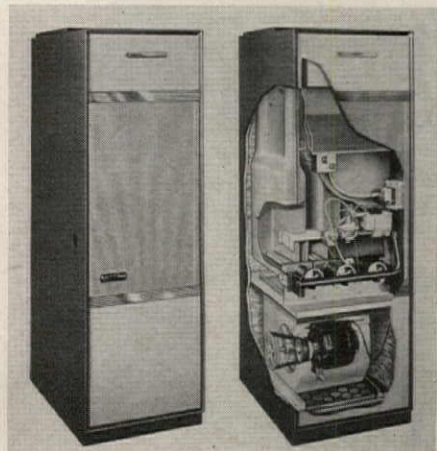
a choice of 10 shapes and sizes from 4 to 16 in. high. A. Braunstein Studio, 123-35 82nd Road, Kew Gardens 15, N.Y.

#### Insulating Glass

Tucker's *Insul-Pane* aluminum windows and doors have a blanket of insulated air between the glass, to prevent frost up and heat loss. A patented locking device secures each vent tightly to the frame. Tucker Aluminum Products, Inc., P. O. Box 1651, Miami 1, Fla.

#### Quiet Highboy Air Conditioners

Low sound level as a major concern is claimed for the gas-fired 149 high-boy line of air conditioners, available



in five capacities ranging from 75,000 to 200,000 Btuh. Larger blower diameters are used, and motor and blower assembly is suspended on a floating mount. Mueller Climatrol Div., Worthington Corp., 2005 W. Oklahoma Ave., Milwaukee 1, Wis.

more products on page 182

# Eliminate Scrap — Reduce Cutting with **SQUARE D** **UNDERFLOOR DUCT!**

**Exclusive  
Modular Design  
SIMPLIFIES THE  
JOB... TREMENDOUSLY**



Actually, we've understated our case — for on jobs involving spans of 21 feet or more (and the vast majority do), there's no cutting and no scrap! Why? Because Square D's Underfloor Duct is furnished in four lengths — 5', 6', 10', and 12'. With combinations of these four, you can meet any footage requirement, from 21' on up!

Every electrical contractor who has installed an underfloor duct system the old way knows that cutting on the job is a costly time-consumer. The problem of unavoidable scrap is an equally bothersome headache.

There's a lot of food for thought in the comparison shown below. Look it over and if you'd like the complete story of Square D Underfloor Duct, drop us a line.

### Here's a Typical Comparison

THE OLD WAY						THE SQUARE D WAY					
RUNS BETWEEN BOXES	CUTS PER RUN	SCRAP PER RUN	NUMBER OF RUNS	CUTS PER FLOOR	SCRAP PER FLOOR	RUNS BETWEEN BOXES	CUTS PER RUN	SCRAP PER RUN	NUMBER OF RUNS	CUTS PER FLOOR	SCRAP PER FLOOR
27 ft.	2	3'	36	72	108'	33 ft.	0	0	36	0	0
5 ft.	2*	5'	24	48	120'	5 ft.	0*	0	24	0	0
TOTAL CUTS PER FLOOR... 120						TOTAL CUTS PER FLOOR... 0					
TOTAL SCRAP PER FLOOR... 228 ft. (over 20%)						TOTAL SCRAP PER FLOOR... 0					

*\*Unbelievable? The clue is in the insert location*

**write for Underfloor Duct Bulletin**  
Square D Company, Mercer Road, Lexington, Kentucky

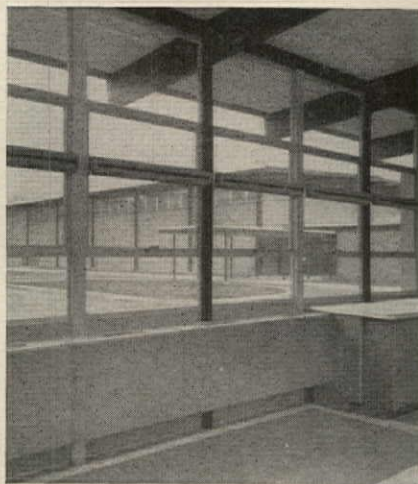


## **SQUARE D COMPANY**

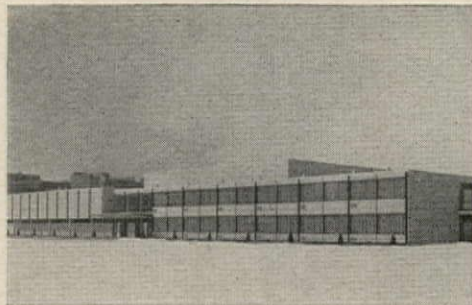
wherever electricity is distributed and controlled

**97.8¢ Per Sq. Ft.**

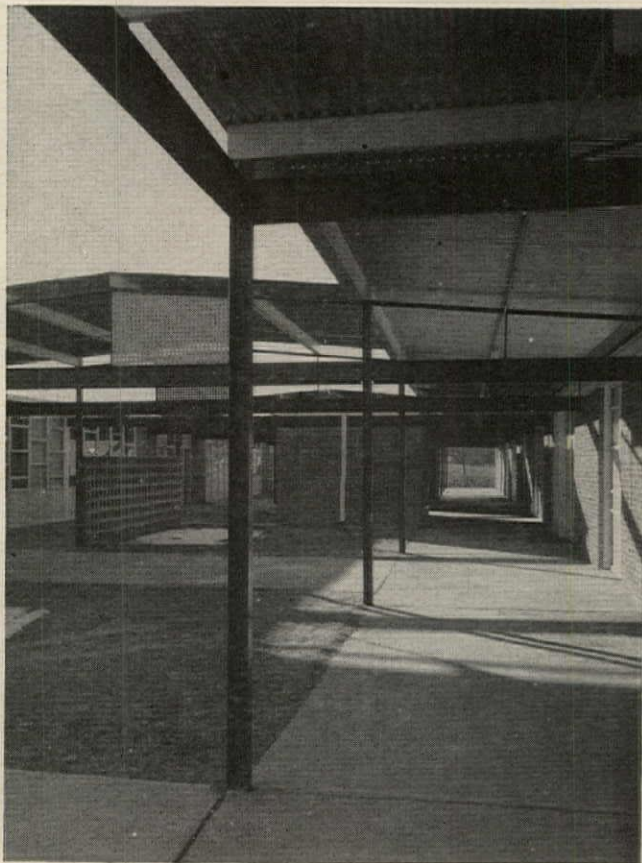
*total H. & V. cost for 32-room  
Burrell-Slater High School,  
Florence, Ala. Architect:  
Northington, Smith & Kranert  
Engineers: Clark Engineering  
Co., Tuscumbia, Ala.*



**83¢ Per Sq. Ft.** *total H. & V. cost  
for De LaSalle High School Addition,  
Minneapolis, Minn. Architect: Eugene V.  
Schaffer & Associates, St. Paul, Minn.  
Engineer: Gausman & Moore, Inc., St.  
Paul, Minn.*

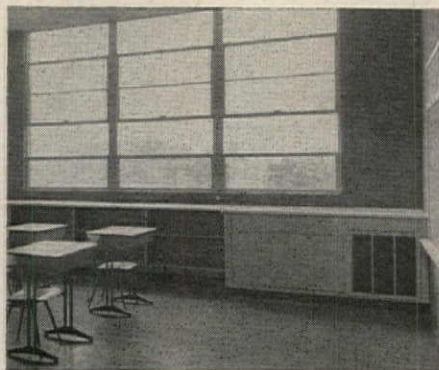


**66.2¢ Per Sq. Ft.** *total H. & V. cost for James Lane  
Allen School, Lexington, Ky. Architect: Merriwether, Marye  
& Associates, Lexington, Ky. Engineer: Procter & Ingalls,  
Lexington, Ky.*



**85¢ Per Sq. Ft.** *total H.  
& V. installation cost for AASA  
cited Northside Elementary  
School Addition in Morrilton,  
Ark. Architect: Ginocchio,  
Cromwell Carter, Dees and  
Neyland, Little Rock, Ark.  
Mech. Contractor: R. O.  
O'Bryant Co., Morrilton, Ark.  
Paul G. Liddicoat, Supt., Mor-  
rilton Public Schools.*

**87.6¢ Per Sq. Ft.** *total  
H. & V. for Mary G. Hogsett  
School, Danville, Ky. Architect:  
Merriwether, Marye & Asso-  
ciates, Lexington, Ky. Engineer:  
George Baxter, Lexington, Ky.*



*See our display booths 609-11-13 American Association of School*



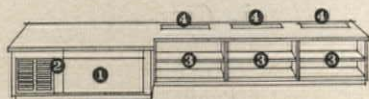
# Compare these Typical Costs for Individual Schoolroom Heating and Ventilating Systems

Size, design or location makes no difference. It can be a new school or school addition. Complete construction costs are lower wherever Norman individual schoolroom heating and ventilating systems have been specified and installed.

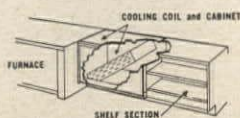
In thousands of classrooms year after year, fully automatic gas-fired Norman Systems provide room-wide indoor comfort while keeping fuel bills and maintenance expenses to a minimum. Actual operating cost figures are available for many schools on request.

We invite you to find out why Norman Systems have proved so economical and efficient to install and operate.

Send for your free copy of the comprehensive Manual on Norman HVS Horizontal or Inn-A-Wal Counter Flo models, specifically engineered for modern schools.



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.



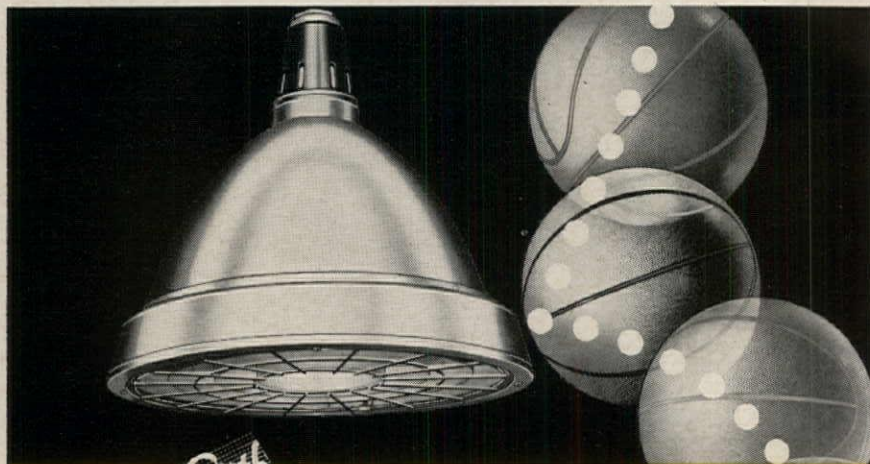
Air Conditioning optional  
at time of installation or  
anytime later.

## Norman®

**PRODUCTS COMPANY**

1152 Chesapeake Ave., Columbus 12, Ohio  
Division of John J. Nesbitt, Inc.

*Administrators Exhibit Atlantic City, February 17 to 21st*



it's **Guth**

## ALZAK ALUMINUM

**for Gym Lites!** *They're lightweight!  
They're breakproof! They're hazard-proof!*

The GUTH Line of Gym-Lites is the LARGEST Gym-Line. Recessed, Surface and Pendant Types. Deep-Shielded open-bottom, or rugged protective guards, or concentric louvers for extra shielding. All types relamp with Pole-Relampers. Layout flexibility is afforded with Guth's 30°, 60° and 90° light-beam reflectors. The 60° and 90° beams insure excellent HORIZONTAL illumination, resulting in BETTER SEEING for basketball and indoor baseball.

All these features PLUS genuine ALZAK ALUMINUM reflectors. Here is the modern metal, with the super ALZAK finish — highly efficient performing accurate light-control. ALZAK is guaranteed NEVER to tarnish or turn black with age or heat under normal uses. ALZAK's harder-than-glass surface is easiest to clean. Hit it with a ladder — or even with a fast-traveling ball — and it will NEVER BREAK or SHATTER. No hazard of "falling pieces".

Write for Section F, Guth Brascolite Catalog.



# brascolite

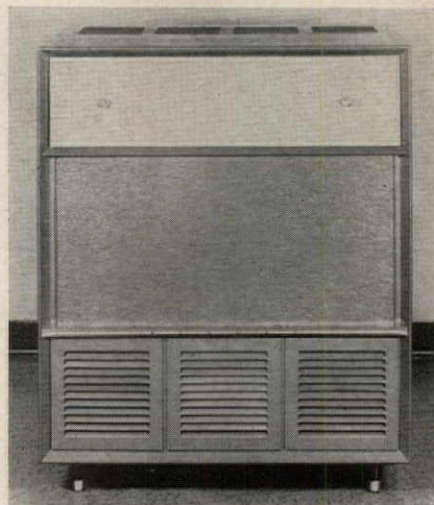
The Edwin F. Guth Co. 2615 Washington Blvd.,  
Box 7079, St. Louis 77, Mo.

## Product Reports

*continued from page 178*

### Two Space Heaters

*Solara 7410-T oil space heater is*



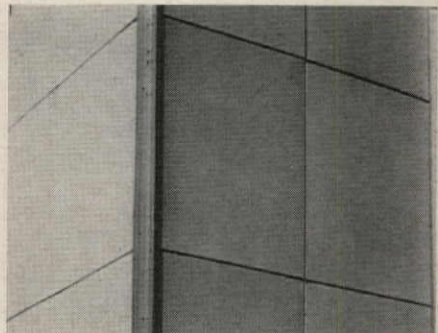
equipped with two 2-speed fans, 2-speed automatic airfeed, directional louvers and modulating thermostat control. Output is 65,000 Btu. The QRDF-50 forced air wall heater has picture frame corners and two-tone exterior. *Heil-Quaker Corp., 647 Thompson Lane, Nashville 4, Tenn.*

### Control for Sliding Doors

An electro-hydraulic control will operate either single or bi-parting sliding doors, up to a total weight of 500 lb. *Hydra-Slide* can be used for interior and exterior doors with heavy traffic. *Ronan & Kunzl, Inc., Marshall, Mich.*

### Textured Metal Panels

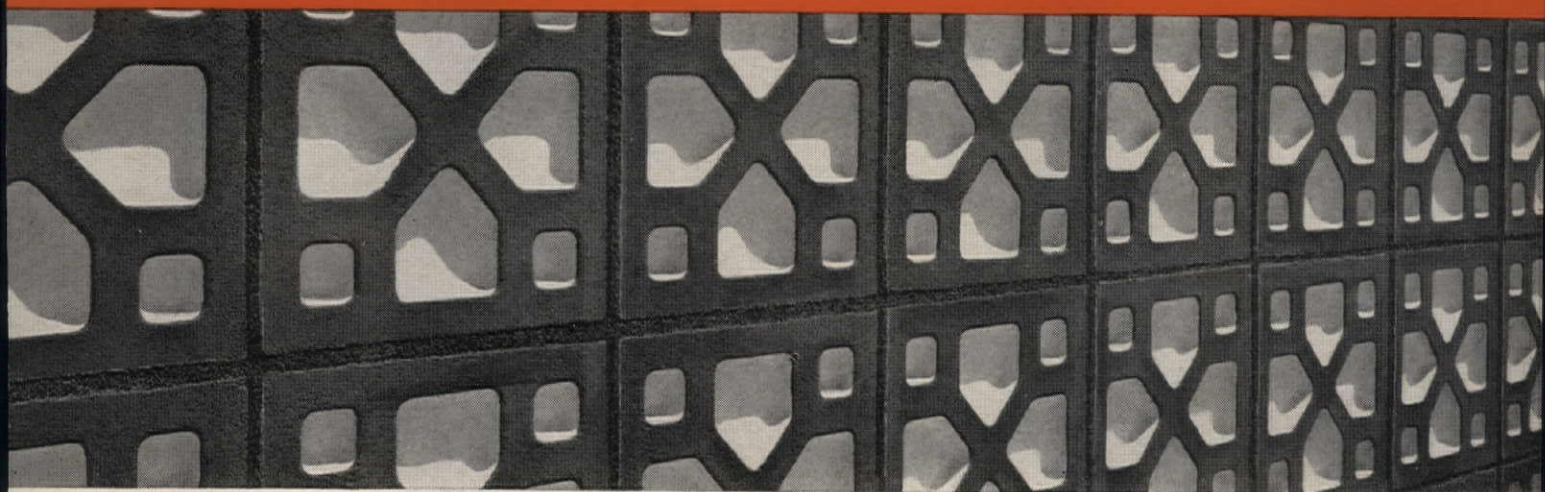
*Ardmore* textured metal building panels' nine standard designs eliminate the glare found in plain flat metal surfaces. Perforated textured metal with sound-absorbent backing material provides additional advantages of acoustical control. The panels may be plated, painted, polished,



etc. Porcelain enamel surfacing is shown in the picture. *Ardmore Products, Inc., 101 Aldene Road and First Ave., Roselle, N.J.*

*more products on page 186*

Great new things  
are shaping up  
in concrete block

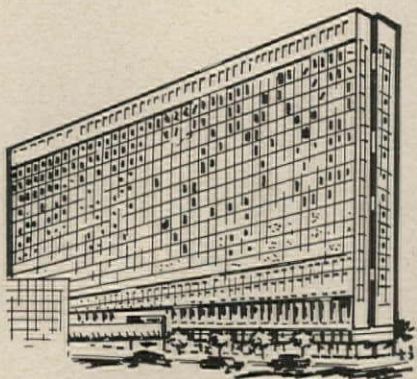


**Solid-back grille block:** This new concrete unit facilitates the installation of a screen-pattern facing over masonry walls. Ideal for remodeling. For dramatic interest, the screen web and the solid back may be painted different colors. Units are usually available to match pierced grille blocks so the same design can be used for solar screens or free-standing walls. Ask your local block manufacturer. ■ To lay up solid-back grille block, ATLAS MASONRY CEMENT provides the right mortar. It produces a smooth, workable mix...saves labor and waste...gives weather-tight joints that are uniform in color. Complies with ASTM and Federal Specifications. For information on masonry cement, write Universal Atlas, 100 Park Avenue, New York 17, N. Y.



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

lightweight  
**JAMOLITE®**  
 doors  
*help speed service  
 at the  
 Denver Hilton*



Built by Webb & Knapp, Inc.  
 Leased to Hilton Hotel Corporation



*Easy, fast cleaning keeps Jamolite doors gleaming bright. High sill installation shown above.*



*Lightweight Jamolite provides easy, safe, one-hand operation. Jamolite Freezer Door in background.*



*Attractive, flush-fitting Jamolite doors blend with ceramic tile walls and floor.*

● Kitchen and food preparation rooms of the Denver Hilton, Denver, Colorado, are typical of modern establishments where the emphasis is on cleanliness, efficiency and fast service. Throughout the country, in hotels, restaurants, schools, institutions and other food service centers, Jamolite doors are providing these important advantages:

- faster installation**
- easier cleaning**
- lighter weight—1/5 that of metal clad doors**
- new attractiveness:**
  - available in gleaming white and four colors**
- impervious to moisture and vapor**
- high insulating efficiency:**
  - foamed-in-place polyurethane plastic**

Jamolite plastic doors are also available as vertical sliding, package-passing and horizontal sliding doors. Get complete data on features and performance. Write today for catalog Sec. 7 to Jamison Cold Storage Door Co., Hagerstown, Md.

**JAMISON**  
**COLD STORAGE DOORS**

## STRAIGHT CHORD STEEL JOISTS? IN THESE CURVED ROOFS?



*They were used here—with economy and efficiency!*

One of the biggest advantages of Laclede Open Web Steel Joists is their versatility—their adaptability to practically any architectural style.

Here's an example: the interesting new store recently opened by Central Hardware Company, biggest and best known retail hardware chain in the St. Louis area. It was designed by Schwarz and van Hoefen, and built by Alport Construction Co., both of St. Louis.

Notice how the joists were set longitudinally across the arched I-beams, forming a strong, lightweight, firesafe base for the cylindrical arches. Observe another practical little touch: the fluorescent lighting tubes attached to the bottom chords of the joists for the entire depth of the store.

No matter in which style you design or build, you'll find many time-saving, cost-saving uses for versatile Laclede Open Web Steel Joists.



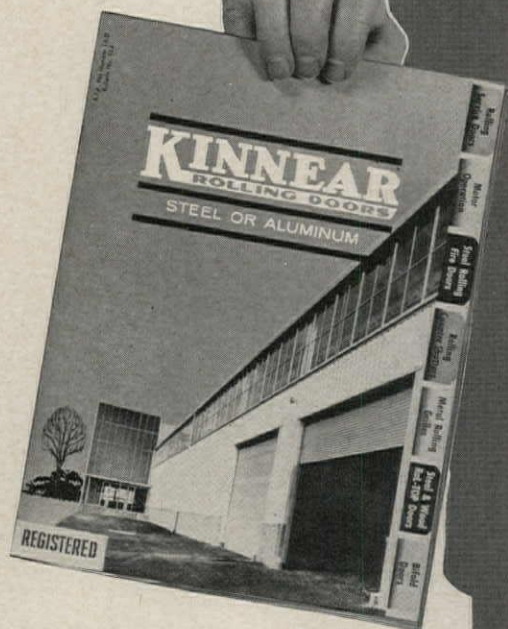
**LACLEDE STEEL COMPANY**

SAINT LOUIS, MISSOURI



Producers of Steel for Industry and Construction 6133

# Get this complete New door catalog



Here's the story of how and why Kinnear equips doorways for fullest protection, highest opening-closing efficiency — at lowest over-all cost.

Remember, the door with the upward-acting curtain of interlocking steel slats was *originated by Kinnear*—a head-start Kinnear has maintained with many new advances and "firsts."

Kinnear Rolling Doors coil out of the way above the opening.

They leave all space around doorways fully usable at all times.

When closed, they provide rugged, all-metal protection against wind, weather, fire, vandals, trouble makers.

Reports of Kinnear Doors that have given continuous, daily low-maintenance service for 30, 40 or 50 years or more, are not at all unusual.

Kinnear Rolling Doors are REGISTERED. All parts for all doors can *always* be supplied; complete records and drawings of every door are kept in Kinnear's fireproof vaults.

## The KINNEAR Mfg. Co.

Kinnear also makes Metal Rolling Grilles, sectional, upward-acting Rol-TOP doors (wood or all steel), Rolling Counter Shutters for every need, and labeled Steel Rolling Fire Doors.

**KINNEAR**<sup>®</sup>  
ROLLING DOORS  
Saving Ways in Doorways

FACTORIES: 1860-80 Fields Ave., Columbus 16, Ohio, 1742 Yosemite Avenue, San Francisco, California.  
Offices and representatives in all principal cities.

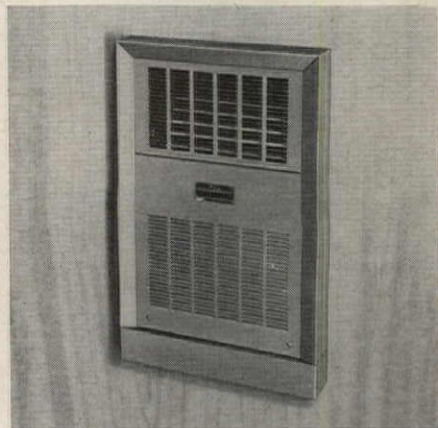
You get full details on Kinnear's complete line in this all-new 1962 catalog. Write for your free copy today!

## Product Reports

continued from page 182

### Space Saving Air Conditioner

Where space is at a premium, Seasonmaker Junior remote type individual room air conditioner is built



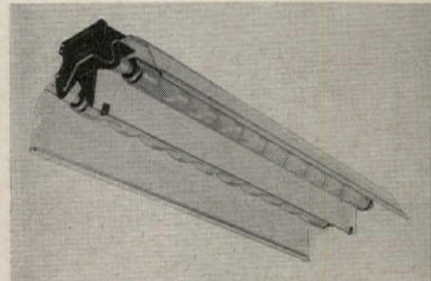
to be installed between studs 16-in. on centers. Two models, recessed and free standing, are available, each with capacities of 150 cfm or 330 cfm. A variable rheostat permits manual control of air volume from 50 to 100 per cent of capacity. *McQuay, Inc., 1600 Broadway, N.E., Minneapolis 13, Minn.*

### Pencils with Plastic Leads

*Filmar* pencils with plastic leads for drawing on film drafting bases are available in five degrees of hardness, HB to 3H, graded to match graphite leads. The drawings can be erased with soft erasers. Samples may be obtained if requested on company or professional letterhead. *Emil Sorensen, A.W. Faber-Castell Pencil Co., Inc., 41 Dickerson St., Newark 3, N.J.*

### Fluorescent Light Fixtures

Better light distribution with high level lighting is offered by the Wheeler 8600 line of fluorescent fixtures



which have shielding angles up to 34°. They are especially suited for conditions where corrosive atmospheres require a rugged, fume-resistant fixture. *Wheeler Reflector Co. Hanson, Mass.*

more products on page 19

## Creating a selling situation with FORMICA®

Like skillfully done mood music behind a dramatic scene, Formica laminated plastic often serves best by calling scant attention to itself.

The beautiful practical Formica walls and show cases act as subliminal sales aids in this quietly effective jewelry salon.

In a selling situation Formica need not up-stage the merchandise to earn its keep. Design in any key. Formica's range stretches to any octave you can reach with your own imagination.



In the months and years ahead look for Formica research and development to provide the building industry with new and better products, methods and applications.

Write for form #934A, a new commercial catalog of ideas and technical information. You will also receive the Formica Red Book, a geographical and classified directory of Formica qualified commercial fabricators of laminated plastic.

Formica Corporation, Dept. X-1, Cincinnati 32, Ohio

subsidiary of 



laminated plastic

Architect: Pope and Kruse



## Look what kids on playgrounds "teach" schoolhouse designers

- Armco Steel Corp.
- The Babcock & Wilcox Co., Tubular Products Div.
- Jones & Laughlin Steel Corp., Electricweld Tube Div.
- National Tube Division, United States Steel
- Ohio Seamless Tube Div., Copperweld Steel Co.
- Republic Steel Corp., Steel and Tubes Div.
- Sawhill Tubular Products, Inc.
- Southeastern Metals Co.
- The Standard Tube Co.
- Superior Tube Co.
- Trent Tube Co., Subs. Crucible Steel Co. of America
- Van Huffer Tube Corp.

- ↓ PRODUCES WELDED STAINLESS STEEL TUBE
- ↓ PRODUCES WELDED CARBON STEEL TUBE

You see a lesson in design every time a school child clambers up a jungle gym. It's made of tubing and it is strong and low-cost. What does this mean for schoolhouses? Easy. There's no better, lower-cost way to support modern curtain wall construction than with strong, welded steel tubing. It comes in any shape or size. You see square and rectangular tubing used today in plants, office buildings, private homes.

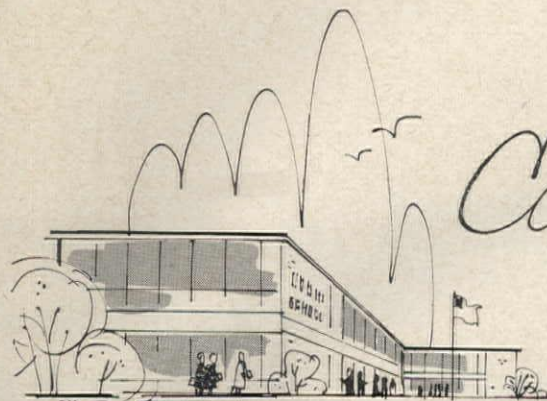
Welded steel tubing lends itself to ready prefabrication and on-site assembly. Its practicality and economy have been proved. To learn more about the architectural and fabricating features of carbon and stainless steel tubing, contact any of the quality producers listed here or write for Bulletin 8591, Welded Steel Tube Institute, Inc., Department AR-1, 1604 Hanna Building, Cleveland 15, Ohio.

## WELDED STEEL TUBE INSTITUTE, INC.

262



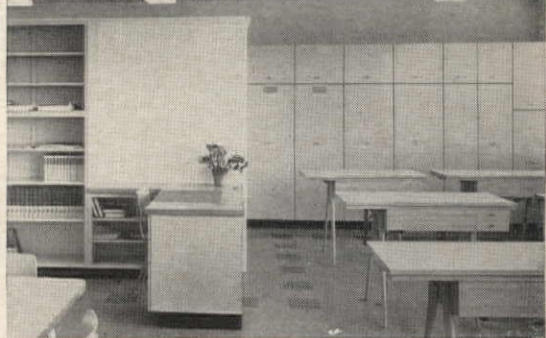
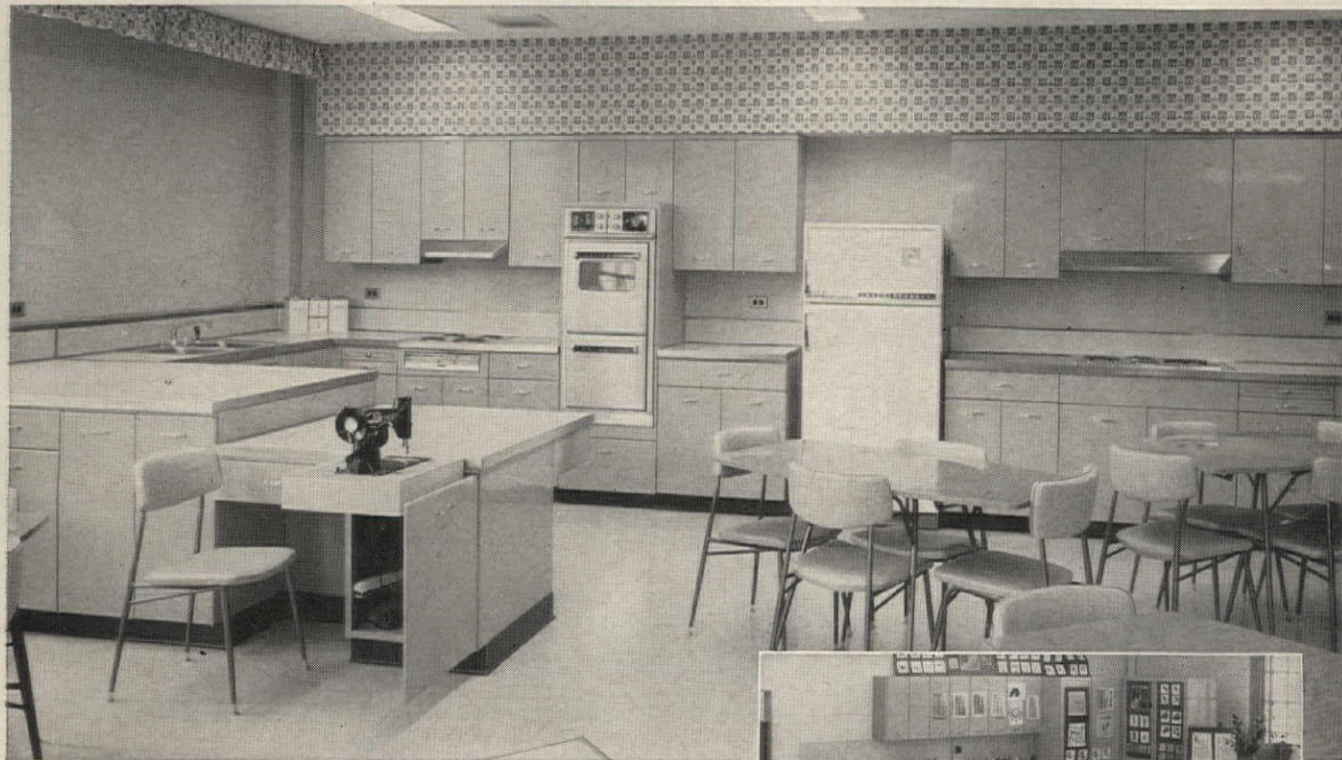




# Cabinets and Casework

**BY GENEVA**

**FOOD LABORATORIES, ARTS AND CRAFTS, HOMEMAKING**



**WIDE CABINET SELECTION, LOW MAINTENANCE,  
GREATER DURABILITY, LASTING BEAUTY**

It will pay you to standardize on Geneva cabinets and casework. Your requirements are more readily filled with greater freedom of design, resulting from Geneva's more complete line of standard cabinets and advanced facilities for custom design. And Geneva's quality construction, superior finish, and many exclusive features are unparalleled in the industry.

See Geneva Impasto... the exclusive new textured cabinet finish in etch-line steel. New warmth in appearance with the dignity and strength of Gibraltar. *Mail coupon for literature.*

**GENEVA MODERN KITCHENS**

DIVISION OF ACME STEEL CO.

**Geneva, Illinois**



GENEVA MODERN KITCHENS

Dept. AR-2-62, Geneva, Illinois

Please send literature and details on Geneva cabinets and casework for schools.

Name \_\_\_\_\_

Address \_\_\_\_\_

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

# How to have window walls



SAN ANGELO (TEXAS) CENTRAL HIGH SCHOOL employs roof overhangs and *Parallel-O-Grey* Plate Glass in classroom areas (upper level), and clear *Parallel-O-Plate*

Glass in protected locker area (lower level). Architects: Caudill, Rowlett & Scott, Houston, Oklahoma City, and Stamford, Conn.; Max D. Lovett, San Angelo.

Air conditioning doesn't require schools to look and feel like warehouses. They can be designed for air conditioning and still be bright, friendly, comfortable—with the feeling of freedom that young emotions demand.

Vitally important in reaching this goal is the proper use of glass. Large, clear glass areas can overcome the limitations of space imposed by your budget and the physical structure. Glass conveys a *consciousness* beyond physical barriers . . . provides an "Open World" environment for teaching and learning.

Engineering studies\* conducted at Southern Methodist University by Prof. J. W. Griffith, internationally known authority on daylighting, show that heat generated by the lighting equipment in a windowless school may require more expensive air-conditioning equipment—and make it

more costly to operate—than in a school where daylighting supplements artificial illumination.

Orientation of the school building; use of shading devices such as roof overhangs, trees and Venetian blinds or drapes; the use of tinted and insulating glass will all help minimize the cost of air conditioning.

**Glazing the air-conditioned school**  
L·O·F offers four kinds of glass that are especially beneficial in glazing the air-conditioned school:

**1/4" Parallel-O-Grey® Plate Glass**  
excludes approximately 40% of the solar energy (heat) to reduce load on air conditioning. Neutral grey in color, it transmits only about 44% of average daylight (illuminant C) as compared with a transmission of about 89% through regular 1/4" plate glass. This lower light transmission results in reduction of glare and

brightness, yet views through it are seen in their true colors. *Parallel-O-Grey* is also available in 1/4" *Tuf-flex*® tempered plate glass for use in potential breakage areas such as gymnasiums and hallways.

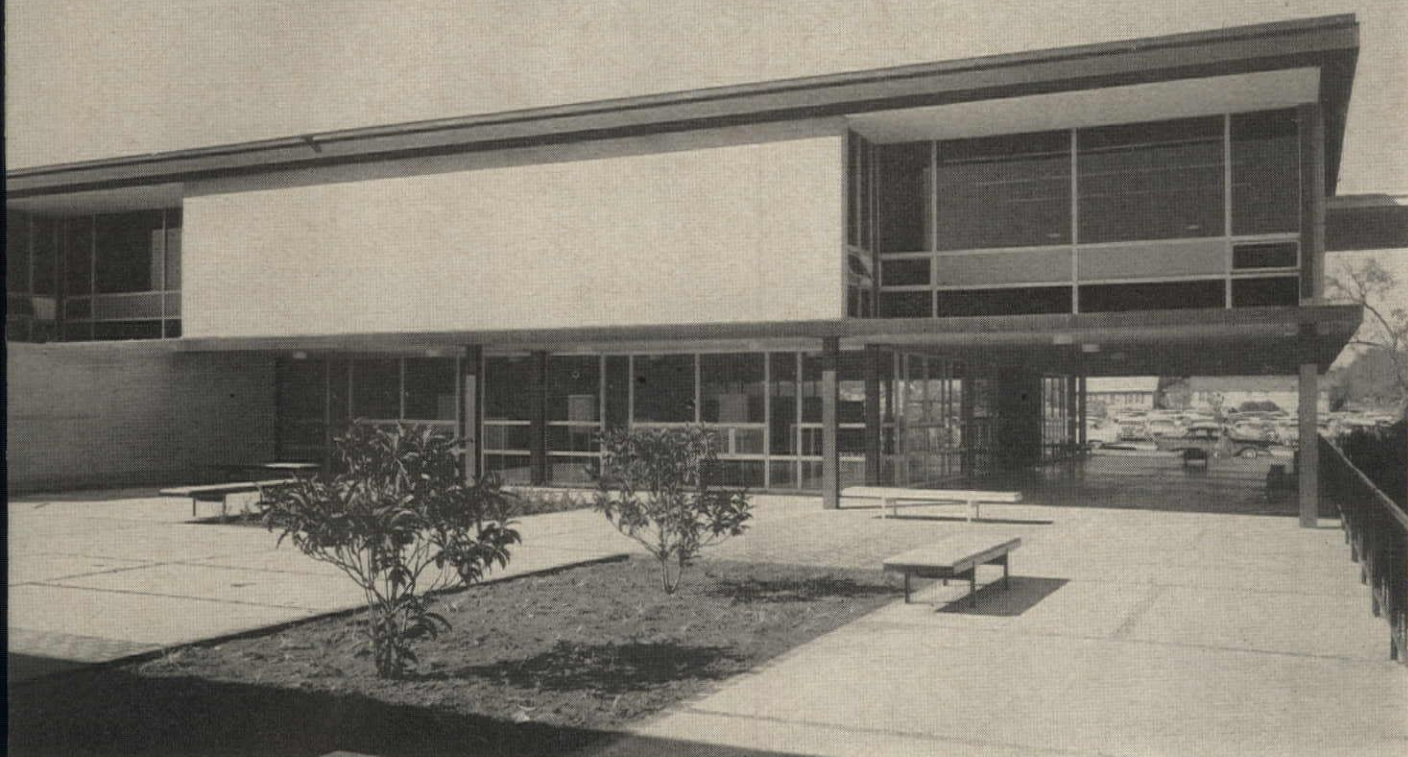
#### 3/4" Grey Polished Plate

is *ground* and *polished*, resulting in qualities far superior to tinted sheet glass. Being thinner, it costs less than twin-ground *Parallel-O-Plate*®. It excludes approximately 36.4% of the solar energy. Its neutral grey color—similar to 1/4" *Parallel-O-Grey* provides eye comfort. And the colors of objects seen through it retain their true values. It transmits approximately 50% of average daylight to reduce glare and brightness.

#### L·O·F Heat Absorbing Plate Glass

is a pale bluish-green in color. It excludes more than 40% of the sun's

# and air conditioning, too!



ANTON HIGH SCHOOL, Schenectady, N. Y., utilizes roof overhangs and glass-walled peripheral corridors to protect air-conditioned classrooms from solar-heat radiation. The class-

rooms, themselves, are glass-walled to borrow natural daylight from the corridors. Architects: Perkins & Will of White Plains, N. Y. and Chicago, Ill.; and Ryder & Link, Schenectady.

radiant energy to keep interiors cool-

This lowers initial cost for air-conditioning equipment, and its cost of operation. Heat Absorbing plate glass transmits approximately 75% of the usual daylight, providing ample daylight for clear vision. It is also available in  $\frac{1}{4}$ " *Tuf-flex* tempered glass.

### Thermopane® Insulating Glass

Provides maximum comfort and air-conditioning economy when used in windows and sliding glass doors. Heat loss in winter is cut almost in half, compared to single glazing. Drafts are reduced. Frost and fogging are minimized. Outside noise is muffled.

Thermopane consists of two panes of glass with an insulating blanket of dry, clean air hermetically sealed between. For summer air-conditioning economy, *Parallel-O-Grey* or Heat Absorbing Plate Glass can be used for the outer pane.

	$\frac{1}{4}$ " Clear Parallel-O-Plate Glass	$\frac{1}{4}$ " Heat Absorbing Plate	$\frac{1}{4}$ " Parallel-O-Grey Plate	$\frac{13}{64}$ " Grey Polished Plate	1" Thermo-pane with $\frac{1}{4}$ " Parallel-O-Plate	1" Thermo-pane with $\frac{1}{4}$ " Parallel-O-Grey (outer pane)	1" Thermo-pane with $\frac{1}{4}$ " Heat Absorbing (outer pane)
Total Solar Heat Excluded	16.6	40.7	40.4	36.4	27.2	50.5	50.8
Direct Transmittance Illuminant C (daylight)	89.1	74.7	44.2	50.0	79.9	39.6	66.9

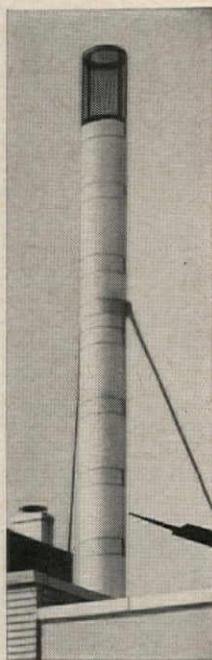
Laboratory tests made in accordance with accepted standards show above direct-transmittance factors for the different types of glass.

MADE IN U.S.A.



\*For a complete report on these studies, and how they were conducted, write to L·O·F, 222 Libbey·Owens·Ford Building, Toledo 1, Ohio.

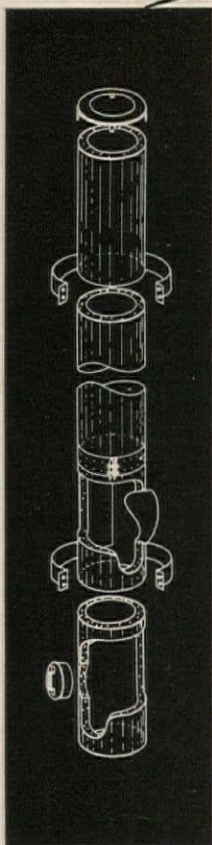
**Libbey·Owens·Ford**  
Toledo 1, Ohio



# VAN-PACKER® Stacks Engineered to Fit Your Design

GIVE MORE . . .

REQUIRE LESS . . .



Give *more durability* . . . average three-times longer life than steel stacks over a whole range of installations. *More economy* . . . save expense and trouble of replacing steel stacks . . . no extra cost. Handsome, aluminized steel outer jacket requires no maintenance. *More draft* . . . Van-Packer insulated sections of refractory material prevent excessive heat loss through the stack wall, increasing draft and boiler or furnace efficiency. Ideal for incinerators, too . . . Van-Packer Stacks take *less space* . . . eye-appealing, unobtrusive stacks with your design in mind. Take *less time* to install . . . pre-fabricated factory made sections are put together quickly.

See Architectural SWEETS, or write for Data Bulletin IS-55, today.

*Model HT Stack is UL listed*

## VAN-PACKER PRODUCTS

The Flintkote Company

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Plant: Buda, Ill.

Manufacturers of Diversified Products for Home and Industry

In the West: Pioneer Division, The Flintkote Company, Box 2218,  
Terminal Annex, Los Angeles, Calif.

In Toronto, Ontario: The Flintkote Company of Canada, Ltd.



## Product Reports

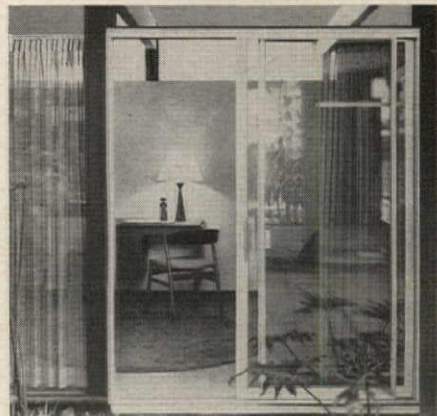
*continued from page 186*

### Magnetic Paint Primer

A magnetically active liquid, *Magic Decorator*, can be painted on any vertical surface as a primer coat, and then painted over with any color. Things can then be hung on the wall with magnets, providing fast changes of displays. *Magic Decorator Co.*, 7603 Forsyth Blvd., St. Louis, Mo.

### Sliding Glass Door

*Acme Series 500* sliding glass doors are available in standard 6 ft 8 in. heights and custom made to 8 ft. Two, three, or four-panel doors are



made for single glazing up to 1/4 in. and double glazing of 1/2 in. or 5/8 in. The aluminum has a salt-spray resistant finish. *Northrop Architectural Systems*, 5979 West Third St., Los Angeles 36, Cal.

### Gate Valves

A line of 125 lb S.W.P. pressure rated gate valves make mind-changing after installation more economical. Each size *Triad* valve, from 3/8 in. to 2 in., allows three possible combinations: rising stem, solid wedge; rising stem, split wedge; and non-rising stem, solid wedge. Action or wedge can be changed at any time. *NIBCO Inc.*, Dept. TR, Elkhart, Ind.

### Classroom Comfort

Controlled ventilation and electric resistance heating are combined in the *Nesbitt Series 600* Syncretizer, especially designed for classroom use. Three important features are noiseless operation, low maintenance requirements and contemporary styling to complement classroom decor. *John J. Nesbitt, Inc.*, State Road & Rhawn St., Philadelphia 36, Penn.

*more products on page 200*

**FLIGHTRON**  
3000 SERIES

LIGHTING

*QPRX3004 with  
translucent OPALUX plastic*

*QPCX3002 with  
clear SUNLUX® plastic*

## ENGINEERED FOR VERVE AND VARIETY

At last a lighting fixture has been designed to satisfy the engineer's search for variety within a unified plan. It is the FLIGHTRON! This new Visionaire,<sup>®</sup> gently sculptured in plastic and metal, resides harmoniously in any commercial, institutional, modern industrial and public building.

Flightron's direct/indirect distribution with a strong upward component adds to its application versatility. Low brightness side panels assure seeing comfort. Flightron can be surface or pendant mounted, singly or in continuous rows with or without top reflectors and operate on two or four rapid start or slimline lamps. It is available with clear SUNLUX<sup>®</sup> for low brightness control, translucent OPALUX for even diffusion or miniature-celled plastic louver for high shielding.

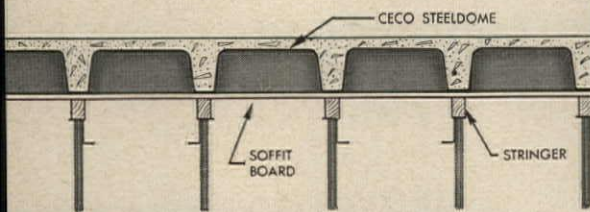
Engineers can confidently dispense with their slide rules when evaluating Flightron's solid construction. The interlocking plastic diffusing panels are entirely supported and protected as a single element in a rigid metal frame. This is no mere "wrap-around" affair. The diffuser assembly opens from either side for quick access without disturbing fixture level. For unsurpassed rigidity, wireway channels are deeply grooved, and the socket plates are die-formed for precision alignment.

FLIGHTRON is the fixture to specify again and again!  
Write for bulletin #A66E.



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777 EAST 14TH PLACE, LOS ANGELES 21, CALIFORNIA

*In construction products  
Ceco engineering  
makes the  
big difference*

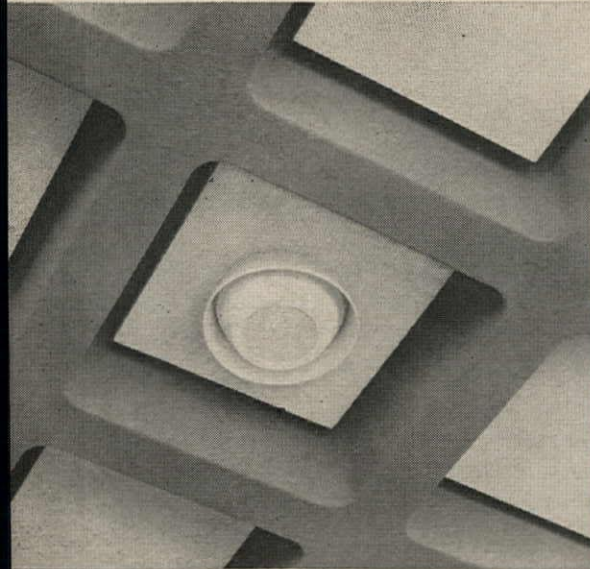


*New 20-story Merchandise Mart Building in Atlanta, Georgia,  
utilizes Ceco Steeldome construction.*

*Architect: Edwards & Portman*

*Engineer: Jack Wilborn*

*Contractor: Consolidated Realty Investments, Inc.*



▲ *Typical Steeldome ceiling treatment with  
acoustical finish on exposed concrete, and  
acoustical tile in voids.*

*Dramatic effect is created with "open-grid" ▶  
used for patio area of newly constructed  
North Central High School, Miami, Florida.  
Architect: Plevitzky, Johnson & Associates  
Engineer: H. J. Ross and Associates  
Contractor: Thompson & Polizzi Construc-  
tion Company*





*In Washington, D.C., the Riddell Building was designed with floors and ceilings of Ceco Steeldome construction.*

*Structure at left end is the Bank of Commerce, an earlier Ceco floor-framing project.*

*Architect: Corning, Moore, Elmore & Fischer | Contractor: Standard Construction Co., Inc.*

*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 flange-forms, adjustables and longforms, ask for your copy of newly published 72-page manual 4002-C, "Monolithic Reinforced Concrete Construction with Ceco Service."

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# ANNOUNCING...

## ... A NEW AISC SPECIFICATION

Leading to more efficient and more economical use of structural steel for buildings

The American Institute of Steel Construction has just announced the publication of a new Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.

The new Specification recognizes a full range of carbon and high strength steels. In addition, new design criteria are included for composite design and the plastic design of steel.

Recent research into the behavior of steel structures and their components, as well as technological advances in the production, fabrication, and erection of structural steel are reflected in the Specification. Research has also produced new column formulae, advances in the design of plate girders and other flexural members, such as box type members.

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*To all Architects and Engineers in the U.S.A.*

New Design Rules For Building Construction with

If you are an architect, engineer, designer, or professor, fill in the coupon below for your complimentary copy of the Specification. A Commentary explaining the new provisions is included.

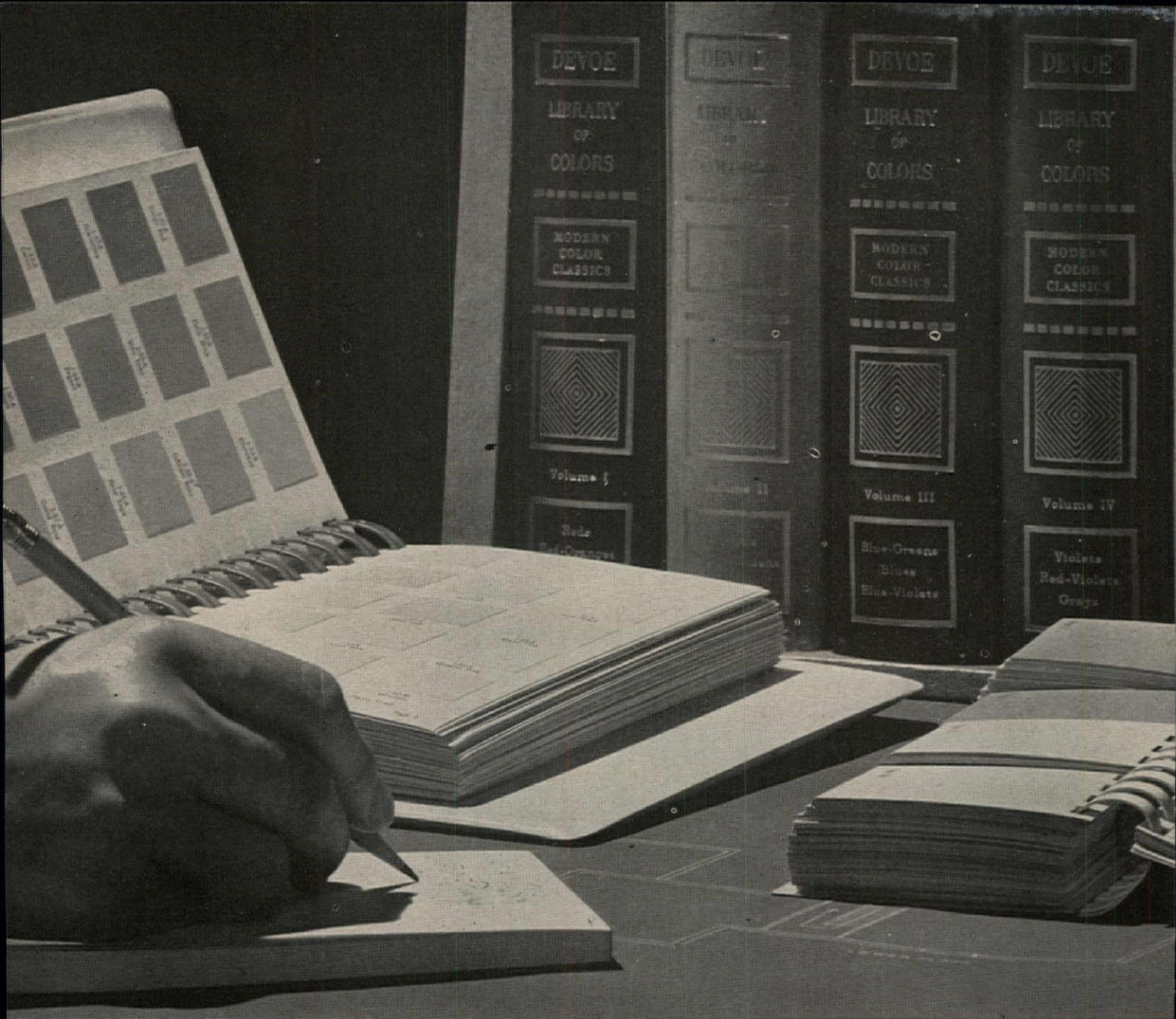


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Charles S. Williamson, the "Man From Devoe" in Pittsburgh

## Let the "Man From Devoe" help you with imaginative color planning

As you know, good color plans call for much more than the mere selection of attractive tints and tones. They must consider light reflectivity, harmony with adjacent colors and textures, overall architectural form and area function, to mention a few.

Charles S. Williamson, Pittsburgh's new Man From Devoe, is well equipped to solve problems such as these for you. Brought to Pittsburgh to further broaden Devoe's services there, he has had years of experience in working with architects on various projects—residential, commercial or institutional.

Like all other Devoe Representatives, Mr. Williamson will

be glad to acquaint you with the Devoe Library of Colors®. This method of color selection and preparation offers over 1,000 colors, each of which is available in interior vinyl flat, alkyd flat, eggshell enamel, semi-gloss and decorator enamel, as well as exterior paint. Its color chips duplicate actual colors. You are assured of laboratory-accurate matching and mixing—with no exceptions. Among other handy tools, the Library of Colors System includes a Color Formula Index Book which contains the exact formula for the perfect mixing of each color you select, plus its coefficient of light reflectance.

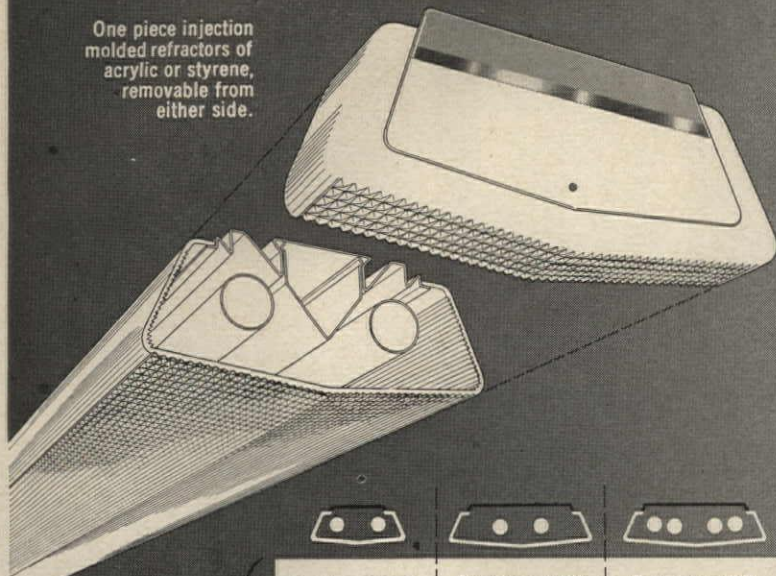
No matter where you are, there's a "Man From Devoe" nearby, ready to work with you and your staff . . . entirely without cost or obligation. For more information, write to: Devoe & Reynolds Company, Inc., Louisville, Kentucky—Architect Service, Post Office Box 1863.



**DEVOE**  
DEVOE & REYNOLDS COMPANY, INC.

## ...fluorescent

One piece injection molded refractors of acrylic or styrene, removable from either side.



Available in 4 ft. or 8 ft. tandem lengths.

Two lamp PHOTOMETRIC is recommended for classrooms and offices.

Four lamp width equipped with two lamps provides optimum seeing quality with low brightness.

Four lamp PHOTOMETRIC is recommended for office and school areas requiring high intensity.

PHOTOMETRIC luminaires are recommended for on-ceiling or stem mounting in schools, colleges, offices, libraries, drafting rooms and laboratories. Refractors are injection molded acrylic or styrene. Lengths are 4 ft. and 8 ft. tandem. Photometrics, mounted in rows, provide continuous shafts of light as no metal endplates cause distracting contrasts.

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VERMILION, OHIO

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## Quick facts about prism controlled lighting by WAKEFIELD CORPORATION



## ...incandescent

AMCOLENS of clear glass provide a scientific method of prismatic light control. Each AMCOLENS is pressed on precision equipment then given a fluoroscopic inspection to insure perfection of light control performance. They are available in a wide range of sizes, in recessed and surface square and round designs for ceiling applications and in a unique design for mounting on walls.

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No. 20-3512 Clear Asymmetric Amcolens for corridors, entrances and covered walkways.

No. 3549 Clear Wallens for surface mounting in corridors and restrooms.

No. 3600 Recessed Square Amcolens with concave bottom for small irregular or narrow areas.

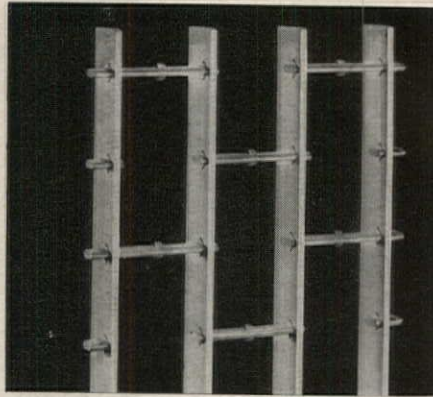


## Product Reports

continued from page 192

### Decorative Grill

Different designs are obtainable by adding or eliminating cross bars in an aluminum grill design. The grill comes in a variety of colors, or with a clear, anodized mill finish for both interior and exterior use. *Kerrigan Iron Works Co., P. O. Box 479, Nashville 2, Tenn.*



### Through-Wall Air Conditioner

A compact, through-the-wall heating unit is designed for easy addition of a self-contained cooling or heat pump package. The unit can heat by steam, hot water, electric resistance or a heat pump combination. It can be inserted in new or existing buildings for individual room control. *Carrier Corp., Syracuse 1, N.Y.*

### Hardboard Siding

An exterior hardboard siding has the same density as wood, so it is easy to handle with conventional tools. It is made from hardwood fibers bonded with a thermoplastic resin. The siding, which comes in both horizontal and vertical courses, is free of knots and graining. It comes from the factory with two coats of gray, mildew-resistant primer. One finish coat is needed at the job site. *Armstrong Cork Co., Lancaster, Pa.*



MILLS RESTAURANT • COLUMBUS, OHIO

ARCHITECTS • BENHAM RICHARDS AND ARMSTRONG

## eager appetites satisfied 42 years by Van customer

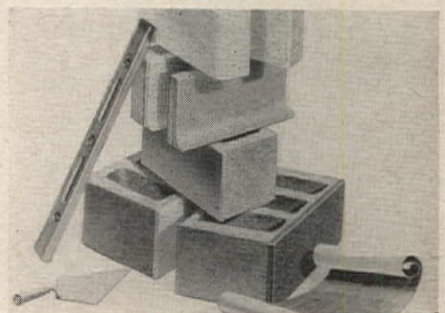
- When The Greenfield-Mills Restaurant Co. decided to rebuild their restaurant at 77 South High, Columbus, it was natural that Van, who had installed their other restaurants at Columbus, Detroit, Cleveland and Cincinnati should furnish all the equipment.
- Evolved after careful study of self-service restaurants all over the country, limited only by the lot size, every idea for lower food costs, less food waste, greatest customer appetite satisfaction was incorporated.
- In the uniquely arranged single fast-serving salad counter and two hot food counters as in the heart of the restaurant . . . the kitchen . . . Van's gleaming stainless equipment serves as it has in this chain for a quarter of a century.
- Whatever your food service equipment problem, use Van's century of experience.



Write THE JOHN VAN RANGE CO.

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FOOD SERVICE EQUIPMENT



### Concrete Block Face

*Decor-Glaze* is a polyester finish which is molded to lightweight concrete block with an integral permanent bond. A variety of aggregates,

from marble chips to metal flakes, makes up the decoration. The exposed aggregate is protected by a transparent, stain-resistant coating. Because of the transparent coating, the aggregate has a three-dimensional effect. *National Plastics Co., Inc., Martinsville, Va.*

### Duct System

Fiberglas duct systems are available in preformed rectangular and round forms, which are packed flat for shipment. The systems combines air duct, thermal insulation, acoustical liner and vapor barrier. There are different sizes for both residential and commercial use. *Owens-Corning Fiberglas Corp., 717 Fifth Ave., N.Y., N.Y.*



# first class service

*...table d'hôte or à la carte...*

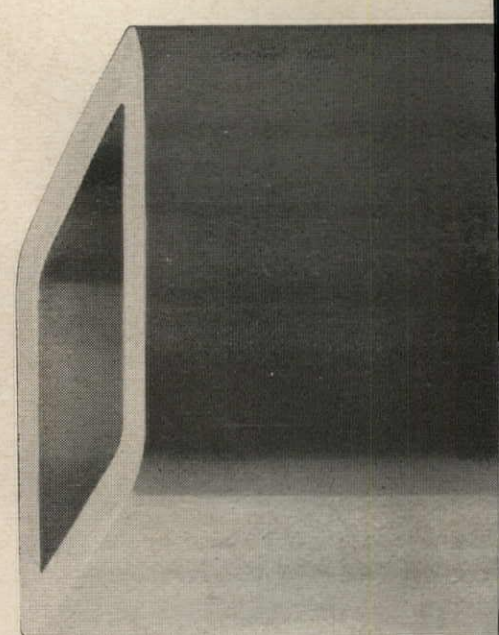
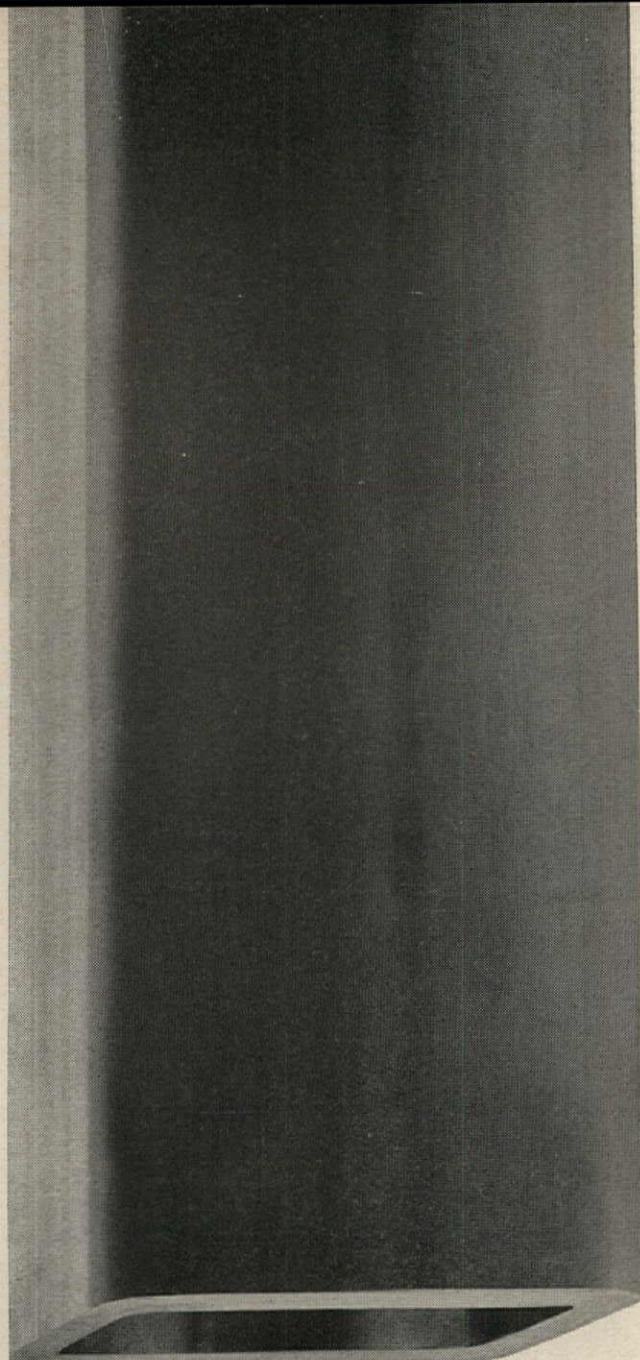
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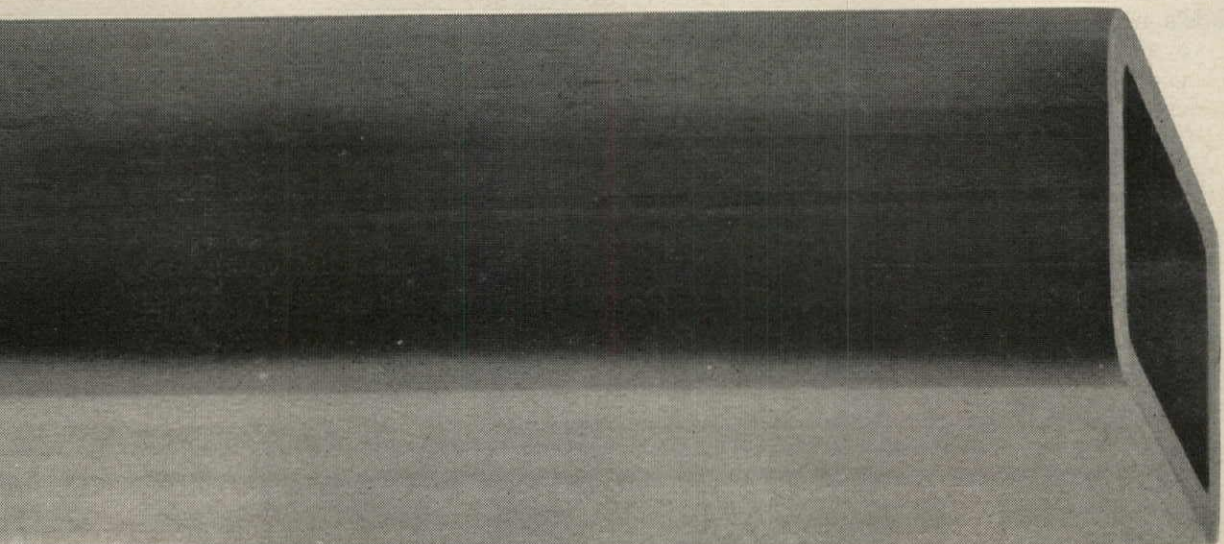
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YIELD STRENGTH  
FOR STRUCTURAL  
STEEL TUBING SHAPES**



Without increasing price, Republic has raised guaranteed minimum yield strength of ELECTRUNITE® Structural Steel Tubing by 36%. At a slight increase in price, structural tube shapes are now available with a 60,000 psi minimum value, which is over 80% greater than shown in ASTM Specification A-7.

**SPECIFICATION ST-101 REV. 12-1-61**  
**MECHANICAL PROPERTIES—ROUNDS**

	Grade A	Grade B	Grade C
Tensile Strength, Min. psi . . . . .	45,000	52,000	60,000
Yield Strength (.2% offset), Min. psi . . . . .	33,000	42,000	50,000
Elongation in 2", Min., per cent . . . . .	25	25	20

**MECHANICAL PROPERTIES—SHAPES**

	Grade A	Grade B	Grade C
Tensile Strength, Min. psi . . . . .	60,000	60,000	70,000
Yield Strength (.2% offset), Min. psi . . . . .	33,000	45,000	60,000
Elongation in 2", Min., per cent . . . . .	25	25	10

The high minimums (shown in chart) are set forth in Republic's new ST-101 Specification—first specification ever written for structural steel tubing. ST-101 accurately reflects the appreciably higher physicals made possible by the cold forming of flat-rolled steel into the tubing, coupled with the metallurgical properties of the steel itself. The specification helps you utilize this strength to reduce weight, trim cross section, and cut overall costs.



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Architects and engineers continue to design with more and more structural steel tubing. This lightweight material reduces weight of structures, permits lighter foundations. It provides strength at minimum cost. Tubing is easily joined at the job site or readily shop fabricated.

COLD FORMING OF STEEL into welded tube does more than increase yield strength. This process permits closer tolerances—more uniform straightness, wall thickness, and cross section. Cold forming also improves surface quality. Tube can be used for exposed interior or exterior applications, is quickly and easily painted.

Republic's ELECTRUNITE Carbon Steel Structural Tubing is available in rounds up to 6 inches O.D.; squares to 5 inches per side; rectangles in peripheries to 20 inches. ENDURO® Stainless Steel Tubing is available in rounds up to 5 inches O.D.; squares and rectangles in peripheries to 16 inches.

Mail the coupon for a copy of Republic's new *ELECTRUNITE Structural Steel Tubing* booklet. This booklet contains complete information covering elements of sections for structural tubing. Coupon also brings a reprint of Republic's new ST-101 Specification.



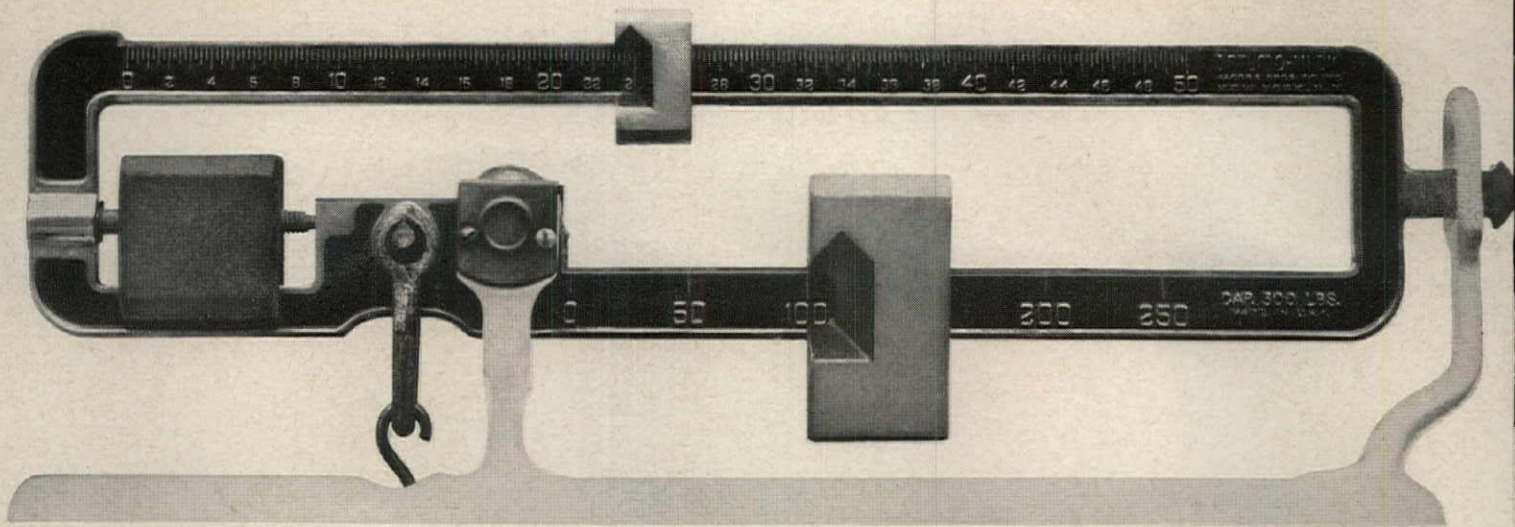
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“The most valuable assistant in our office is green and white, six feet long and weighs 123 pounds. I’m referring to our Sweet’s File, of course. It’s an indispensable aid to selecting building materials and equipment. It was a fortunate day for all of us when building-products manufacturers adopted this sensible and convenient way to meet our catalog needs.”

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AMERICAN LOUVER offers 3 shielding medias—42°—45° and the all new 55° louver, for higher lighting efficiency and uncluttered appearance—they will meet your most rigid lighting requirements for individual fixtures, modules or complete louvered ceilings.

*It pays to specify American*

- PERMANENT COLOR STABILITY
- HIGH IMPACT FOR GREATER STRENGTH
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- PATENTED INTERLOCKING LOUVERS
- ASSURE PERFECT ALIGNMENT
- LOW COST UPKEEP—EASY TO CLEAN
- AVAILABLE IN COMBINATION OF SIZES
- LOUVERS MAY BE CUT TO SPECIFICATIONS

## american plastic louvers

	Units	Formulation HF 77-1040	ASTM
<b>MECHANICAL</b>			
Tensile Strength	Lbs. per sq. in.	6500-8000	D638-52T
Elongation at Break	Percent	1.8-2.4	D638-52T
Modulus of Elasticity	In. tension lbs./sq. in.	4-5 x 10 <sup>7</sup>	D638-52T
Hardeness	Rockwell	87.0-90	D785-51
Flexural Strength	Lbs. per sq. in.	9000-13,000	D790-49T
Deflection at Break	Inches	0.15-0.35	D790-49T
Impact Strength	Foot lbs. per in. of notch	0.25-0.35	D256-47T
1/2" x 1/2" Notched	Foot lbs. per in. of notch	0.60-0.70	D256-47T
1/2" x 1/4" Gate End Notched	Foot lbs. per in. of notch	0.30-0.40	D256-47T
1/4" x 1/4" Dead End Notched	Average		
<b>MACHINING</b>			
<b>THERMAL</b>			
Thermal Expansion	In./in. per °C	6-8 x 10 <sup>-4</sup>	D696-44
Heat Distortion	"F. at 264 psi	183-191	D648-45T
	"F. at 4000 psi at 50°C.	0.8-1.0	D621-51
Deformation Under Load	"F. at 2000 psi at 50°C.	—	D621-51
<b>OPTICAL</b>			
Light Transmission @ 1040 Pigmentation	Percent Transmission @ 0.50 mu	52	
0.050" thick	" " " "	38	
0.100" thick	" " " "	29	
0.150" thick	" " " "		
<b>PHYSICAL</b>			
Specific Gravity		1.04-1.06	D792-50
Moisture Absorption	Percent	0.03-0.04	D370-42
Burning Rate (0.050" thick)	In./min.	1	D635-44
<b>ELECTRICAL</b>			
Dissipation Factor	10 <sup>7</sup> cycles	0.001-0.005	D150-47T
Dielectric Constant	10 <sup>7</sup> cycles	2.45-2.85	D150-47T
Dielectric Strength	Volts/Mil., 1/8" thick	400	D149-44
Volume Resistivity	Ohm/cm	10 <sup>12</sup>	D257-52T

The above data represent average values determined on virgin molding powder under appropriate A.S.T.M. tests conducted in the present range of Lustrax Permalone colors, formulations.

\* Lustrax Permalone Reg. U.S. Pat. Off. Monsanto Chemical Company

*Available in pastel colors*

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# american louver company

5308 NORTH ELSTON AVENUE • CHICAGO 30, ILL.

*New*  
**45° SHIELDING**  
2½FT x 5FT SIZE

Louver size 29¾" x 59¾"; +0", -¼"  
Cell opening ¼" x ¼" x ¼" high

**55° SHIELDING**  
2FT x 4FT SIZE

Louver size 23¼" x 47¼"; +0", -¼"  
Cell opening ¼" x ¼" x ½" high

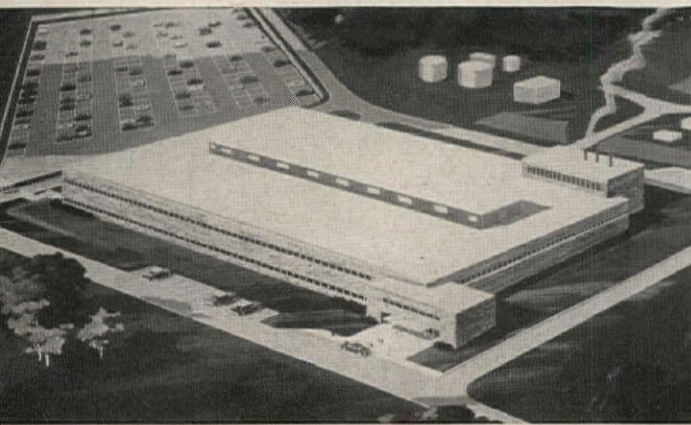
**45° SHIELDING**  
2FT x 4FT SIZE  
CHOICE OF TWO SIZES

Louver size 23¼" x 47½"; +0", -¼"  
Cell opening ¼" x ¼" x ¼" high

Louver size 23¼" x 47¼"; +0", -¼"  
Cell opening ½" x ½" x ½" high

**42° SHIELDING**  
1 FT x 4 FT SIZE

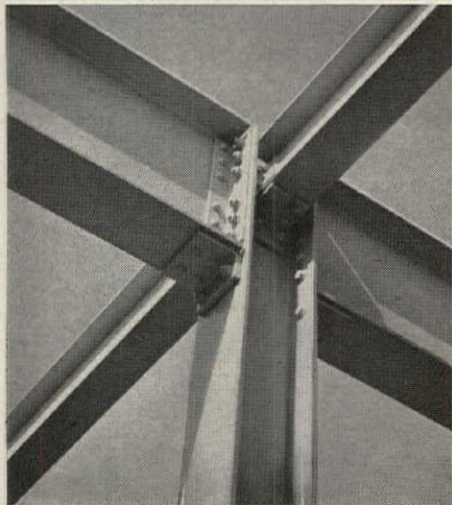
Louver size 10¾" x 47¾"; +0", -¼"  
Cell opening ¼" x ¼" x ¼" high



for Strength  
... Economy  
... Versatility



*Western Electric Company, Incorporated manufacturing plant for electronic devices, Reading, Pa. 450,000 sq ft of floor space. Architects: Greater Berks Associated Architects (Frederick A. Muhlenberg & Associates, Muhlenberg Bros., and Carl A. Eisenhower, all of Reading, Pa.), and Western Electric Company, Design and Construction Division. Structural Engineers: Kneas & Long. General Contractor: Burkey Construction Company. Steel Fabricator and Erector: The Belmont Iron Works. Owner: Greater Berks Development Fund, Reading.*



*2,318-ton framework of Bethlehem structural steel was erected in only 2½ months during the rugged winter of 1960-61, thanks to (1) the rigid schedule of The Belmont Iron Works and, (2) high-strength bolting. Almost all field connections were made using Bethlehem high-strength bolts. Shop connections were either riveted or welded.*

# A36 steel saves 120 tons

This manufacturing plant was designed in ASTM Specification A-36-60T steel. Thanks to its higher strength-to-weight ratio, the weight of the frame was cut 5 per cent . . . and 120 tons of steel were saved. A-36 is only one of many new "bargain" steels developed recently. Would you like more information on them? Call our nearest sales office. Or write to us at Bethlehem, Pa.

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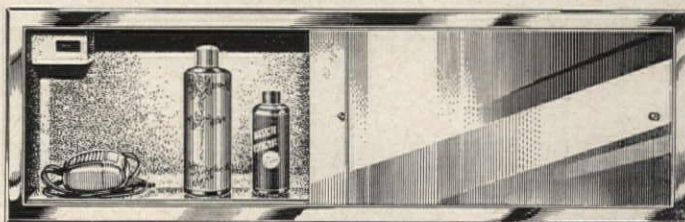
Their quiet dignity

blends harmoniously with any decor... saves precious space... provides extra convenience for every member of your family.

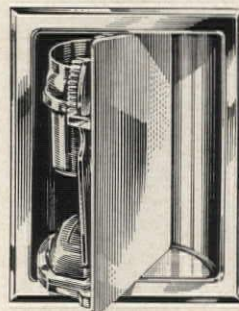
The traditional fine quality of Hall-Mack accessories brings lifetime beauty to your bathroom... combines discriminating concealment with full utility. Accessories make the bath, so to be sure to specify Hall-Mack when you build or remodel.



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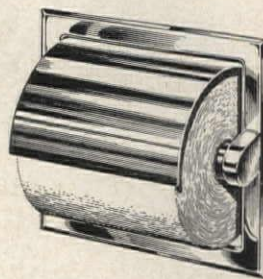


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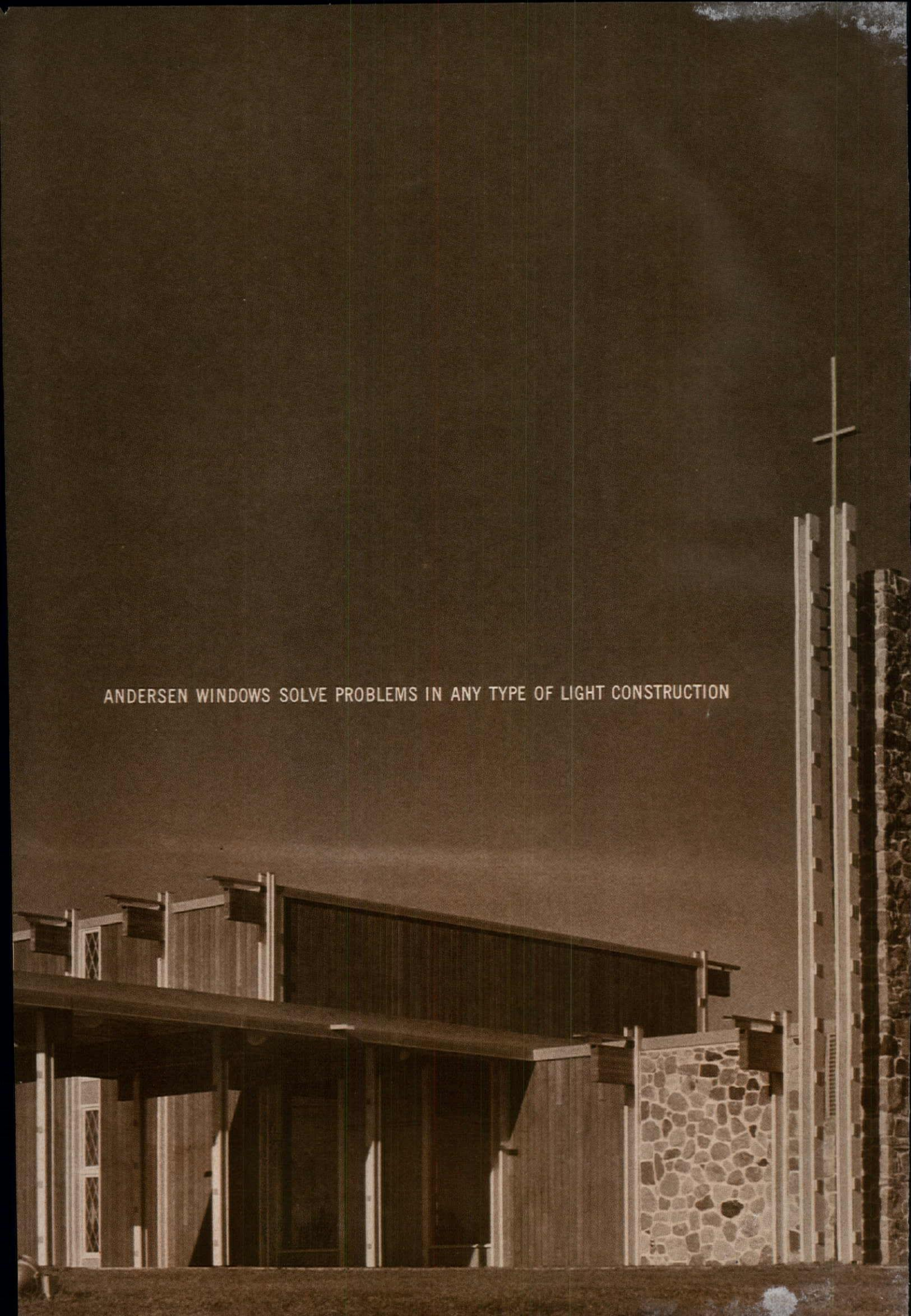
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*Our Savior's Lutheran Church  
Madison, Wisconsin  
Architects: Ames, Torkelson, Nugent*

## Removable diamond-lights heighten "Gothic Appearance" of this contemporary church

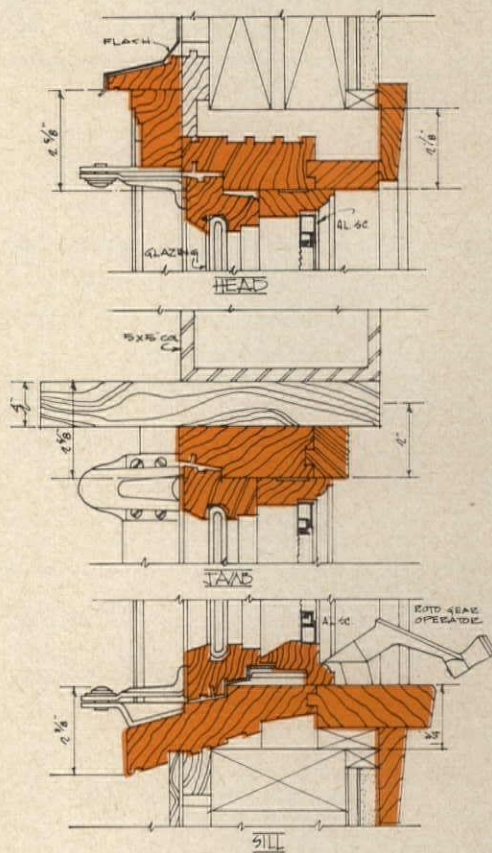
*Stock Andersen Casements are used in sanctuary of Our Savior's Lutheran Church in Madison, Wis.*

The diamond-light wood grilles in these Casements are removable. Normal maintenance and painting can be done easily and at minimum cost.

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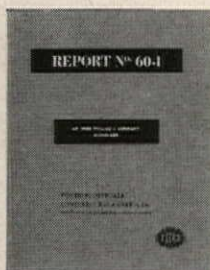
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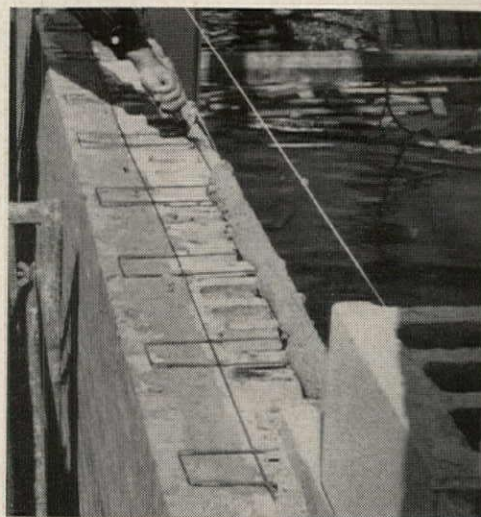
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AR 2-62



Made of all 3/16" wire or all #9 wire. Made in 12 foot lengths with 4" wide box ties 16" O.C. (9 ties per length). Available finish: Galvanized box ties with brite basic side rods; all mill galvanized wire; hot-dipped galvanized after fabrication.

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# How one Barber-Colman OVERdoor saved \$2243 per year\*



\* At Avon Sole Company  
Avon, Massachusetts,  
manufacturer of  
footwear soles.

AVON, in moving 3,000,000 lb of material in and out of its plant each month, realized that this material flow had a major influence on operating efficiency and cost. But how much did plant doors affect these costs? Using the Barber-Colman "Analyze Inefficient Doors" Plan, this is what they found with just *one* door:

**PROBLEM:** One heavy-traffic door used by 20 lift trucks opened 300 times in three eight-hour shifts. If hand-operated, it cost \$1323 per year extra in labor. (Estimated at 40 seconds to open and close by hand, 100 times per shift, at average hourly wage rate.)

**SOLUTION:** Installation of Barber-Colman OVERdoor with heavy-duty electric operator for remote operation by ratchet-type pull switches. Lift-truck men operate doors without walking, without slowdown in material flow.

**SAVING:** \$1323 per year in "walking labor" on one door.

**TOTAL SAVING** to Avon through Barber-Colman AID (Analyze Inefficient Doors) Plan on just *one* door: \$2243 per year! All told, Avon made indirect cost savings of \$6582 per year with six electrically operated Barber-Colman doors in its plant.

**PROBLEM:** The unusually heavy operation of this *same* door caused a \$450-per-year repair cost, using standard counterbalancing springs. Another \$720 per year was spent for extra labor and truck rerouting during these repairs. Total breakdown cost—over \$1170 per year, *not* including production slowdown!

**SOLUTION:** Barber-Colman OVERdoor with guaranteed 100,000-cycle counterbalancing springs, plus a counter that gives an accurate guide to spring replacement before a breakdown interrupts production—provides maximum performance, and eliminates extra spring replacement cost and labor.

**SAVING:** \$920 per year on one door.

it's costing your clients money every day you delay—write now! →

## AID

### Analyze Inefficient Doors

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BARBER-COLMAN COMPANY Dept. P22, Rockford, Illinois

# OVERdoors

helping industry boost efficiency

**On the Calendar**

*February*

- 9-10 Third Annual Congress of the Professions, sponsored by the Michigan Association of the Professions—Kellogg Center, Michigan State University East Lansing, Mich.
- 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

- 17-21 Annual convention, American Association of School Administrators—Atlantic City, N.J.
- 19-23 National convention, American Society of Civil Engineers; theme: "Planning and Building for Industrial Growth" — Shamrock - Hilton Hotel, Houston
- 23ff Meeting of the Jury of Fel-

lows of the American Institute of Architects; through Mar. 5—The Octagon, Washington, D.C.

*March*

- 3-4 Second annual conference, U.S. Institute for Theater Technology—New York City
- 8-9 Meeting of the Executive Committee of the American Institute of Architects—The Octagon, Washington, D.C.
- 12-15 58th annual convention, American Concrete Institute—Brown Palace Hotel, Denver
- 14-15 Reynolds Awards Jury—The Octagon, Washington, D.C.
- 20-22 1962 Annual Conference on Church Architecture, sponsored by the Church Architectural Guild of America and the Department of Church Building and Architecture of the National Council of Churches — Sheraton - Cleveland Hotel, Cleveland
- 28-30 48th Annual Convention, Michigan Society of Architects—Sheraton-Cadillac Hotel, Detroit

*April*

- 9-13 43rd Annual Convention and Welding Exposition, American Welding Society — Sheraton Cleveland Hotel and Cleveland Public Auditorium, Cleveland
- 24-26 Building Research Institute Spring Conferences — Shoreham Hotel, Washington, D.C.
- 27ff 31st Annual Conference, American Institute of Decorators; through May 1—Jack Tar Hotel, San Francisco

**Office Notes**

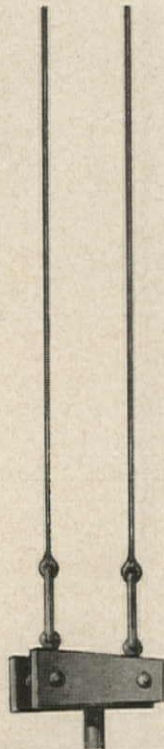
*Offices Opened*

James Howland Ballou, A.I.A., Architect and James Irving Starratt, Associate announce the opening of a new office for the practice of architecture located at 6 North St., Salem, Mass.

*New Firms, Firm Changes*

James W. Hammond, A.I.A., has resigned as general partner in Skidmore, Owings & Merrill, to form a new architectural firm of Hammond and Roesch, with Peter Roesch. Of-

*continued on page 224*



**WHY SPECIFY SEDGWICK DUMB WAITERS AND DOORS?**

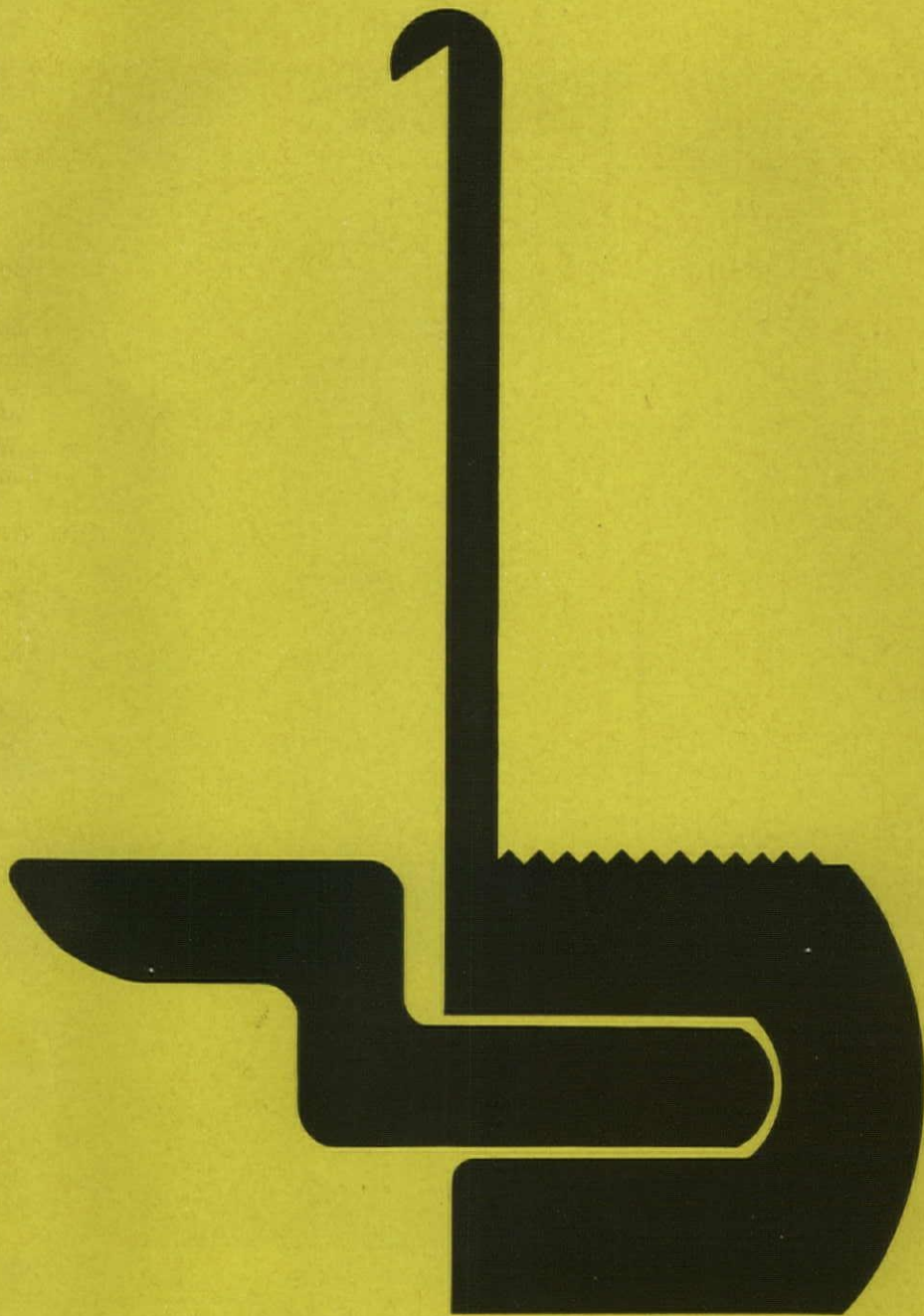
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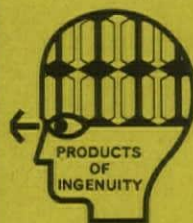
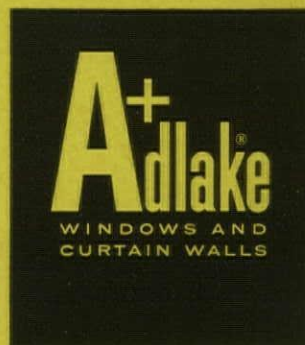


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\* *patent applied for*





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Here's a new step-saving, cost-saving method using Styrofoam insulation for insulating masonry structures which produces permanently high insulating values, provides a solid base for wallboard, and eliminates the problem of nail-popping . . . all in a single operation.

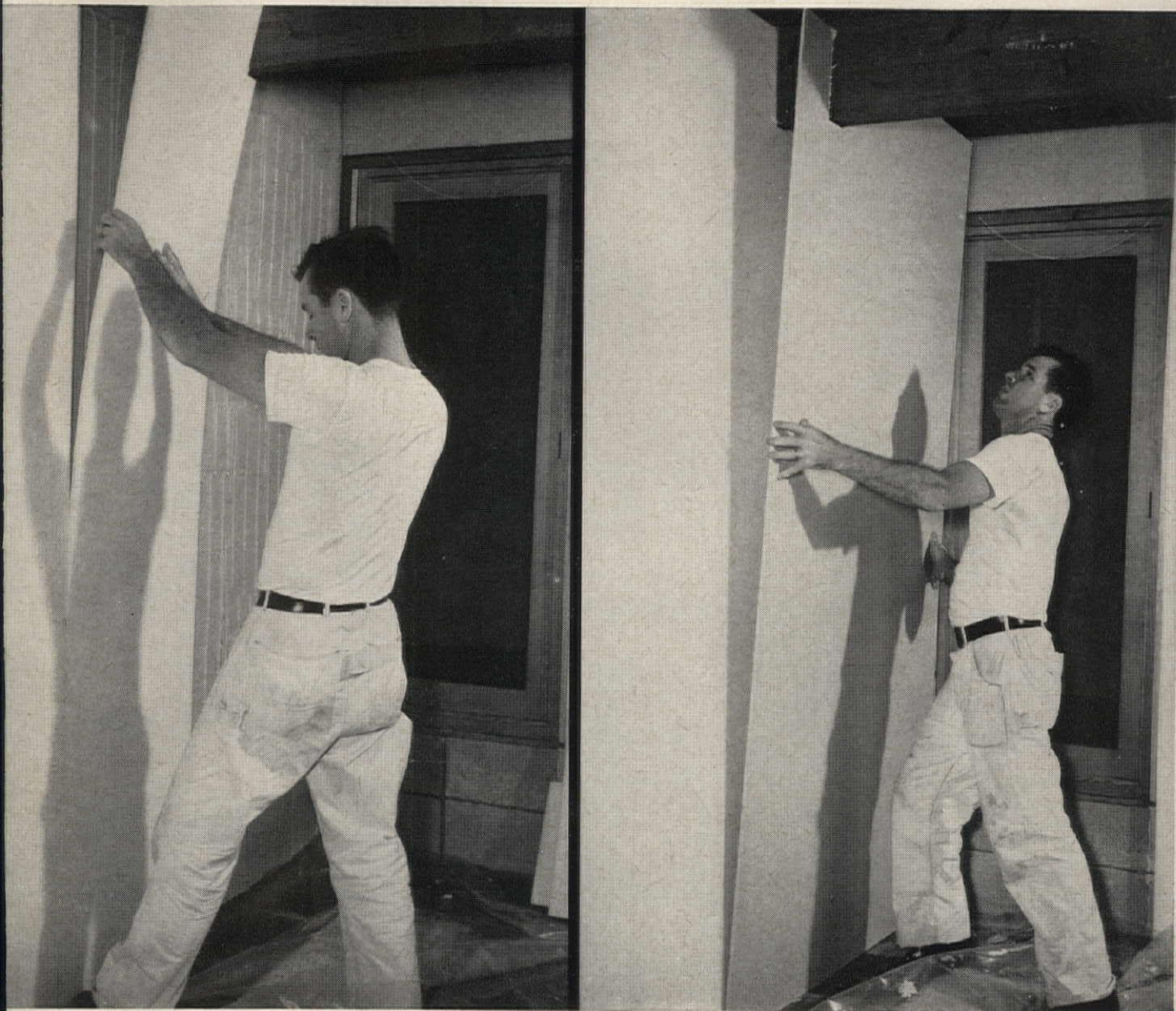
This new method makes use of Styrotac to bond Styrofoam brand insulation board directly to the inside face of the masonry wall, as illustrated. After the bonding cement has set overnight, gypsum wallboard is then adhered to the Styrofoam insulation using the same material.

Using this method, furring and lathing are eliminated, producing a solid insulated wall with no hollows. There is no wood present for insects to feed on, no nail holes to fill and "pop," and the completely-supported wallboard will

not bow in or warp. This new insulating method, developed by Dow, offers architects a means of building-in the quality of double-laminate walls, using only a single thickness of wallboard.

Styrotac can be applied to dry absorbent masonry surfaces without first wetting the surface, or it can be applied to the Styrofoam. Either spot application or full coverage using a notched trowel is recommended. Only firm hand pressure against the boards of Styrofoam is required to bond them solidly to the wall.

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## New insulating method saves money, saves steps in masonry construction

insulation provides positive keying action to the plaster, producing maximum bond strength.

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For more information on the time-saving, cost-saving advantages of using Styrofoam insulation and this new insulating method for masonry construction, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. 1301N2.

*Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.*

**THE DOW CHEMICAL COMPANY**



Midland, Michigan

fices will be in the McCormick Building, 332 South Michigan Ave., Chicago. Mr. Roesch, second prize winner in the international Enrico Fermi memorial building competition for a proposed Chicago Civic Center, joined Skidmore, Owings & Merrill in 1957. Mr. Hammond joined the firm in 1946 and has been a partner since 1955.

Three new partners have been admitted to the firm of Harland Bartholomew and Associates. They are:

Charles P. Clayton, in charge of the southeastern Office since 1951; Frederic M. Robinson, assistant manager for the southeastern office since 1955; and Jack Wood, an associate partner since 1958. Mr. Clayton and Mr. Robinson will continue to direct activities of the Atlanta office. Mr. Wood is in charge of the firm's work on the new community of Reston located in the environs of Washington, D.C.

New associate partners in the firm

of Harland Bartholomew and Associates include: Arthur B. Gallion, director of planning of the Honolulu office; Malcolm C. Drummond, in charge of many of the planning projects of the St. Louis office; Joseph M. Ross, who has been project engineer on the comprehensive plan for Birmingham, Ala.; Thomas A. Campbell, director of planning of the Memphis office; Ronald D. Schmied, currently project engineer on design of the Red Mountain Expressway in Birmingham; and Robert A. Fosnaugh, office engineer on Interstate design in Memphis.

Louis M. S. Beal, A.I.D., has joined the staff of I.S.D., Inc., the interior space design division of Perkins & Will, Architects. He will direct the New York office, 125 East 55th St., New York City.

Charles Luckman Associates of New York and Los Angeles announce the appointment of Clive Entwistle, F.R.I.B.A., as chief architectural designer.

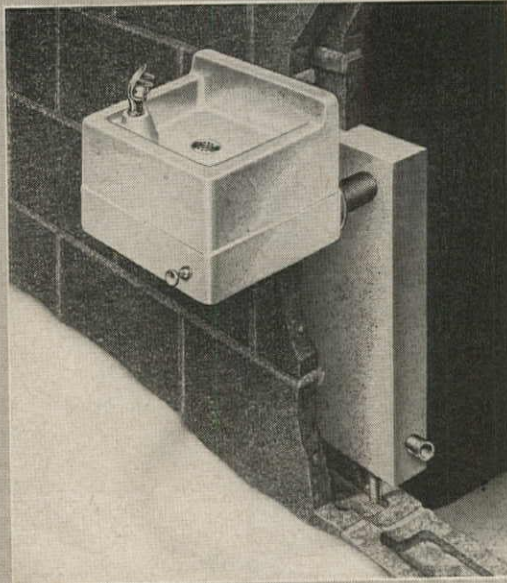
Alexis Smislova and Thomas Carcaterra have formed the partnership, Smislova & Carcaterra, Consulting Engineers, for the practice of structural engineering. Offices are located at 8719 Colesville Road, Silver Spring, Md.

William R. Ewald Jr. has been elected senior vice president and treasurer of Doxiadis Associates, Inc., with headquarters in Washington, D.C. Mr. Ewald will direct in a technical and creative capacity all activities as well as be in charge of administration, coordination and finance of the firm, which is the United States subsidiary of Doxiadis Associates, an international firm of consultants in urban and area development, Athens, Greece.

A new architectural firm has been formed by Harry J. Quinn, president of Pacesetter Homes, Inc., in South Holland, Ill. The firm, known as Harry J. Quinn Associates, Architects and Engineers, has offices at 1000 East 162nd St., South Holland. Associated with Mr. Quinn are three other registered architects: Donald S. Kay, Duane E. Linden and Richard R. Carlascio.

Peter Callins and Cyrus H. Wagner have consolidated their offices under the firm name of Callins Wagner, Architects. The address is 140 Olmos Drive, W. San Antonio, Texas

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continued on page 23

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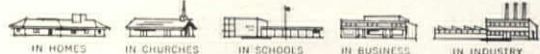


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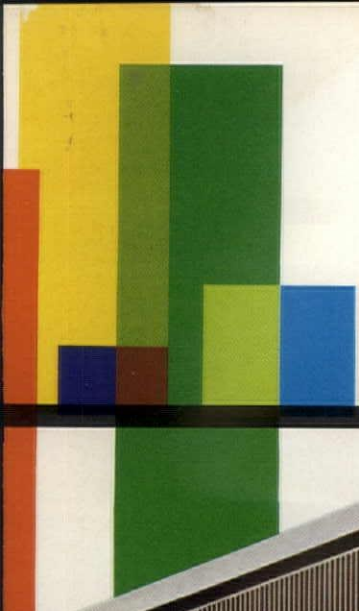


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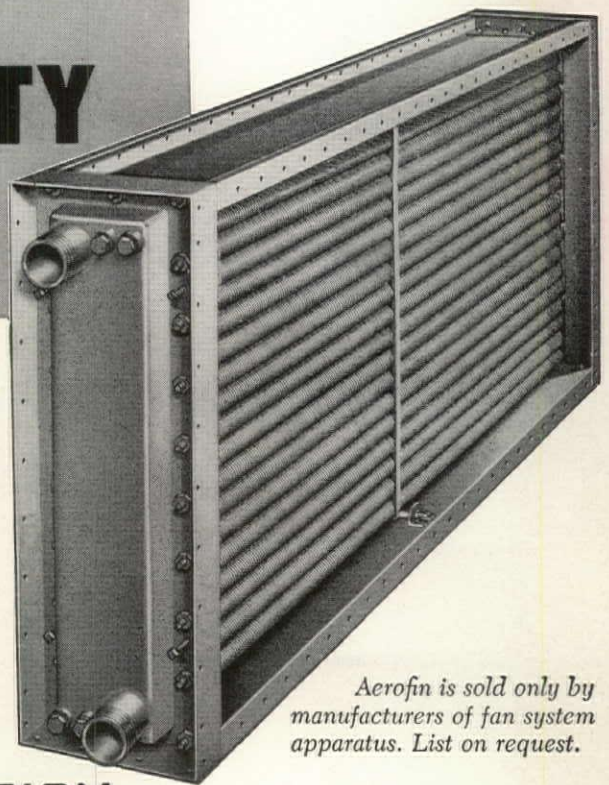
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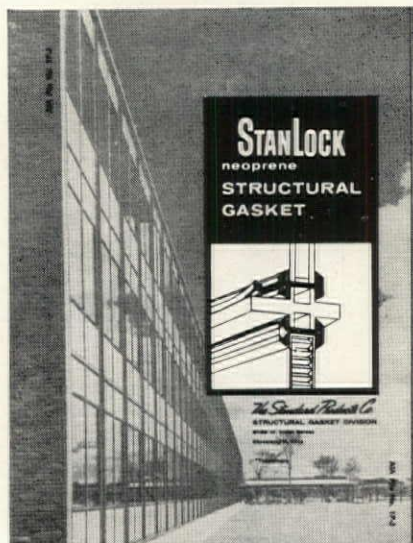
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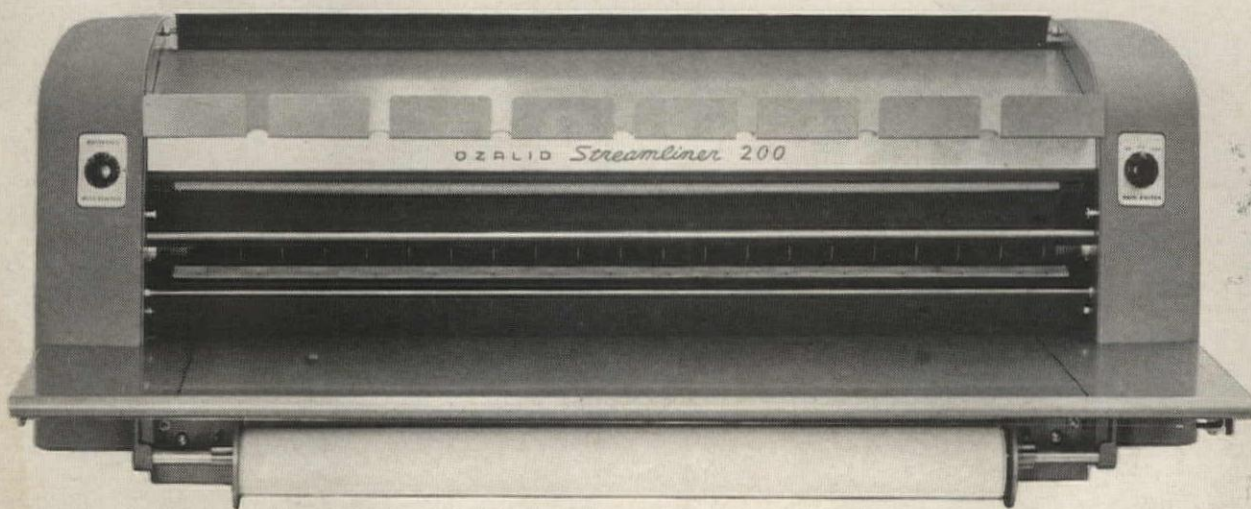
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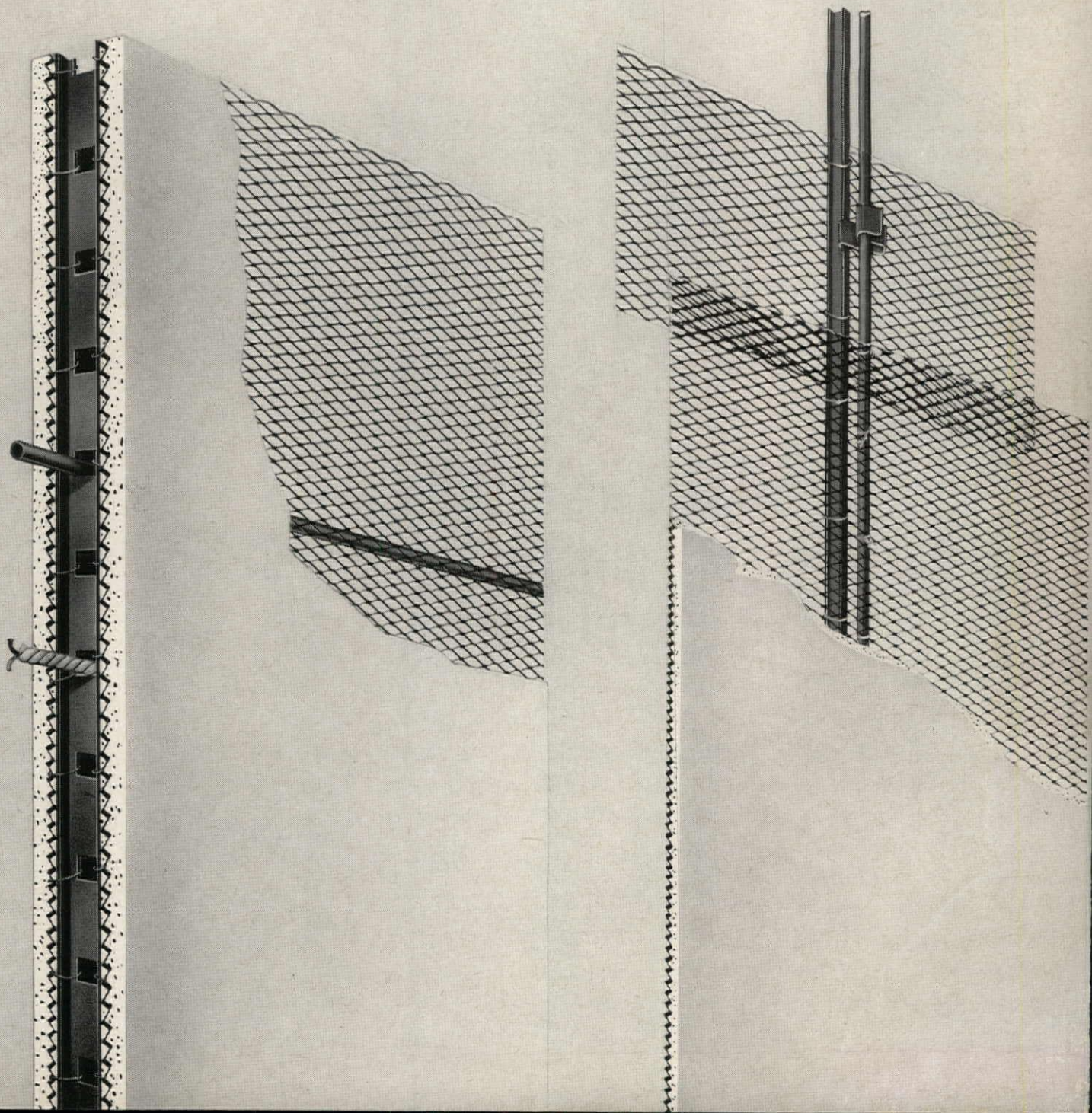
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A utility wall that provides free passage of wiring and pipes (the holes are 1 $\frac{1}{4}$ " x 1 $\frac{1}{8}$ "). Yet so slim that the finished lath-and-plaster wall is only 3 $\frac{1}{8}$ " thick—more than a full *inch* thinner than most interior partitions. Think of the extra floor space that means. And a full set of metal accessories is available to complete the partition.

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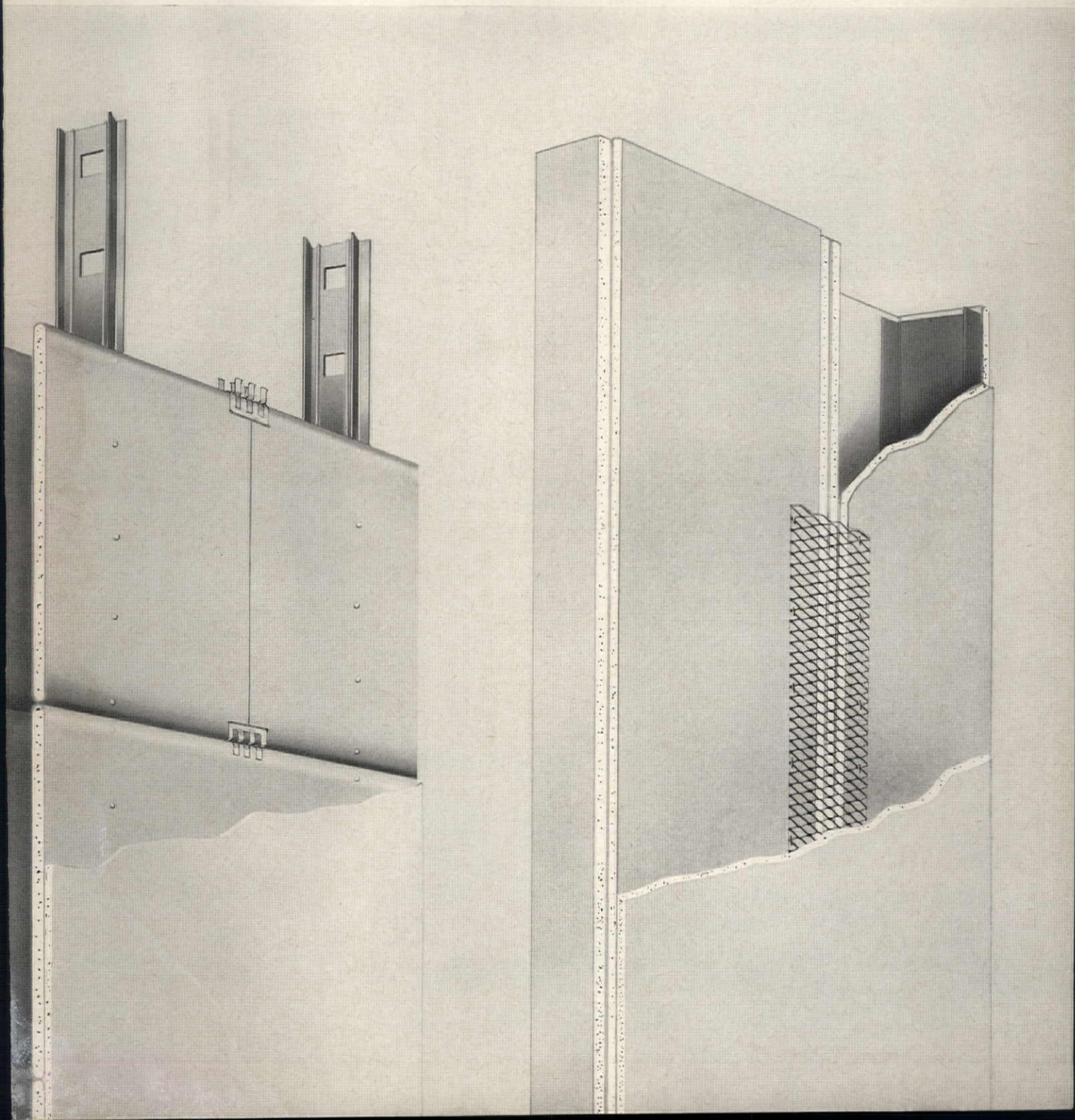
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Leron A. Hester, architect, has been appointed an associate in Blurock, Ellerbroek & Assoc., architects and planners, Corona del Mar, Calif. He heads the Specifications Department.

Samborn, Steketee, Otis and Evans, engineers and architects, have expanded facilities in the new Libbey-Owens-Ford Building in Toledo, O. Additional space has been leased. Since moving to the building in 1960, 22 employees have been

added to department staffs, bringing the personnel total to 85. The expansion, according to Alfred H. Samborn, partner, is the result of substantial increases in business in both the engineering and architectural departments.

J. Byers Hays of the firm of Hays and Ruth, Architects, Cleveland, has retired from active practice. Paul C. Ruth has joined with N. Jack Huddle, Keith E. White and H. David Howe Jr. to form the successor firm

of Ruth, Huddle, White & Howe. Mr. Hays will serve the new firm in an advisory capacity. The new firm has offices at the same address: 1720 Euclid Ave., Cleveland.

### New Addresses

Frederick G. Frost Jr. & Associates, Architects, 30 East 42nd St., New York 17.

J. Stewart Stein, Architects-Engineers, 159 North Dearborn St., Chicago 1, Ill.

J. George Szeptycki, A.I.A., Architect and Associates, 7188 Sunset Blvd., Los Angeles 46, Calif.

### Elections

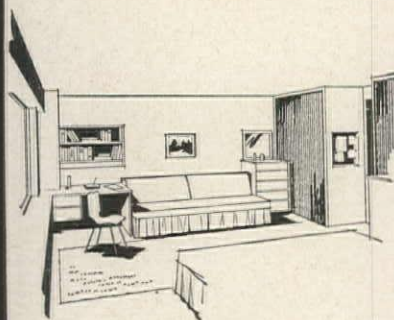
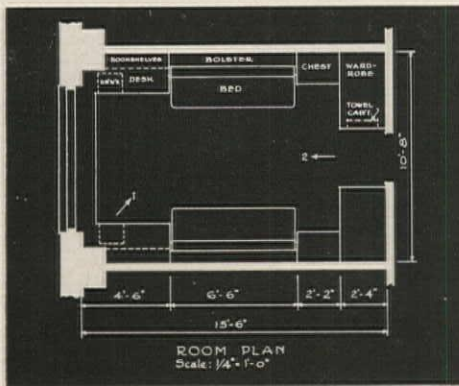
1962 officers of the Philadelphia Chapter of the American Institute of Architects are as follows: Lyle Boulware, president; Harold E. Waggoner, first vice president; Robert Allen Class, second vice president; Arthur B. White, treasurer; Louis DeMoll, secretary; Marvin Suer, recorder. New members of the Chapter's Board of Directors are: Norman N. Rice, Roy W. Banwell, and Harry Kale. Continuing members of the Board include Heyward Myers Pepper, Robert W. Noble, and Charles F. Ward Jr.

Dr. Eric A. Walker, electrical engineer and president of Pennsylvania State University, has been elected president of the Engineers Joint Council for 1962 and Louis R. Howson, senior partner in the engineering consulting firm of Alvord, Burdick, and Howson, Chicago, elected vice president. Re-elected treasurer was E. L. Chandler and secretary, L. K. Wheelock.

### Catholic U. Confers Award on Architect Alumnus

John J. Carey, chairman of the Judiciary Committee of the Regional Council of the American Institute of Architects and member of the College of Fellows of the A.I.A., has received an award from the Catholic University of America for having achieved distinction in the field of architecture. Mr. Carey of Mobile, Ala., class of 1922, was one of 11 alumni given awards at the annual banquet of the Alumni Association held in Washington, D.C. in mid-November.

more news on page 240



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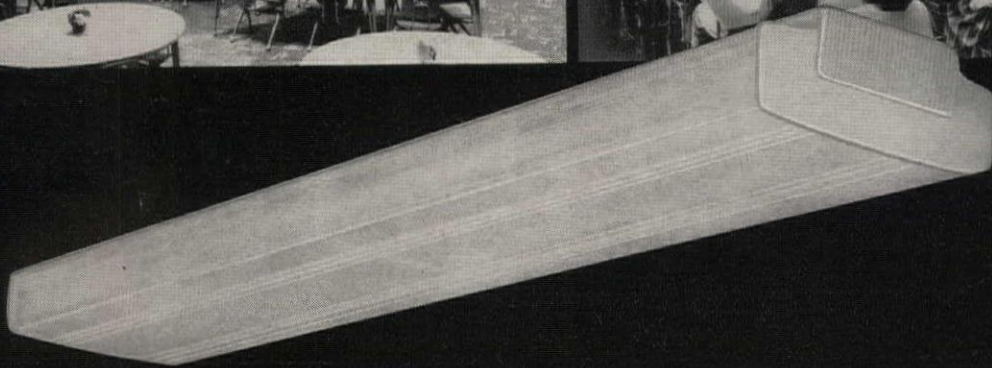
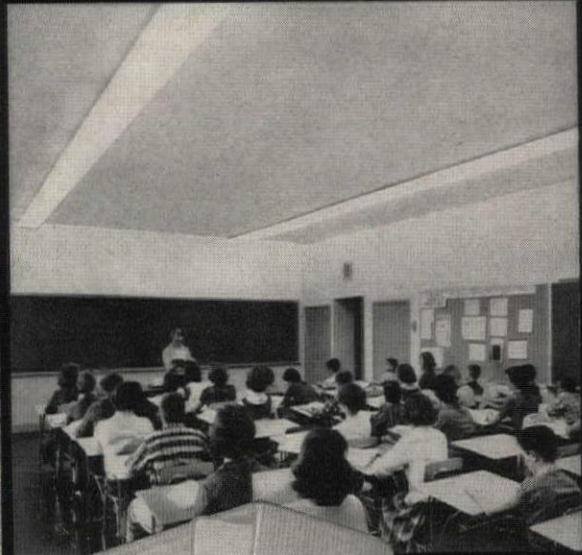
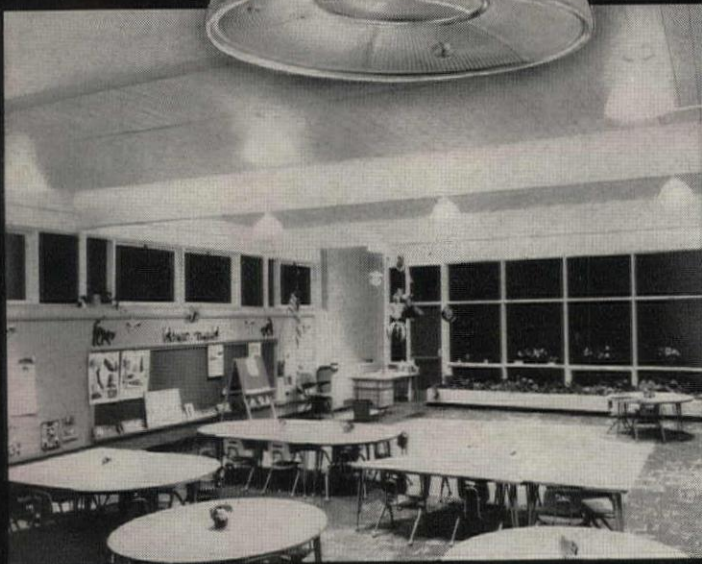


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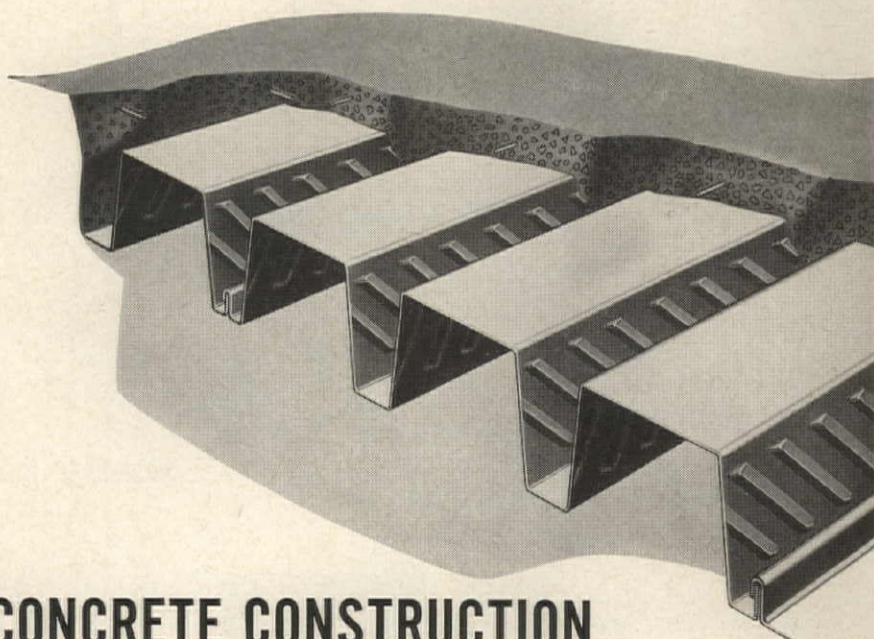
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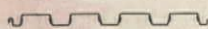
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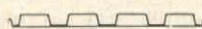
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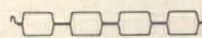
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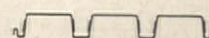
**Type BR Hi-Bond Floor Deck**  
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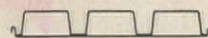
**Type BF Cellufloor**  
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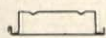
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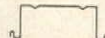
**Type N Hi-Bond Floor Deck**  
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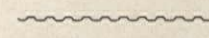
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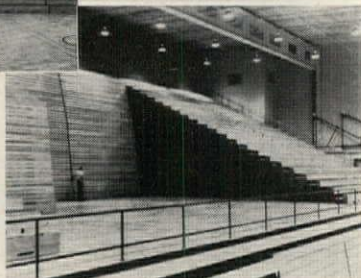
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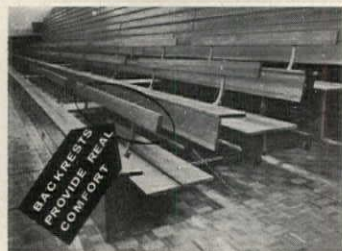
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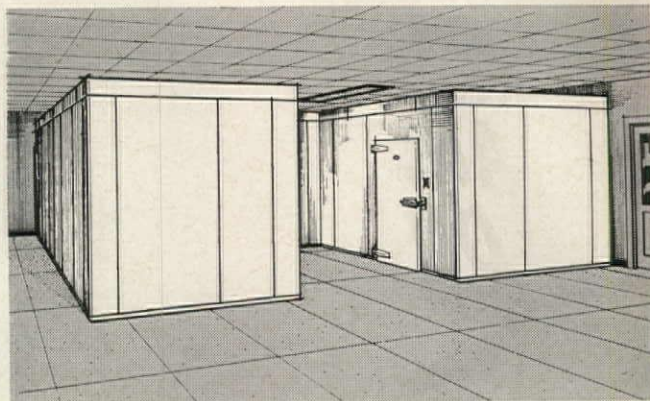


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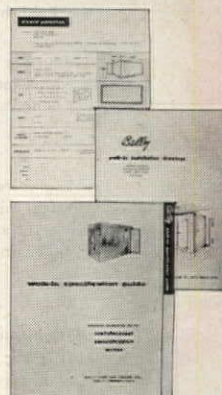
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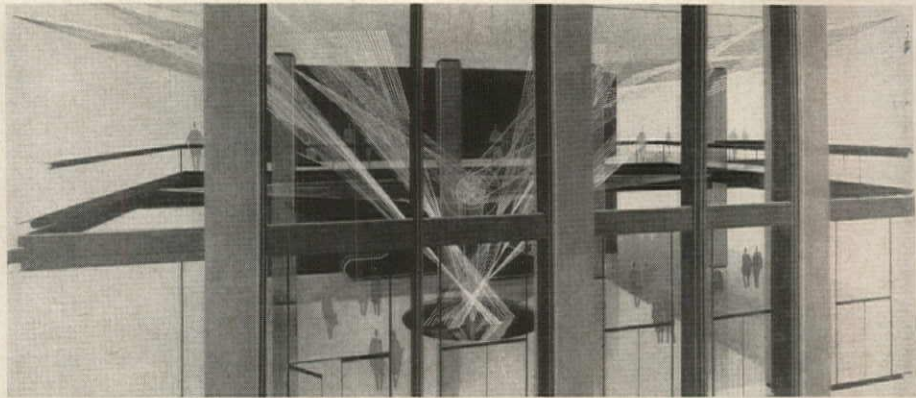
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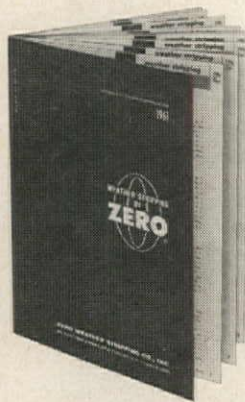
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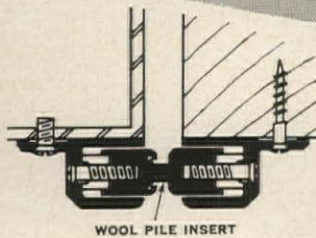


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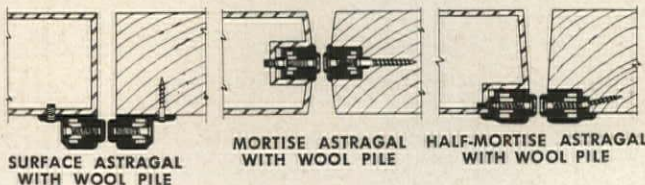
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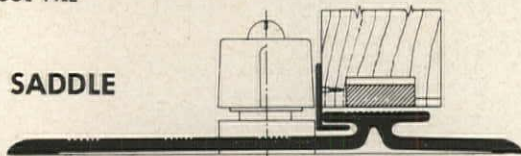


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Commissioned on the basis of recommendations by the design consultants for the building, Walter Gropius and Pietro Belluschi, and by the building's architects, Emery Roth and Sons, the wire sculpture under tension will be three stories high, 40 ft deep and will extend 80 ft across the lobby.

Of the sculpture which was created as an art expression relating to the building's principal tenant, Pan American World Airways, Mr. Lippold says: "The forms . . . are derived from the performances and shapes of modern aircraft, except for a sphere of the world in the center. From this sphere, a seven-pointed star radiates toward the seven continents (and seven seas), its long, conical arms originating in Great Circles of the globe, like routes followed in intercontinental travel.

" . . . Surrounding this world-sphere . . . are silver forms whose general character suggest . . . flight patterns of jet aircraft.

" . . . A reflecting surface is shown on the floor, indicating water below the upper regions of earth and air-space. Two materials are used: a high carat gold over bronze for the globe and star, and stainless steel for the silver colored elements. These relate to the gray granite and travertine marble of the interior. The shapes have been chosen and placed with regard to the space of the lobby, in an effort to continue the unity of form of the architecture, and also to echo the unique angularity of the exterior of the building."

more news on page 248

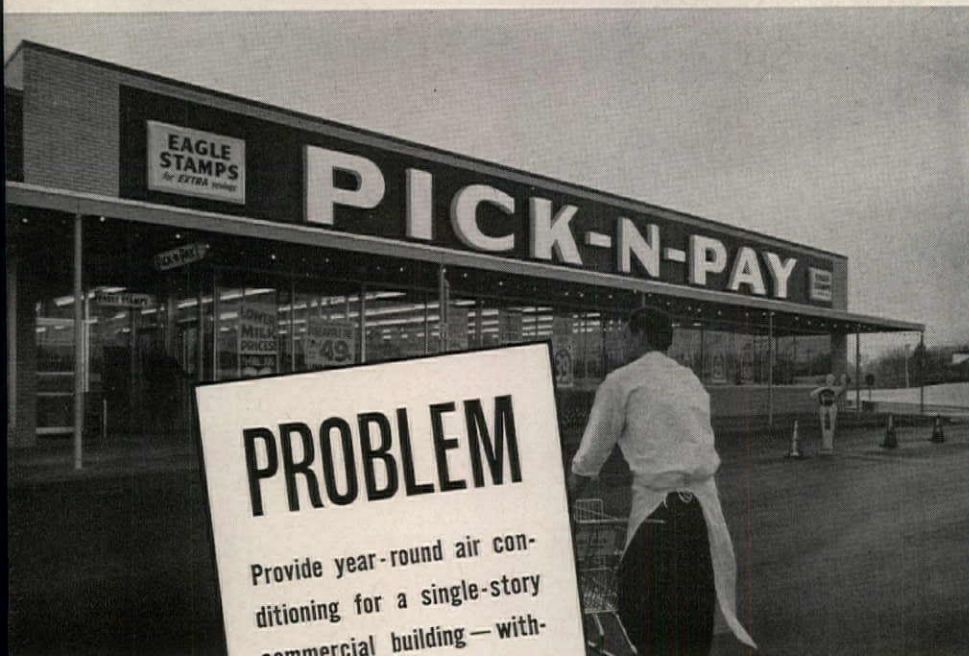


**CREATIVITY IN CERAMIC VENEER** is achieved in Washington, D. C. by Corning, Moore, Elmore & Fischer, architects, who specified facing, trim and specially-designed grilles of modern architectural terra cotta by Federal Seaboard. Other than tower section illustrated at right, this Educational Center of the American Association of University Women is enclosed with Ceramic Veneer in a harmonizing combination of blue-gray and russet on three elevations. The unrivaled versatility and vast color range of Ceramic Veneer for exteriors and interiors are illustrated in colorful literature available upon request. Construction detail, data, advice and estimates on preliminary sketches also will be furnished promptly without charge. Write today.

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SEABOARD  
TERRA COTTA  
CORPORATION

10 E. 40th St., New York 16, N. Y.  
Plant at Perth Amboy, N. J.





**PROBLEM**  
 Provide year-round air conditioning for a single-story commercial building — without sacrificing usable space.

**SOLUTION**

## the YORK SUNLINE Roof ventilates... allow



The York SUNLINE Air Conditioner may be installed anywhere on the roof, not necessarily over the area to be conditioned; unit may also be located on the ground, outside building.

Here's the most advanced way to provide a better business climate for store, factory, office . . . any single-story commercial building! It's the York SUNLINE, a compact, all-in-one Roof Top Air Conditioner that provides crisp, dry cooling in summer . . . gentle, even gas heating in winter . . . tempered, filtered air in every season of the year.

**Complete freedom of design!** The York SUNLINE is a single, compact unit for mounting on the building roof. It may be located anywhere on the roof—not necessarily over the conditioned space. And it may be installed on the ground, outside the building, where a roof top location is not desired. Unit may be installed with or without ducts to meet a wide variety of design requirements. No furnace or power room is needed, so there's more usable interior space.

**Easy to install,** the York SUNLINE Air Conditioner is delivered factory-wired and piped, with all controls mounted. The compressor is hermetically sealed and rubber mounted for long service and quiet operation. A spe



# Top Air Conditioner that heats, cools, complete design freedom!

feature of the York SUNLINE unit is low ambient cooling: it will provide cooling even when the outside temperature is as low as zero—to compensate for heavy occupancy during peak business hours.

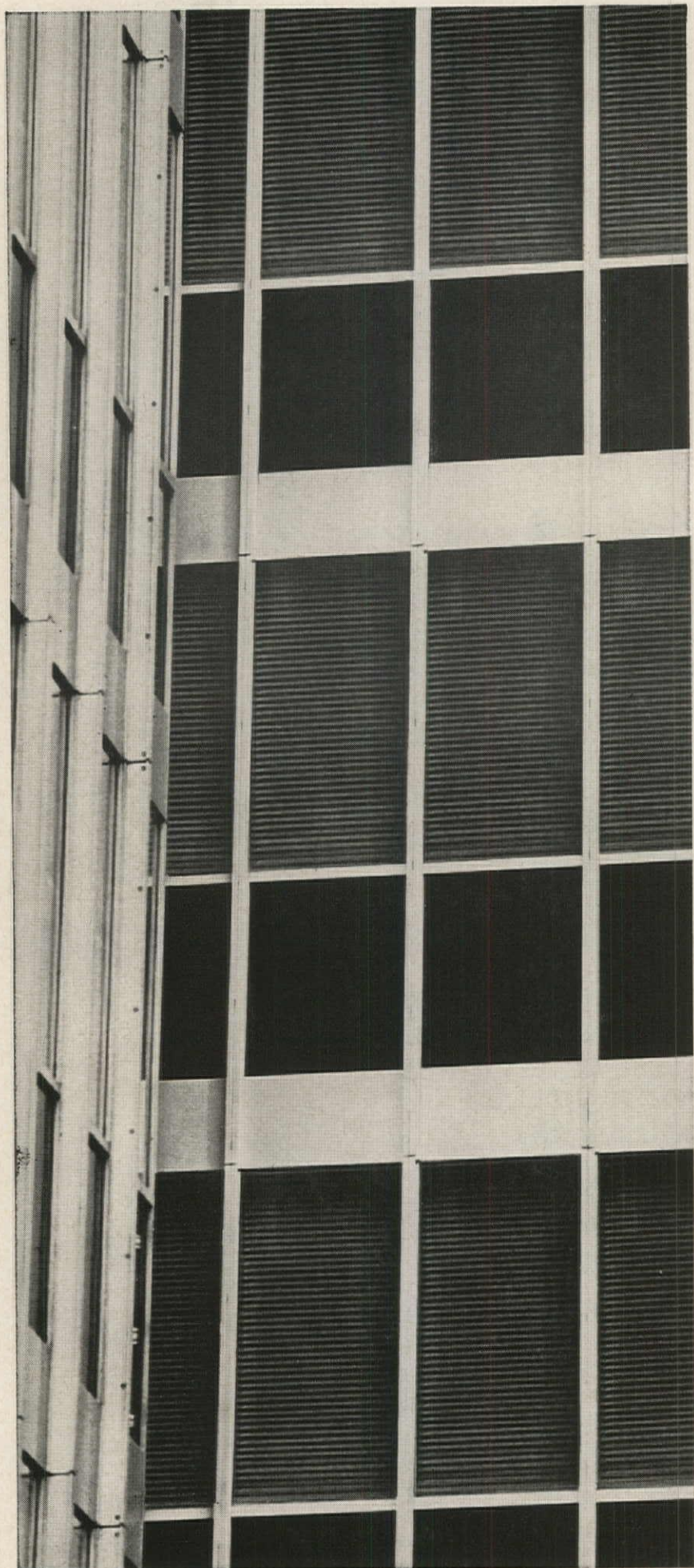
Go **an** ahead with York when you plan air conditioning for any type of building. For over 75 years, York has pioneered major advances in conditioning air for comfort and process. For complete facts on the York SUNLINE Roof Top Air Conditioner, see your York Representative; or write York Corporation, York, Pennsylvania.

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

THE QUALITY NAME IN AIR CONDITIONING AND REFRIGERATION

**ANOTHER YORK SOLUTION!**

A York Heat Pump uses only electricity and air to heat and cool any type of building. May be located almost anywhere, from basement to rooftop; no space-taking fuel storage.



## Where did the tapes go?

Behind the mullions.

Result: versatile, venetian-blind light control with no unnecessary verticals to mar the clean lines of a curtain-wall facade.

Architects asked for this look. Flexalum engineered it. You can specify it for your building, with tapes positioned anywhere from  $\frac{3}{8}$ " to 12" from the ends of the slats (depending upon the width and position of your mullions).

This mullion-line tape blind is the latest—but not the first—Flexalum Twi-Nighter modification designed for and with architects. During the past year, many buildings have specified the skyscraper modification which restricts lift position to full up, full down, and one intermediate stop—thereby assuring a more uniform exterior by eliminating erratic blind heights.

There is also a special Twi-Nighter hospital modification which provides the maximum combination of light and privacy through opposite phasing of the upper and lower halves of the blind. For hospitals, Flexalum also supplies special plastic tapes that are fungus-resistant.

All these blinds have the Twi-Nighter's unique, integrated design. Only Twi-Nighters are designed like your buildings—with every part engineered with relation to every other.

Perhaps one of these blinds solves problems for your buildings. Or perhaps you've seen a need for some special new features which we can engineer for you. For specifications, or consultation on new innovations, write Bridgeport Brass Company, Hunter Douglas Division, 30 Grand Street, Bridgeport 2, Connecticut.

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SPECIAL PURPOSE VENETIANS



# Sylvania's New Power-V Series

ideal for  
Industrial Plants...  
and Schools, too?

Sylvania's new Power-V Series serves ideally for lighting just about any area in any industrial plant . . . and for specialized sections of schools and institutional buildings as well.

The neatness of design, ruggedness, and simplicity enable the Sylvania Power-V to perform superbly in most industrial applications plus in gymnasiums, workshops, laboratories, and other similar areas.

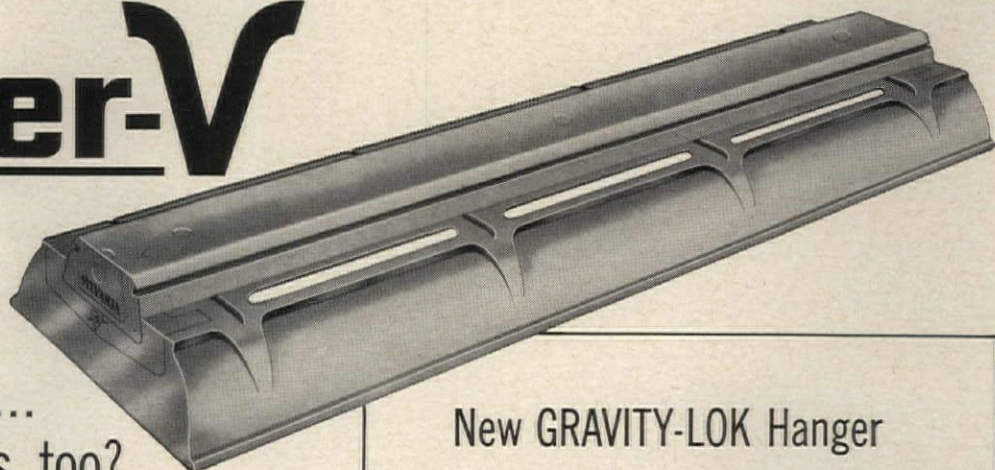
Ask your Sylvania representative or your Sylvania Select Distributor for details. Or write to:

SYLVANIA LIGHTING PRODUCTS  
A Division of SYLVANIA ELECTRIC PRODUCTS INC.  
One 48th Street, Wheeling, West Virginia

PV-25 Series  
Nominal 25% Uplight—  
30° Crosswise Shielding

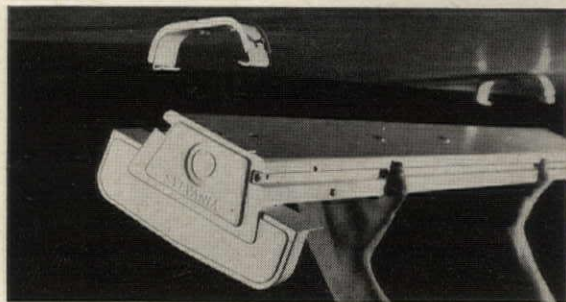


PV-10 Series  
Nominal 10% Uplight—  
13° Crosswise Shielding

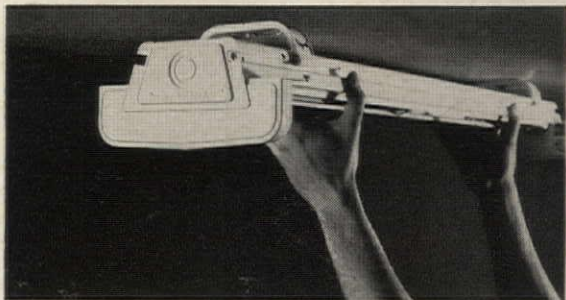


## New GRAVITY-LOK Hanger

This new Sylvania hanging device makes the installation of Power-V fixtures as simple as 1-2-3. Ask for a demonstration in your own office.



After Gravity-Lok Hanger is fastened or suspended, engage groove of one side of fixture channel into lip of stationary side of Gravity-Lok Hanger.



Rotate fixture into position. Movable clamp of Gravity-Lok Hanger moves aside as channel is pushed upward. Clamp then falls into groove on channel holding it in place. Then tighten screw on side of Gravity-Lok Hanger to prevent lengthwise movement of channel, when desirable.

**LIGHTING FIXTURES BY**

# SYLVANIA

SUBSIDIARY OF

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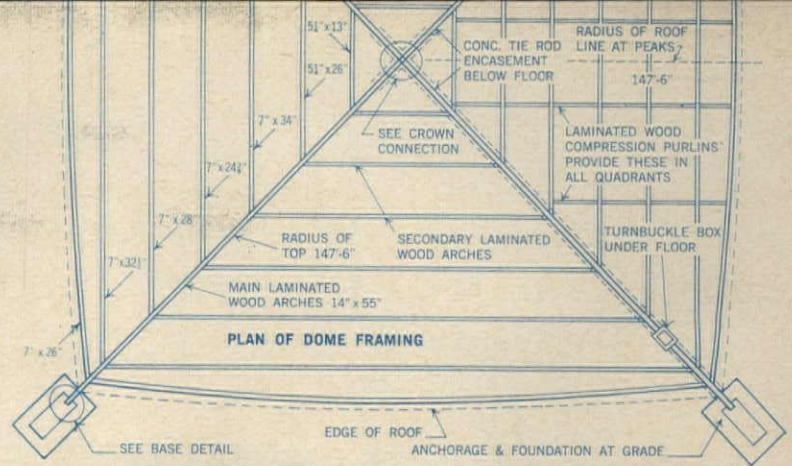
## Rilco laminated wood

NORTH DAKOTA STATE TEACHERS COLLEGE  
FIELD HOUSE

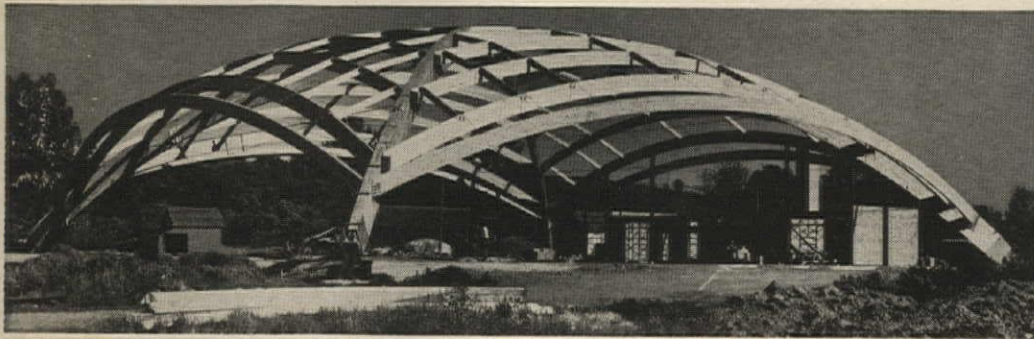
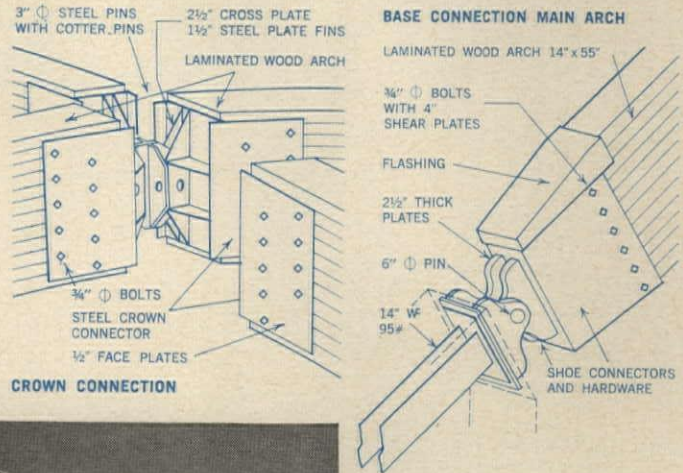
LOCATION: Valley City, North Dakota

ARCHITECT: Clark, Elken and Holman  
Fargo, North Dakota

CONTRACTOR: Wick Construction Incorporated  
Valley City, North Dakota



Four 14" x 55" laminated arches spanning 208 feet are the primary supporting members holding a roof load of almost 120 tons. 1 1/8" tie rods with turnbuckles increase rigidity. Rilco 3" x 6" t&g wood decking was laid at right angles to segment timbers and face nailed with 40d spikes.



## the span between imaginative design and economical construction

A web of 32 Rilco arches and 80 compression purlins forms the structural backbone of the North Dakota State Teachers College field house. ■ A Rilco framing system was selected for these reasons: 1) no other material could match the economy of Rilco members; 2) the architect was able to design the building to the exact shape necessary for indoor athletics, with 100% use of space; 3) good acoustical and insulation qualities were achieved without special treatments or need for framework enclosures; 4) through close planning with Rilco field service engineers, the prefabricated structure became a simple and fast field assembly job. ■ These same advantages can be put to work on your school, commercial and church projects. Experienced Rilco engineers will help you with preliminary plans, structural specifications and erection details. Information available in Sweet's Architectural Catalog File, 2bRi and AIA File 19-B-3, or write Rilco Engineered Wood Products Division, Tacoma 1, Wash.



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**HARTER**



comfortable,  
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When your plans call for flexible seating, specify Harter Stacking Chairs. They stack eight-high in half the height of leg-on-leg stackers and require practically no lifting. Foam rubber cushions. Wide selection of striking fabrics and colors. Optional chrome ganging fixture holds a removable ash tray and folds away for stacking. Many chairs can be moved quickly and easily with one Harter hand truck. No need for a number of individual dollies. Harter Stacking Chairs provide flexibility with beauty, comfort and convenience.

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New Zealand—Australia:  
Morrison Industries, Hastings, New Zealand

*The Record Reports*

*continued from page 240*

**Univ. of Pennsylvania Awards  
Open to Applicants**

A number of fellowships and scholarships are open to application from persons wishing to undertake graduation studies in landscape architecture. They range in value from free tuition, free board and a stipend of \$500 a year to a minimum of free tuition.

The closing date for completed applications is March 1. Inquiries should be directed to Ian L. McHarg, Chairman, Department of Landscape Architecture, University of Pennsylvania, Philadelphia 4, Pa.

**Kate Neal Kinley Memorial  
Fellowship Available**

The Kate Neal Kinley Memorial Fellowship carrying the sum of \$2000 to be used toward a year's advanced study of the fine arts in America or abroad is open to candidates. Eligible are graduates of the College of Fine and Applied Arts of the University of Illinois and graduates of similar institutions of equal educational standing whose principal or major studies have been in one of the following: Music—all branches; Art—all branches; Architecture—Design or History. Applicants should not exceed 24 years of age on June 1, 1962, although the Committee in charge reserves the right to deviate slightly from this provision.

The Fellowship will be awarded on the basis of unusual promise in the fine arts.

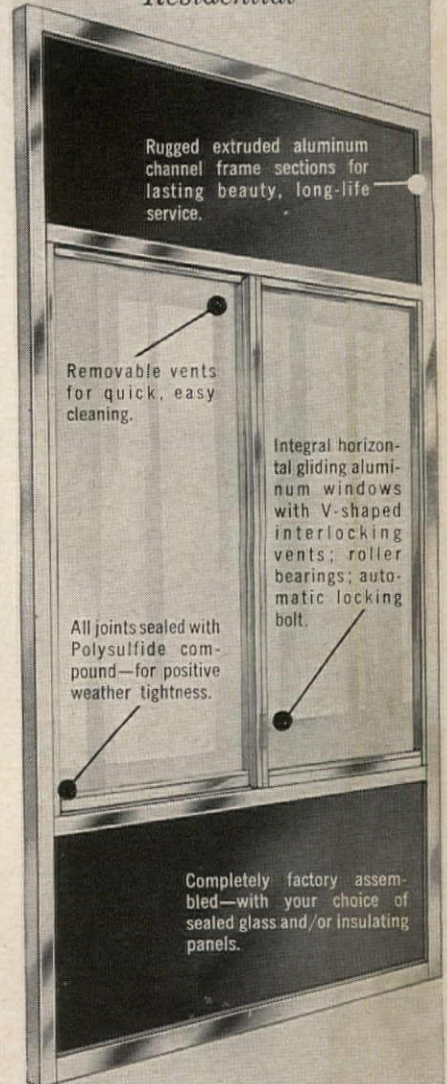
For application blanks and instructions, write Dean Allen S. Weller, College of Fine and Applied Arts, Room 110, Architecture Building, University of Illinois, Urbana, Ill. Applications should reach the Committee not later than May 22, 1962.

**Appointment**

Architect and graduate engineer Paul Schneider-Esleben of Dusseldorf has been appointed professor at the Staatliche Hochschule fur bildende Kunst Hamburg.

*more news on page 256*

*Glidorama*  
**...A VERSATILE  
APPROACH TO BEAUTIFUL,  
LOW-COST BUILDING**  
*Commercial • Institutional  
Residential*



Custom fabricated to meet your specific design requirements, Glidorama Window Walls permit easier erection . . . provide more useable floor space . . . reduce labor, material and maintenance costs. Available for both monumental and light construction applications—in single and multiple story units.

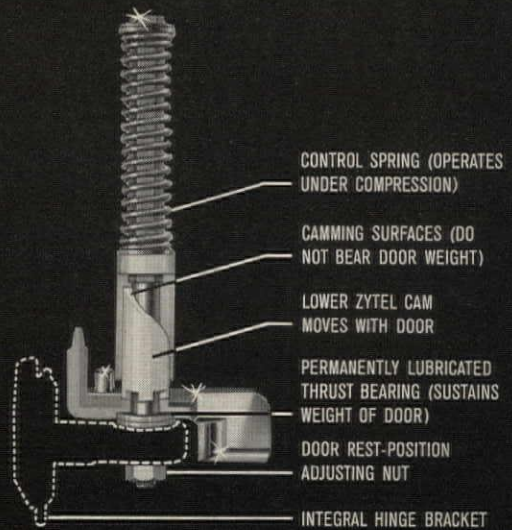
Write for Technical Bulletin GL-12. Glidorama, Division of Whizzer Industries, Inc., 350 S. Sanford St., Pontiac, Michigan.

**Glidorama Custom Aluminum  
WINDOW WALLS**

SANYMETAL TOILET COMPARTMENTS • Lowest In-Place Cost ••• Minimum Maintenance ••• Longest Life

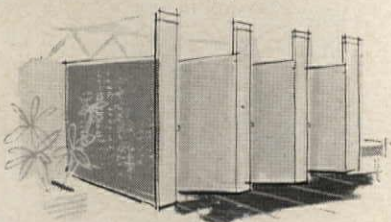


LONG LIFE  
HINGES  
ON HINGES

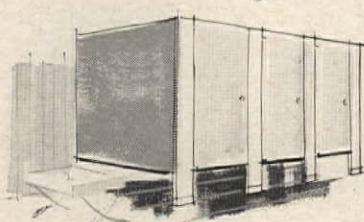


Why are hinges so important? Because the main points of wear in any toilet compartment installation are the hinges. This is where Sanymetal quality pays off in: **EXTRA LONG WEAR** (full door weight rides on thrust bearing — no vertical stresses. Independently tested for over 1 million swings); **LOWEST MAINTENANCE** (fully recessed hinges for easiest cleaning, highest sanitation) and ... **LOWEST IN-PLACE COST** (hinges and brackets are theft-proof installed at the factory to greatly reduce installation costs). Write for "Design Studies" — 8 colorful pages of unusual toilet compartment design ideas.

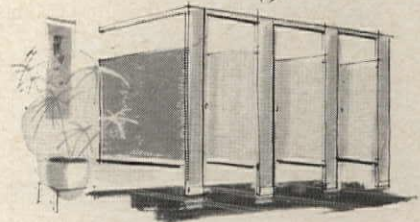
*Century*



*Normandy*



*Academy*



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by "Websters" and perhaps  
you didn't know . . .

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**service-proved**

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**for every building need**

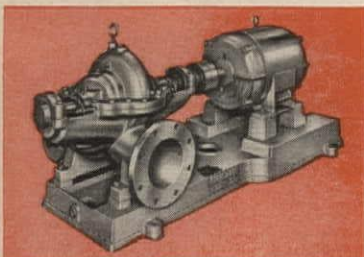
House, Booster, Condensation, Brine, Fire, Circulating, Sewage, Sump Pumps . . . Pneumatic and Tankless Water Systems . . . Sealed Electrode Floatless Pump Controller and Automatic Alternators for Duplex Sets of Pumps . . . Return line Vacuum Heating and Boiler Feed Pumps.

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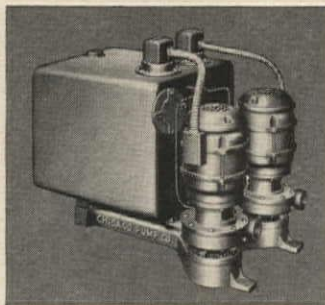


Flush Kleen Clog-Proof Sewage System—Capacities to 1000 GPM, Heads to 105 Ft. Bulletin 122D

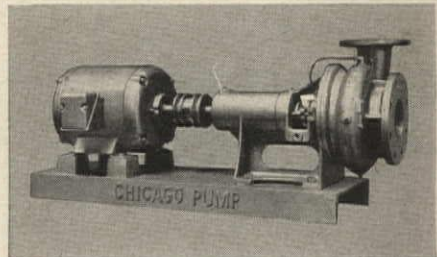
VCS Non-Clog Sewage Pumps. Cap. to 5000 GPM. Heads to 105 Feet Bulletin 124G



DS-DSA-DPA Double Suction Pumps Capacities to 3750 GPM.—Heads to 375 Feet Bulletin 102A



SURE RETURN—Capacities to 75,000 EDR—Discharge Pressure to 80 PSI Bulletin 250F



FLEXIBLE COUPLED END SUCTION PUMPS—Capacities to 900 GPM.—Heads to 260 Feet Bulletins 107 and 107H



Type L Sump Pumps Capacities to 350 GPM.—Heads to 50 Feet Bulletin 170



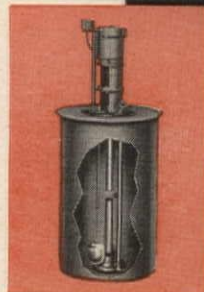
UW Sewage Pumps Cap. to 750 GPM.—Heads to 115 Feet Bulletin 97



CLOSE COUPLED PUMPS Capacities to 550 GPM.—Heads to 260 Feet Bulletins 108 and 108H



IMMERSJunior Capacities to 72 GPM.—Heads to 29 Feet Bulletins 115 and 116



NVC—VERTICAL CONDENSATE UNIT Capacities to 75,000 EDR—Discharge to 50 PSI Bulletin 254A

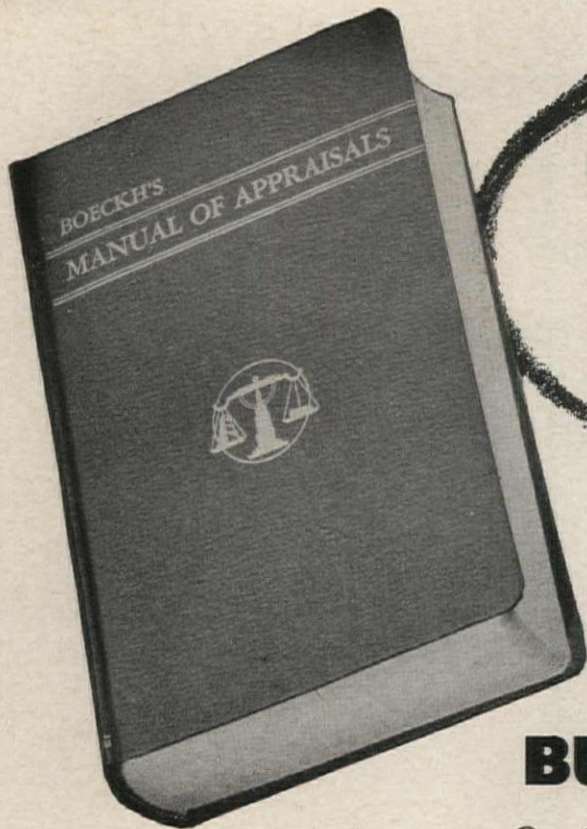
Write for descriptive literature indicated above.



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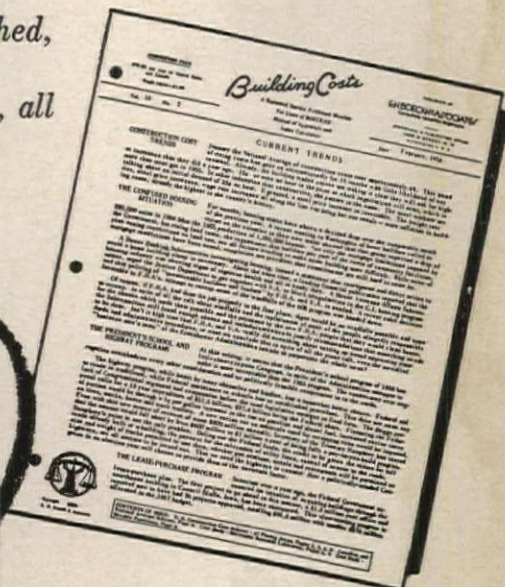
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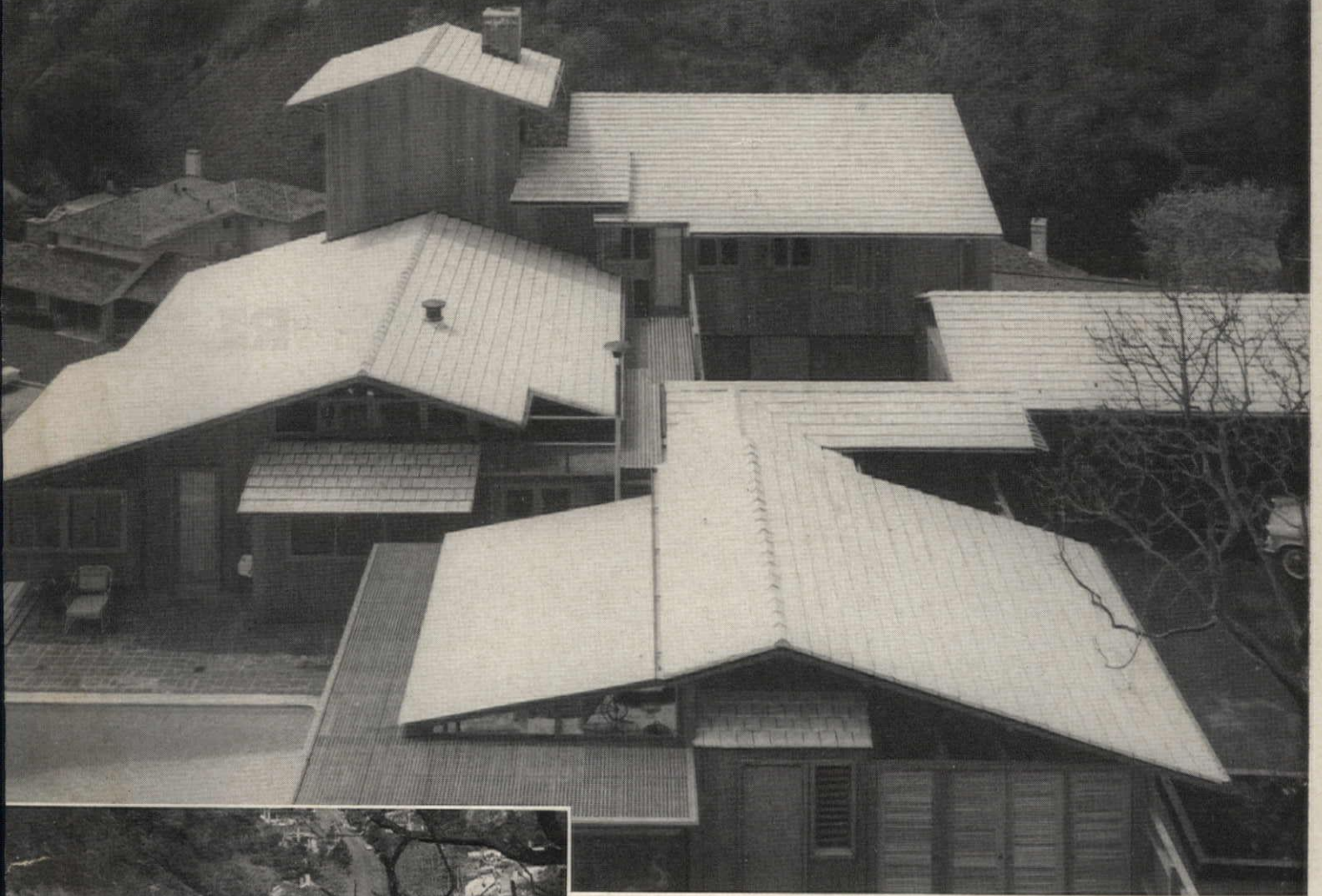
Please send me full descriptive literature on your estimating and cost planning services.

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# High on a Hill in Bel Air

... Designer tile of everlasting beauty



## \* "THE TILE ROOF SAVED IT"

During the recent disastrous fire in the Bel Air section of Los Angeles, this Ludowici-Celadon roofed home, on the east side of Chantilly Road, was the only house left standing on its block. As one fire official stated, "It is commonly known that tile roofs just do not burn or melt."

Although inherent fire resistance qualities of Ludowici tile saved this home, tile was originally chosen for its unique texture, color and beauty.

A multitude of colors, sizes, styles and textures are at your disposal. Write for the name of our consultant in your area, he's ready and willing to serve you.

\* From Variety, Nov. 8, 1961

 **LUDOWICI-CELADON CO.** 75 East Wacker Drive, Chicago 1, Illinois

Fire scarred residential area surrounds unscathed home roofed with fire resistant Ludowici tile.

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## #1 DOUBLE BARRIER SEAMS

Anodized aluminum extrusions are assembled to rear panel and pre-caulked at the factory. Smooth seam both inside and out . . . permanently leakproof.



FIVE KEY POINTS OF DESIGN SUPERIORITY PRODUCE  
A SHOWER OF EXCEPTIONAL QUALITY AND PERMANENCE

## THE COMMANDER

Check the five key values found only in the new *COMMANDER* shower by *Fiat* and you'll find the answer to long-life, good appearance and low maintenance for shower rooms in school, college, club, industry and institution.

Just three factory-fabricated sections (plus headrail) complete the *Commander Cabinet* which erects on the widely used and approved *Fiat PreCast Terrazzo Floor*. Actual tests prove the *Wonderwall Commander* to be many times faster and much easier to erect than any conventional shower. Labor saving drastically reduces total installed cost.

Unlimited design and service requirements are satisfied by three models. Each model available in stainless steel, baked enamel or a combination. For complete information on the *Commander* write for copy of the new PLAN BOOK, or see Sweet's  $\frac{26c}{Fi}$ .

## #2 COVE CORNER INTERIOR

All four corners have 1" radii with no corner joint, crack or crevice. Can't harbor grime and germs—sanitary—easy to clean.



## #3 WONDERWALL SANDWICH PANEL

Full inch of expanded polystyrene is permanently bonded between two sheets of rust-proofed metal. Temperature changes, high humidity, boiling water, soaps, alcohol or detergents are daily duties the *Commander* handles in stride.



## #4 STAINLESS PILASTER CAP

Added service and neat appearance maintained by factory applied stainless steel cap running the entire length of pilaster.



## #5 DEEP TERRAZZO FLOOR

Permanently leakproof and sanitary; high shoulders keep wall joints well above water level. Stainless steel connecting flange and brass drain cast integral.

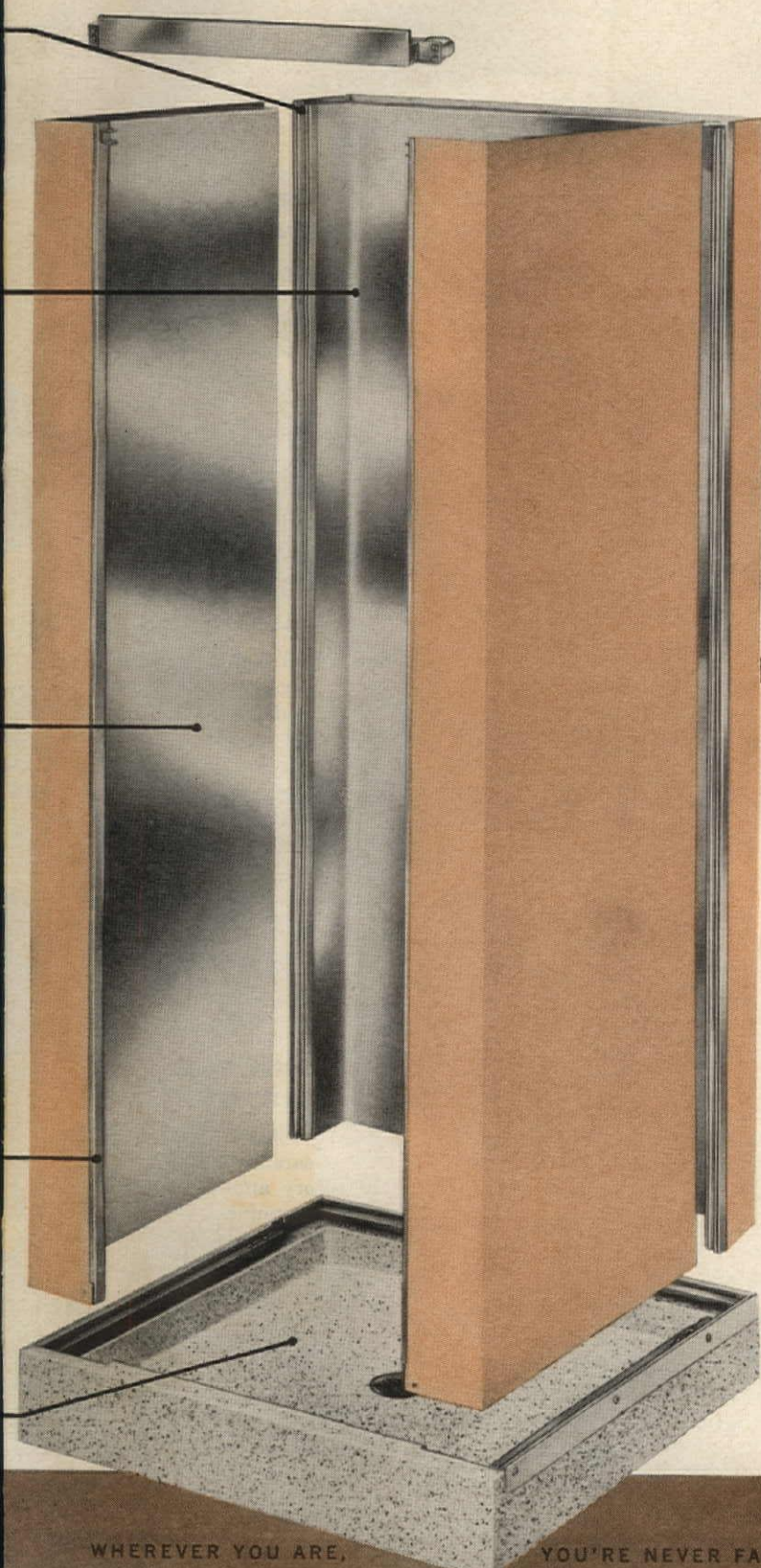


The rigid, rugged *Commander* cabinet combines with *Fiat* Dressing Enclosures as single units or in battery arrangements to provide added convenience and privacy. (Enclosures not illustrated.)



# ORMITORY NEEDS...

ALL NEW SANDWICH PANEL, SOUND DEADENED,  
RIGID WALL SHOWER CABINET ASSURES  
SATISFACTION & COST-SAVING INSTALLATION



NO PAPER FILLER  
TO ROT OR  
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INSULATED  
DOUBLE WALL PANEL  
ELIMINATES  
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STRONG,  
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MAKE IT RUGGED

FLUSH WALL  
CONSTRUCTION IS  
SMOOTH AND  
SANITARY



FAST  
EASY ERECTION  
SAVES MUCH  
ON-SITE LABOR

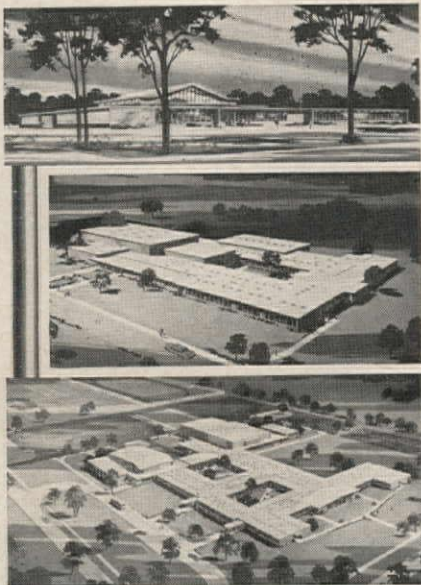


WHEREVER YOU ARE,

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From top: Colon High School, Colon, Mich.; Augusta High School, Galesburg, Mich.; Lakeview High School, Battle Creek, Mich.  
 ARCHITECT: Guido A. Binda, Architect and Associates, Battle Creek, Mich.  
 MECHANICAL CONTRACTOR: Hunter-Prell, Battle Creek, Mich.

## Vulcathene<sup>®</sup> cuts school lab drainage costs by a third!

Engineers in the firm of architect Guido A. Binda specified Vulcathene traps, fittings and pipe for the laboratories of all three of these ultra-modern Michigan high schools. Why Vulcathene? Savings of 30% to 35% over acid-resistant materials previously specified. Plus the long-range economies of this completely scale-proof, clog-proof, shatter-proof drainage system. Our new catalog tells you all about it. Just write Dept. 3714.



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VULCATHENE

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## The Record Reports

continued from page 248

### Bauhaus Director To Conduct Columbia Graduate Program

Professor Herbert Ohl, Director of the Architectural Division of the New Bauhaus in Ulm, Germany, will conduct one of the graduate programs at Columbia University's School of Architecture during the 1961-62 spring term.

Professor Ohl, having undertaken continued research in the field of industrialized building components, will explore with his students the potential of his theories regarding industrialized fabrication techniques as they relate to the problems of central business districts in the United States.

### Tour Related to Prestressed Concrete World Conference

A tour of Europe to promote attendance at the Fourth World Conference on Prestressed Concrete, to be held in Rome and Naples, May 28-June 2, is being organized by structural engineers Jack Meehan and Bill Pattillos. At the annual convention of the Structural Engineers Association of California in October, the Board of Directors gave their endorsement to the tour, which will also aim at visiting well known laboratories and structures as well as provide the pleasure of traveling with companions of similar tastes and interests.

The basic tour will be three weeks, including attendance at the conference. A two week extension will be available to visit Germany and the Scandinavian countries. Travel to Europe and between all major cities will be by air.

For information regarding price, complete itinerary, dates and other details, write Jack Meehan or Bill Pattillos, 4748 Del Rio Rd., Sacramento 22, Calif.

### "Arts of the U.S." Color Slides Available

"Arts of the United States," a collection of 4000 color slides documenting America's visual arts from their beginnings to the present is now on file at a unique Color Slide Gallery, 39

continued on page 264

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Expert RAULAND engineering help is at your command, so you can specify with confidence to satisfy the full requirements of any internal communications system.

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School, Industrial and Institutional systems can be designed for every application to your exact requirements from standard panels, designed and built by RAULAND, the pioneer in sound communications.

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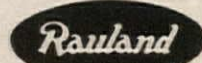
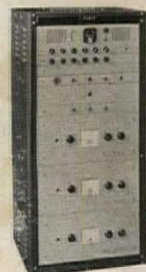
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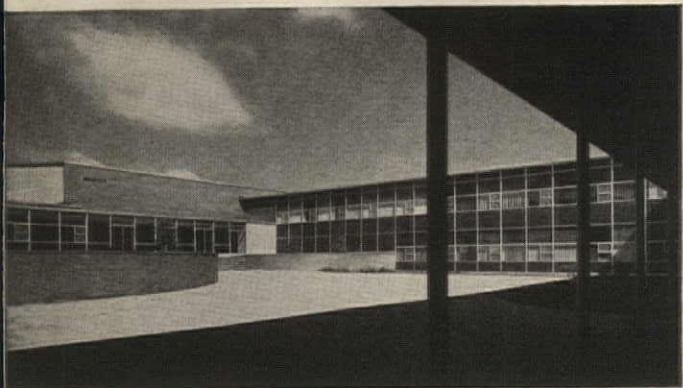
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Great Neck Junior-Senior High School, North Hempstead, L. I., New York. Architect: LaPierre, Litchfield & Partners (Alfred Hopkins & Assoc.). Contractor: Peatty & Fuhrman, Inc., New York, N. Y. Photograph by: C. V. D. Hubbard.



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.

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- to help trendworthy developments become trends by communicating them expertly to the profession and its clients;
- to inspire creative new approaches to house design based on latest developments in building materials, equipment and technology.

To these ends "Record Houses of 1962" will present . . .

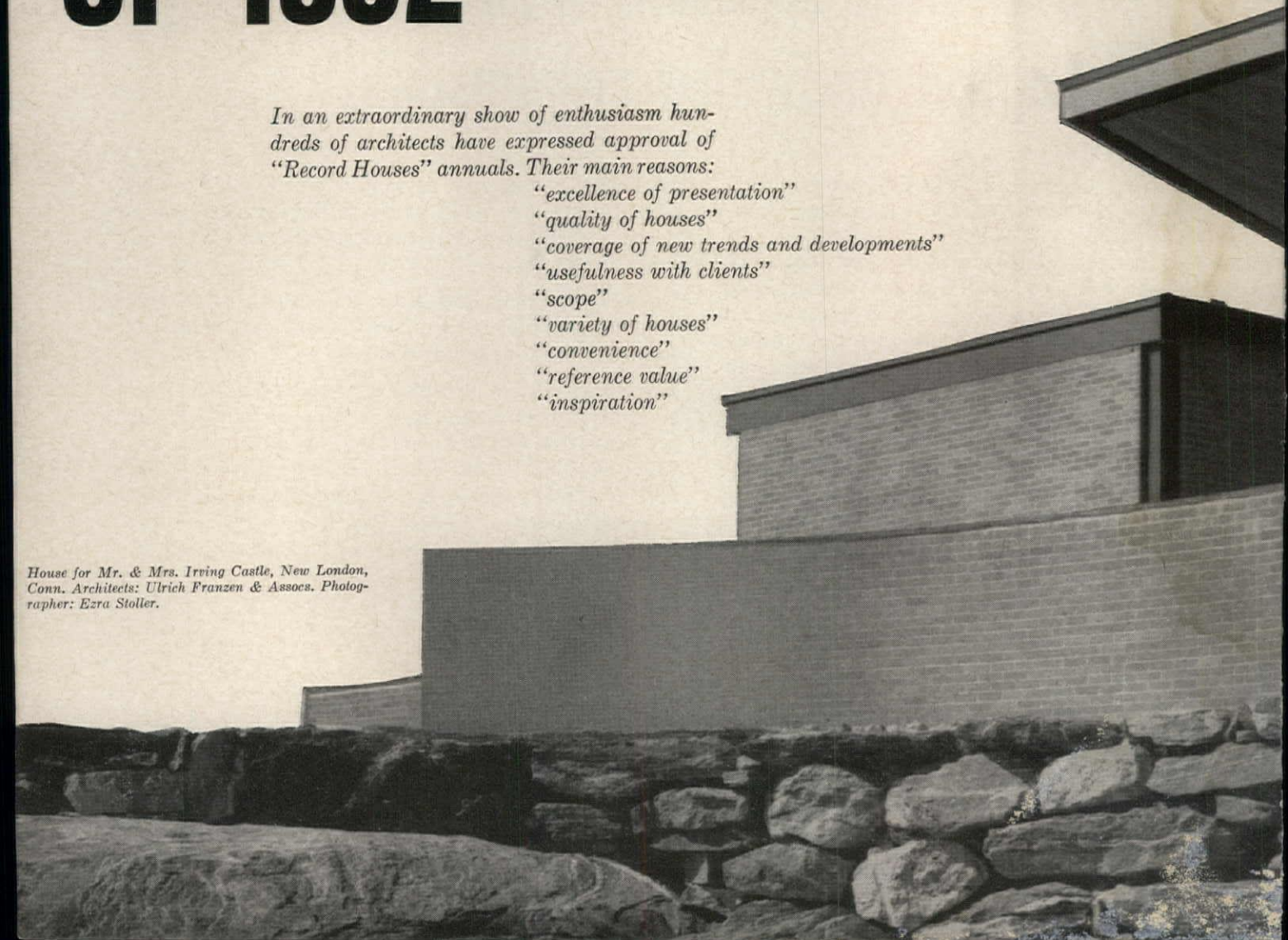
1. *20 of the Finest Architect-Planned Houses of the Year*—a coast-to-coast selection embracing low budget to luxury houses planned for individual owner and merchant builder clients.
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*House for Mr. & Mrs. Irving Castle, New London, Conn. Architects: Ulrich Franzen & Assocs. Photographer: Ezra Stoller.*





*for a nation of individuals*

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## Architectural Record



119 West 40th Street  
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# How the Dodge Reporter helped erect this church for the deaf



In Ralph Rapson's design for this low-budget church for worshipers who must read the minister's lips, good lighting and good sight lines were major considerations. Another necessity was space for community facilities because the building also serves as a social and educational center for St. Paul's deaf people.

"To achieve our objectives within the limits of a fixed budget of \$13.30 per sq. ft. we counted on the Dodge Reporter to spread the word, make our requirements known to contractors and suppliers," said Mr. Rapson.

"During one of his regular visits we informed him of our job assignment, then filled him in on details as they developed. Ultimately, we filed our plans in the Dodge Plan Room in St. Paul. The suppliers and trades who called on us were aware of our needs. Dodge Reports succeeded in holding down our office traffic to free valuable time. Dodge alerted the kind of people we like to do business with — informed men who are able to suggest materials, solutions to design problems, make accurate on-the-spot estimates. We operated in a healthy bidding climate, valuable to our client, to us, to the success of our project."

Practical architects know that it is good practice to keep the Dodge Reporter constantly informed. You'll do your firm and your clients a favor by always making the Dodge Reporter welcome in your office.

Prince of Peace Lutheran Church for the Deaf  
St. Paul Minnesota.

Architects: Ralph Rapson, AIA Architect

This handsome, modern church seats 120 persons; provides overflow space of 50 additional seats. Basement facilities serve approx. 75 to 100 children.

To facilitate lip reading, the inside design approach provides a high level of illumination, including sand-finished brick walls, white-painted pews and plaster ceilings for high reflectivity. The court plan, with connecting bridge to the street, provides a semi-private area. The structure consists of precast concrete floor panels, concrete block basement walls, and, on the upper level, stacked-bond brick cavity walls.

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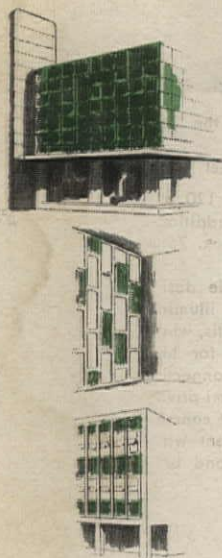
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## The Record Reports *continued from page 256*

W. 53rd St., New York City, which is open to the public. Slides individually and in sets can be bought there.

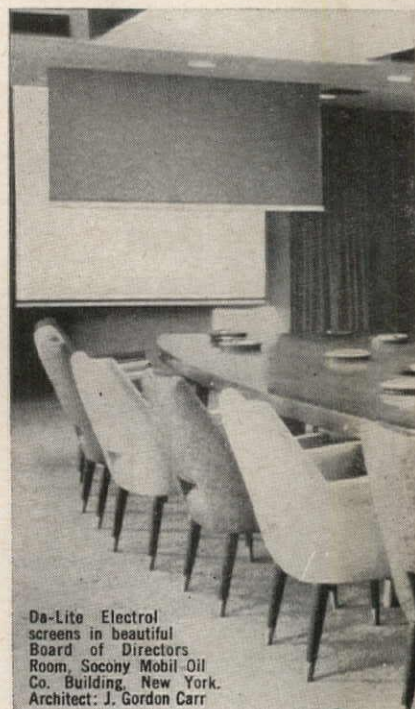
A grant from the Carnegie Corporation of New York, administered by the University of Georgia, supported the art survey which, according to the project's sponsors, fills a void in the field of education, since visual materials to document our cultural heritage have been inadequate in quality and coverage. The collection includes painting, sculpture, architecture, graphic art, posters, interiors, photography, stage and costume design and the art of the American Indian. It is designed for use of educational institutions, including museums and libraries, and will have special value in international exchange programs.

The Advisory Committee of the 6-year project included: Lamar Dodd, head of the University of Georgia's Art Department, under whose leadership the project developed; William Pierson, professor of Art at Williams College, executive secretary; Lloyd Goodrich, director of the Whitney Museum; Mrs. Martha Davidson, coordinating editor; Oliver Larkin, professor of Art at Smith College; and the late Tremaine McDowell, chairman, American Studies, University of Minnesota.

Sandak, Inc. of New York, because it had been successfully experimenting with a new slide process, was chosen to handle the photography and produce the slides. The photographers were: John Waggaman, Ferdinand Boesch, Allan Meisel and Charles Phelps.

From the 4000 slides which resulted, Lamar Dodd and his committee selected two sets—one of 2500, the other of 1500—which would be most useful in art, history and civilization courses. Carnegie Corporation has arranged for selected four-year colleges and universities, libraries and museums to purchase these sets on a 50-50 basis. Applications can be made to the Corporation by eligible institutions. To date, over 200 educational institutions are using these collections.

The McGraw-Hill Book Company has published a book, "Arts of the United States," based on the survey. (See AR, Feb., 1961, p. 56).



Da-Lite Electrol screens in beautiful Board of Directors Room, Socony Mobil Oil Co. Building, New York. Architect: J. Gordon Carr

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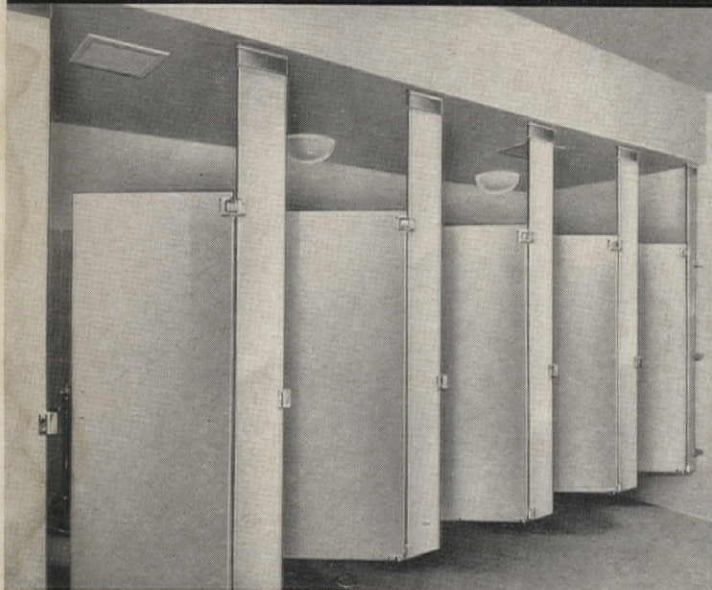
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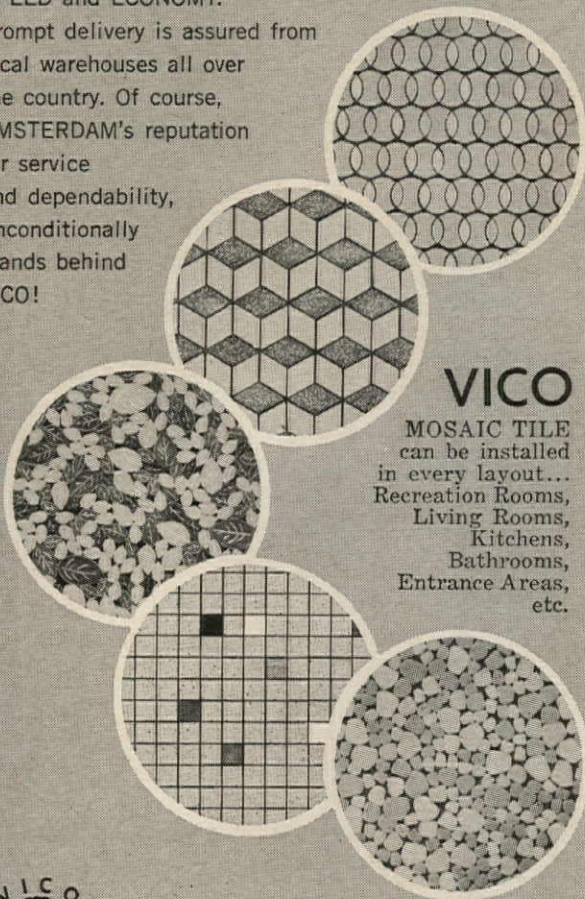
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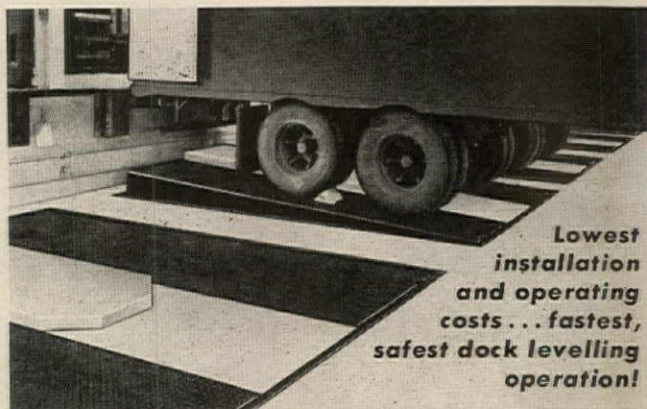


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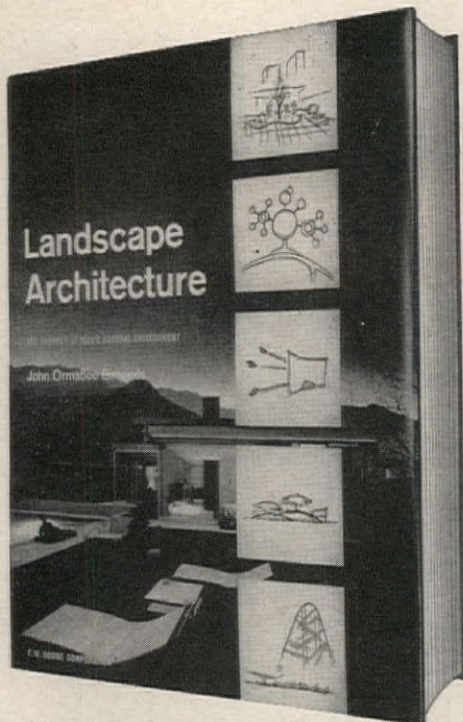


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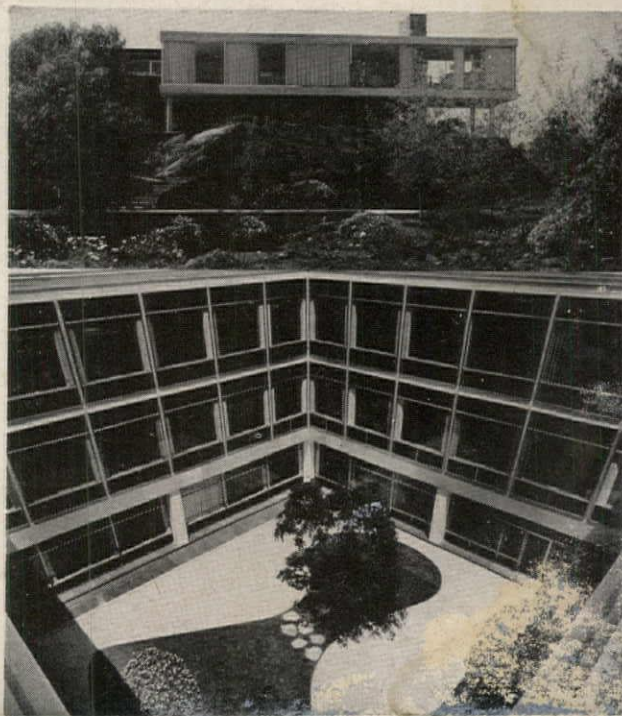
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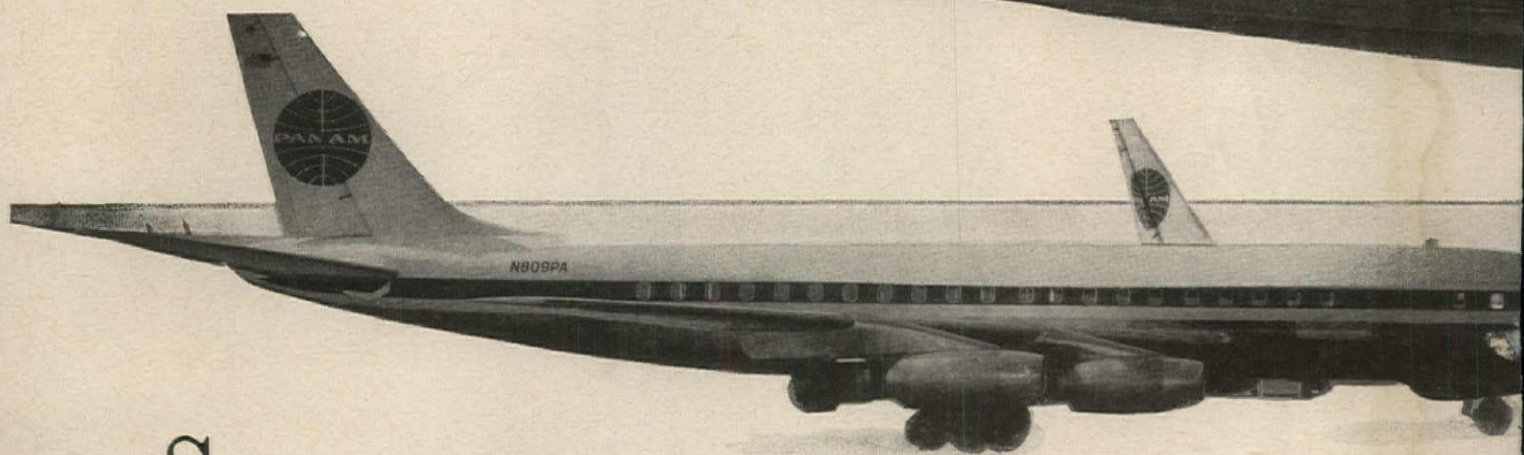
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Salt Lake City municipal airport, with curtain wall and facing of Mo-Sai precast concrete. Architects: Ashton, Evans & Brazier. General Contractor: Christiansen Bros., Inc.



# new studies preference for



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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.

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"stimulus to creative architectural and engineering design"

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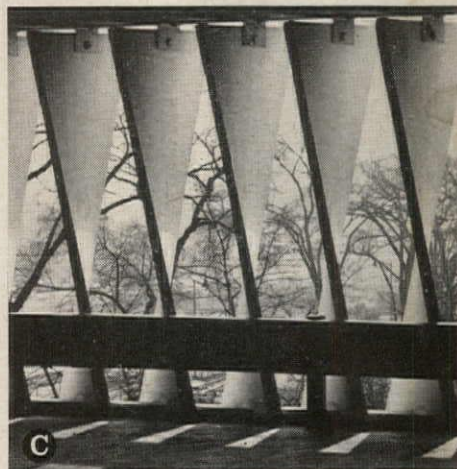
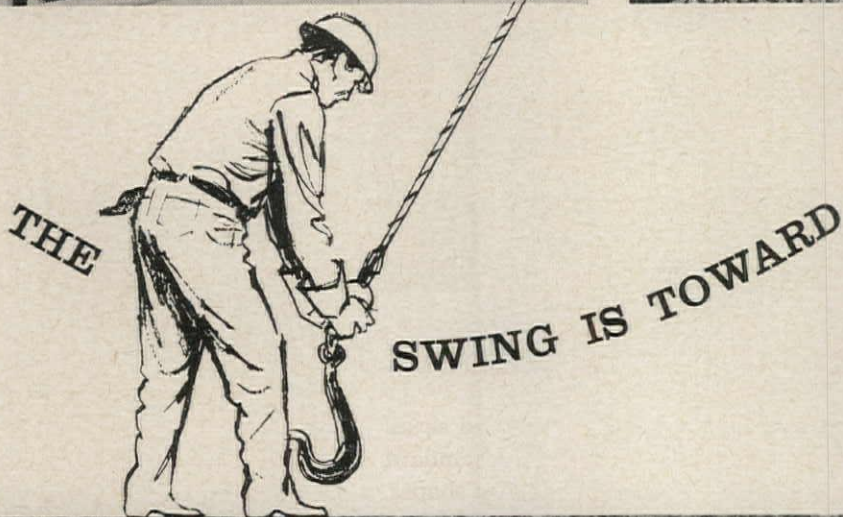
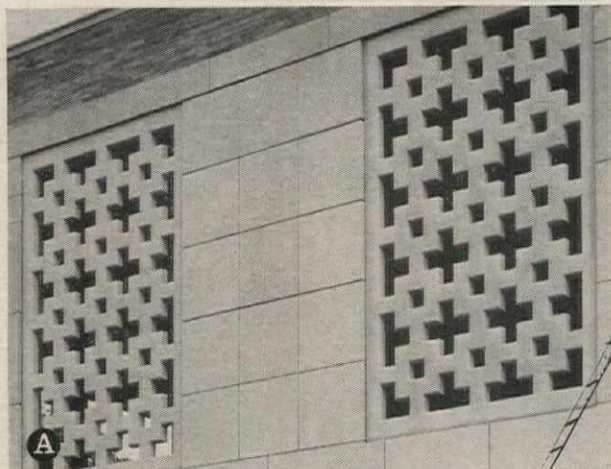


*Pan Am Terminal  
Idlewild Airport  
Architects: Tippetts-  
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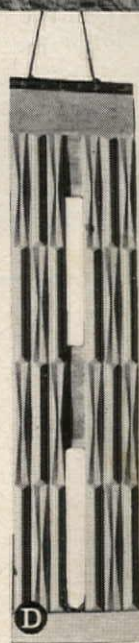


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### MADE WITH MEDUSA WHITE PORTLAND CEMENT . . .

Definitely there is a swing toward precast concrete panels in curtain-wall construction to attain new creative advances in design and color. Utilizing Medusa White—the truly white—Portland Cement, architects make almost unlimited use of their creative ability in design and color, in planning walls of solar screen or pierced grill panels; coarse aggregate surface panels; smooth or textured plain panels; individual panels in unusual shapes and sculptured over-all wall designs in large size panels. Leading concrete products manufacturers and Medusa engineers will work with you in planning modern walls with precast concrete panels.

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- B** Coarse Aggregate Surface Panels—Architect: Raymond Harry Ervin & Associates, Denver, Colorado, Gen. Contractor: Fred L. Spallone, Denver, Colorado, Panels by Mack Precast Products Co., Adams City, Colorado.
- C** Individual Panels of Unusual Shape—Architect: Albert Kahn Associates, Inc., Detroit, Michigan, Gen. Contractor: Darin & Armstrong, Inc., Detroit, Michigan, Panels by The Truscon Division of Devoe & Reynolds, Detroit, Michigan.
- D** Sculptured Type Large Size Panels—Architect: Brooks-Borg, Des Moines, Iowa, Gen. Contractor: Arthur H. Neumann and Brothers, Des Moines, Iowa, Panels by Midwest Concrete Industries, Des Moines, Iowa.



ASK YOUR CONCRETE PRODUCTS MANUFACTURER



## MEDUSA PORTLAND CEMENT COMPANY

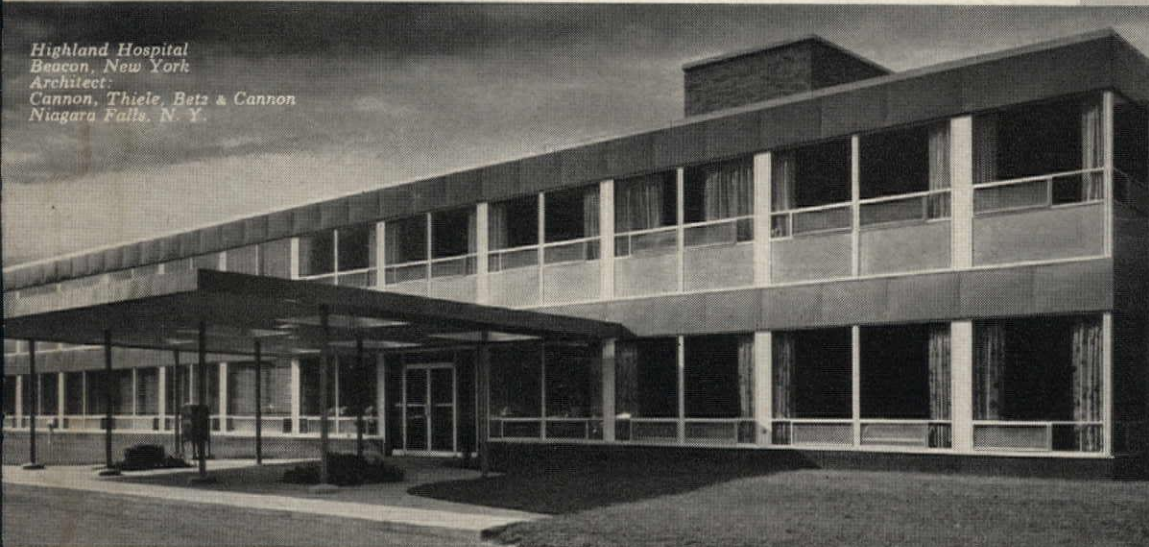
P. O. BOX 5668 • CLEVELAND 1, OHIO

"Over 70 Years"

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for the design man  
with standard MARMET AP's

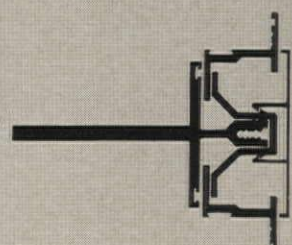
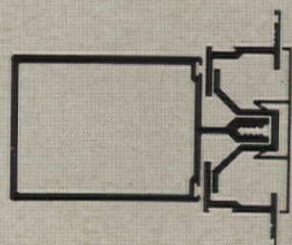
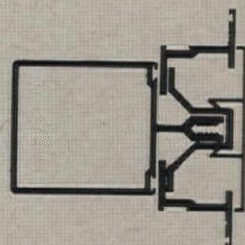
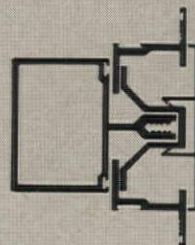
Highland Hospital  
Beacon, New York  
Architect:  
Cannon, Thiele, Betz & Cannon  
Niagara Falls, N. Y.



## choice of mullions and cross members

Even on tightly budgeted jobs, MARMET architectural projected series gives you full freedom of design on face effects with a standard window system. A whole array of mullion and cross member shapes, varying in depth of section (as shown at right) offer a choice of final effect for varying shadow patterns on the building face.

Selection of operating sash includes all of the basic types illustrated at right, in two series. Windows are 1½" in depth in the 5142 series and 2⅛" in depth in the 5212 series. Tubular sash is available in either series for ventilating lites where window design requires a large expanse of glass. In AP's or in Curtain Wall, the flexibility of MARMET window systems gives you monumental treatment at standard engineered system's cost. For full freedom of design on a tight budget . . . plan to specify MARMET for your next job.



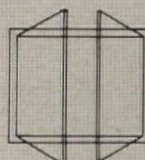
For additional information on the complete line of MARMET products — consult Sweet's Catalog File No. 17a and 16a or write to MARMET Mar Mar



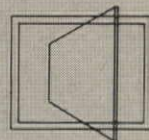
CORPORATION

300-Z Bellis St., Wausau, Wis.

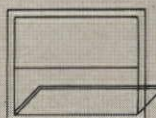
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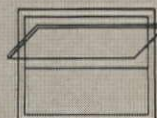
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PIVOT TYPE



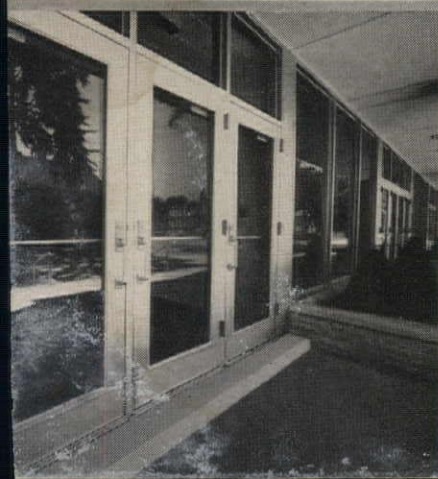
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