

# ARCHITECTURAL RECORD

**5** MAY 1964 • TWO DOLLARS PER COPY

BUILDING TYPES STUDY: COLLEGE BUILDINGS

PHILIP JOHNSON'S NEW YORK STATE THEATER AT LINCOLN CENTER

NEW SERIES: "TRADITION AND CONTINUITY IN ARCHITECTURE" BY WALTER GROPIUS

FULL CONTENTS ON PAGES 4 & 5







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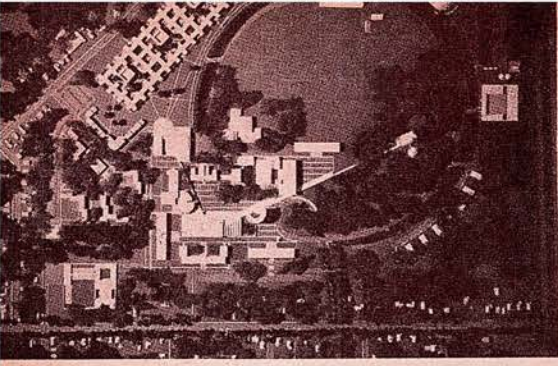
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### ARCHITECTURE FOR A COMMUNITY COLLEGE

*A well-integrated plan for that burgeoning American type, the community college, and the first six completed buildings for the new campus of Corning Community College will be presented in a feature which also marks the first appearance in the RECORD of the work of Warner, Burns, Toan, Lunde.*

### BUILDING TYPES STUDY: DIRECTIONS IN STORE PLANNING

*Next month's Building Types Study will lead off with an article which offers a thorough analysis of the specifics of planning elements as they relate both to the merchandising problems of individual stores and to the over-all patterns of shopping centers. The study will include examples of a wide range of kinds of shopping facilities from the small shop to the shopping center.*

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# The Spirit of Man

Last month I trotted out my favorite expression of architectural necessities\* and quoted its author, Dean Hudnut, on "... the need, more ancient and more imperious than your present techniques, for some assurance of importance and worth in those things that encompass humanity." The particular complaint was the dismal quality of our housing—public housing, private housing, any housing. A month before that I was moved to comment on the really awful quality of what might be called our vernacular architecture, and the resulting townscape.

Surely the visual aspects of our general environment—our cities, our highways, our housing—must be reaching toward some abysmal low point. Beauty, grace, order, dignity—these all seem old fashioned words. Now we have glamour, clamor, impact and existentialism. And now we have irresponsibility, delinquency and psychiatry. A sweeping generalization, it is true, but surely if we could feel more satisfaction in our housing and our townscape we should not fling out so desperately into anti-social behavior patterns.

Let me quote a confrère in England as to the townscape problem there. He speaks to architects, and "over their heads," about the need to save the "urbanized land-surface of Britain." (His editorial is not signed, but I have a hunch the name would be H. de C. Hastings.) He writes in the February issue of *Architectural Review*: "The Review has been preaching townscape for 15 years now. . . . Townscape is something far bigger than individual buildings, modern architecture or indeed the whole professional idea of architecture and planning. It is simply the visible expression of collective life—not collectivized life—man growing together to make a higher organism, enhancing rather than destroying the individual lives comprised within it. . . ."

"It is pretty far from architectural self-expression. It is equally far from the judicious planner's balance of social, political, economic and architectural factors. And yet it is the only

thing that will engage man's whole activity; not the voting animal, the fashion-obeying animal, the wage-packet animal, the wife-and-kids animal (by a long way the noblest of them)—but the whole being. Not an animal at all, but man. . . ."

"... If at times it seems to have a note of hysterical urgency, then the situation is so desperate that nothing else will carry through. This is not time for self-congratulation or the Old Boys Act; surely when whole places lie bleeding you will not put up the professional shutters, get out the T-squares and rule up another Euclidean abstraction.

"Be in no doubt of the stakes. You in your little corners and we in ours are playing for the whole urbanized land-surface of Britain. Not as statistic, not as expressionist playground, but as an integral part of people's lives. . . ."

"Romantic, absurd, idealistic. Maybe. But not for a moment out of touch with the deepest desires of real human beings. And when the chips are down, what else is there? What else has there ever been?"

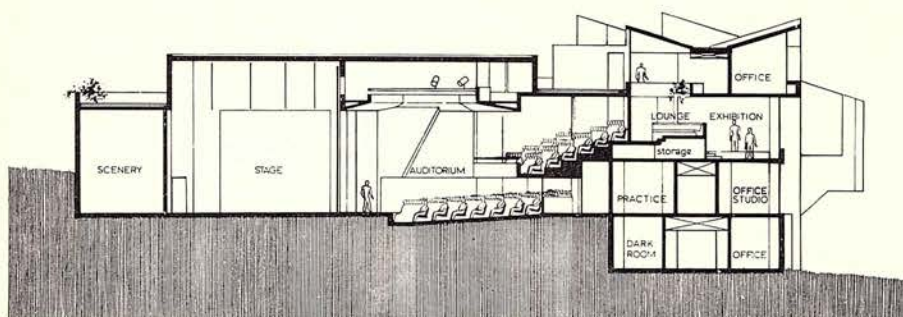
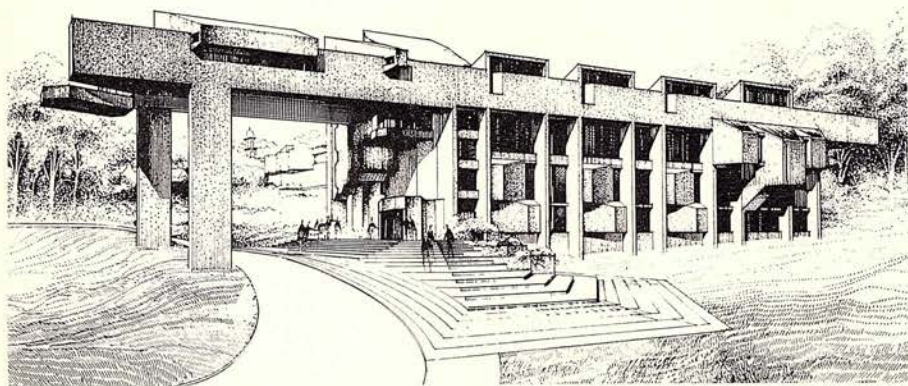
Back to mentor Hudnut: "Of course I know that modern architecture must adjust itself to the evolving pattern of industry, that building methods must attain an essential unity with all the other processes by which in the mechanized world materials are assembled and shaped for us. No doubt the wholesale nature of our constructions imposes upon us a monotony and banality beyond that achieved by past architectures. . . . Still more inimical to architecture will be those standardizations of thought and idea already widely established in our country: that assembly-line society which stamps men by the millions with mass attitudes and mass ecstasies. . . ."

"Space, structure, texture, light—these are less the elements of a technology than the elements of an art. They are the colors of the painter, the tones of the musician, the images out of which poets build their invisible architectures. Like color, tone, and image they are the most serviceable when they are so used as to make known the grace and dignity of the spirit of man." —*Emerson Goble*

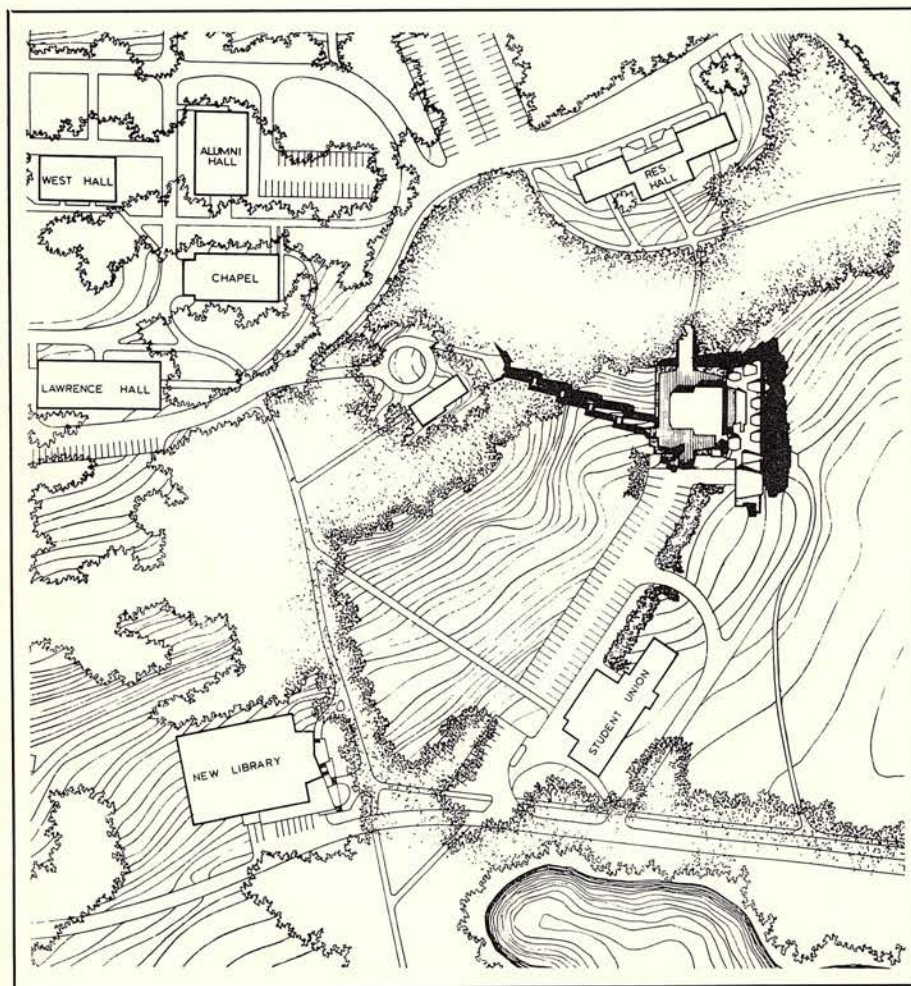
\*"The Post-Modern House," by Joseph Hudnut, *ARCHITECTURAL RECORD*, May 1945, pages 70-75



## RUDOLPH DESIGNS FOR COLGATE



SECTION 0 5 10 25



Colgate University has called upon Paul Rudolph to design a Creative Arts Center to provide, in the words of President Vincent Barnett, "at once an imaginative setting for drama, music and the visual arts at Colgate and a practical asset to our campus."

The resulting design is a multi-level, 4-story structure to be built in two phases. The site, a location at the base of a hill which slopes down from the main quadrangle, was considered a major factor. By placing the center at right angles to the upper campus, Rudolph feels that a clear geometric relation is established with the main axis—the center will thus be separate yet related to a major artery of campus traffic, leading from the upper quad down to the near-by student union and fraternities.

For students and townspeople alike, the extending covered entrance would serve, in the architect's words, as "a gateway to the campus." It is also felt that the building material, reinforced concrete poured into a corrugated form with the leading edges broken to expose the aggregate, would blend with the rest of the campus' stony surfaces.

The building is essentially planned around a 400-seat, 8,850 square-foot theater that extends through the third story. Surrounding this, on the first two floors, are practice and rehearsal rooms, offices and storage spaces for the drama and music departments. The auditorium balcony, on the third floor, can be sub-divided into three classrooms. Also on this level are more offices, a student lounge, dressing rooms, a music library and exhibition areas. The top floor provides studios, classrooms and offices for the fine arts. A roof terrace over the theater may be expanded to include space for courses using audio-visual techniques. The top floor may be entered directly by means of two open, concrete bridges which span the gulf between the hillside and the building.

Including both phases of construction, the total enclosed area will be approximately 40,000 square feet. The project was stimulated by an initial grant of \$400,000 from the Charles A. Dana Foundation. The total cost is estimated at \$1.2 million. Construction will begin this summer.



# Chichester Senior High adds a fourth "R"...

*Top photo:* The floor tile in the heavily trafficked lobby is Ruberoid Vinyl Asbestos 3001.

*Center photo:* Building exterior is in harmony with the wooded, rolling countryside.

*Bottom photo:* Sunlit corridors enhance the beauty of the floors in this 800 pupil school.



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General Contractor: F. K. Campion, Inc., Flourtown, Pa.  
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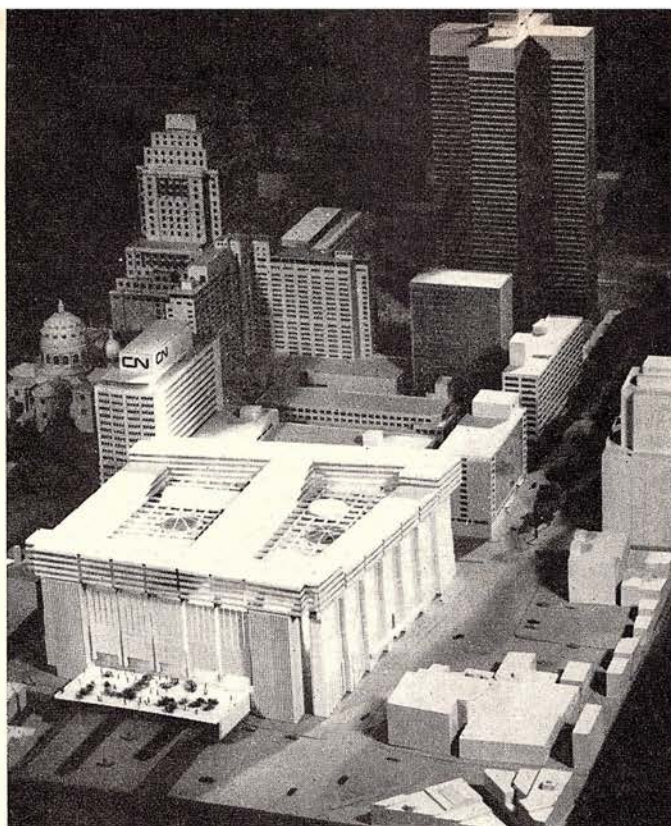
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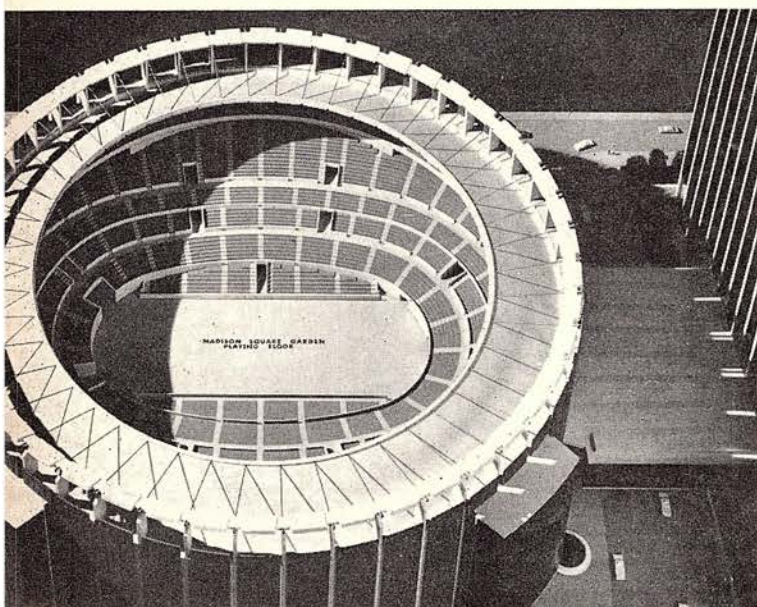


## Montreal Trade Center

A large-scale development scheme by Concordia Estates Ltd. has resulted in plans for a trade center in Montreal. A \$75 million venture, the 12-story structure will occupy a six-acre site which straddles the Canadian National Railway tracks leading to the Central Station. Just south of Place Ville Marie at the matrix of Montreal's downtown activity, the center will have a 150,000-square-foot retail shopping concourse at street level, above parking facilities, commuter trains and a projected subway line. Above this is an exhibition hall of 315,000 square feet, nearly 200,000 on one level, designed for large trade shows, exhibitions, conventions and meetings. Occupying several levels, an area of 1,000,000 square feet, is a merchandising center—"a shopping center at the wholesale level"—where permanent showroom space can be provided for 1,200-1,500 tenants. The upper floors will house a hotel overlooking two interior "winter gardens," partly enclosed by glass. The site, including air rights, will be leased from the Canadian National Railways. Construction will begin this summer with completion scheduled for spring 1967. Architects are Affleck, Desbarats, Dimakopoulos, Lebensold and Sise



*Louis Checkman photos*



## Heir to Penn Station

Now that the fate of New York's Penn Station is being administered and a Piranesian gloom has claimed the once-grand space within, its future replacement, in the form of a newly revised design, has been shown to the public. On exhibit at the Municipal Art Society's show, "Our Town—1970," Charles Luckman's design for the new Madison Square Garden Sports and Entertainment Center features a two-building arrangement on the nine-acre site. A free-standing, 29-story office tower will rise along the Seventh Avenue axis. With a net rentable area of 1,210,000 square feet, it will be constructed of steel clad in off-white precast concrete enclosed with a grayish-brown tinted glass. A canopy-covered entrance across the Seventh Avenue plaza will provide direct access to two underground levels, including the new railroad station; a main entrance to the office tower; an entrance for spectators, by way of an arcade over a glass bridge at the rear, which spans a taxi road, to the circular sports complex, 425 feet in diameter and 150 feet high. From a ticket lobby above ground, the spectator may go up to the arena, located 47 feet above ground, or down to the forum, at ground level, by means of the four glass-enclosed escalator towers. The two-level forum has a seating capacity of 4,000 as well as 400-seat sports cinema, an art museum of sports, a Hall of Fame, a Hall of Records, a library and a bowling alley. The main playing floor in the arena will seat approximately 22,000 people. Under a cable-hung roof, it will be a column-free area providing an unobstructed view. The roof is hung from a steel-compression ring around the perimeter, supported by steel columns clad in precast concrete. Surrounding the field, under the seats, is an exhibition space of 50,000 square feet. The total estimated cost of \$66 million includes renovation work for Pennsylvania Railroad facilities. Work will start this fall on the foundation for 1967 completion. Owner is Madison Square Garden Center, Inc.



## New Hotel by Yamasaki

"A hotel that looks like a hotel." This is how Yamasaki describes his design for the new Century Plaza Hotel, an 800-room, luxury hotel that will be a major focal point in ALCOA's 180-acre, multi-million dollar "city-within-a-city" development at Century City, Los Angeles. Now under construction, the 20-story hotel (four are underground) will occupy a six-acre site. The east, or concave, side opens onto a pedestrian mall below grade level. At the rear are several acres of landscaped terraces, gardens, pools, restaurants and a Japanese Tea House. The lowest three levels of the building will be of concrete construction; from the plaza level up, structural steel will be used. The glass and aluminum facing will be relieved by 16-foot concrete balconies projecting from each of the guest rooms. Minoru Yamasaki and Associates are the architects of the hotel scheduled for completion in late 1965. Welton Becket and Associates are the master planners of Century City.

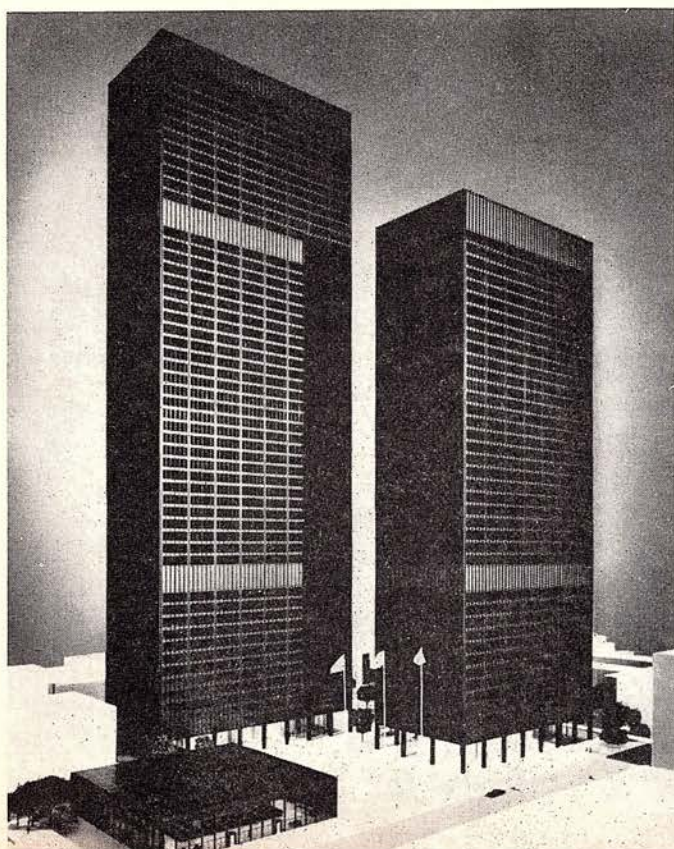


## Public Housing: Chicago

The by-now typical super-block idea for low-income housing has been reworked with new formal interest in a plan for Chicago by Bertrand Goldberg. Sponsored by the Chicago Housing Authority, the project will provide housing in two crescent-shaped buildings for about 336 families and in two round buildings for senior citizens. On a U-shaped site, the buildings are grouped around an open amphitheater with seating for 1,000 people. A shopping and recreation quadrangle connects the two round structures, each of which is 16 stories high with 182 units per building. One of the 22-story curved buildings will house an eight-classroom school on the ground floor. All four main structures will be built by slip-form concreting. Continuous slab floors will be poured between the load-bearing walls whose curve will give them a self-supporting rigidity during construction. Target date for completion is early 1966. Total estimated cost is \$11,000,000.



Mart Studios Inc.



## Twin Towers for Toronto

As a consultant, Mies van der Rohe has quite noticeably left his mark on the design of a three-building commercial complex planned for downtown Toronto. The exterior structure of all three buildings will be black steel, accented by stainless steel sash and bronze-tinted windows. The \$125 million project, called the Toronto-Dominion Centre, will occupy a site of almost seven acres, with more than half devoted to a landscaped plaza. Dominating the center and the entire financial district of Toronto will be a 55-story, \$60 million Toronto-Dominion Bank Building. With a rentable area of 1¼ million square feet, the 750-foot-high structure is expected to open July 1, 1967. Scheduled for completion in 1969 is the Banking Hall, a single-storied, 40-foot-high, 23,000 square-foot structure to house the main Toronto branch of the bank. The third building will add a 44-story tower to complete the center. Architects are John B. Parkin Associates and Bregman & Hamman. The project is being jointly financed by the Toronto-Dominion Bank and Cemp Investments Ltd. (owned by sons and daughters of the president of Distillers Corp.—Seagram's Ltd.)



# ONE MAJOR 1964 EXHIBITION EMPOWERS ARCHITECTURE TO REFLECT GOALS OF PROGRAM

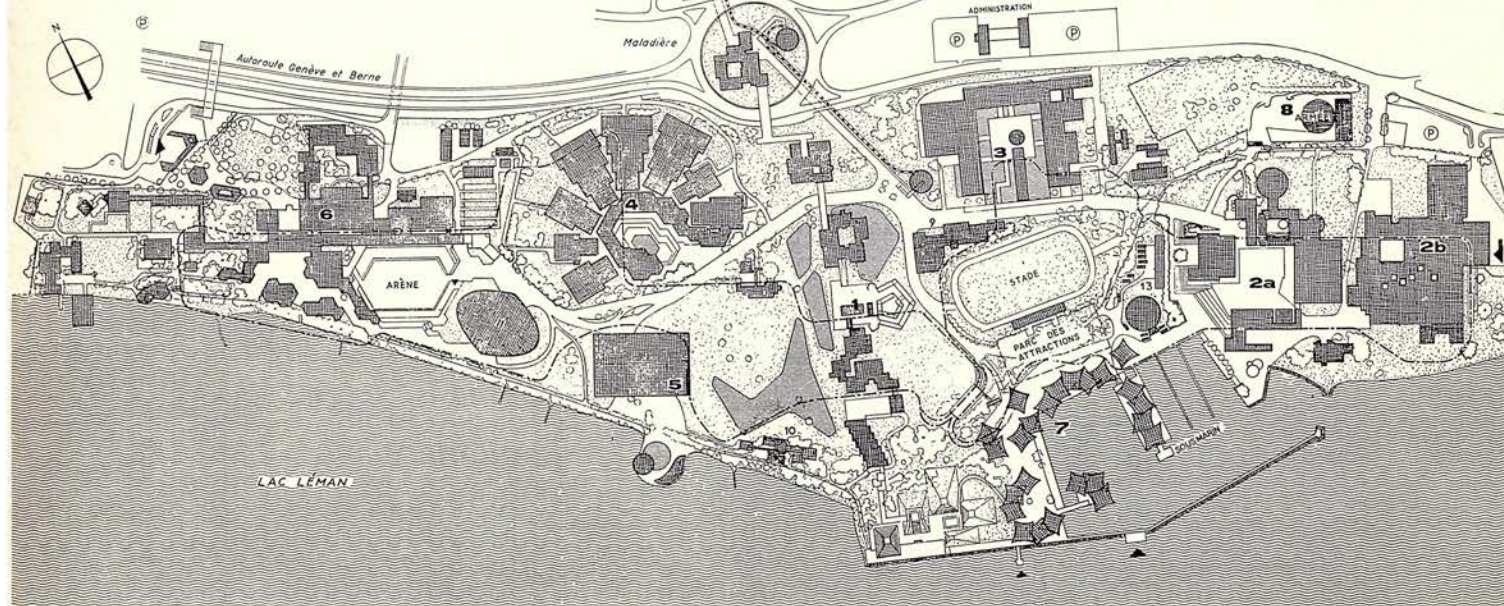
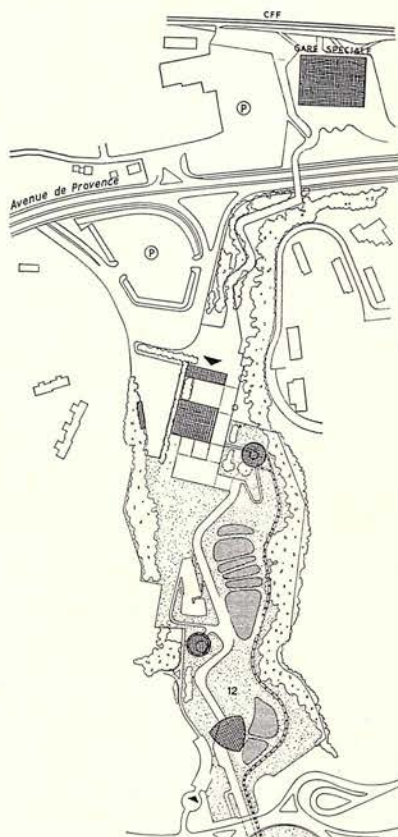
Not too much fanfare but a great deal of architectural planning and coordination has preceded the April 30th opening of the Swiss National Exhibition in Lausanne. An event of primarily national importance, held every 25 years since 1857, it is limited in scope as compared to major world's fairs. Yet its approach to an extremely complex program, the display of an entire nation's physical, political, economic, social and spiritual life, may serve as a provocative example of organization and effective exhibition.

With a magnificent site along the banks of Lake Geneva, the planning staff was from the beginning in an advantageous position. In laying out the various sectors, they were careful not to destroy the natural resources of the site. Each group of buildings was planned to span a partitioned ground shaped by special planting of trees and reconstructed earth, all relieved by lagoons and the tranquil wooded areas of the Flon River valley. The exhibition covers an area of land and water (including filled-in parts of the lake) of approximately 6,000,000 square feet.

The extremely realistic manner in which the pavilions were planned is best expressed by Alberto Camenzind, chief architect of the exhibition: "Taking into consideration the products, objects and activities as much as they reflect a way of life, and not as an end in themselves, the management of the Exposition proceeded to define this way of life in its programs and exposition topics before visualizing the stage of archi-

1. The Swiss Way
2. The Art of Living (2a. The Joy of Living; 2b. Culture, Science and Art)
3. Communication and Transportation
4. Industry and Crafts
5. Trade
6. Soil and Forests
7. The Port
8. National Defense
9. Main crossroads
10. Le Relais
11. Festival Hall
12. Nestlé's Children's Garden
13. Circus

Circulation around the site will be eased by two independent means. A monorail system, shown by the broken line, runs east-west, threading its way through exhibition galleries. A "tele-lounge," or perpetually moving shuttle train runs north-south past the Children's Park (12). The cars are boarded from synchronized rotating drums





tectural construction." Camenzind feels that this approach "represents an evolution in the domain of creating an exposition, because it reverses the initial phases of functional order; in other words the elaboration of programs, the general delineation of plans and organization of related activities comes first and only then follows the workout of architectural projects."

The exhibition's theme is "For a Switzerland of Tomorrow: Believe and Create." The unity of the Swiss nation in all facets of life is first presented in the exhibition's general section, The Swiss Way. A grouping of laminated wood structures along the north-south axis, designed by the exhibition's own architectural office, they incorporate displays dramatizing the history of Switzerland, its institutions, realizations and hopes for the future.

Grouped to the east and west are the other major pavilions: The Art of Living (subdivided into The Joy of Living designed by Tita Carloni and Culture, Science and Art by Max Bill), Communication and Transportation (J. Ducret), Industry and Crafts (F. Brugger), Trade (F. Vischer), Soil and Forests (J. Zweifel), the Port Area (M. Saugey) and National Defense (J. Both).

Planning began with the assumption that the event should be both didactic and festive, at once informative and fun. Thus, at the heart of the site, along the waterfront, is the colorful port area featuring restaurants serving regional specialties within canvas tent-like structures, a night-club on pontoons over the water, a lakeshore promenade, a circus, an amusement park and the landing pier for "the world's first tourist submarine."

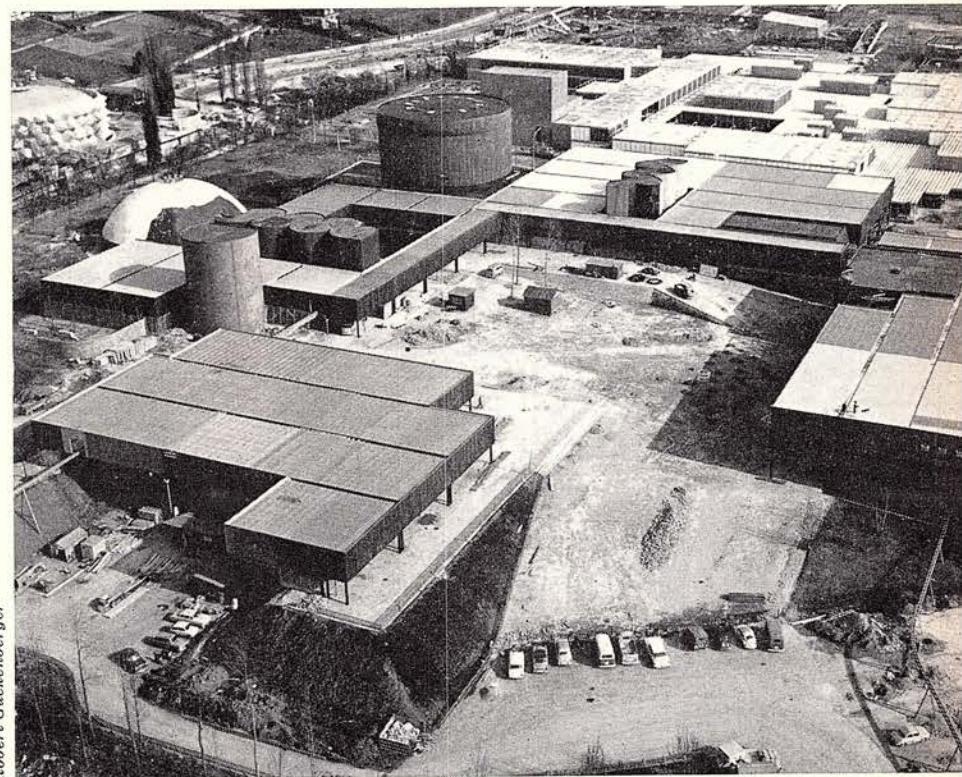
The exhibition will last only 179 days. Soon there will be no trace of the fair except for the ideas that were embodied in its erection and a large, refurbished park area. The same was true of the 1939 exhibition in Zurich, yet an observation at that time may provide a reminder for the present: "The Swiss National Exhibition, held this year in Zurich, has been sadly overshadowed by the Brobdignagian International Fair at New York; this is a pity, for there is a lot we can learn from the competent and intelligent way in which the Swiss people have planned and organized their own national show." (Architectural Review, August 1939.)

Robert Guckenberger

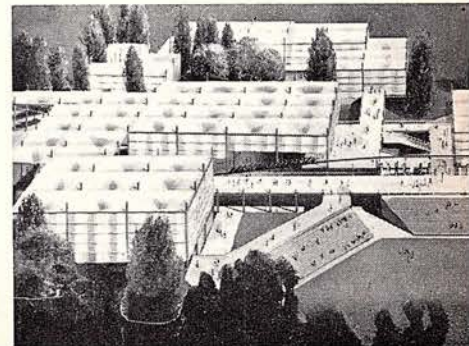
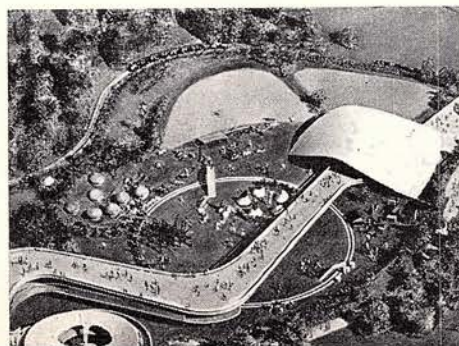


Above: Middle ground, the Swiss Way. Background, Industry and Crafts, a fan-shaped pavilion of tubular steel construction covered with canvas. Below: Foreground, the Joy of Living, with facades of wood and roofs of plastic. Background, Culture, Science and Art, steel columns support asbestos-concrete roofing elements and are faced with pressed-wood panels, laminated white plastic sheets and transparent polyester sheets. Cubic sections are grouped around a court containing 20 pieces of sculpture, cast in aluminum and gilded

Robert Guckenberger



Below left: Children's playground area, elevated walkways and "tele-lounge" system. Below right: Soil and Forests, exhibition's largest section, built of rough wooden structures, with walls and roofs of canvas, surrounding cultivated areas and an arena





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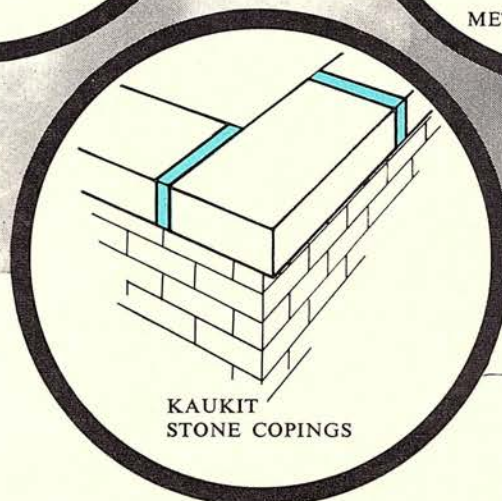
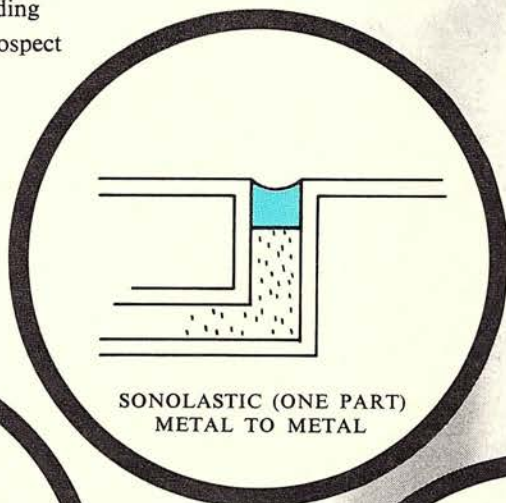
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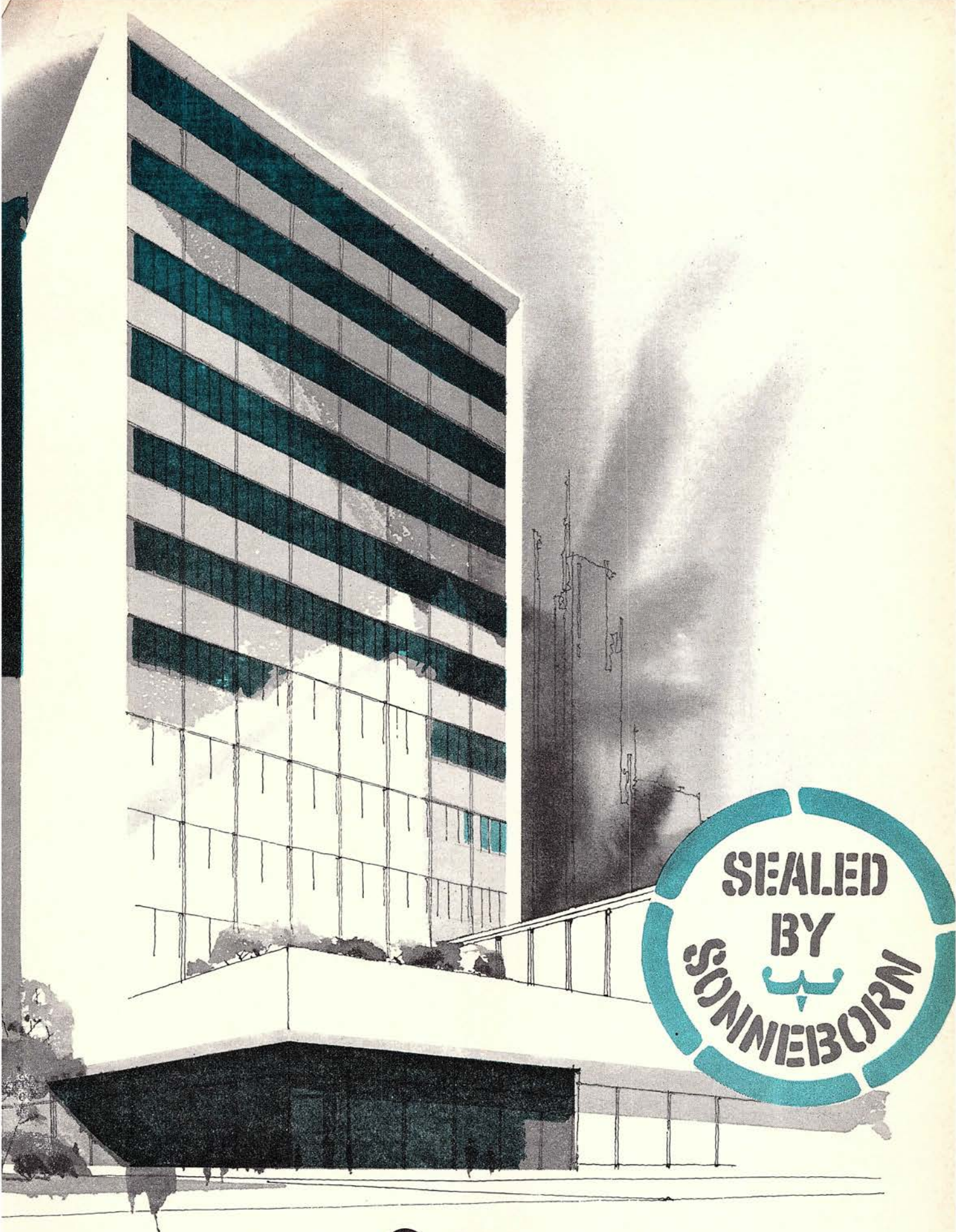
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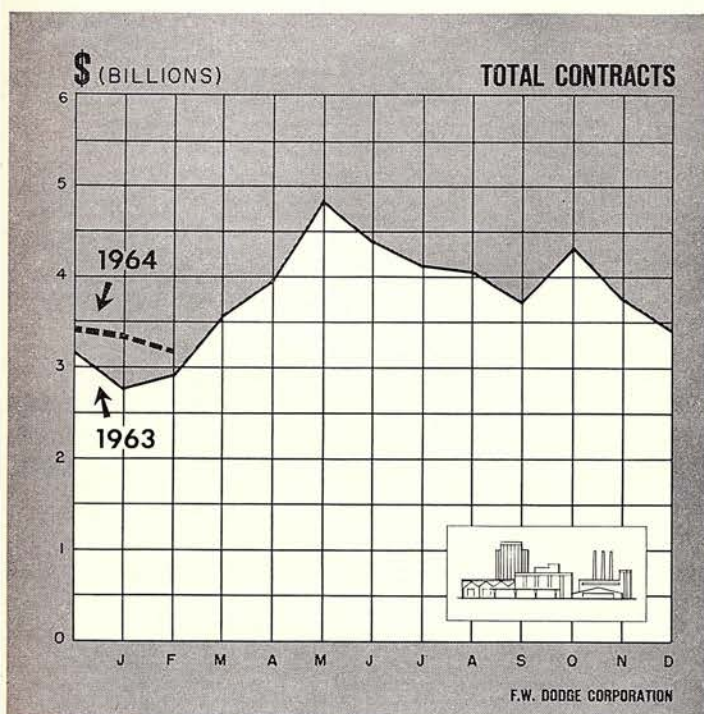


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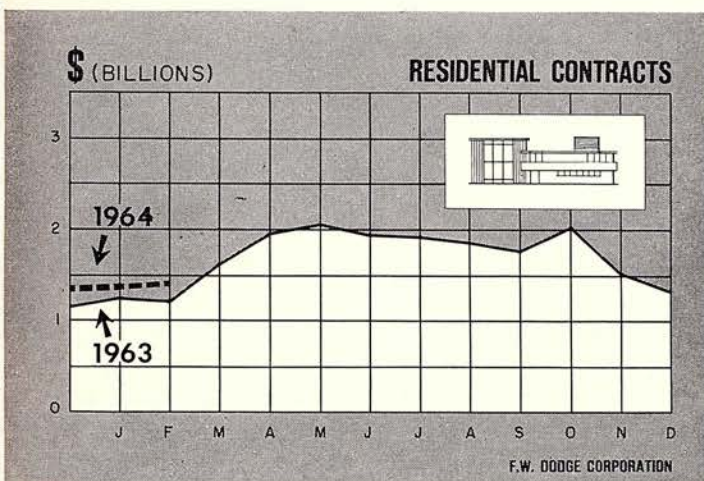
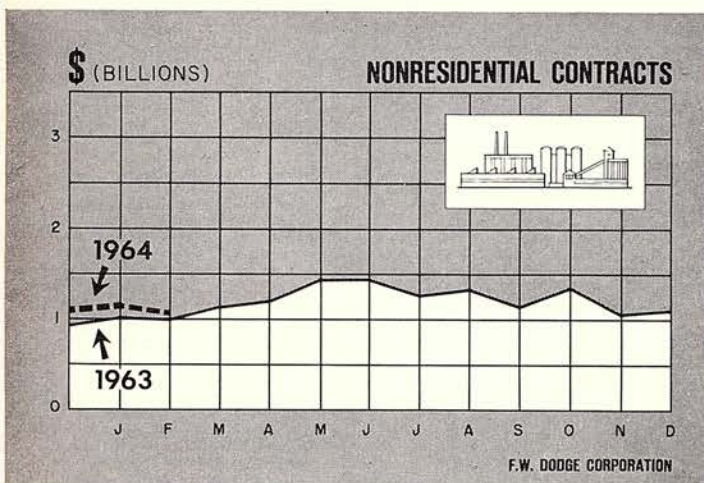
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## COLLEGE AND UNIVERSITY BUILDING



Total contracts include residential, nonresidential and non-building contracts



There is one certainty about the nation's school system: when the number of children entering kindergarten substantially exceeds the number of teenagers graduating from high school (and the schools are already full), expansion is necessary. When this condition persists for a decade or more, working its way through the education pipeline, it engenders a building boom that moves from kindergarten through 12th grade and beyond.

This, of course, is exactly what has happened in the postwar years. Grade school enrollments began to take off in 1949, reflecting the beginnings of the population explosion roughly five years earlier, and the *rate of growth* increased until 1954. The growth rate remained constant until 1959, when it began to decline slightly. Elementary school construction surged during this period, reaching a peak in 1957, two years before the growth in enrollments through eighth grade began to slow up. This was caused by the increasing amount of junior high school (grades 7-10) construction during the middle and late fifties, which helped to relieve the pressure on elementary school building.

1959 was the take-off year for high school enrollments. From 1959 to 1963, the number of students entering high school increased rapidly—an average rise of 7 per cent a year. And high school construction went hand-in-hand with this growth.

## On to College

This bulge in the number of students has now reached college age. Starting with 1949, if you add eight years of grade school and four years of high school, you wind up in 1961, the year when the number of high school graduates began to swell. College enrollment data show that many of these graduates are pursuing college degrees. In 1950 there were 2.3 million college and university students; by 1960, this number had ballooned to 3.6 million; and last year it soared to over 4.5 million students. To accommodate this flood, the construction of college and university buildings and facilities had to speed up. And it did, not only in total amounts, but also in the proportion of total school construction that went to higher educational institutions. From 1957 to 1963, total value of university, college and junior college contracts nearly doubled. So far this year, contract value is more than double what it was for the comparable months of 1963. And the value of these contracts as a per cent of total school building contracts rose from 5.5 per cent in 1957 to over 9 per cent in 1959, remaining around that level until this year, when it is running close to 14 per cent!

The outlook for college and university construction is bright. Here are the more important reasons why contract value will continue to rise in the next several years:

- It is estimated that there will be over 5.2 million college students in 1965; by 1970 roughly 7 million persons will be studying for degrees; and by 1975 more than 8.5 million will be enrolled.
- More people are going to college, and more are continuing on to graduate degrees.
- Incomes are increasing, helping to meet the rising costs of higher education.
- And the Federal Government is aiding both universities and students.

Henry C. F. Arnold, Economist  
F. W. Dodge Company  
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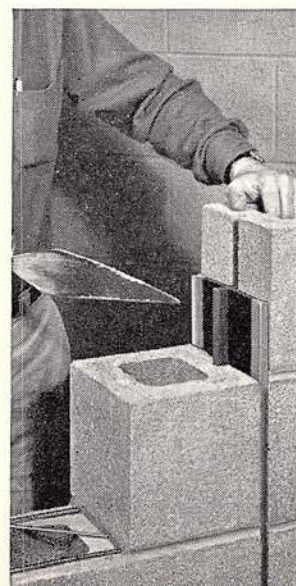
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# Building Construction Costs

By Myron L. Matthews

Manager-Editor, Dow Building Cost Calculator,  
an F. W. Dodge service

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

A. CURRENT BUILDING COST INDEXES—APRIL 1964  
1941 Average for each city = 100.0

Metropolitan Area	Cost Differential	Current Dow Index Residential	Current Dow Index Nonresidential	Per Cent Change Year Ago Res. & Nonres.
<b>U.S. AVERAGE—21 Cities</b>	8.5	263.6	280.8	+2.63
Atlanta	7.1	296.0	314.0	+2.64
Baltimore	8.0	266.5	283.5	+2.27
Birmingham	7.4	244.2	262.6	+3.06
Boston	8.4	236.4	250.2	+2.66
Chicago	8.8	293.6	308.9	+2.66
Cincinnati	8.8	254.5	270.5	+2.61
Cleveland	9.3	266.2	283.0	+2.38
Dallas	7.8	250.2	258.3	+1.70
Denver	8.3	271.9	289.0	+3.85
Detroit	8.9	265.3	278.5	+3.03
Kansas City	8.3	240.0	254.0	+3.38
Los Angeles	8.4	267.0	292.2	+2.32
Miami	8.4	262.7	275.7	+3.73
Minneapolis	8.9	264.9	281.6	+2.54
New Orleans	7.9	240.2	254.5	+1.82
New York	10.0	271.7	292.2	+1.60
Philadelphia	8.7	264.3	277.5	+3.23
Pittsburgh	9.1	248.5	264.1	+2.35
St. Louis	8.9	255.3	270.5	+2.57
San Francisco	8.5	334.9	366.4	+2.31
Seattle	8.5	242.1	270.6	+2.72

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

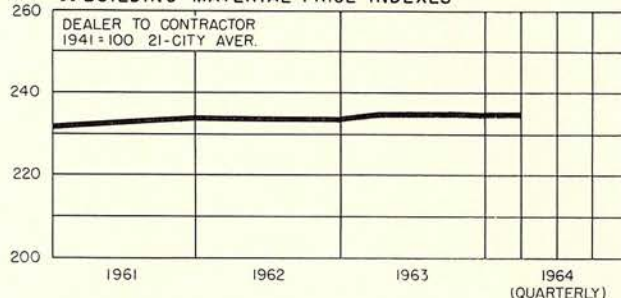
1941 average for each city = 100.0

Metropolitan Area	1952	1957	1958	1959	1960	1961	1962	1963 (Quarterly)				1964 (Quarterly)			
								1st	2nd	3rd	4th	1st	2nd	3rd	4th
<b>U.S. AVERAGE 21 Cities</b>	213.5	244.1	248.9	255.0	259.2	264.6	266.8	269.4	270.3	273.4	275.0	274.7			
Atlanta	223.5	269.6	277.7	283.3	289.0	294.7	298.2	302.0	303.0	305.7	307.5	310.0			
Baltimore	213.3	249.4	251.9	264.5	272.6	269.9	271.8	272.3	272.9	275.5	277.1	277.2			
Birmingham	208.1	228.6	233.2	233.2	240.2	249.9	250.0	251.3	252.0	256.3	257.8	258.0			
Boston	199.0	224.0	230.5	230.5	232.8	237.5	239.8	240.4	241.2	244.1	245.6	246.1			
Chicago	231.2	267.8	273.2	278.6	284.2	289.9	292.0	296.4	296.4	301.0	302.8	302.2			
Cincinnati	207.7	245.1	250.0	250.0	255.0	257.6	258.8	260.0	260.7	263.9	265.5	265.1			
Cleveland	220.7	258.0	257.9	260.5	263.1	265.7	268.5	272.3	272.8	275.8	277.4	276.3			
Dallas	221.9	228.4	230.5	237.5	239.9	244.7	246.9	251.5	252.2	253.0	254.5	253.7			
Denver	211.8	245.6	252.8	257.9	257.9	270.9	274.9	275.0	275.4	282.5	284.2	282.6			
Detroit	197.8	237.4	239.8	249.4	259.5	264.7	265.9	267.1	267.9	272.2	273.8	272.7			
Kansas City	213.3	230.5	235.0	239.6	237.1	237.1	240.1	242.3	242.9	247.8	249.3	246.2			
Los Angeles	210.3	248.4	253.4	263.5	263.6	274.3	276.3	279.1	279.7	282.5	284.2	284.0			
Miami	199.4	234.6	239.3	249.0	256.5	259.1	260.3	262.4	266.7	269.3	270.9	270.1			
Minneapolis	213.5	235.6	249.9	254.9	260.0	267.9	269.0	271.4	272.1	275.3	276.9	275.0			
New Orleans	207.1	232.8	235.1	237.5	242.3	244.7	245.1	246.5	246.5	248.3	249.8	247.1			
New York	207.4	240.4	247.6	260.2	265.4	270.8	276.0	280.9	280.9	282.3	284.0	284.8			
Philadelphia	222.3	255.0	257.6	262.8	262.8	265.4	265.2	265.6	265.6	271.2	272.8	271.1			
Pittsburgh	204.0	234.1	236.4	241.1	243.5	250.9	251.8	255.0	256.1	258.2	259.7	260.8			
St. Louis	213.1	237.4	239.7	246.9	251.9	256.9	255.4	260.1	262.4	263.4	265.0	266.8			
San Francisco	266.4	302.5	308.6	321.1	327.5	337.4	343.3	350.1	350.1	352.4	354.5	358.2			
Seattle	191.8	221.4	225.8	232.7	237.4	247.0	252.5	256.5	257.8	260.6	262.2	260.1			

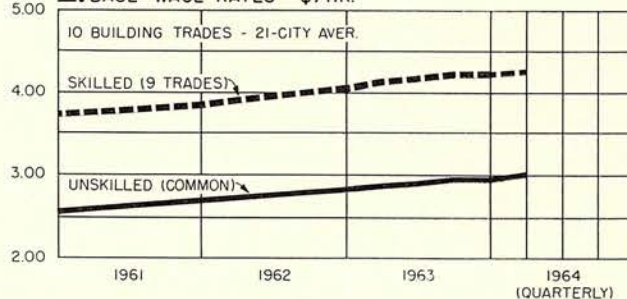
**HOW TO USE TABLES AND CHARTS:** Building costs may be directly compared to costs in the 1941 base year in tables A and B: an index of 256.3 for a given city for a certain period means that costs in that city for that period are 2.563 times 1941 costs, an increase of 156.3% over 1941 costs.

**TABLE A.** Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second: if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in first city are 25% higher than costs in second. Also, costs in second city are 80% of those in first ( $8.0 \div 10.0 = 80\%$ ) or 20% lower in the second city.

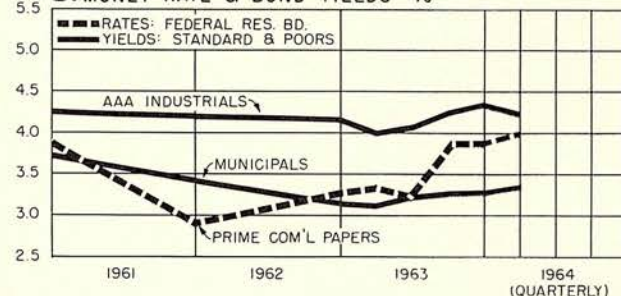
1. BUILDING MATERIAL PRICE INDEXES



2. BASE WAGE RATES \$/HR.



3. MONEY RATE & BOND YIELDS %



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





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—Drawn for the RECORD by Alan Dunn

"I suggest a few quiet weeks in a buffer zone—you have an anxiety neurosis from living in an urban-renewal area"

## RUDOLPH CALLS STUDENTS TO TASK OF URBAN DESIGN

The architect today must face the problem of urban design, Paul Rudolph told a standing-room-only audience of Columbia University architecture students in a recent lecture.

It is, he noted, an infinitely more difficult problem than that which his mentors of "the first machine age" confronted.

Today, Rudolph feels, the architect must attempt "much more." "Pretty buildings or buildings that work" are not enough, for "any fool can make buildings work." Significant architecture can only be achieved through "buildings that urbanistically work with the past and with the future." Within this framework, Rudolph proposed an approach to urban or civic design based on the following three considerations: the hierarchy of building types, the manipulation of scale, and the all-important factors of time and environment (physical and historical context). The main part of the lecture then proceeded as a slide-demonstration of these principles.

As for his first consideration, Rudolph stated that cities should be designed with a basic agreement as to

what should be prominent and what should be secondary, foreground and background buildings. Thus city gateways, public structures and churches, though "less functional" than structures for housing and commerce, should be more prominent in the cityscape. At this point Rudolph admitted, with tongue-in-cheek humor, that though his New Haven garage should rightfully be a background building it was forced to the foreground by its surroundings of mediocrity.

In this context, Rudolph cited the achievements of the teachings of the Ecole des Beaux-Arts, in such monuments of civic design as the Place de la Concorde—not that their principles can be reapplied today, but that their formulae supported a "unanimity of outlook and a respect for the past and the future" should be recognized. Rudolph picked the Piazza San Marco and the pre-1950 days of New York's Park Avenue as exemplary of good hierarchical grouping combined with a sensitive awareness of the environment: San Marco, with its dominating cathedral and pivotal Campanile, a public gathering place; and Park Avenue, an enclosed, sub-

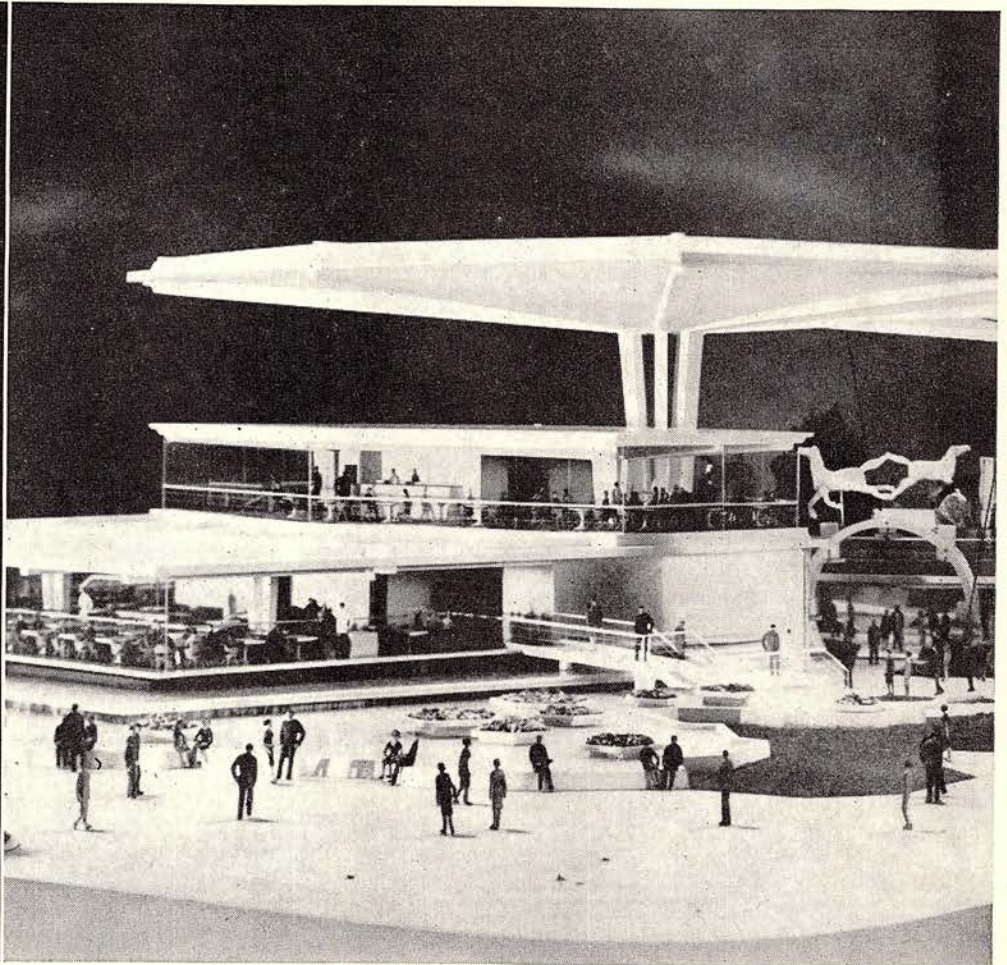
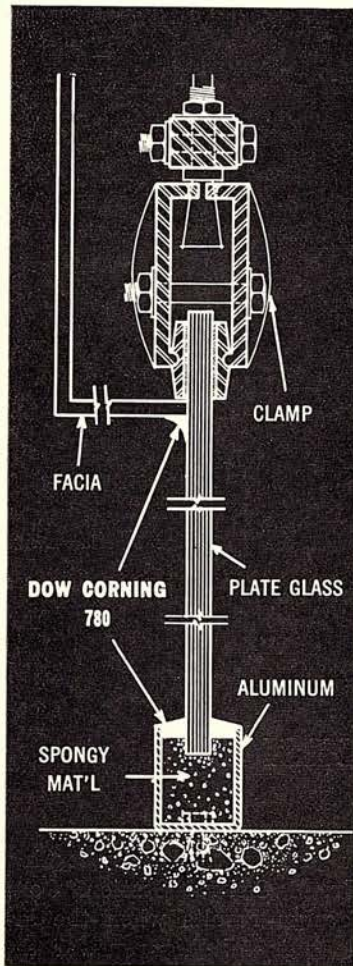
servient gateway to the city leading from Grand Central Station. Good urban design results when the arrangement of buildings answer the question of what an area needs and wants to be. Honky-tonk areas such as Times Square are just as necessary to the vitality of the city as are parks, for each appeals to a different aspect of the human spirit.

In order to engage the human being in the active experience of architecture, Rudolph believes that the architect must be able to manipulate the element of scale—to draw the observer towards the building by a continuous process of appreciation from a distant viewing to a more proximate one. Again, the cathedral in Saint Mark's Square offers a historical example—from a distance, the facade presents a bold pattern of voids and solids; a manipulation of scale by the use of painting and sculpture keeps the interest of the viewer by breaking the scale down and drawing him from afar to near. It is at Chandigarh that Rudolph sees Le Corbusier's work as the exemplary modern expression of this type of plastic handling of scale. In

*continued on page 26*



# Sealing at the World's Fair



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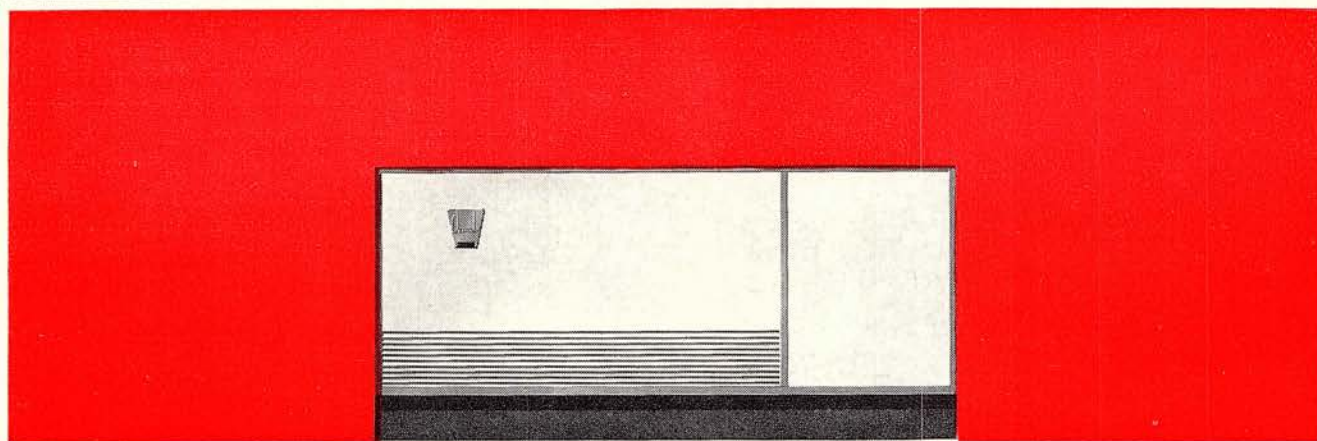
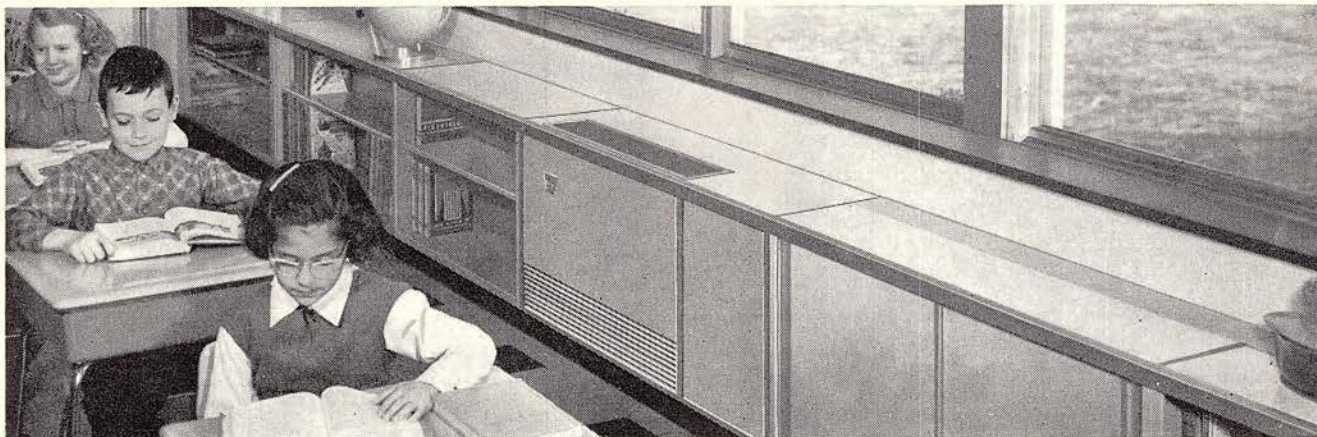
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the distance, the Secretariat and then the High Court stand out as monolithic structures against the opposing hills and Indian sky. The large open space of the courtyard is related to the great expanses of the environment. However, at closer range, the ramps and sculpture help to reduce the scale from its original super-human proportions. The High Court building, first seen as a one-story monument, a building for giants, is broken down by the handling of details as sculpture to read as a four-story structure.

Not daunted by the even more complex problems posed by the introduction of fast-moving vehicular viewpoints, Rudolph feels that only the automobile is "large enough to organize the city on a large scale." The architect will thus have to be more sophisticated than he has been so far in planning multi-leveled cities to separate vehicular from pedestrian traffic while asserting in each building a differentiation of scale to be read from both vantage points.

In conclusion, Rudolph admitted

that it is hard enough to create a single building but insisted that if the great tradition of architecture is to be carried on, efforts must be made to coordinate individual structures into the larger scheme of things.

He was, however, adamant in stating how this is to be approached—the problems of urban design can *only* be solved by the initiative of *individual* architects and not through the group effort of committees, for they can only produce a result "of the lowest common denominator."

## EDMUND RANDOLPH PURVES DIES AT 66



Gretchen Van Tassel

Edmund Randolph Purves, F.A.I.A., of Washington, D.C., former executive director of the American Institute of Architects, died April 7 at the age of 66 after an illness of several months.

Mr. Purves devoted the major part of his life to serve and lead his professional organization, the American Institute of Architects. A member of the A.I.A. since 1930, he joined the national headquarters staff in 1941. From 1949 to 1960 he served as the A.I.A.'s executive director, remaining as consulting director for another year. From 1961 until his death he was an associate of the Washington, D.C., firm of Chatelain, Gauger & Nolan, architects and engineers.

Mr. Purves was born on June 20, 1897 in Philadelphia and remained there to study architecture at the University of Pennsylvania. In 1917, he interrupted his studies to join the American Field Service of the French Army and later transferred

to the American Expeditionary Force. For his World War I service, he was recognized by the Croix de Guerre with Silver Star, the Verdun Medal, the Field Service Medal and the Victory Medal.

In 1920, he received a Bachelor of Science degree in Architecture from the University of Pennsylvania and, in the same year, he was a finalist in the Paris Prize design competition. After studying and traveling abroad, Mr. Purves opened his architectural practice in Philadelphia in 1927. From 1936 to 1938 he served as president of the Pennsylvania Society of Architects. He was a member of the Pennsylvania Board of Examiners for Architects from 1938 to 1950, and from 1938 to 1941 he was a member of the national board of directors of the A.I.A. In 1941 he became the A.I.A.'s Washington representative.

He again volunteered for military service during the Second World War. After joining the Seventh Air Force in the Pacific, he became Chief of Counter-Intelligence in the Pacific Theater. During his absence he was named a Fellow of the A.I.A. A year after his return in 1945 he became the Institute's director of public and professional relations, which in turn led to his appointment as executive director.

Mr. Purves wrote often for the architectural journals. An important article for *ARCHITECTURAL RECORD* (May 1959, pages 168-171) expressed his views on the expanding role of the architect in contemporary society, a subject which was of great concern to him in his final years at

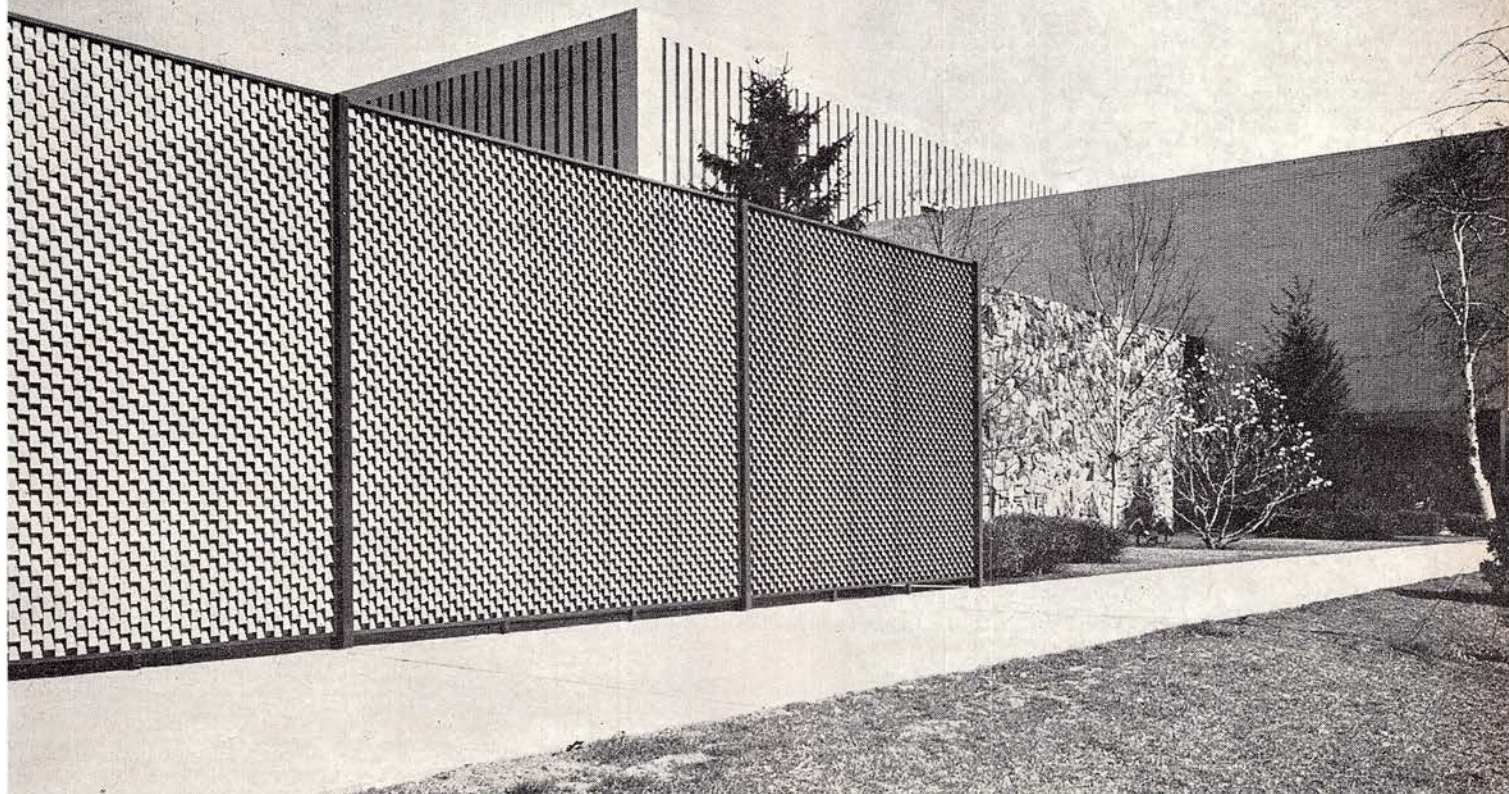
the A.I.A. In the *RECORD* article he asserted that the architect must equip himself to meet "the complexities and demands of our times" to fulfill today "the role he once played well—that of 'master builder'." The architect must provide the corporate client with a "comprehensive understanding of his problem, financially as well as physically . . . the production of a program that he can understand . . . the production of documents that will realize for him an economically sound and esthetically fitting project . . . (and) the well-balanced relationship of the project with the general development."

The encouragement of an A.I.A. Ad Hoc Committee on the Profession, established to consider how the profession should deal with emerging problems and opportunities, was among Mr. Purves' most absorbing interests in the closing years of his service to the Institute.

He was elected an honorary corresponding member of the Royal Institute of British Architects and of the Royal Architectural Institute of Canada. He was a member of the Philadelphia Club; the Century Association, New York; and the Cosmos Club, Washington, D.C.

Among honors he received are: the A.I.A.'s Edward C. Kemper Award, a special citation from the A.I.A., the Gold Medal of the Philadelphia Chapter, A.I.A., the F. Stuart Fitzpatrick Memorial Award, and special commendations from the Housing and Home Finance Agency and the U. S. Atomic Energy Commission.





Architect: Abbott, Merkt & Co., New York City

## BORDEN ARCHITECTURAL DECOR PANELS: DECA-GRID

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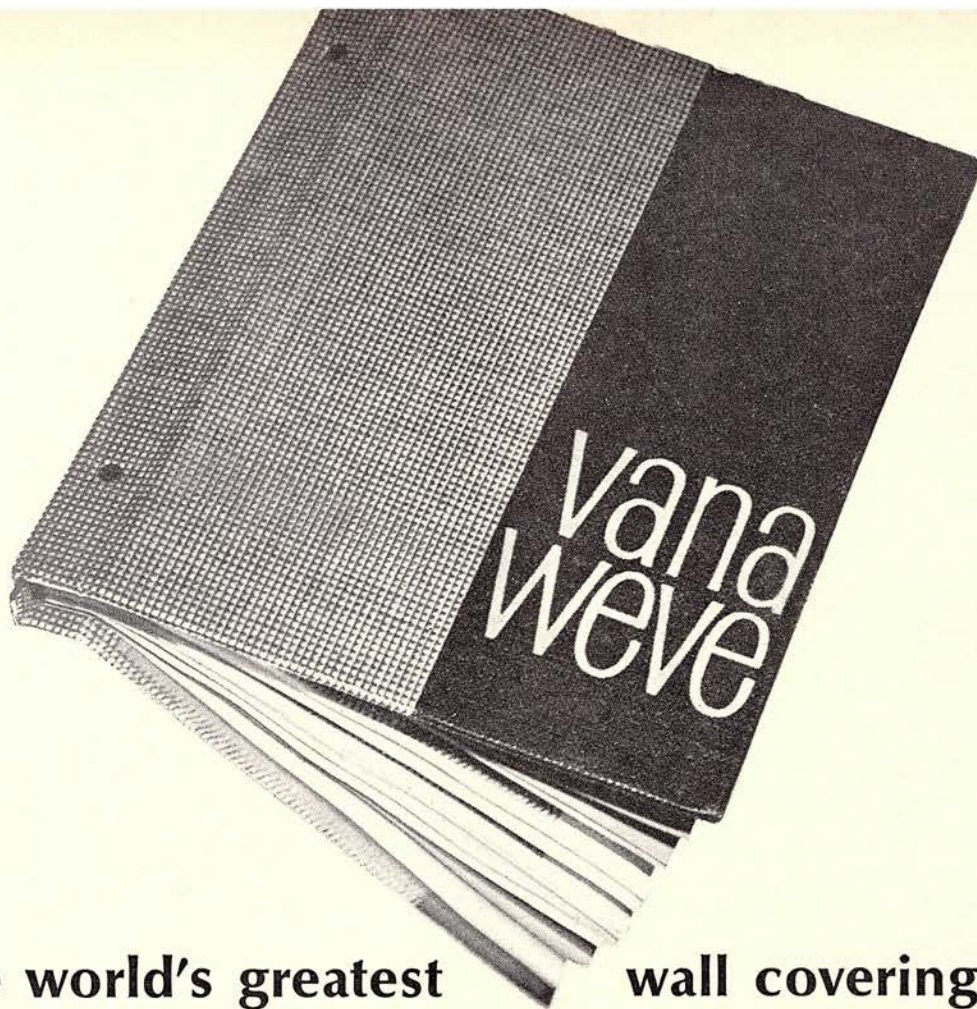
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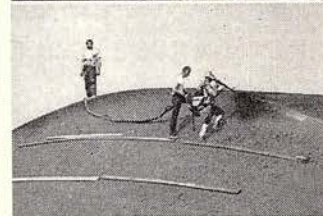
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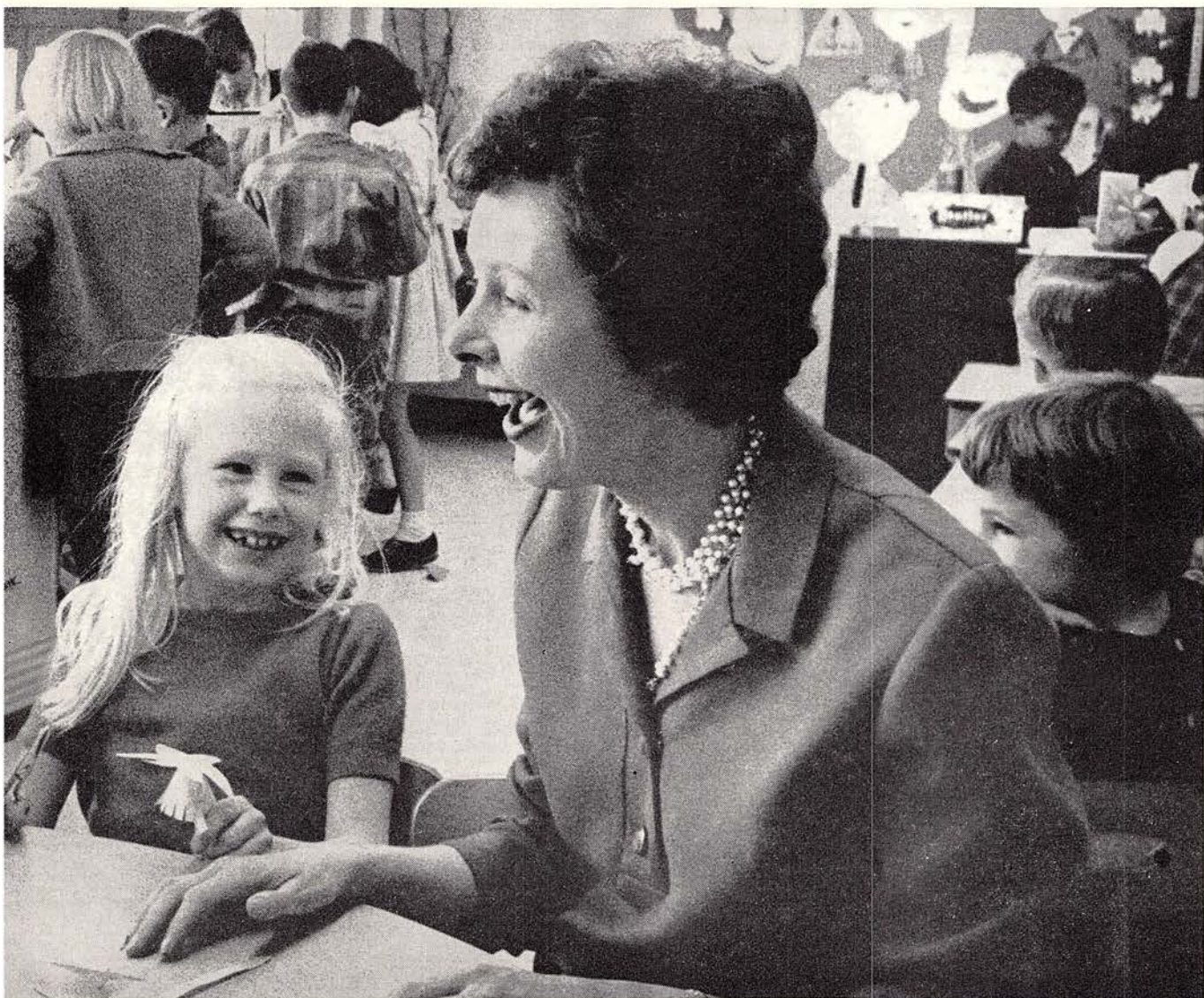




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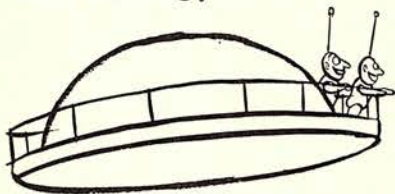
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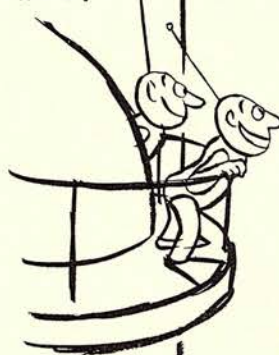


"Great galloping galaxy!  
How terribly  
attractive!"



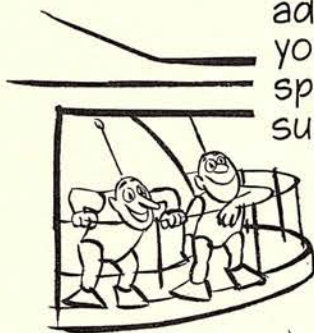
"Let's take one back  
to Mars with us."

"Oh,  
Miss."



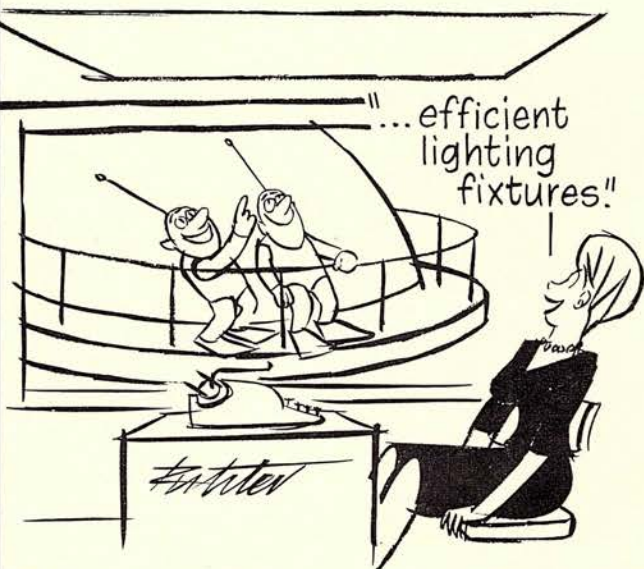
"Who...  
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## Time to Take Account

How many hours of volunteer service do architects give in a year toward improving the environment of their communities? Service which involves their professional training and knowledge, used to make the physical community a visually pleasanter place in which to live?

It would be interesting to know the total. There is little doubt that it would be impressive.

For architects serve on innumerable committees—citizen committees for special purposes connected with the city's environment, committees to preserve fine old buildings and beautiful landmarks, committees to prevent or to protest the despoiling of an area by inappropriate uses, study committees, action committees, A.I.A. chapter committees on design or on planning, art commissions, planning commissions, design review boards—name it, you'll find an architect serving on it, serving some other purpose than his own immediate and private gain.

One reason that the architect is so necessary to such committees is that he is trained to visualize and to present visually the result of certain design decisions. The layman can neither visualize nor present visually an idea or a proposal, yet because he outnumbers the professional on such committees and commissions, his votes determine most of the decisions which affect our environment. It is vitally important, then, that the layman know what his vote will lead to. The architect with his sketches, diagrams, well-chosen slides, expressive—if amateur—movies, can open lay eyes to new values and old dangers.

The architect is needed, too, because he can determine, through his training and background of practice, what is feasible in a given set of circumstances. The layman has no such fund of experience on which to draw, and more often than not his decisions are subjective in the extreme—or are influenced by those with selfish interests.

Especially the architect is needed because he can imagine something finer, better, more beautiful than that which exists. While the layman can often stimulate this imagination, he cannot himself imagine in the dimensions which are the elements of architecture.

Because he is needed for all these reasons, the architect serves, giving his out-of-office hours to his community. But who knows that he serves, or how? Few who so serve do so for publicity. And the proposals and actions of those who serve on public bodies—commissions and the like—are often reported in the press with indulgent—and sometimes not so indulgent—smiles: the visionary, like the prophet, is without honor in his own land.

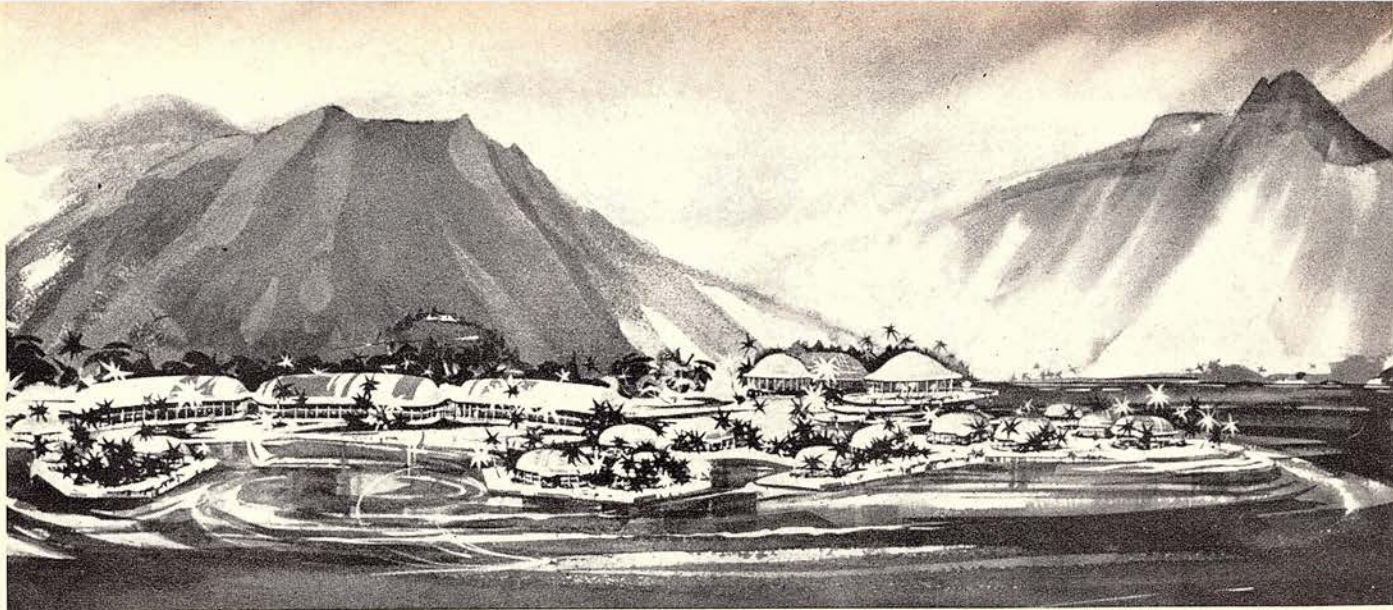
It would be a good thing to show the public what men of vision and of good will have done, unsung, to give more delight to the cities of this country. God knows they need it. Recently Paul Thiry pointed out that it is unthinkable but a fact that cities less than 100 years old are in dire need of re-doing. If a second wave of renewal is not to be imperative in less than another 100 years, now is the time to make good decisions.

But there will be no good decisions—or too few of them—if the quality which architects can impart to civic projects and civic thinking does not receive due consideration. One means to this is to make known what architects have done and are doing for communities, and where their vision has paid off in the public interest.

How have *you* served your community in the past year? Will you share information on what you have done, what results have been achieved and how much time you have given? The RECORD's Western Section urges you to write—a letter or a card—to its editor about your service. The light should not be hid under the bushel.

—E.K.T.





Camera Hawaii

Wimberly, Whisenand, Allison & Tong, Architects, will design American Samoa's first resort hotel

## WESTERN ARCHITECTS DESIGN FOR A DEVELOPING SAMOA

Once a South Seas outpost for the U.S. Navy almost unknown to the usual traveler, American Samoa is about to build its first hotel and to initiate an advanced and unique educational system in new school buildings unlike any previously seen on the islands (and unlike any previously designed by the architects). The hotel and school buildings are being designed by architects from two Western states: John Lyon Reid and Dr. Alexander Tarics of San Francisco are architects for the schools; and Wimberly, Whisenand, Allison & Tong of Honolulu are architects for the hotel.

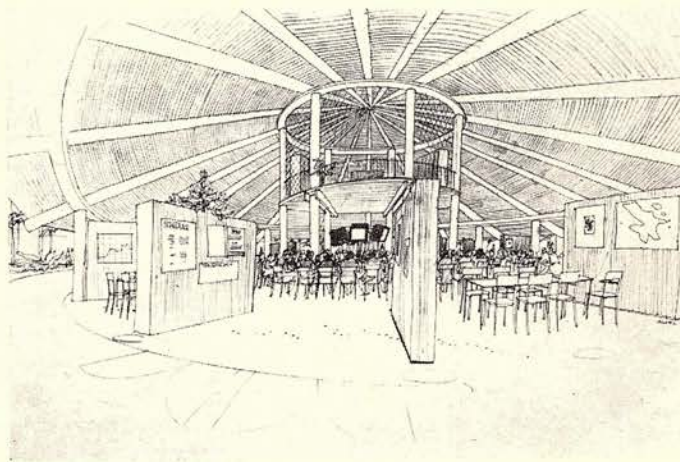
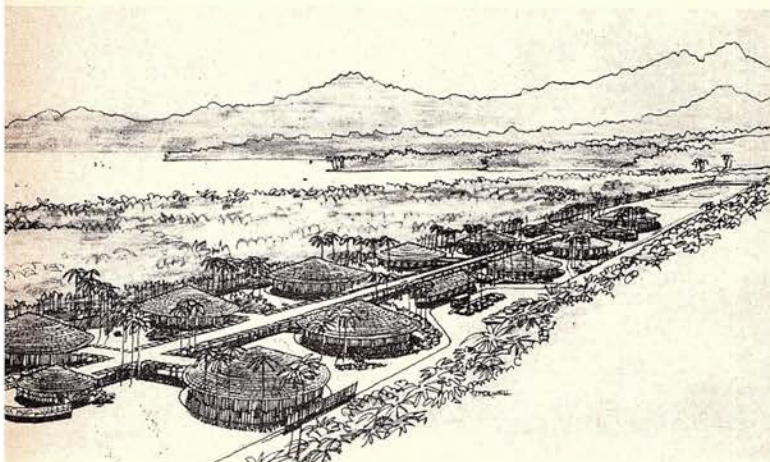
These projects are the latest in the development program of American Samoa's Governor H. Rex Lee who began his administration in 1961 and in three years has provided new roads, new industries, new houses and a new jet airport for the territory, a group of six islands totaling 76 square miles in area.

The hotel will be Samoa's first. On a bluff overlooking Pago Pago Bay, the \$1.5 million resort will provide 100 rooms in one-story "fales" (Samoan cottages) and two-

story Polynesian "long houses," built of reinforced concrete and hollow concrete block with wood-framed shake roofs. Restaurants, shops and public rooms will complete the resort. Owned by native residents of the island, the hotel is being financed partially by funds raised by them, partially by the banks of Hawaii and of American Samoa, and by the U.S. Area Redevelopment Administration, and will be operated by Intercontinental Hotels Corporation.

Reid and Tarics' buildings will include two new high schools and additions to Utulei High School at Pago Pago. While the schools will follow Samoan architectural tradition closely, resembling the "fale" in their general aspect and in their openness to permit full ventilation in the humid climate, they will be equipped with an educational TV system which will permit teaching of classes by "Master Teachers" from the United States. Samoan teachers will also be trained by this method.

Three educational TV channels will begin to present programs for the schools late in 1964. Later three more channels will be added.



Reid & Tarics are architects for the islands' new high school using educational TV system



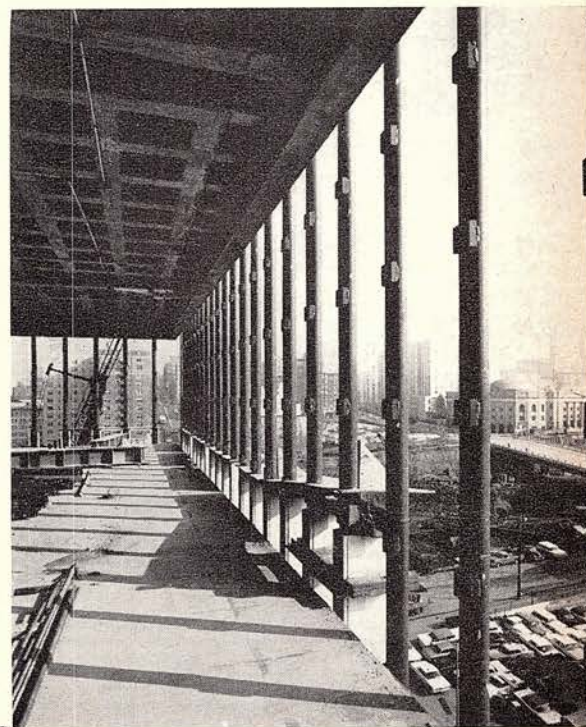
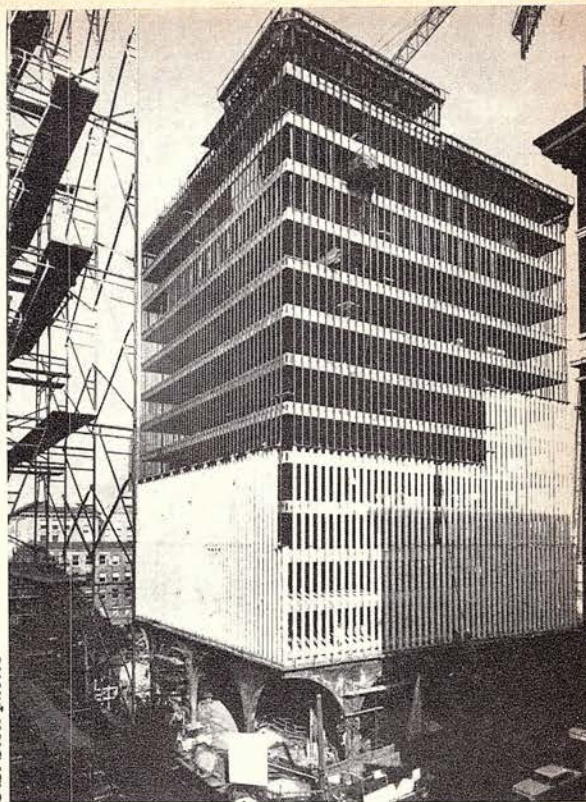
## EASTERN ARCHITECTS DESIGN FOR WESTERN CITIES

In two Western cities, projects designed by internationally known architects from Eastern states are under way. These are the IBM Building in Seattle, for which Minoru Yamasaki & Associates of Birmingham, Michigan, are architects; and the Oakland, California, Museums Center for which Eero Saarinen & Associates are architects. Both projects are unusual in concept.

The IBM Building, now well along in construction, uses unusually small-section steel pipes ( $4\frac{1}{2}$  inches in diameter) to carry external loads from the fourth through the ninth floors, achieving with them an exceptional attenuation of the vertical structural elements. The external loads from these floors are transferred to the ground from these pipes through steel arches which support the upper structure.

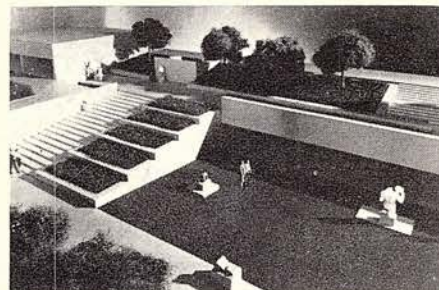
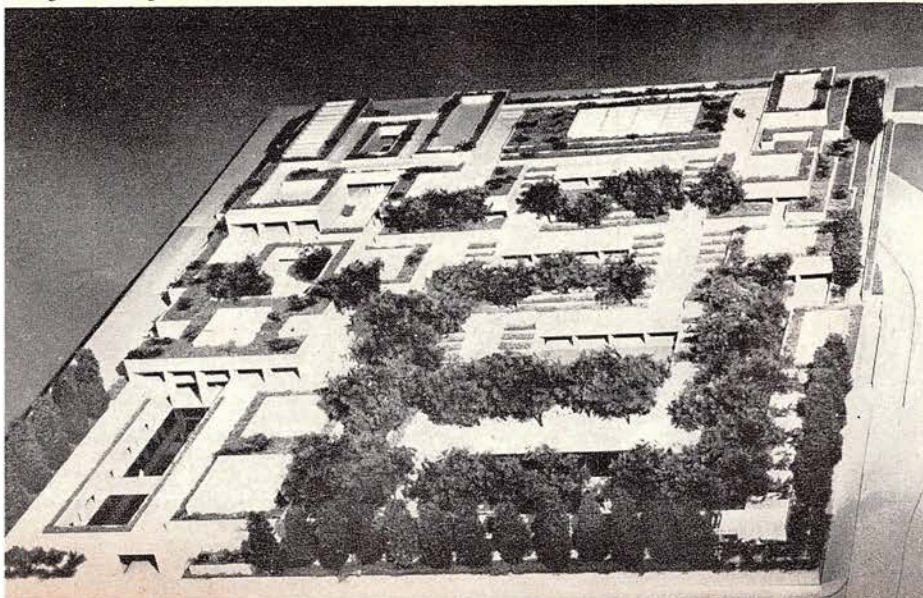
The Oakland Museums Center will be built on three blocks of sloping ground near Lake Merritt and will house the city's three municipally supported museums—natural history, art and anthropology. The design uses the sloping site to provide three levels, one for each museum, with landscaped courts onto which exhibition galleries and other facilities can open. Included in the center are several auditoriums and a public restaurant. The center is to cost \$6 million.

U.S. Steel photos



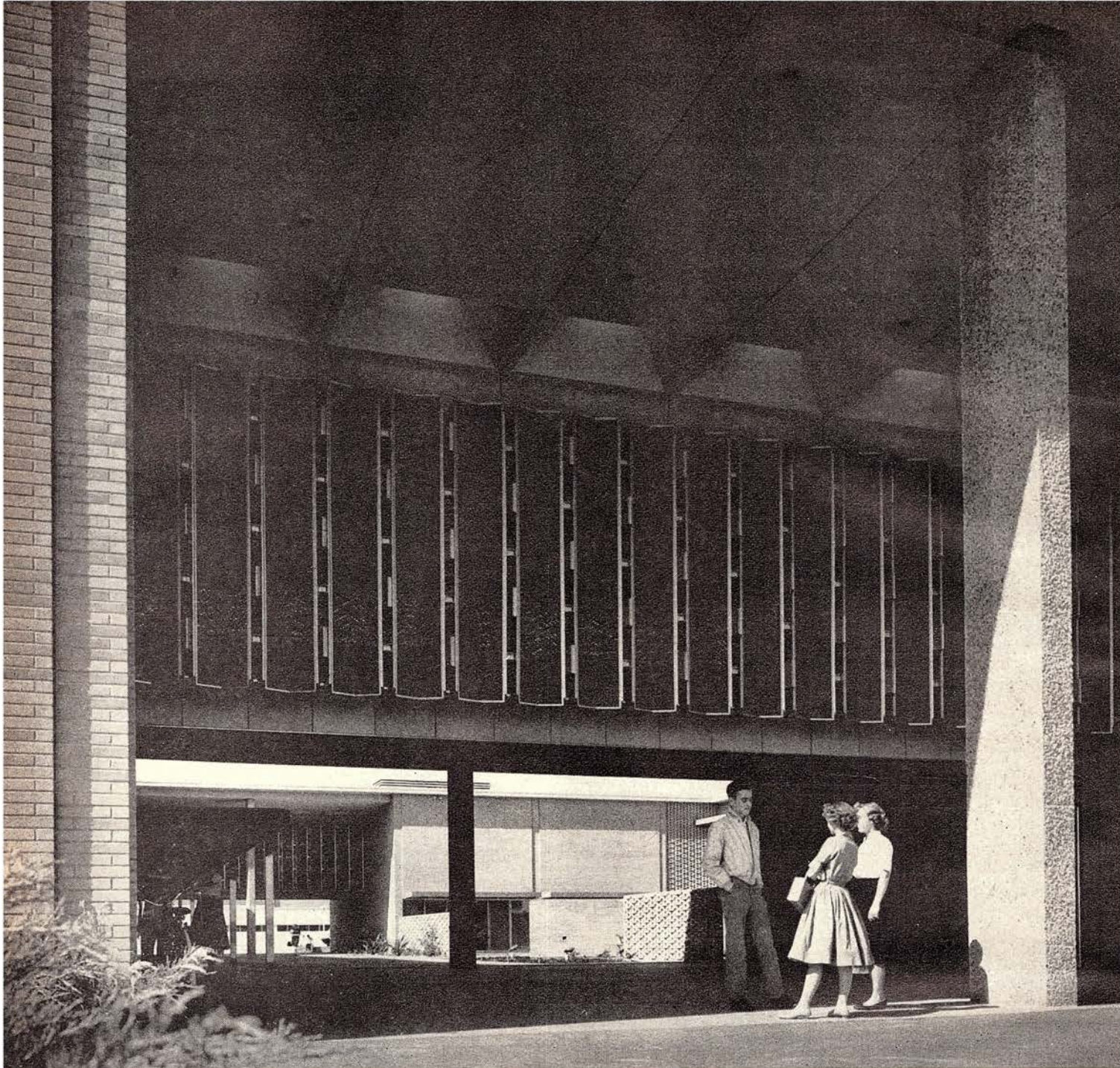
IBM Building in Seattle was designed by Minoru Yamasaki & Associates

errington-Olson photos



Oakland Museums Center's architects are Eero Saarinen & Associates





## COURT SEPARATES NOISY AND QUIET FUNCTIONS

*Music Building*  
*San Fernando Valley State College*  
*Northridge, California*

ARCHITECTS:

*Allison and Ribbe*

SUPERVISING ARCHITECTS:

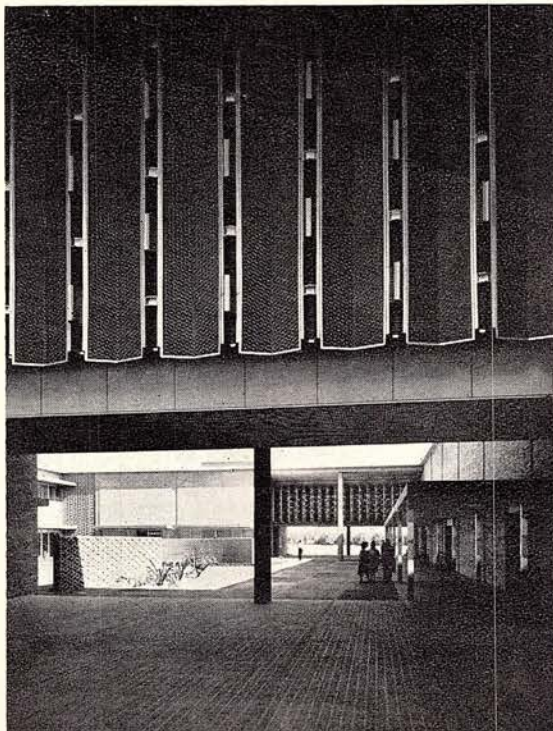
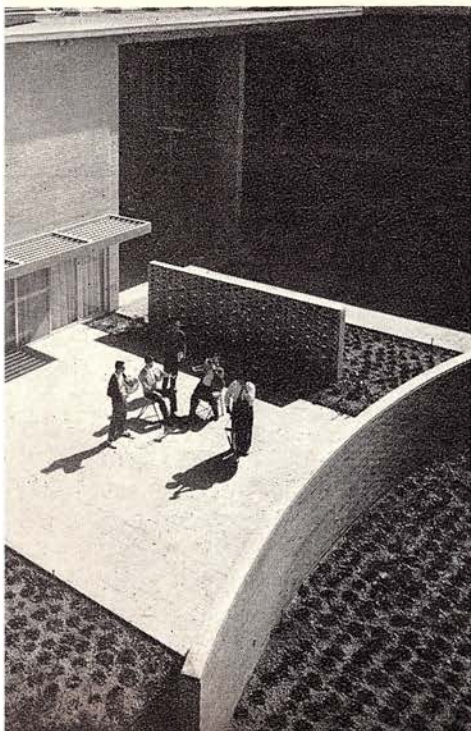
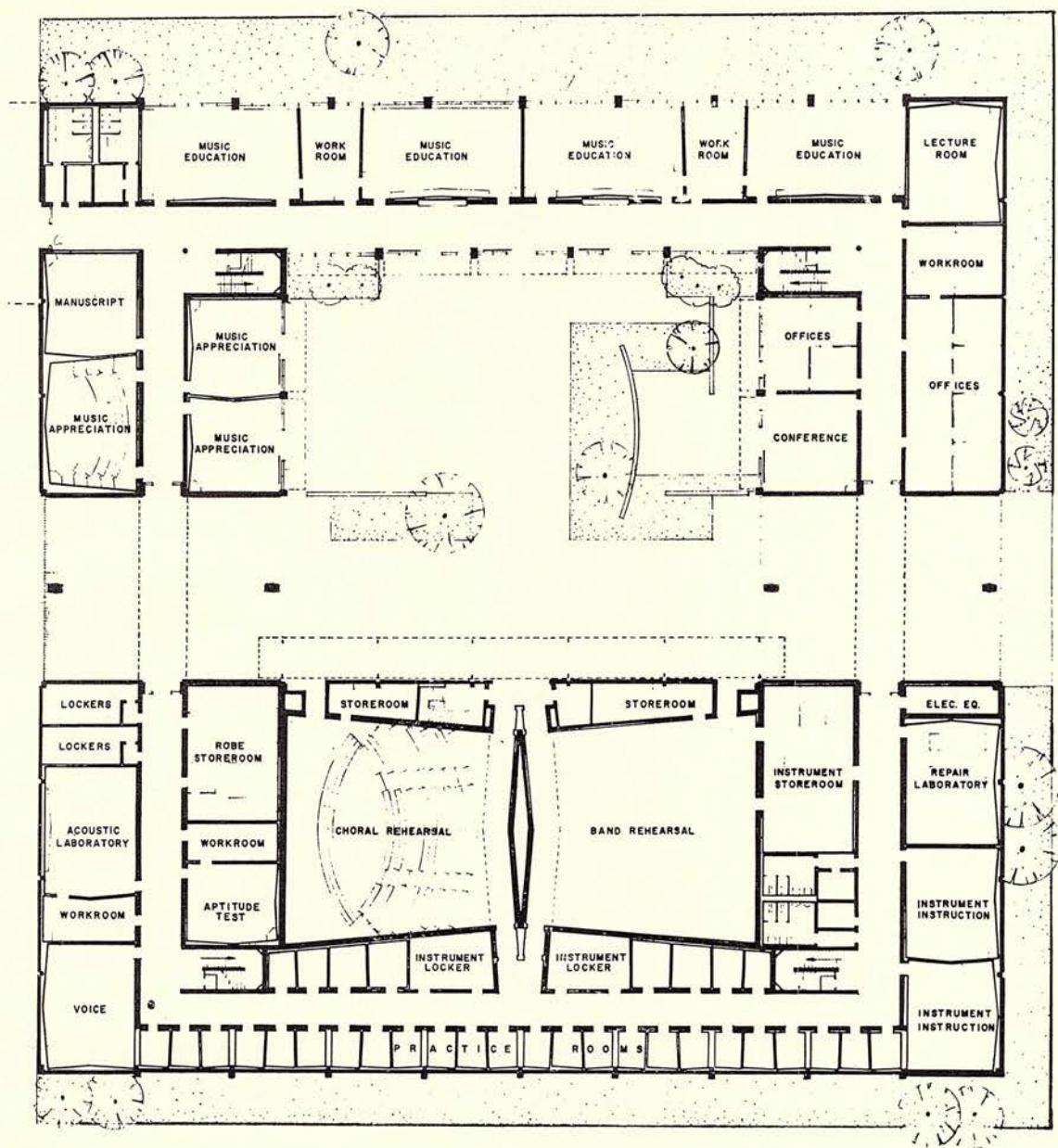
*California Division of Architects*

CONTRACTOR:

*Twatts-Wittenberg*

Insulation, isolation and separation were the three basic principles involved in planning the new Music Building for San Fernando Valley State College, a 242-foot-square building which provides for teaching, practice, rehearsal and for faculty offices. The "noisy" rooms—choral and band rehearsal and practice rooms—are contained in a single windowless rectangle on the south side whose blank walls simplify both acoustical and sun control. To insure complete isolation of the practice rooms from each other, all walls, floors, ceilings and door frames are designed to "float" independent of the building structure. Pipes, ducts and mechanical equipment are fully insulated to prevent transmission of their operating noise. Walls and ceilings of teaching, rehearsal and practice rooms are splayed, and where acoustical material is used, it is balanced with hard, reflecting, polygonal surfaces. The "quiet" areas—faculty offices, lecture rooms and library—are in the north wing. Separating the wings is a pleasant court, entered on the east and west under the bridges that connect the two wings, and on the north and south by portals under the second floor. The building has a reinforced concrete frame, faced with brick to harmonize with adjacent buildings except on the south where tilt-up, exposed aggregate panels are used.





Julius Shulman photos



# Another kitchen **SOLD** by a Hotpoint Dishwasher!



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A pioneer in the field, Hotpoint has maintained the demand for its dishwashers with the features owners brag about: a rust-resistant porcelain interior and exterior; new sound-absorbing insulation; and quiet, fountain action for hygienically clean dishes. Steady advertising, and consistent top ratings in unbiased consumer product reports, have made Hotpoint the sought-most, bought-most built-in dishwashers. Yet they cost no more than many lesser-known brands.

You'll like them too. The plumbers who helped Hotpoint engineers design these dishwashers insisted that all plumbing and electrical connections be up front—accessible without fumble or effort.

Dishwashers sell houses. And the Hotpoint name denotes a builder who has pride in his product. See your builder-jobber or

### *Call on these distributors:*

#### **California**

**HOTPOINT**  
4353 Exchange Avenue  
Los Angeles, California  
Dial LU 3-9881

#### **Colorado**

**WESTERN APPLIANCE CORPORATION**  
201 South Cherokee Street  
Denver, Colorado  
Dial 722-4611

#### **New Mexico**

**GORMAN APPLIANCE CO.**  
1326 Twelfth Street  
Albuquerque, New Mexico  
Dial 243-2274

#### **Texas**

**GORMAN ENGINEERING CO.**  
1701 Texas Avenue  
El Paso, Texas  
Dial 532-5483

#### **Washington**

**HOTPOINT**  
2819 Elliott Avenue  
Seattle, Washington  
Dial MA 3-8340

## **Call on Hotpoint**

A DIVISION OF GENERAL ELECTRIC COMPANY

4353 Exchange Ave., Los Angeles, California 90058

- Ask for the free color brochure on Hotpoint dishwashers or any of the full line of builder appliances and helpful promotional ideas. ■ Get the full Hotpoint line, and get dependable Hotpoint service back-up that puts pep and profit in your sales.

For more data, circle 16 on Inquiry Card

For more data, circle 17 on Inquiry Card ➔





## I run, jump, sing, shout, scribble, scuff, study...and grow

Who expects kids to be clean, dignified and quiet? Parents maybe. But school planners have to be practical. That's why so many schools (like the new Douglas A. Newcomb Elementary school in Long Beach, California) are built inside and out with Facebrick. It fits the function. Choir practice doesn't drown out geography class. Heel scrapes and pencil doodles don't mar walls. And earthen-toned Facebrick interiors are the next best thing to being outdoors.

A school built of Facebrick will be around a long time—saving maintenance money every year. And, years from now, when kids grow up, they will still be proud to say: that's where I went to school. Wouldn't you be proud to build a school like that?

For information on Facebrick for your applications, write:

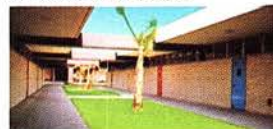
**Pacific Clay Products** LOS ANGELES BRICK DIVISION  
1255 W. 4th St., Los Angeles, Calif. 90017 • HUntlely 2-3100



Facebrick Dutch White Norman Ruffle



Architects: Hugh Gibbs & Donald Gibbs A.I.A.  
General Contractor: R.J. Daum Construction  
Mason Contractor: C.R. Crain & Sons, Inc.





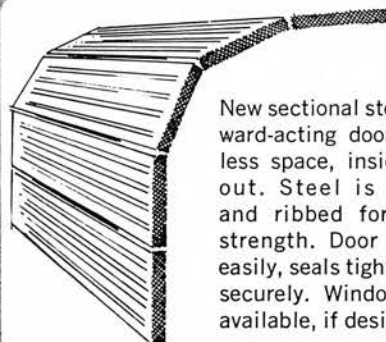


## New Sectional Steel Door built on the West Coast...*for West Coast needs*

**News for West Coast architects!** Now, for the first time, you can specify a sectional, upward-acting steel door that's made right here on the West Coast. The new California plant of The "OVERHEAD DOOR" makes this superior steel door available quickly to solve your door problems. And prices for this new door are slightly higher EAST of the Rockies.

**Designed for West Coast needs,** this door offers many advantages. Because it is sectional, it requires much less head clearance, has fewer parts, needs less maintenance. It seals better, locks tighter against the elements. And because it's sectional, its design can include windows.

Full range of sizes available right now. Factory-trained "Architect Counselors" now available on West Coast. Contact your nearest "OVERHEAD DOOR" Distributor, or write us here at the Oxnard factory.



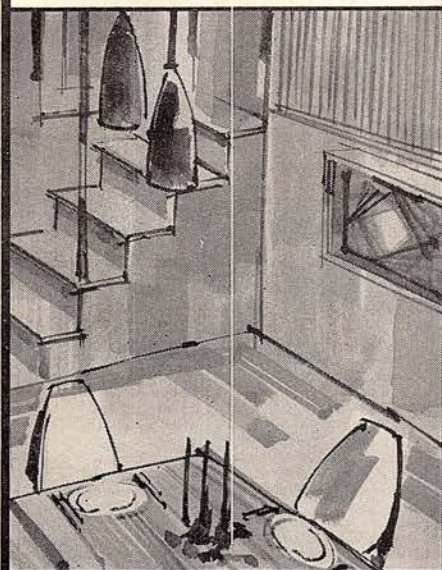
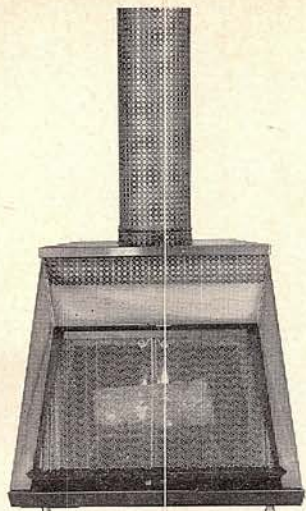
New sectional steel, upward-acting door takes less space, inside and out. Steel is rolled and ribbed for extra strength. Door closes easily, seals tight, locks securely. Windows are available, if desired.



**OVERHEAD DOOR COMPANY OF CALIFORNIA**  
Overhead Door Company of California, Oxnard, California—a Division of Overhead Door Company of Oregon, Inc.

For more data, circle 18 on Inquiry Card





### HERE'S ALL YOU NEED TO KNOW TO MAKE YOUR ROOM DRAWING:

1. **Available Models:** Two — The Sequoia wall model shown above left; The Woodside, space-saving corner model shown above right. Choice of 3 colors in both models: Matte Black, Rio Red, Glowing Coppertone.

#### 2. Dimensions/Size:

The Sequoia (wall model)		The Woodside (corner model)
24" x 37"	Overall Dimensions	29" x 29"
35"	Height	34"
	Width	
37"	Corner-to-corner	40"
	Depth	
24"	Front-to-back	38"

3. **Proximity to Wall:** Because the Dura-Glo Fireplace is air-circulating and UL Tested and Listed, it can be used as close as 3 inches from the wall depending upon wall construction.

4. **What's Included:** The suggested \$260 Retail Price includes: grate; curtain-type screen; 5'2" aluminized steel flue pipe with damper; ceiling cover plate. Decorative flue pipe cover, extra.

# WIN A DURA-GLO FIREPLACE!

SIMPLY MAKE A ROOM DRAWING SHOWING HOW YOU WOULD INCLUDE A DURA-GLO FIREPLACE INTO THE PLANS . . . AND, YOU HAVE FOUR CHANCES TO WIN!

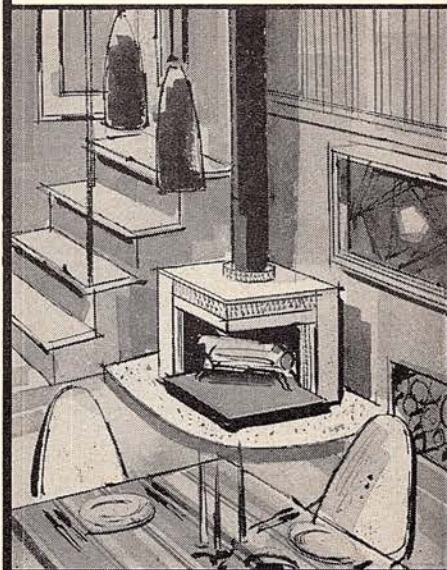
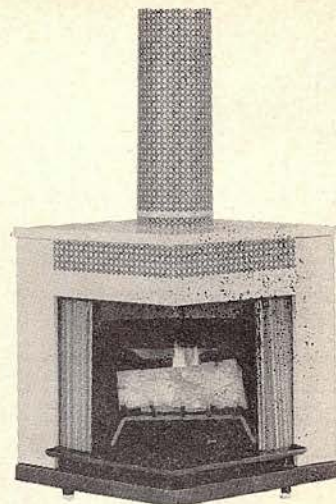
**Four \$260 Wood-Burning, Free-Standing Dura-Glo Fireplaces Will Be Awarded To Western Architects Only For The Winning Entry In These Four Categories:**

1. **A Tract Home Drawing** — where the Dura-Glo Fireplace will be used in place of an expensive masonry fireplace in the living room or family room.

2. **A Custom Home Drawing** — where the Dura-Glo Fireplace will be an "added feature" in a family room, bedroom, kitchen-dining area, bathroom-dressing area, etc.

3. **A Multiple-Dwelling Unit Drawing** — where the Dura-Glo Fireplace will be used in a motel or hotel room, or an apartment.

4. **The Most Imaginative Drawing** — let yourself go . . . create a "conversation piece" . . . use the Dura-Glo Fireplace anywhere, in any kind of a room (maybe a patio, a beach or mountain cabin?).



### HERE ARE THE SIMPLE RULES:

1. **Your Drawing:** can be in any medium you choose . . . can be in color or black-and-white . . . must be approximately 8" x 10" (horizontal or vertical) and not folded.

2. **You May Enter:** one or all four categories . . . but a separate drawing must be submitted for each category entered . . . thus, you could win all four Dura-Glo Fireplaces!

3. **You Must Be A Practicing Architect:** employed by a Contractor, Builder, Developer, Architectural Firm or self-employed . . . and must be practicing in one of the 13 Western States or Texas.

4. **Contest Closes:** Midnight, June 30, 1964 . . . all entries become the property of Dura-Vent Corporation . . . in event of a tie, duplicate prizes will be awarded . . . entries judged on basis of originality, execution and neatness.

5. **Include With Your Drawing-Entry:** Name/Firm/Address. This information must be attached to entry along with category entered (1, 2, 3 or 4 at left).



For further information . . . write Dura-Glo Contest

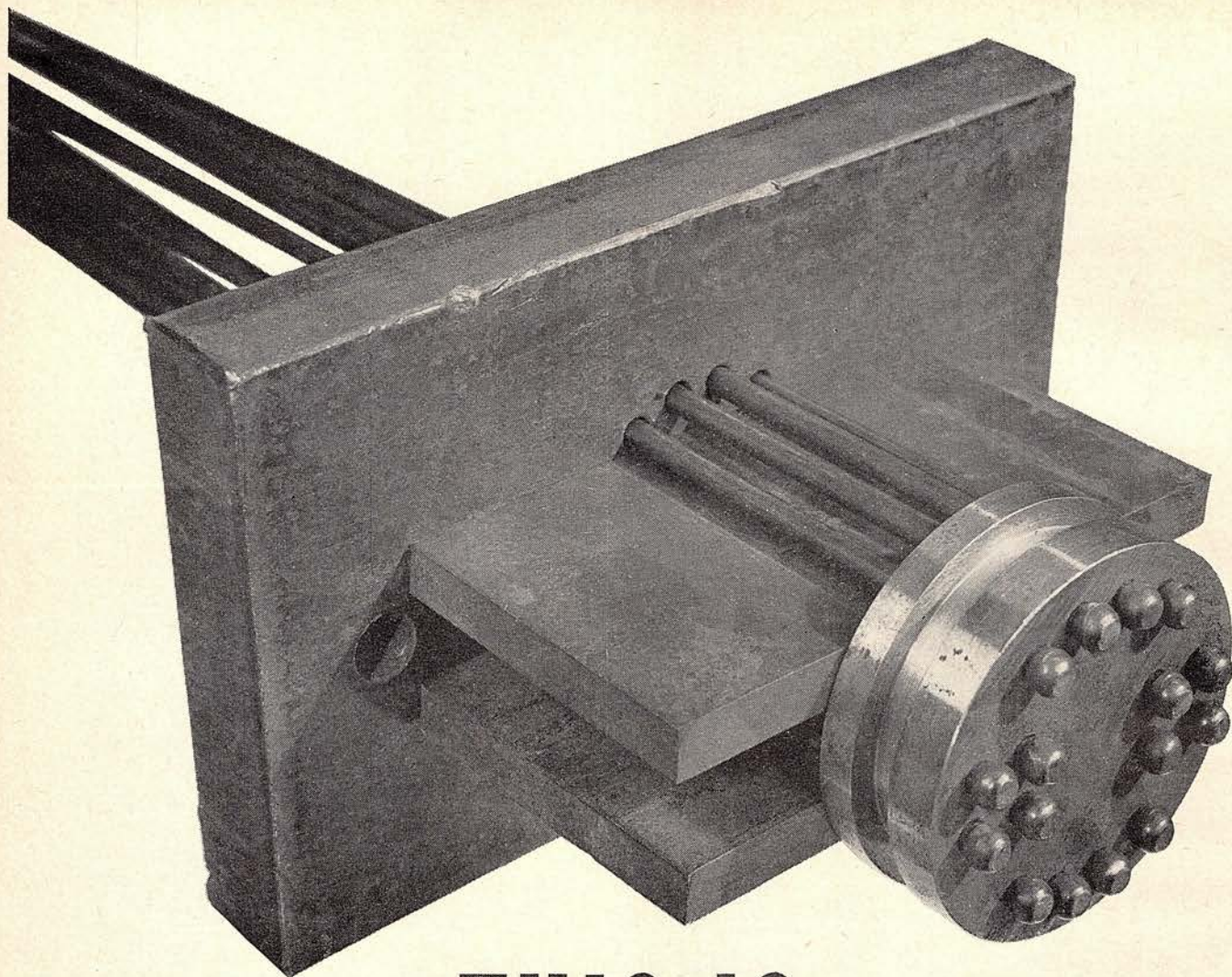
**DURA-VENT CORPORATION**  
2525 El Camino Real/Redwood City, California



A SUBSIDIARY OF **DOVER** CORPORATION

For more data, circle 19 on Inquiry Card





# THIS IS POSITIVE END ANCHORAGE

There cannot be slippage or loss of tension in the tendons of the Prescon System of post-tensioning. Cold-formed button heads on the wires of the tendon transmit the force to the stressing washer, to the shims, to the bearing plate and to the structural member. Precise

shims maintain the exact tension specified—*indefinitely.*

For *positive* end anchorages in prestressed concrete, specify the Prescon System. Hundreds of structures of all types testify to the dependability and advantages of this positive end anchorage.



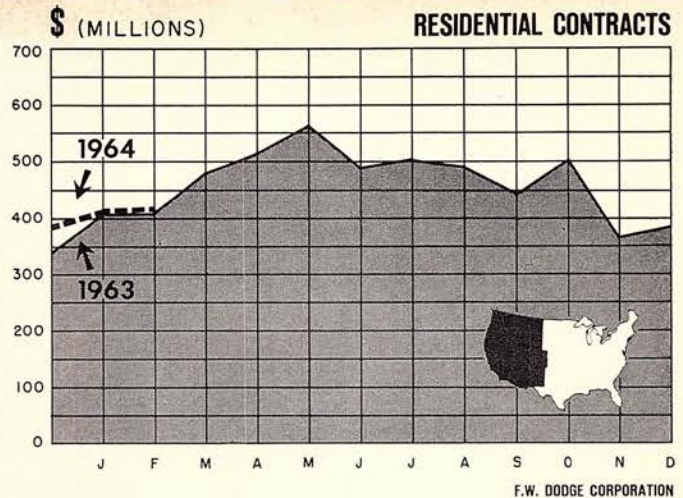
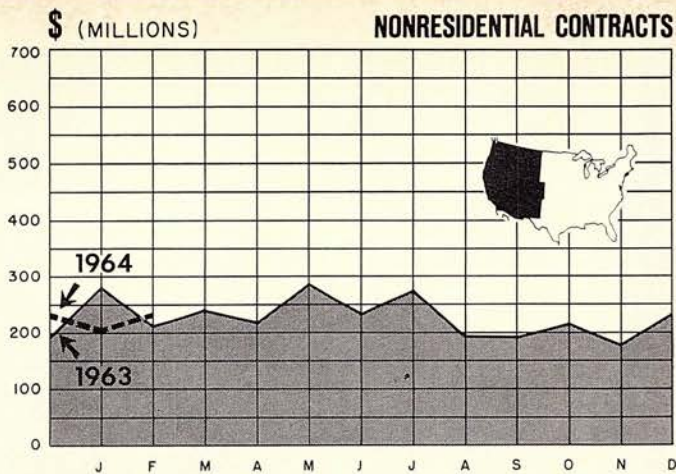
## *THE PRESCON CORPORATION*

P. O. Box 4186      Corpus Christi, Texas 78408  
Atlanta • Boston • Chicago • Memphis • Dallas • Houston  
Denver • St. Louis • Los Angeles • San Francisco  
San Juan • Toronto • Honolulu • Mexico City

MEMBER OF PRESTRESSED CONCRETE INSTITUTE

For more data, circle 20 on Inquiry Card





## WESTERN CONSTRUCTION TRENDS

(For analysis of construction trends nationwide, see page 18)

In February, construction activity in the 11 Western states was still in the doldrums. Total contract value slumped 2.6 per cent from February 1963's level to \$786 million. For the first two months of 1964 contract value was running 1 per cent behind the total posted during the comparable 1963 period.

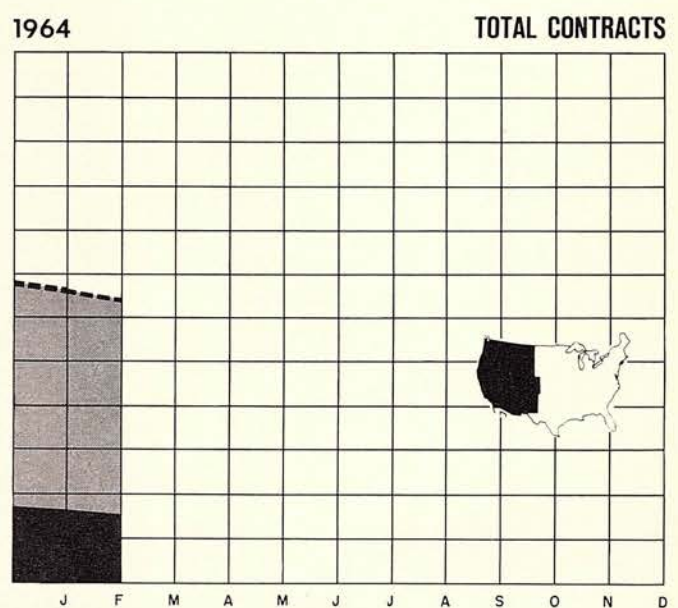
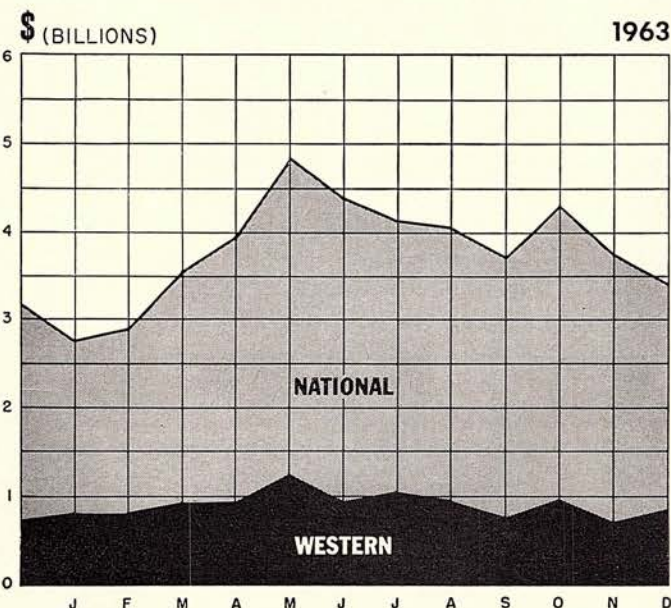
A 23 per cent decline in non-building construction was the weight that dragged down total contract value. Precipitous drops in communications systems contracts—off 98 per cent—and missile and space facilities contracts—down almost 90 per cent—were the main causes of the sharp skid in nonbuilding contract volume. Electric power and heating systems contracts also showed a substantial decrease of 43 per cent, while, on a happier note, streets and highways contracts were up 6 per cent.

Nonresidential building, which had lagged behind the other two major construction categories last year, and had declined nearly 30 per cent in January, picked up steam in February: total contract value rose 8.5 per cent to over \$230 million. A substantial increase in store construction more than offset a slight dip in office building and yielded a 21 per cent jump in commercial building contract volume. Educational and science buildings were up 55 per cent and social and recreational buildings contracts nearly doubled from February-to-February. On the downside, manufacturing plant construction declined over 20 per cent and public buildings contract value plummeted 84 per cent—a special case because February 1963's contract total was abnormally large: that was the month when the first big apportionment under the Accelerated Public

Works program reached the contract stage. Cumulatively, for the first two months of this year, nonresidential contract value was still 12 per cent lower than it was during the same period in 1963.

Residential building hardly showed any year-to-year change as contract value inched up only 6/10ths of 1 per cent. Apartment contracts were ahead almost 15 per cent, but single-family homebuilding slipped slightly, and nonhousekeeping residential buildings (hotels, motels and dormitories) dropped nearly 60 per cent. The cumulative total of residential construction contracts for January and February was 1 per cent higher this year than it was for the first two months of 1963.

Henry C. F. Arnold, Economist  
F. W. Dodge Company  
A Division of McGraw-Hill, Inc.



Total contracts include residential, nonresidential and non-building contracts

F.W. DODGE CORPORATION



# Estimator's Guide: SAN FRANCISCO BAY AREA

The Estimator's Guide alternates monthly among four Western areas. The prices below are compiled from average quotations received by LeRoy Construction Services for commercial work of approximately \$100,000-\$250,000

total value. Except as otherwise noted, prices are for work installed including all labor, material, taxes, overhead and subcontractors' profit. Material prices include local delivery as noted, but no state or local taxes.

## EXCAVATION

### MACHINE WORK IN COMMON GROUND

Large basement .....	CY	.80-1.10
Small pits .....	CY	1.20-1.90
Trenches .....	CY	1.75-2.50

### HAND WORK IN COMMON GROUND

Large pits & trenches .....	CY	8.00-12.00
Small pits & trimming .....	CY	12.00-16.00
Hard clay or shale, 2 times above rates		
Shoring, bracing & disposal of water not included		

## SEWER PIPE MATERIALS

### VITRIFIED

Standard 4" .....	LF	.33
Standard 6" .....	LF	.63
Standard 8" .....	LF	.90
Standard 12" .....	LF	1.94
Standard 24" .....	LF	7.89

### CLAY DRAIN PIPE

Standard 6" .....	LF	.32
Standard 8" .....	LF	.45

Rate for 100 LF FOB Warehouse

## CONCRETE & AGGREGATES

GRAVEL, all sizes .....	TON	3.75
TOP SAND .....	TON	4.00
CONCRETE MIX .....	TON	4.10

### CRUSHED ROCK

1/4" to 3/4" .....	TON	4.00
3/4" to 1 1/2" .....	TON	4.00
Lightweight Aggregate .....	e.y.	10.75

### ROOFING GRAVEL

SAND (#1 & 2) .....	TON	5.00
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### CEMENT

Common, all brands (paper sacks)		
Small quantities .....	Per Sack	1.40
Large quantities .....	Per Btl	4.45
Atlas White .....	Per Sack	3.80

### CONCRETE MIX

6 sacks in 5-yd loads .....	Per Yd	15.65
Lightweight 105 #c.y. ....	Per Yd	21.25

### CURING COMPOUND

Clear, 5-gal drums .....	Per Gal	1.45
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## STEEL MATERIALS

### SHEETS

Hot rolled .....	LB	.11
Cold rolled .....	LB	.12
Galvanized .....	LB	.12
PLATE .....	LB	.11
STRIPS .....	LB	.13

### STRUCTURAL SHAPES

Hot rolled .....	LB	.11
Cold finished .....	LB	.15
Reinforcing .....	LB	.105

### REINFORCING MESH

6 x 6" #10 x #10 .....	SF	.04
6 x 6" #6 x #6 .....	SF	.07

2000# FOB Warehouse

## STRUCTURAL STEEL

\$340.00 and up per ton erected when out of mill.  
\$370.00 and up per ton erected when out of stock.

## BRICK AND TILE

ALL Prices-FOB Plant

COMMON BRICK		
Common 2 1/2 x 3 3/4 x 8 1/4" .....	M	55.00
Select 2 1/2 x 3 3/4 x 8 1/4" .....	M	62.00
Clinker 2 1/2 x 3 3/4 x 8 1/4" .....	M	60.00
Jumbo 3 1/2 x 3 x 11 1/2" .....	M	95.00

### FACE BRICK

Standard .....	M	75.00- 85.00
Jumbo .....	M	120.00-140.00
Roman .....	M	100.00-120.00
Norman .....	M	100.00-120.00

### BUILDING TILE

8 x 5 1/2 x 12" .....	M	180.00
6 x 5 1/2 x 12" .....	M	140.00

### HOLLOW TILE

12 x 12 x 3" .....	M	165.00
12 x 12 x 4" .....	M	185.00
12 x 12 x 6" .....	M	245.00

### MANTEL FIRE BRICK

2 1/2 x 9 1/2 x 4 1/2" .....	M	180.00
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### GLAZED STRUCTURAL UNITS

2 x 6 x 12" Furring .....	SF	.60
4 x 6 x 12"-1 side .....	SF	.91
6 x 6 x 12"-1 side .....	SF	1.32
4 x 6 x 12"-2 sides .....	SF	1.00
Add For Color .....	SF	.25

## CONCRETE BLOCKS

4 x 8 x 16" .....	EA	.23
6 x 8 x 16" .....	EA	.29
8 x 8 x 16" .....	EA	.34
12 x 8 x 16" .....	EA	.51
Add for color .....	EA	.02

## AGGREGATE

Haydite or Basalite .....		
All sizes in bulk .....	CY	6.80

## BRICKWORK AND MASONRY

### COMMON BRICKWORK, reinforced

8" walls .....	SF	2.90
12" walls .....	SF	4.20

### SELECT COMMON, reinforced

8" walls .....	SF	3.05
12" walls .....	SF	4.35

### CONCRETE BLOCK, reinforced

6" walls .....	SF	1.70
8" walls .....	SF	1.85
12" walls .....	SF	2.30

### BRICK VENEER

4" Select Common .....	SF	1.50
4" Roman .....	SF	2.10
4" Norman .....	SF	2.10
3" Jumbo .....	SF	1.30

## BUILDING PAPERS AND FELTS

### BUILDING PAPER

1 ply per 1,000-ft .....		4.20
2 ply per 1,000-ft .....		6.40
3 ply per 1,000-ft .....		8.75
Sisalcraft, reinforced, 500-ft roll .....		9.50

### SHEATHING PAPERS

Asphalt sheathing, 15-lb 324 SF Roll .....		2.17
30-lb 216 SF Roll .....		2.93
Dampcourse, 216-ft roll .....		3.30

### FELT PAPERS

Deadening felt, 3/4-lb, 50 s.y. Roll .....		3.00
1-lb, 50 s.y. Roll .....		3.50

### ROOFING PAPERS

Standard grade, smooth surface		
432 SF rolls		
Light, 45-lb .....		2.20
Medium, 55-lb .....		2.63
Heavy, 65-lb .....		2.85
Mineral surfaced 216 SF Roll .....		3.50

## LUMBER

### DOUGLAS FIR

Construction .....	2x4-2x10 MBM	96.00-104.00
Standard .....	2x4-2x10 MBM	93.00- 98.00
Utility .....	2x4-2x10 MBM	75.00- 82.00
Economy .....	2x4-2x10 MBM	57.00- 68.00
Clear, air dried .....	MBM	198.00-231.00
Clear, kiln dried .....	MBM	231.00-264.00

### REDWOOD

Foundation grade .....	MBM	135.00-145.00
Construction Heart .....	MBM	120.00-130.00
A Grade .....	MBM	230.00-270.00
Clear Heart .....	MBM	260.00-290.00

### PLYWOOD (DOUGLAS FIR)

1/4" AB .....	MSF	90.00
1/4" AD .....	MSF	70.00
1/4" Ext. waterproof .....	MSF	77.00
3/8" AB .....	MSF	105.00
3/8" AD .....	MSF	95.00
3/8" CD .....	MSF	70.00
1/2" AB .....	MSF	140.00
1/2" AD .....	MSF	120.00
1/2" CD .....	MSF	91.00
3/8" AB .....	MSF	156.00
3/8" AD .....	MSF	136.00
3/8" CD .....	MSF	102.00
3/4" AB .....	MSF	178.00
3/4" AD .....	MSF	158.00
3/4" CD .....	MSF	135.00
3/8" Plyform .....	MSF	170.00

### SHINGLES

Cedar #1 .....	Square	17.00-19.00
Cedar #2 .....	Square	14.00-17.00

### SHAKES

Cedar		
1/2" to 3/4" butt .....	Square	19.00-22.00
3/4" to 1 1/4" butt .....	Square	21.00-24.00
Redwood		
3/4" to 1 1/4" butt .....	Square	21.00-24.00

## INSULATION AND WALL BOARD

FOB Warehouse Per M SF

### FIBER GLASS INSULATION-foil backed

1 1/2" thick .....		40.75
2 1/4" thick .....		48.75
3 5/8" full thick .....		58.75

### SOFTBOARDS-wood fiber

1/2" thick .....		60.00
3/4" thick .....		128.50

### ALUMINUM INSULATION

35# Kraft paper with alum. foil		
1 side only .....		24.00
2 sides .....		30.00

### GYPSPUM WALLBOARD

3/8" thick .....		51.00
1/2" thick .....		62.00
5/8" thick .....		84.00

### HARDBOARDS-wood fiber

1/8" thick, sheathing .....		67.00
3/16" thick, sheathing .....		82.00
1/4" thick, sheathing .....		111.00
1/8" thick, tempered .....		89.00
3/16" thick, tempered .....		120.00
1/4" thick, tempered .....		152.00

### CEMENT ASBESTOS BOARD

1/8" flat sheets .....		145.00
3/16" flat sheets .....		190.00
1/4" flat sheets .....		255.00

## ROUGH CARPENTRY

### FRAMING

Floors .....	BM	24-29
Walls .....	BM	30-35
Ceilings .....	BM	32-40
Roofs .....	BM	27-32
Furring & blocking .....	BM	40-60

Bolted framing, add 50%

### SHEATHING

1 x 8" straight .....	BM	22-28
1 x 8" diagonal .....	BM	25-30
5/16" plysord .....	SF	19-24
3/8" plywood CC .....	SF	27-32

### SIDING

1 x 8" bevel .....	BM	45-50
1 x 4" V-rustic .....	BM	50-60

Bolted framing, add 50%

## DAMP-PROOFING & WATERPROOFING

### MEMBRANE

1 layer 50-lb felt .....	SQ	10.00
4 layers dampcourse .....	SQ	15.00
Hot coat walls .....	SQ	9.00
Tricosal added to concrete .....	CY	1.00
Anti-Hydro added to concrete .....	CY	1.50

## ROOFING

### STANDARD TAR & GRAVEL

4 ply .....	Per Sq	17.00-22.00
5 ply .....		19.50-25.00
White gravel finish-Add .....		2.00- 4.00

Asph. compo. shingles .....		20.00-24.00
Cedar shingles .....		24.00-28.00
Cedar shakes .....		32.00-38.00
Concrete tiles .....		36.00-48.00
Clay tiles .....		42.00-52.00

## SHEET METAL

### ROOF FLASHINGS

18 ga galv steel .....	SF	70-1.10
22 ga galv steel .....	SF	.60-1.00
26 ga galv steel .....	SF	.50- .90
18 ga aluminum .....	SF	1.10-1.60
22 ga aluminum .....	SF	.90-1.40
26 ga aluminum .....	SF	.75-1.15
24 oz copper .....	SF	2.00-2.50
20 oz copper .....	SF	1.80-2.30
16 oz copper .....	SF	1.60-2.10
26 ga galv. steel		
4" OG gutter .....	LF	1.10-1.35
Mitres and Drops .....	EA	2.00-4.00
22 ga galv. louvers .....	SF	2.75-3.75
20 oz copper louvers .....	SF	3.50-5.00

## CHIMNEYS, PATENT

FOB Warehouse

6" .....	LF	1.45
8" .....	LF	2.05
10" .....	LF	2.85
12" .....	LF	3.50

Rates for 10-50 LF



## MILLWORK

### All Prices FOB Mill

D.F., clear, air dried S4S	MBM 220.00-250.00
D.F., kiln dried S4S	MBM 225.00-275.00
<b>DOOR FRAMES &amp; TRIM</b>	
Residential entrance	17.00 & up
Interior room entrance	9.00 & up
<b>DOORS</b>	
1 3/8" hollow core	8.00 & up
1 3/4" solid core	19.00 & up
1 3/8" Birch hollow core	10.00 & up
1 3/4" Birch solid core	22.00 & up
<b>WOOD SASH</b>	
D/H in pairs (2 lts)	SF .55
Casement (1 lt)	SF .65
<b>WOOD CABINETS</b>	
3/4" D.F. plywood with 1/4" plywood backs:	
Wall hung	LF 10.00-15.00
Counter	12.00-17.00
Birch or maple, add 25%	

## FINISH CARPENTRY

<b>EXTERIOR TRIM</b>	
Fascia and molds	BM .48-.55
<b>ENTRANCE DOORS &amp; FRAMES</b>	
Single	60.00 & up
Double	100.00 & up
<b>INTERIOR DOORS &amp; FRAMES</b>	
Singles	36.00 & up
Pocket sliding	46.00 & up
Closet sliding (Pr.)	52.00 & up
<b>WINDOWS</b>	
D/H sash & frames	SF 2.00 & up
Casement sash & frames	SF 2.30 & up
<b>SHELVING</b>	
1 x 12 S4S	BM .30-.50
3/4" plywood	SF .40-.60
<b>STAIRS</b>	
Oak steps D.F. risers	
Under 36" wide	Riser 14.00
Under 60" wide	Riser 19.00
Newels posts and rail extra	
<b>WOOD CASES &amp; CABINETS</b>	
D.F. wall hung	LF 15.50-20.60
D.F. counters	LF 18.50-25.75

## HARDWOOD FLOORING MATERIALS

<b>OAK 5/16" x 2" STRIP</b>	
Clear	M 210.00
Select	M 200.00
#1 Common	M 190.00
<b>OAK 5/16" RANDOM PLANK</b>	
Select & better	M 280.00
#1 Common	M 235.00
<b>OAK 25/32" x 2 1/4" T&amp;G</b>	
Select	M 200.00
#1 Common	M 190.00
<b>MAPLE 25/32" x 2 1/4" T&amp;G</b>	
#1 Grade	M 305.00
#2 Grade	M 280.00
#3 Grade	M 230.00
<b>NAILS—1" FLOOR BRADS</b>	KEG 18.00

## HARDWOOD FLOORS

<b>Select Oak</b>	
Filled, sanded, stained and varnished	
5/16" x 2 1/4" strip	SF .50-.55
5/16" random plank	SF .55-.60
25/32" x 2 1/4" T&G	SF .85-1.00
<b>Maple</b>	
2nd grade & better	
Filled, sanded, stained & varnished	
25/32" x 2 1/2" T&G	SF .90-1.05
<b>Wax finish, add</b>	SF .10

## RESILIENT FLOORING MATERIALS

Linoleum, standard gage	SY 2.65-2.85
Linoleum, battleship	SY 2.95-3.10
1/8" Asphalt tile, dark	SF .10-.11
1/8" Asphalt tile, light	SF .14-.16
1/8" Rubber tile	SF .40-.44
.080 Vinyl tile	SF .55-.65
.080 Vinyl asbestos tile	SF .18-.19
1/8" Vinyl tile	SF .78-.82
4" Base, black	LF .15-.16
4" Base, colored	LF .26-.30
Rubber treads	LF 1.60-2.30
Linoleum paste	GAL .75-.90

## FLOORS

1/8" Asphalt tile, dark colors	SF .23-.28
1/8" Asphalt tile, light colors	SF .25-.30
1/8" Rubber tile	SF .60-.70
.080 Vinyl asbestos tile	SF .35-.40
.080 Vinyl tile	SF .75-.85
Linoleum, standard gage	SY 3.75-4.25
Linoleum, battleship	SY 5.25-5.75
4" Rubber base, black	LF .25-.35
Rubber stair treads	LF 2.25-2.75

## LATH & PLASTER MATERIALS

<b>METAL LATH</b>	
Diamond 3.4# copper-bearing	SY .49
Ribbed 3.4# copper-bearing	SY .53
<b>ROCK LATH</b>	
3/8" thick	SY .36
<b>METAL</b>	
3/4" Standard channel	LF .038
1 1/2" Standard channel	LF .053
3 1/4" Steel studs	LF .088
4" Steel studs	LF .098
Stud shoes	EA .03
<b>PLASTER</b>	
Browning, hardwall	Sack 1.58
Finish, hardwall	Sack 1.75
Stucco	Sack 2.50

## LATH & PLASTER WORK

<b>CHANNEL FURRING</b>	
Suspended ceilings	SY 2.80-3.05
Walls	SY 2.90-3.25
<b>METAL STUD PARTITIONS</b>	
3 1/4" studs	SY 3.00-3.35
4" studs	SY 3.20-3.50
Over 10-0 high, add	SY .25-.35
<b>3.4# METAL LATH &amp; PLASTER</b>	
Ceilings	SY 4.20-4.95
Walls	SY 4.25-5.05
Keene's cement finish, add	SY .45-.65
<b>ROCK LATH PLASTER</b>	
Ceilings	SY 3.20-3.70
Walls	SY 3.30-3.80
<b>WIRE MESH &amp; 7/8" STUCCO</b>	
Walls	SY 4.60-5.80
<b>STUCCO ON CONCRETE</b>	
Walls	SY 3.30-3.80
Metal accessories	LF .25-.55

## TILE MATERIALS

<b>CERAMIC TILE</b>	
4 1/4" x 4 1/4" glazed	SF .72
4 1/4" x 4 1/4" hard glazed	SF .74
Random, unglazed	SF .72
6" x 2" cap	EA .19
6" cove base	EA .31
1/4" round bead	LF .18
<b>QUARRY TILE</b>	
6 x 6 x 1/2" red	SF .51
6 x 6 x 3/4" red	SF .53
9 x 9 x 3/4" red	SF .65
6 x 6" cove base	EA .23

## TILE & TERRAZZO WORK

<b>CERAMIC TILE, stock colors</b>	
Floors	SF 1.90-2.30
Walls	SF 2.00-2.50
Cove base	LF 1.10-1.35
<b>QUARRY TILE</b>	
6" x 6" x 1/2" floors	SF 1.80-2.20
9" x 9" x 3/4" floors	SF 1.95-2.40
<b>TERRAZZO</b>	
Terrazzo floors	SF 2.15-2.65
Cond. Terrazzo floors	SF 2.30-2.80
Precast treads & risers	LF 3.60-4.60
Precast landing slabs	SF 3.00-4.10

## WINDOWS

<b>STEEL SASH</b>	
Under 10 SF	SF 2.50 & up
Under 15 SF	SF 2.00 & up
Under 20 SF	SF 1.50 & up
Under 30 SF	SF 1.00 & up
<b>ALUMINUM SASH</b>	
Under 10 SF	SF 2.75 & up
Under 15 SF	SF 2.25 & up
Under 20 SF	SF 1.75 & up
Under 30 SF	SF 1.25 & up
<b>Above rates are for standard sections and stock sizes, FOB Warehouse</b>	

## GLASS—CUT TO SIZE

<b>FOB Warehouse</b>	
SSB Clear, aver 4 SF	SF .17
DSB Clear, aver 7 SF	SF .28
Crystal, aver 16 SF	SF .35
1/4" Polished plate, aver 50 SF	SF .90
1/8" Obscure, aver 7 SF	SF .35
1/8" Ribbed, aver 7 SF	SF .45
1/8" Rough, aver 7 SF	SF .45
1/4" Wire plate, clear, aver 40 SF	SF 1.90
1/4" Wire plate, rough, aver 40 SF	SF .90
1/8" Heat absorbing, aver 7 SF	SF .90
1/4" Tempered plate, aver 40 SF	SF 3.60
1/2" Tempered plate, aver 40 SF	SF 6.40
<b>GLASS BLOCKS</b>	
6"	.70
8"	1.15
12"	3.10

## GLASS & GLAZING

SSB Clear	SF .55
DSB Clear	SF .80
Crystal	SF .95
1/4" Plate	SF 2.00
1/8" Obscure	SF .80
1/8" Heat absorbing	SF 1.35
1/4" Tempered plate	SF 4.75
1/2" Tempered plate	SF 9.00
1/4" Wire plate, clear	SF 2.90
1/4" Wire plate, rough	SF 1.50

## PAINT MATERIALS

### All prices FOB Warehouse

Thinners 5-100 gal	Gal .63
Turpentine 5-100 gal	Gal 1.59
Linseed oil, raw	Gal 2.36
Linseed oil, boiled	Gal 2.43
Primer-sealer	Gal 3.12
Enamel undercoaters	Gal 5.54
Enamel	Gal 5.58
White lead in oil	LB .36
Red lead in oil	LB .36
Litharge	LB .32

## PAINTING

<b>EXTERIOR</b>	
Stucco wash, 1 coat	SY .48
2 coats	SY .80
Lead & Oil, 2 coats	SY 1.10
3 coats	SY 1.60
<b>INTERIOR</b>	
Primer-sealer	SY .45
Wall paint, 1 coat	SY .54
2 coats	SY .98
Enamel, 1 coat	SY .65
2 coats	SY 1.14
Doors & trim	EA 14.00
Sash & trim	EA 16.00
Base & molds	LF .18
<b>Old work, add 15-30%</b>	

## VENETIAN BLINDS

<b>RESIDENTIAL</b>	SF .45 & up
<b>COMMERCIAL</b>	SF .55 & up
<b>VERTICAL</b>	SF 1.25 & up

## PLUMBING

Lavatories	EA 200.00-250.00
Toilets	EA 250.00-310.00
Bath tubes	EA 270.00-370.00
Stall shower	EA 150.00-200.00
Sinks	EA 180.00-240.00
Laundry trays	EA 120.00-180.00
Water heaters	EA 115.00-350.00
<b>Prices based on average residential and commercial work. Special fixtures and excessive piping not included.</b>	

## HEATING

### Furnaces, Gas Fired, Av Job

<b>FLOOR</b>	
25,000 BTU	120.00-140.00
35,000 BTU	128.00-150.00
45,000 BTU	145.00-165.00
Automatic control, add	27.00- 37.00
<b>DUAL WALL</b>	
25,000 BTU	136.00-160.00
35,000 BTU	147.00-170.00
50,000 BTU	174.00-195.00
Automatic control, add	43.00- 55.00
<b>GRAVITY</b>	
75,000 BTU	420.00-510.00
85,000 BTU	450.00-530.00
95,000 BTU	500.00-650.00
Forced air furnace, add	85.00-150.00
Automatic control, add	20.00- 30.00
<b>HEAT REGISTERS</b>	
Outlet	13.00- 28.00

## ELECTRIC WIRING

### Per Outlet

Knob & Tube	EA 11.00
Armor	EA 18.00
Conduit	EA 23.00
110-V Circuit	EA 29.00
220-V Circuit	EA 108.00

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Slow speed apartment house elevator including doors and trim about \$4,000 per floor.



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For more data, circle 22 on Inquiry Card ➤



## The Balance of Set and Suction...

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THE CATALYST  
HERE**

**SO ALL  
YOU DO IS  
PUT ON THE PLASTER!**



# PABCOAT 'CATALYZED' LATH

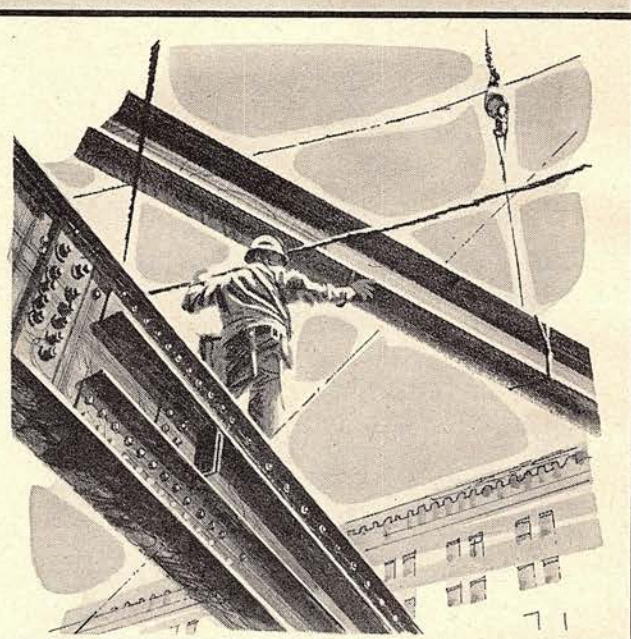
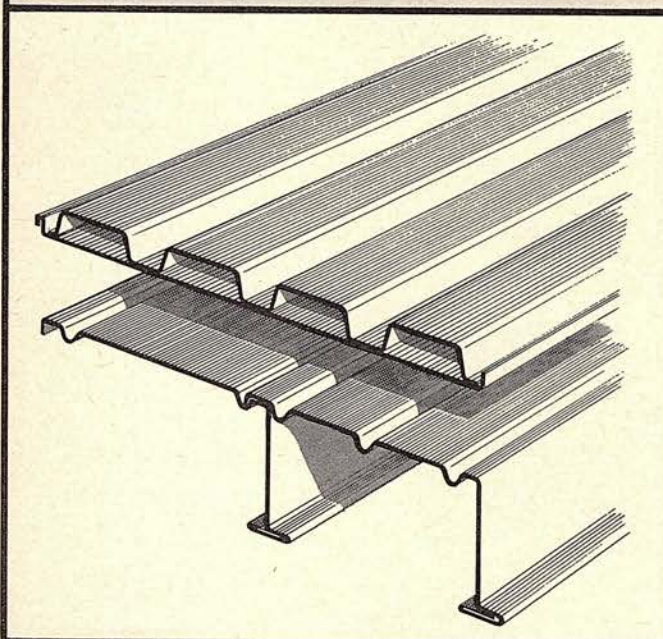
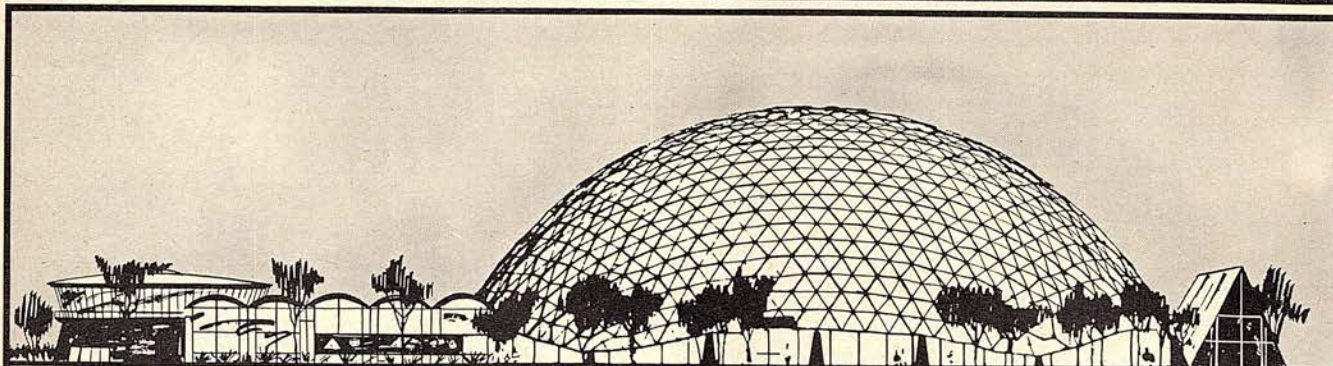
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PABCO



## Mark of Mahon—COMPETENCE



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That's Mahon-West. An operation of products, facilities, and services to serve Western construction with *competence*. It is a self-sufficient and going organization that can serve you well in many architectural areas.

Mahon-West is number 1 in the design, manufacture and erection of geodesic-dome structures for a wide range of building applications—schools, banks, theatres, offices, etc. Here is a *competence* that can be found nowhere else.

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both specifically developed, with *competence*, for Western-area building.

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mum efficiency for the building's specific use. FOOD SERVICE EQUIPMENT — planned to provide greater accuracy and versatility in food preparation, and allow faster service with minimum cost. FULL CAPACITY WIRING — only a building built to all-electric standards has the overall electrical capacity to meet power requirements of modern business and industry.

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San Jose, California

Architects-Engineers  
Office of Architecture  
and Construction,  
State of California

General Contractor  
E. A. Hathaway and Co.  
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## Precast parking for 2074 cars

\$1,019 per car... California's state architects and engineers designed this 5-level garage for 2,074 cars with a contract bid of \$2,113,406. Basalt's precast, prestressed members were employed; skillful stall spacing, traffic circulation layout and floor-to-floor access provided one of the most economical garage projects ever! Basalt supplied 1,671 prestressed joists (57 ft. span) and 544 girders (12 ft., 16 ft. and 32 ft.) all plant-cast with Basalite lightweight expanded shale aggregate concrete and trucked to the jobsite. Basalite lightweight aggregate concrete was used for cast-in-place decks, columns and span-drel beams.

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## ARCHITECTS, DESIGNERS TO ADMINISTER NEW ACT

Appointments to the California State Board of Architectural Examiners and to the new Qualifications Committee, established by the new practice act passed by the last legislature, have been completed. The Board was increased by two architects and two designers: Albert Dreyfuss of Sacra-

mento and Germano Milono of San Francisco are the new architect members; Robert Sherman of San Mateo and William O. Brock of Van Nuys are the new designer members.

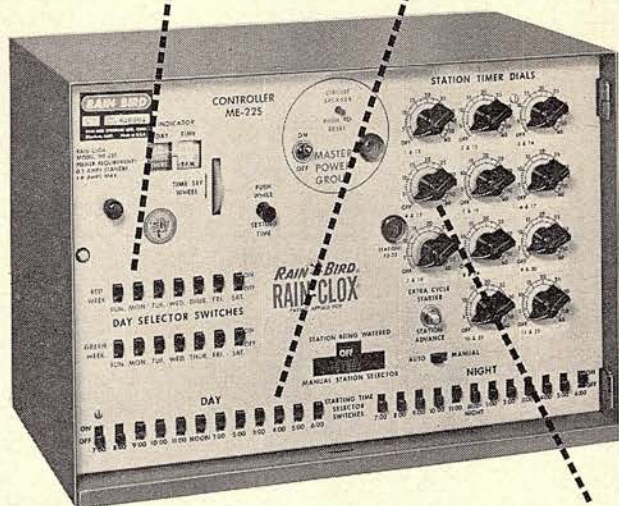
In addition, architect Worley Wong of San Francisco and public member Sydney S. Brody of Beverly Hills have been reappointed.

The newly established Qualifications Committee, authorized to "hold hearings, interview and interrogate

applicants and to require them to provide such information as is necessary to its functions," certifies those applicants it finds qualified to the Board of Examiners which can then register them as building designers. After September 1, 1964, anyone engaging in building design must be registered, and only those who have had five years' experience (as defined by the act), prior to the enactment of the act, may apply. Eight years' experience as a principal in a building design office may be offered to the Committee as application for registration—without some portions of the architectural examination, if the Committee chooses to so recommend—as an architect. (The structural portion of the examination is required, however.) Registered building designers who wish to apply for registration as architects must do so before January 1, 1972.

Some 190 applications had been received by the Board early in April. Three architects and three designers comprise the Qualifications Committee. Architect members are Wm. Stephen Allen of San Francisco, Allen Y. Lew of Fresno and Robert Platt of San Diego. Designer members are Thomas Shoemaker of Newport Beach, Edward Hageman of San Rafael and Oscar Werner of Los Angeles. After 1967 committee members will serve for three-year terms. Until then, terms will be of one, two and three year duration.

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for exactly 20 minutes**

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Rain Bird's Rain-Clox has been proven in all types of landscaping installations. Your Rain Bird supplier has complete information for you on Rain-Clox as well as Rain Bird's wide range of sprinklers. Or you may write for catalog S-64.

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## OREGON ARCHITECTS

### WIN DESIGN HONORS

Four firms have been honored for excellence in design by the Portland Chapter, A.I.A., in its annual honor awards program. They are Wilmsen, Endicott & Unthank of Eugene and Portland, for the U. S. National Bank of Portland branch at Madras, Ore.; Blair and Zaik of Portland, for the Arvid Orbeck house in Portland; Skidmore, Owings & Merrill of Portland for Lloyd Plaza; and Witt and Englund, also of Portland, for the Grant Park Clinic in Portland.

Judges in the program were Dean Walter Creese of the University of Oregon's School of Architecture; and architects Robert B. Price of Tacoma and John Morse of Seattle.





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48 db SOUND RATED  
GYPSUM WALL  
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- Final estimates for contract negotiation or bid checking.
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## Contracts based on Bills of Quantities

- Preliminary estimates and cost control.
- Preparation of complete Bills of Quantities on which lump sum contracts are based.
- Checking low bid for mathematical error.
- Valuations for progress payments.
- Valuation of change orders and final account.
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## Advantages

- Reliable cost control is necessary on most projects.
- Bills of Quantities as the basis of a contract eliminate risk of take off errors for all contractors and subcontractors and reduce estimating overhead.
- Savings, by effective cost control and reduced bidding overhead, more than offset surveying fees.

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## COURT OKAYS BUNKER HILL PLAN

After nearly five years of legal debate, the \$350 million Bunker Hill redevelopment project in Los Angeles has been cleared for action. The State Supreme Court upheld the validity of the plan proposed for the project which envisions using the 136-acre site for high-rise commercial and residential buildings. Five property owners had brought the suit, contesting the right of the city's redevelopment agency to redevelop what had been a primarily residential neighborhood.

Although the decision of the State court could be carried to the U. S. Supreme Court, Community Redevelopment Agency officials indicated there is some doubt that any federal issue would be involved.

The agency recently received proposals for development of the first parcel of land to be put up for sale.

## LIMITED COMPETITION FOR NEW ART CENTER

The new Arts Center for the University of California's Berkeley campus will be designed by an architect chosen from among those invited to participate in a limited architectural competition, the university's regents have announced. No more than eight architects—whose names have not yet been released—will be invited to take part in the program.

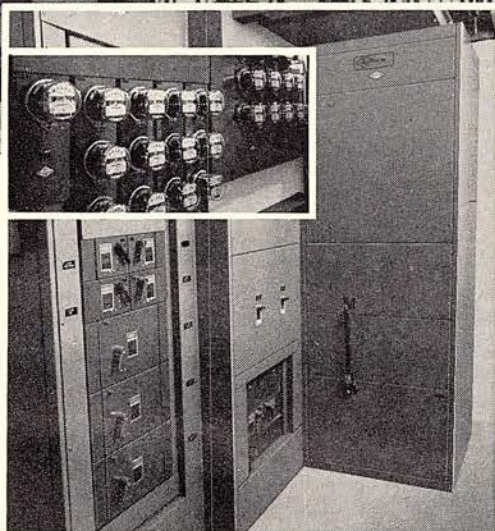
The competition will be conducted under the rules of the American Institute of Architects, with Elbridge T. Spencer, F.A.I.A., as professional adviser.

The center is to consist of a major art gallery, a 300-seat drama workshop auditorium with a "flexible, neutral" stage, a conference suite, music rehearsal rooms and an art studio. The building, to be financed by student incidental fees, endowment funds and private donations, is to be finished by 1968 when the university celebrates its centennial.

APOLOGIES TO: Robert M. Wilder, structural engineer of Pasadena, California, whose name was inadvertently misspelled in the March WESTERN SECTION, page 32-4. Mr. Wilder was the structural engineer on the Pacific Telephone and Telegraph Microwave Tower in Los Angeles.



Architect—Broleman & Rapp  
Electrical Engineer—C. Wm. Matten  
Electrical Contractor—American Elcon, Inc.  
General Contractor—Arnold Construction Co.



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This Zinsco installation will be as modern as it is today in 1974, in 1984, and at the turn of the century. Because Zinsco modular design permits replacement of any component with the latest "model" whenever required. And Zinsco—creator of many important "firsts" in electrical distribution equipment—can be counted on for continued leadership in design and engineering. Call Zinsco for electrical control equipment that is ultra-modern—and will always be.



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## COMMISSION NAMED TO STUDY ALCATRAZ USE

Three Californians have been named by President Johnson to the commission on the disposition of Alcatraz Island which was authorized last year by the late President Kennedy. They are Lieut. Gov. Glenn Anderson, Senator J. Eugene McAtteer and San Francisco attorney, James F. Thacher.

Two other members of the commission are yet to be named, by the President of the Senate and the Speaker of the House of Representatives.

The Commission is to report to the President on what it feels will be the best possible use of the Island. Numerous suggestions, including some by members of the Northern California chapter, A.I.A., have been made.

A federal appraisal places the value of Alcatraz' 12 acres at \$2.1 million, the House of Representatives' Government Operations Committee reports. The land itself is valued at \$178,000. The buildings are worth almost \$2 million even in their deteriorated state—at least that is the evaluation placed on them by the U.S. Bureau of Prisons.

## NEUTRA TALKS OF "BIOLOGICAL REALISM"

"Functional, what is functional?" said Richard Neutra at a press interview in San Francisco recently just before addressing the National Home Fashions League. "In nature there is no such thing as utility alone, beauty alone."

Speaking of "biological realism," he used a powerful contrast: the nest and the maternity ward in a hospital.

Birds place their nests in just the right fork of a tree branch, he said, considering the height from the ground for safety from animals and the relation to winds. Human babies come into a hostile environment of too-bright lights, air filled with medicinal odors—enough to make him cry. The bird's nest involves "pre-human biological planning," an instinctive bio-realistic architecture. But to achieve the same bio-realism in the maternity ward would take "much research," he said.

His new word is "psychotopos" and it describes what home should be: psycho, soul, and topos, the Greek word for place. Thus a place to hang your soul.

## Calendar of Western Events

- May 14-15: "Public Opinion and the Building of Cities," seminar for communications media sponsored by California Council, A.I.A., and San Jose State College Department of Journalism and Advertising, Press Club, San Francisco
- May 26-28: First national convention, Consulting Engineers Association of America, Brown Palace Hotel, Denver
- June 4-5: "Creativity and the Patent Process in Engineering," seminar represented by University of California Engineering and Sciences Extension, University of California Extension Center, 55 Laguna Street, San Francisco
- June 11-21: Los Angeles Home Show and Building Exposition, Los Angeles Sports Arena
- June 21-27: "Design '64: Directions and Dilemmas," International Design Conference, Aspen, Colo. More information from Box 1247, Aspen.
- June 24-26: Joint Automatic Control Conference, Stanford University, Stanford, Calif.

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Most Complete array of STOCK and  
CUSTOM designs

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### Index To Advertising

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a Architectural File (green)  
ic Industrial Construction (blue)  
lc Light Construction (yellow)  
Page numbers of manufacturers' advertising elsewhere in this issue shown in italics

Angeles Metal Trim Co. . . . .	32-14
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A-LC Dura-Vent Corp. . . . .	32-9
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Western advertising offices; LOS ANGELES, Robert L. Clark, 1125 West 6th Street; SAN FRANCISCO, Tom Tredwell, 255 California Street.

For more data, circle 29 on Inquiry Card



People have  
waited  
for elevators  
long enough.  
Now  
an elevator  
that waits  
for people



Mark IV

People in 160 buildings across the country are discovering the pleasure of pressing a button and *ding!* the elevator's there. Reason: Mark IV's don't waste time on needless trips to the top or bottom. They wait in between... nearer to you. And give up to 30.6% faster service than the most efficient elevator system before Mark IV. And Mark IV Elevators can be kept as efficient as the day they were installed with skilled Westinghouse maintenance.

**You can be sure if it's Westinghouse**





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ROTATION of 180 degrees with just 8 inches of hand movement.

NO METAL-TO-METAL CONTACT; Carriers of resilient, silent Delrin.

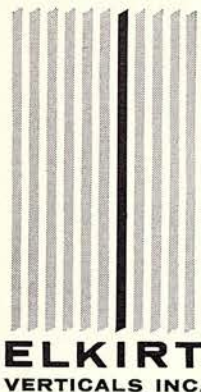
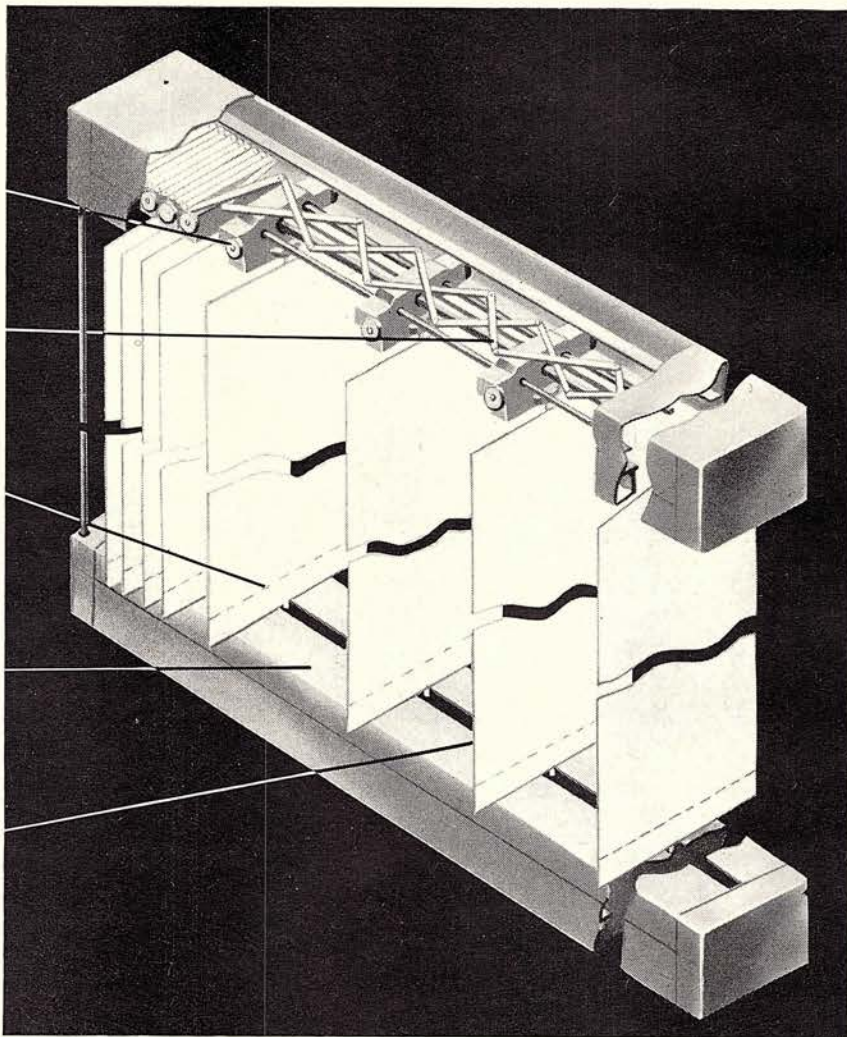
SPACING by a true pantograph system automatically gives even spacing.

NEW LOUVER SPRINGS outside the channel provide minimum light gap with constant, uniform tension — quick, fool-proof installation.

SNAP-ON TRIM eases installation and access to working parts . . . results in attractive Channel with only  $\frac{1}{4}$  inch carrier gap.

VERSATILITY in choice of louver sizes in fabrics, metals and plastics is almost limitless.

TRAVERSES with no more effort than the average free hanging drape (*pounds of pull are almost identical*).



Take a good look at Elkirt's basic re-design of traversing verticals. It's a combination of imaginative engineering and devotion to quality which underlines Elkirt's continuing leadership in traversing and non-traversing verticals.

Elkirt traversing verticals now give the architect new dimensions in control of light, climate and design . . . with the important assurance of trouble-free, low-maintenance, "people-proof" functional beauty.

Principal Offices: Chicago, Dallas, New York, San Francisco.

Write to: Elkirt Verticals, Inc., P. O. Box 284, Des Moines, Iowa 50301 for Catalog.

*Refer to Sweet's Catalog 18 d-EL*

*Almost As Important As The Window Itself!*

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SMOOTH GREEN      SMOOTH CORAL      SMOOTH GRAY



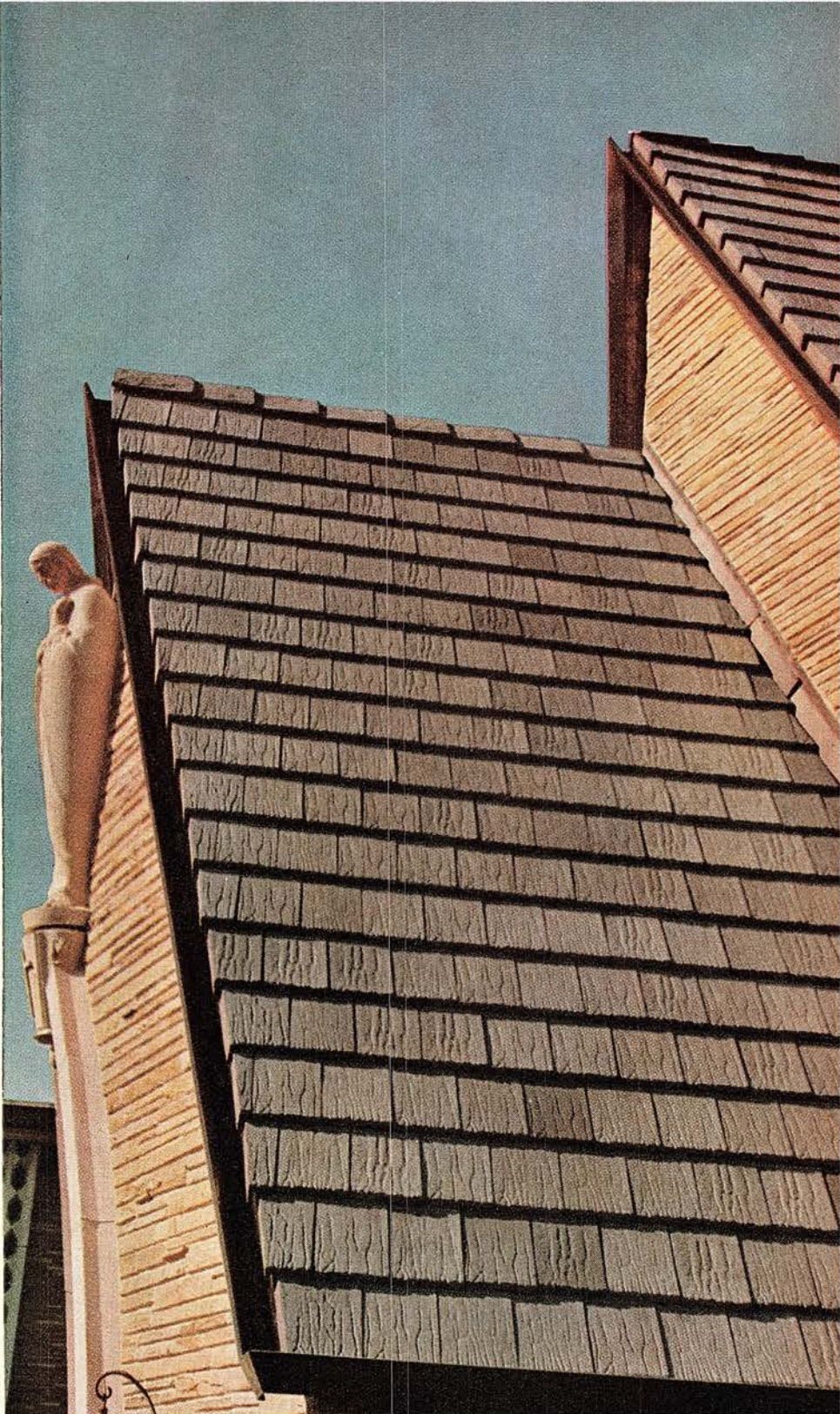
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BLUE GLAZE ON DESIGNER PATTERN      YELLOW GLAZE ON SPANISH PATTERN      GREEN GLAZE ON DESIGNER PATTERN



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

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7909 Big Bend  
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Dial Operator  
ZENith-0779

**WEST COAST REPRESENTATIVES:** International Pipe and Ceramics Corp., Los Angeles, California

**LUDOWICI-CELADON CO. 75 EAST WACKER DRIVE • CHICAGO 1, ILL. • RAndolph 6-6740**

*Manufacturers of quarry tile, the nation's largest producer of roofing tile and NAILON Facing Brick*  
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A monthly roundup of reports on new books  
of special interest to architects and engineers

### Architecture As American History

IMAGES OF AMERICAN LIVING. *By Alan Gowans.* J. B. Lippincott Company, 521 Fifth Ave., New York. 498 pp. illus., \$16.50

"Architecture and furniture" in Dr. Gowans' opinion "are history in their most tangible form" and to understand them fully it is necessary to grasp "the broad patterns in their over-all historical development; for it is as they express the evolution of civilization as a whole that they are most significant."

The significance of American architecture and furniture is the subject of this book. By means of perceptive analysis and excellently chosen illustrations, Dr. Gowans traces the development of American architecture and furniture through four centuries, showing how the different periods and styles relate to the progress and growth of America as a nation.

The 17th century, with its strong medieval English, French and Dutch influences, reflects the culture of the early settlers from Europe; the "classical mind" of the 18th century gives expression to "those principles of precision, self containment and measured control of environment which were at once vehicles for and expressions of the urge for unity which transformed scattered colonies and provinces into united states."

Dr. Gowans gives a fascinating treatment of the long Victorian period, during which America grew from a nation of "Arcadian simplicity to cosmopolitan world power," and the succeeding early modern movement, the development of the "anti-Victorian" International Style in the 1920's and 1930's, and the postwar period, which finally marks the emergence of America from a position of isolationism to leadership of the Western world.

This discursive treatment of American cultural history is both stimulating and original. It seems particularly relevant at the present time, when the progress of American civilization is of such vital interest to the rest of the world, and when the impact of American architecture is being felt internationally.

### Japan

THE JAPANESE INFLUENCE IN AMERICA. *By Clay Lancaster.* Walton H. Rawls, Twayne Publishers, Inc., 31 Union Square West, New York 3. 282 pp., illus. \$17.50.

This volume first explores the early Japanese contacts with the foreign world, the influence of the Far East on Europe from the 13th through the 19th century, the Japanese imprint on Europe in the late 19th and early 20th centuries, and the beginnings of American relations with Japan, and

### This Month's Books

#### REVIEWS

Merrill Folsom, *Great American Mansions and Their Stories* . . . 66

Alan Gowans, *Images of American Living* . . . 44

Clay Lancaster, *The Japanese Influence in America* . . . 44

James Morris, *Cities* . . . 78

Stewart L. Udall, *The Quiet Crisis* . . . 53

Lewis E. Weeks and John R. Griffith, *Progressive Patient Care, An Anthology* . . . 78

Doreen Yarwood, *The Architecture of England* . . . 44

A. Zbionski and L. Tyszynski, *Dictionary of Architecture & Building Trades in Four Languages* . . . 90

BOOKS RECEIVED . . . 90

TECHNICAL BOOKS . . . 254

then offers a detailed account of the impact of Japanese ideas and art forms upon our country following the Philadelphia Centennial of 1876.

The earliest examples of Japanese architecture are cited and the Japanese manifestations at the Columbian Exposition, 1893, the California Midwinter International exposition, 1894, the Louisiana Purchase Exposition, 1903, and the Saint Louis Fair, 1903, are discussed extensively. A chapter is devoted to the Japanese influence upon the Chicago School. Japanese contributions to the development of the bungalow are discussed and—not least—attention is given to the Japanese influence upon contemporary structures. Architecture assumes the role of importance but gardens and landscaping as well as fine arts, applied arts and interior decoration are also considered. The book is beautifully illustrated with 216 photographs, reprints and plans.

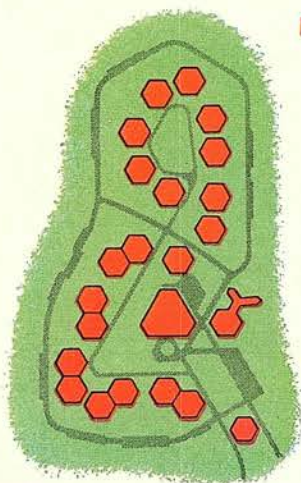
### English Architecture

THE ARCHITECTURE OF ENGLAND. *By Doreen Yarwood.* B. T. Batsford Ltd., London, and G. P. Putnam's Sons, 200 Madison Ave., New York. 672 pp., illus. \$20.

A comprehensive coverage of English architecture from prehistoric times to the present day has been attempted by Miss Yarwood in this recent

*continued on page 53*





**Owner:**  
State of New Jersey, Department of Institutions & Agencies  
**Structural Engineers:**  
Severud-Elstad-Krueger & Associates  
**Mechanical & Electrical Engineers:**  
Vogelbach & Baumann  
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## Therapy through architectural design

This is Woodbridge State School, in Middlesex County, New Jersey, designed by Vincent Kling FAIA, in association with Diehl & Stein AIA.

It is a large institution, providing treatment and training for about 1,000 mentally retarded resident patients. But it does not have the usual institutional character; it was designed as a pleasantly landscaped campus of relatively small, low-profile buildings, placed unobtrusively on a 65-acre site.

By achieving a residential atmosphere, the architecture itself makes an important contribution to therapy.

All but one of forty-some structures are framed with structural steel.

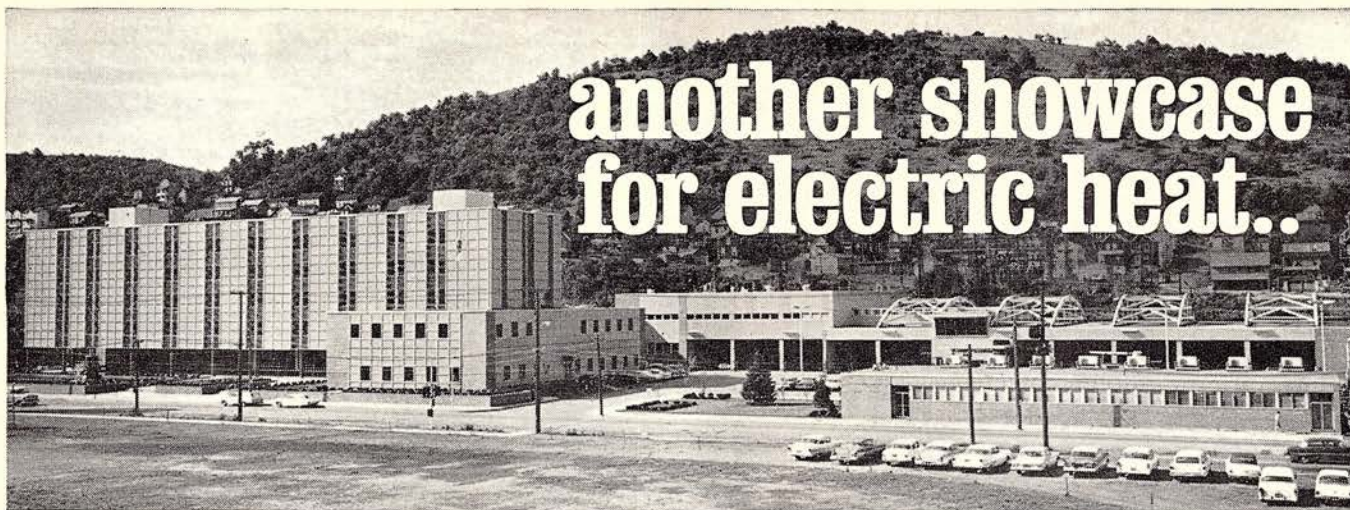
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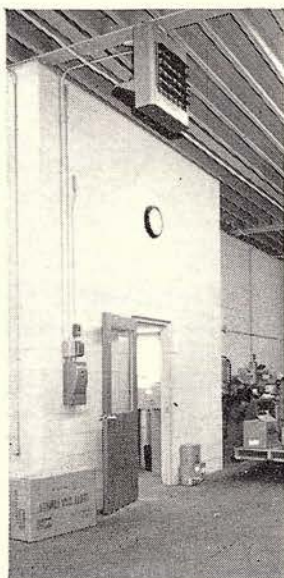
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Down-Flow Wall Heaters keep corridors and stairways warm.



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Line stores area has 15 KW Suspension Heaters.



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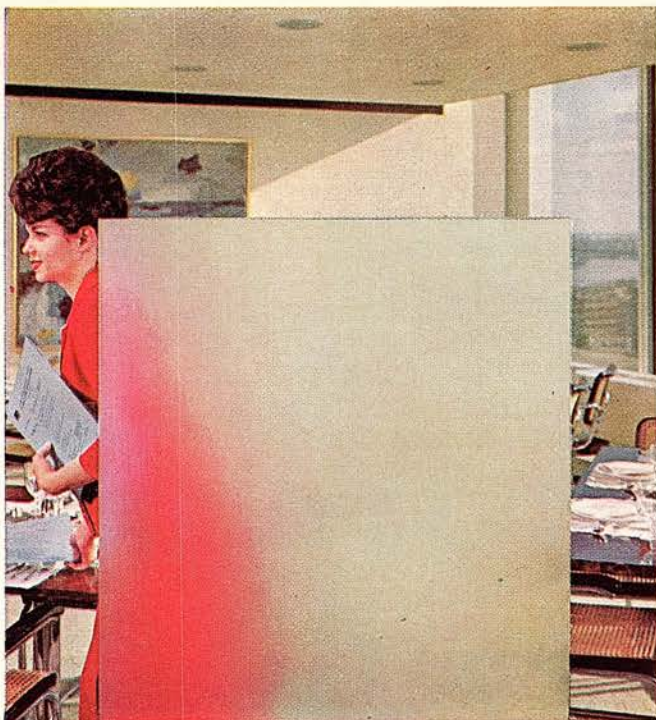
Write for additional information on the complete line of Electromode heaters for home, industry and farm.

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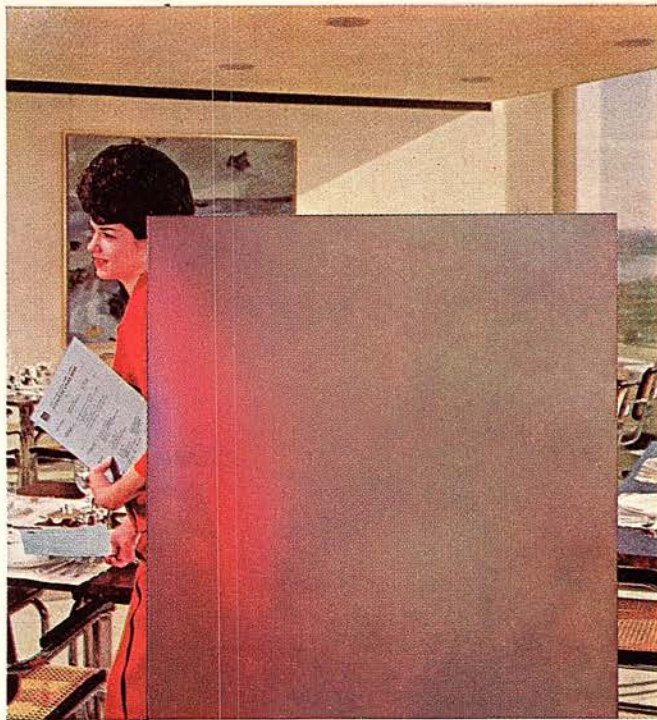
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Rough Grey Plate

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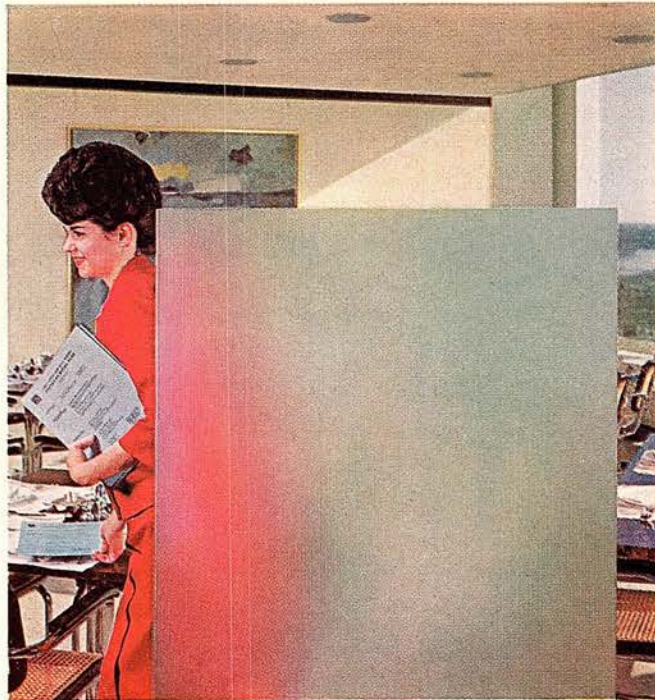
**Libbey·Owens·Ford**

Toledo, Ohio

Rough Bronze Plate



Rough Heat Absorbing Plate



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*Hahn Store, Washington, D.C. Edmund W. Dreyfuss & Associates, architects. Standard Art Marble & Tile Co., contractor. For this enlarged and modernized store the architect created a distinctive white facade by specifying the repetitive use of CV Durathin Design No. CVD-13X. Wherever a deeper relief is desired as in this instance, the CV Durathin Design can be reproduced in thicknesses up to 1½" Unit size is 17¾" x 23¾" which assures utmost economy as well as impressiveness.*



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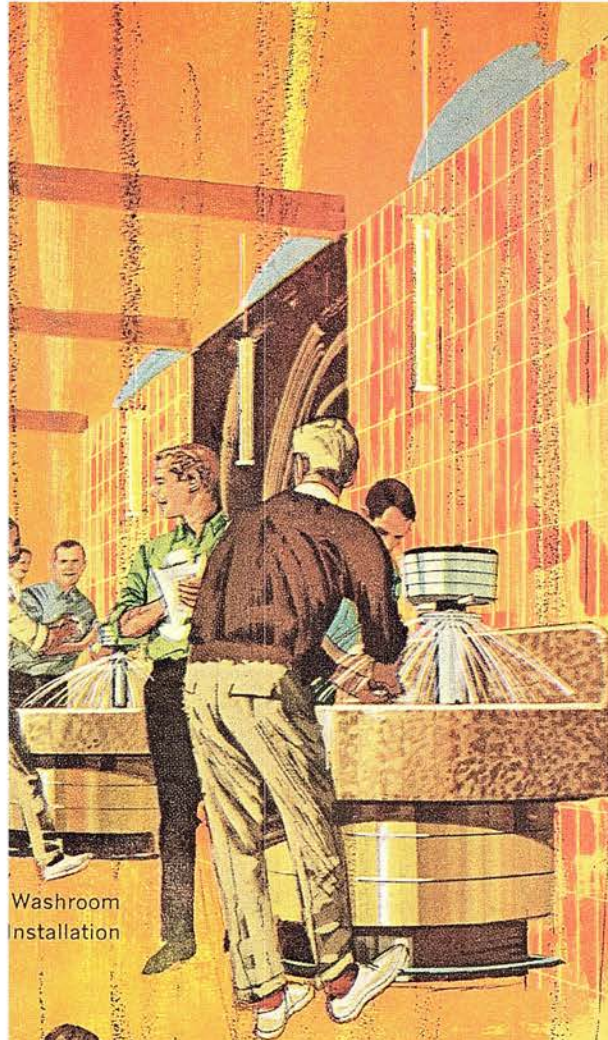
FEDERAL  
SEABOARD  
TERRA COTTA  
CORPORATION

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



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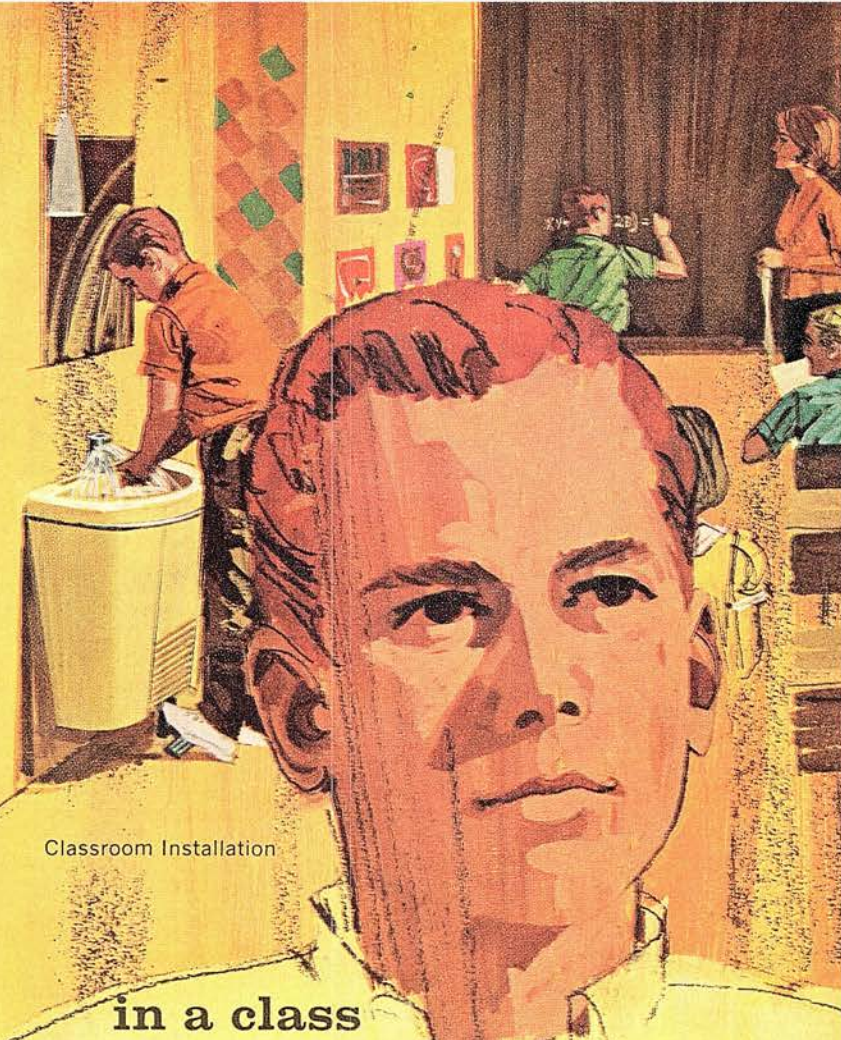




Washroom  
Installation



Corridor  
Installation



Classroom Installation

in a class  
by themselves  
throughout modern schools

## BRADLEY WASHFOUNTAINS

Remember when Bradley Washfountains were specified only for school shop rooms? Today's creative architects outmoded such thinking long ago, and now utilize colorful, functional Washfountains *throughout* modern schools: in corridors, washrooms, classrooms, cafeterias, science and art rooms, as well as shop rooms.

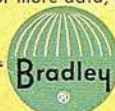
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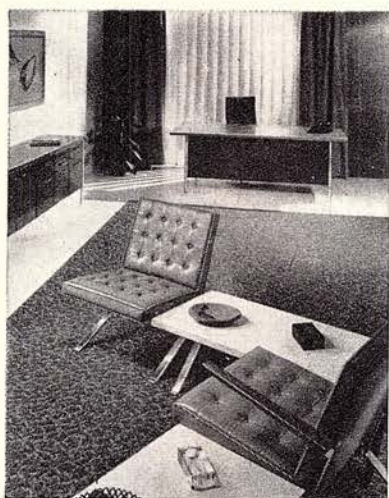
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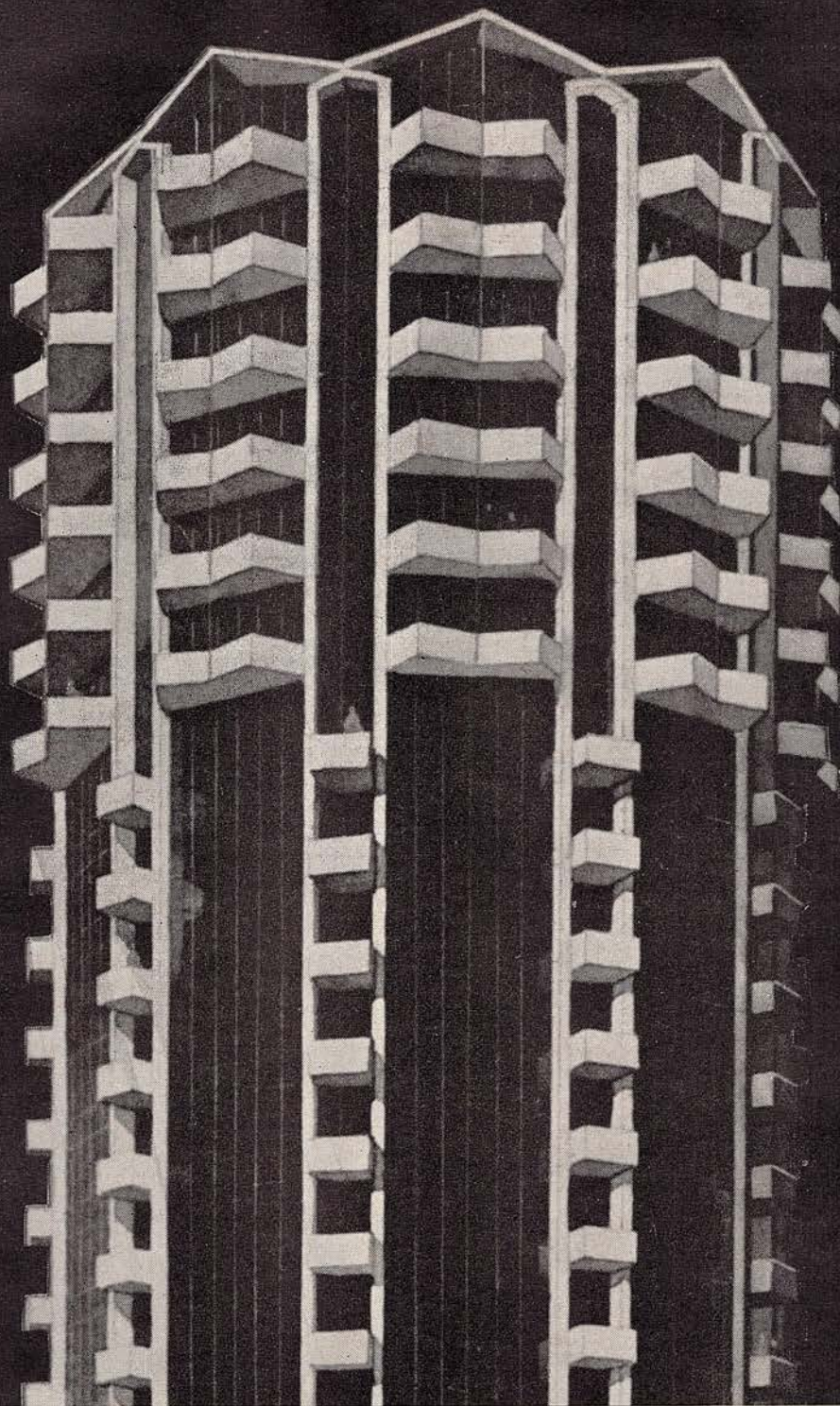


MILANO Chairs, Benches, Ottomans, Tables. The new choice of the contemporary world, from

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**For heating and cooling      Gas is good business!**



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## Required Reading

*continued from page 44*

Batsford publication. Starting with the caves and huts of the Paleolithic and Neolithic ages and ending with Sir Robert Matthew's recently completed New Zealand House in London, Miss Yarwood has traced architectural development in England through the intervening centuries. To undertake such a task in the space of one volume, however large, is possibly a questionable activity, and it is legitimate to ask whether a fair picture of a country's architecture can emerge from a study in which the amount of space devoted to individual architects and buildings is necessarily so small. One must also consider whether a work of this kind has added anything to the existing literature on the subject.

A one-volume history of English architecture seems to have two possible functions. It can serve as a compact and valuable reference work, and it can also be so presented that in spite of the limitations imposed by space, it stimulates the reader to an

independent pursuit of the subject in greater depth. Miss Yarwood's work appears to have more of the former than the latter virtue. Her material is accurate, clearly set out and illustrated with excellent photographs and original line drawings. The modern section is a much needed addition to standard English architectural histories; Banister Fletcher does not go much beyond the mid-fifties. If some would quarrel with her selection of representative buildings and leading architects (Llewelyn-Davies and Weeks and Denys Lasdun are relegated to half a paragraph headed "other architects") Miss Yarwood's treatment of the postwar period is the most comprehensive and balanced account yet included in a history of English architecture.

Accurate and informative as it is, the book is unfortunately written in a rather flat, and at times somewhat pedestrian style. Miss Yarwood's writing has none of the charm of a Summerson, nor the enthusiasm of a Pevsner, which might inspire the reader to look further and probe more deeply into the philosophy of architectural development in England.

## Conservation

**THE QUIET CRISIS.** By Stewart L. Udall. Holt, Rinehart and Winston, Inc., 383 Madison Ave., New York 17. 209 pp., illus. \$5.00.

A concern over an "appalling record of national apathy and land misuse" led U. S. Secretary of the Interior Stewart Udall to write on our nation's relationship between man and land. His summary of the "quiet conservation crisis" of the 1960's reads: "America today stands poised on a pinnacle of vanishing beauty, of increasing ugliness, of shrinking open space, and of an over-all environment that is diminished daily by pollution and noise and blight." In effect, Secretary Udall hopes to evoke a new awakening of concern for our land, a new land ethic to counter the conservation problems that have arisen since World War II.

The book reports on the contributions of such men as Henry Thoreau, George Perkins Marsh, John Muir, Frederick Law Olmsted, Gifford Pinchot and the two Roosevelts. Of particular interest is Mr. Udall's con-

*continued on page 66*

Wittenberg University  
Student Center & Dining Hall  
Springfield, Ohio  
Lethly, Schreiber & Associates,  
Springfield, Ohio; Archt.  
E. M. Redington & Associates,  
Springfield, Ohio; Contr.

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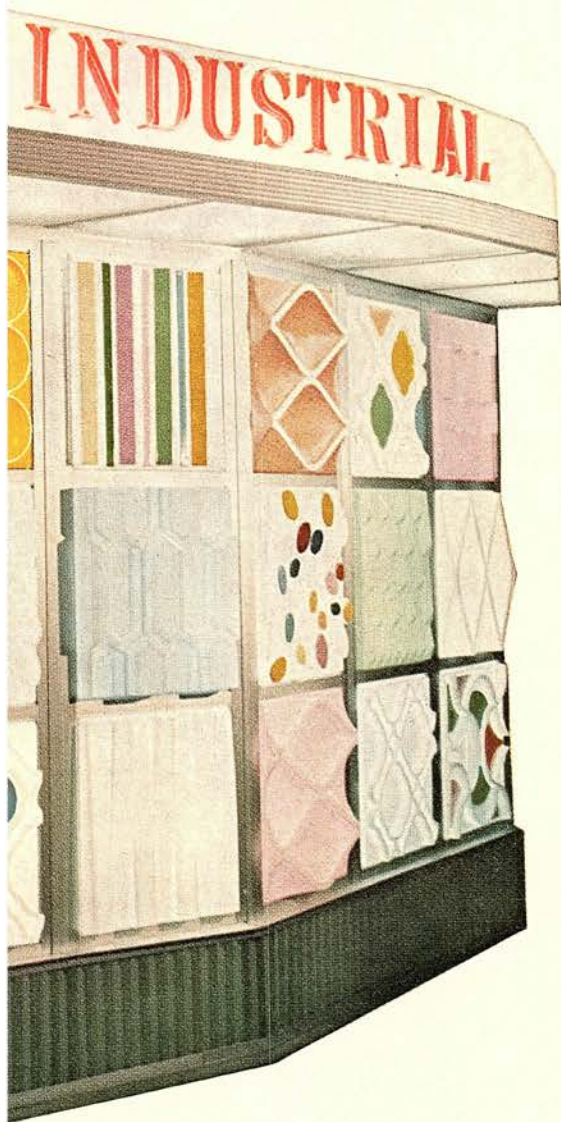
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Architects: Bachman  
and Bertram,  
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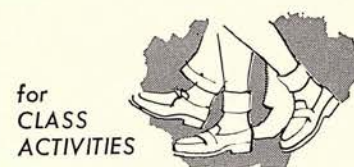
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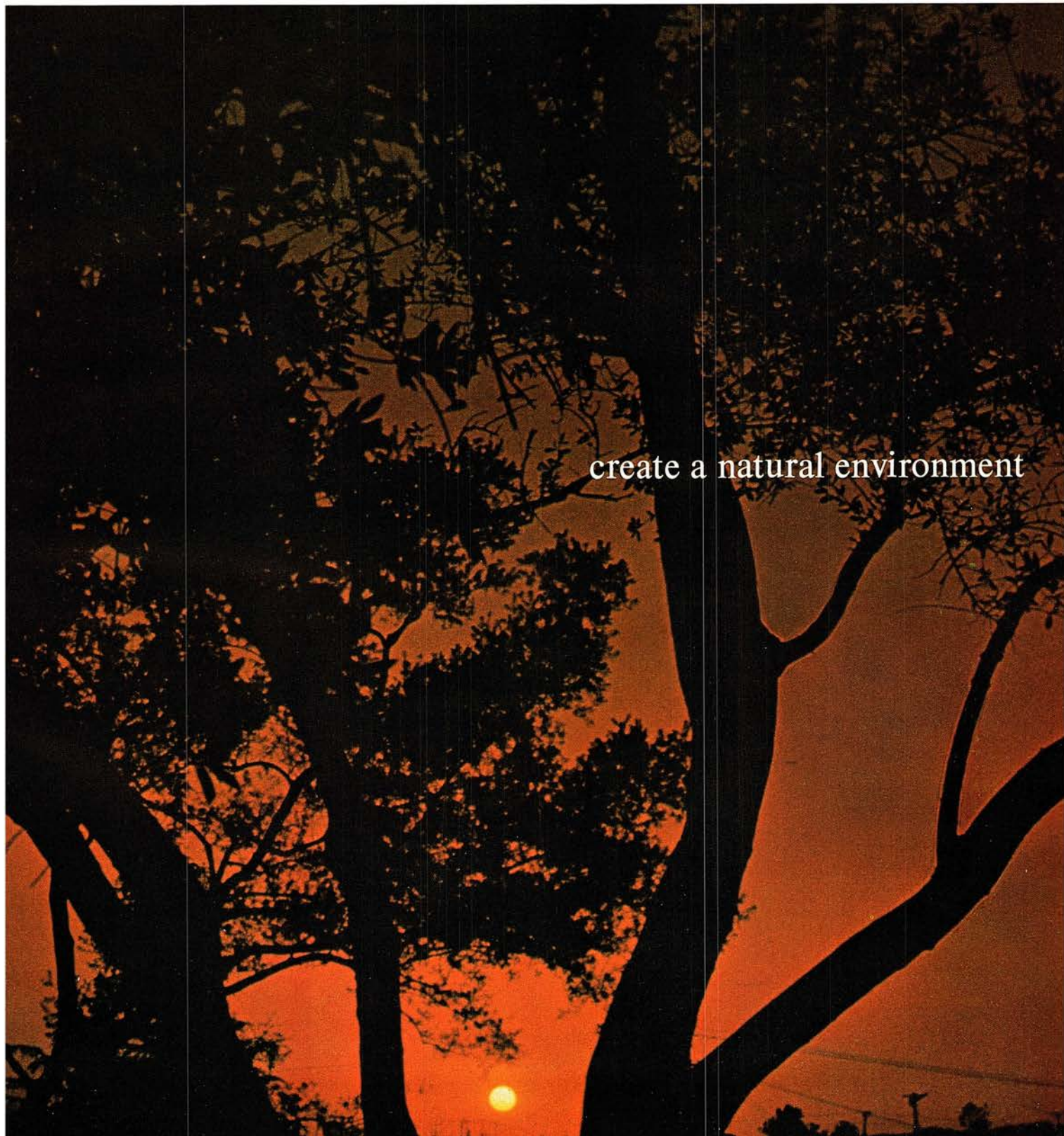
For more data, circle 42 on Inquiry Card

For more data, circle 43 on Inquiry Card ➔



inspiration: infinite range of nature's balanced environments  
translation: a series of flexible indoor planning ideas from  
**Sunbeam Lighting Company**

create a natural environment





## new systematic approach to an institutional environment

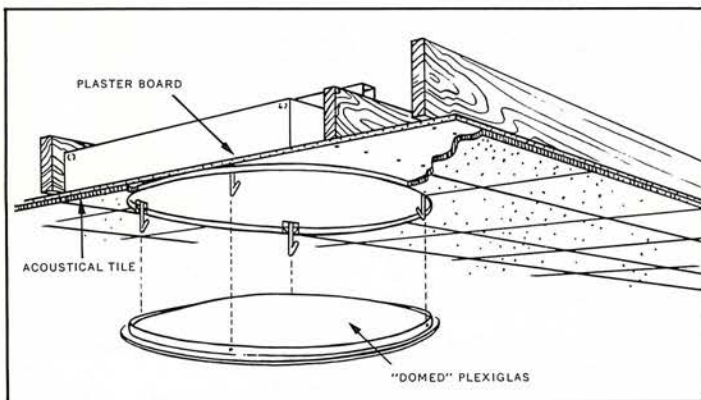


Sunbeam Lighting's VISIONAIRE-5 air-handling luminaires light bank.

Dynamic changes have taken place in banking; and the new look of the structures that house financial institutions has more than kept pace with these changes. Yesteryear's conservative and sedate atmosphere has given way to an environment as progressive as contemporary methods of financing.

The interior design of institutional buildings has given birth to many new lighting effects. But equally important is the need to provide an efficient environment for employees and complete comfort for customers. A number of ceiling system "packages" currently available combine lighting with acoustics, air diffusion and lighting... or even all three. However, these "packages" seldom optimize the quality of components in all categories; and they leave the designer little freedom to create a variety of effects within the "package" parameters.

On the other hand, take a look on the opposite page at what can be done with the *systematic approach* from Sunbeam Lighting Company.



Shallow circular recessed luminaires have square shaped enclosures.

For the main ceiling system that lights and air conditions a two-story area, the designer has chosen four-foot square recessed luminaires surrounded by MODU-FLO linear air distribution channels. These channels are the primary component of a new air distribution/suspended channel ceiling system from Sunbeam Lighting. Used in the manner illustrated, it permits a random arrangement of fixtures that makes possible an unlimited range of ceiling effects. Because of its powerful and controllable air distribution capability, it supplies sufficient air for the entire area. Return air into the plenum is handled through aluminum grid structures around the pillars.

For the mezzanine offices, Sunbeam Lighting's VISIONAIRE-5 air handling fixtures have been selected. These units are designed to give optimum lighting performance while being used in conjunction with an air diffuser. Each fixture will accommodate diffusers for supply air, return air — or both.

Having met the basic environmental requirements, the designer was free to create an unusual esthetic lighting effect in the area below the mezzanine. To do this he selected Sunbeam's shallow recessed circular luminaires in three sizes, with "domed" Plexiglas diffusers placed in a random pattern.

A flexible ceiling system used in a novel manner; a combination of lighting and air diffusion components; a dramatic use of a lighting fixture designed for special effects. All from one responsible source that understands the need for balanced environmental control, design freedom and product flexibility. That is why the *systematic approach* from Sunbeam Lighting offers exciting new dimensions to the environmental planner. We have a new brochure that illustrates and explains this approach with other good ideas. May we send you a copy? SUNBEAM LIGHTING COMPANY

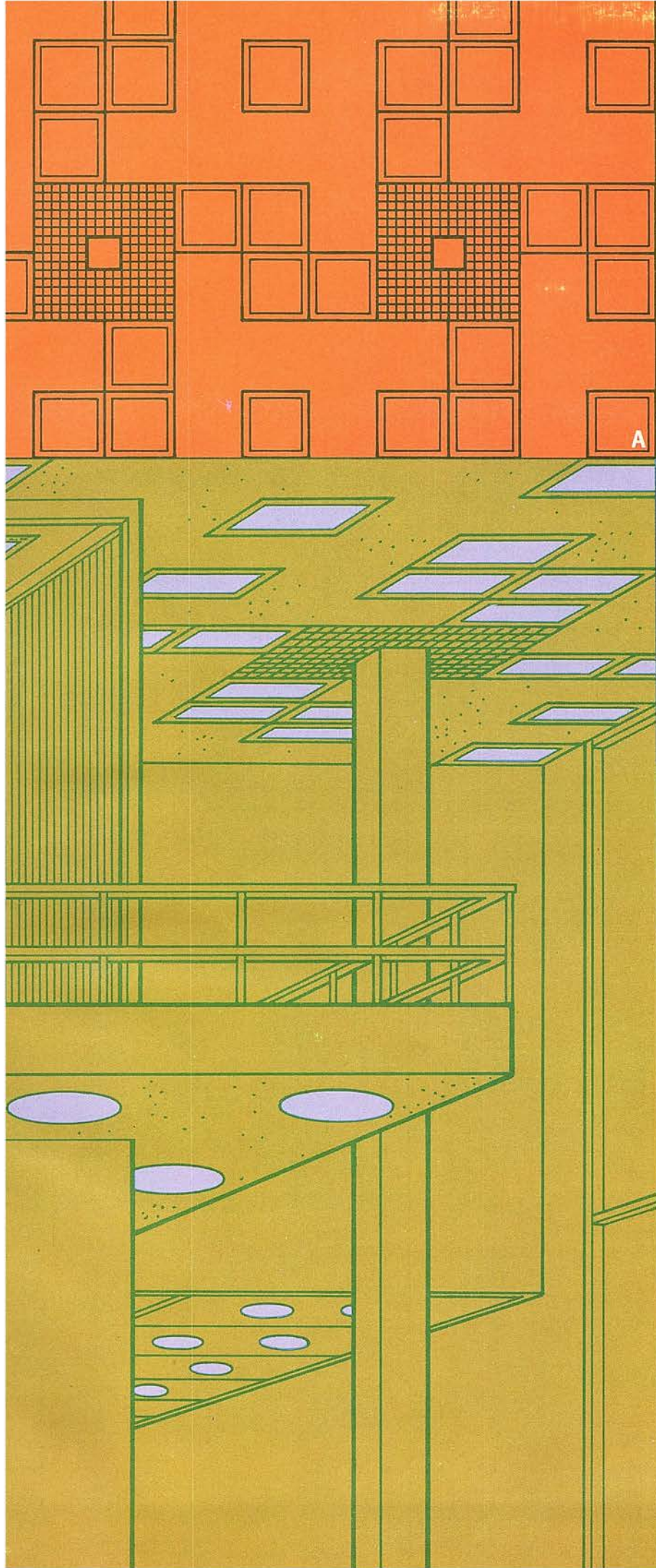
**A** Ceiling plan shows arrangement of luminaires surrounded by MODU-FLO in random design pattern.

**B** Arrangement of four-foot square recessed luminaire surrounded by MODU-FLO bars, as used in bank ceiling, is detailed in this drawing.

**C** Sunbeam Lighting's VISIONAIRE-5 air-handling luminaire can accommodate supply air, return air — or both; are compatible with many diffusers.

**D** Maximum air volumes are provided at low duct pressures by the MODU-FLO air distribution system. This "Throw Chart" shows the system's full adequacy to air condition a large reception or bank lobby area.



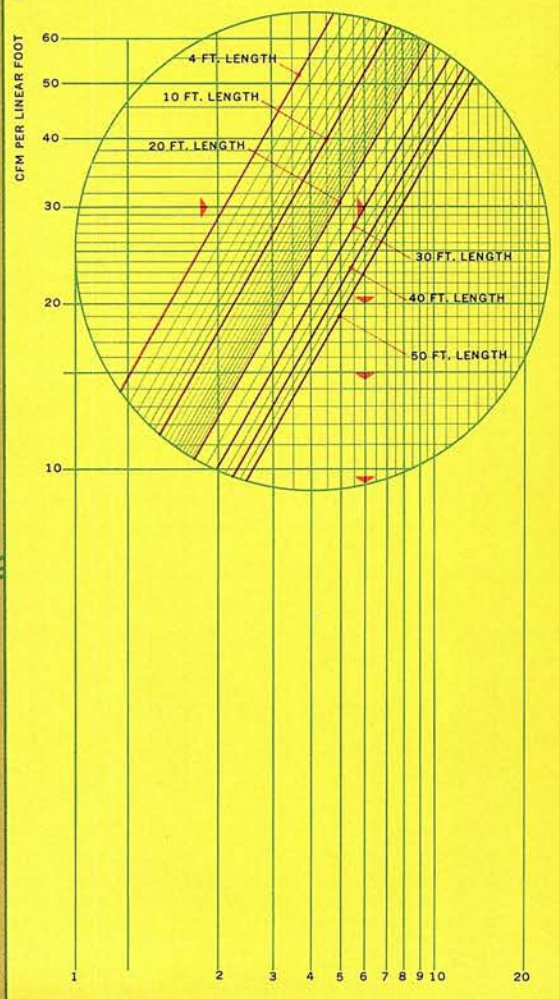
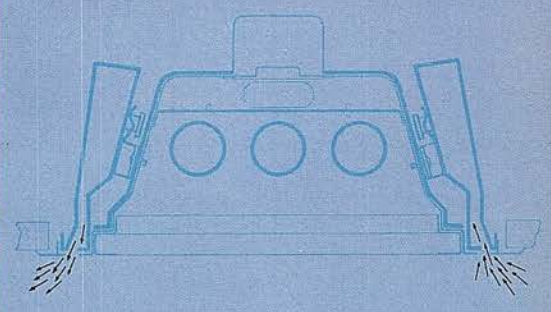
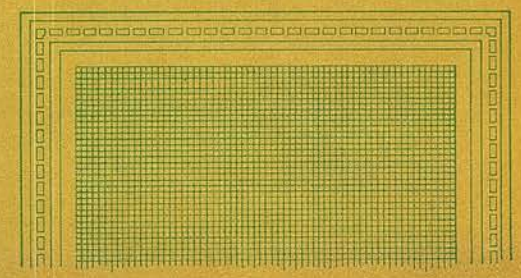
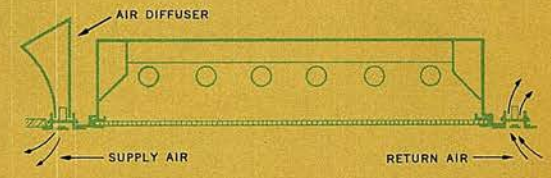


A

B

C

D



THROW IN FEET TERMINAL VELOCITY = 100 FPM



# the systematic approach from Sunbeam Lighting Company

IT OFFERS PRACTICAL — AND PRACTICALLY UNLIMITED SOLUTIONS TO THE NEED FOR BALANCED INDOOR ENVIRONMENT.

ONE RESPONSIBLE SOURCE THAT OFFERS YOU TESTED CONCEPTS, COMPATIBLE COMPONENTS, PROVED PRODUCTS AND TRUE UNDERSTANDING OF THE BALANCED ENVIRONMENT:

## Sunbeam Lighting Company

777 East 14th Place, Los Angeles, California 90021 / Gary, Indiana

Light, heat, space and sound — they constitute the ingredients of human comfort and efficiency. Today's environmental planner recognizes their individual importance as well as their complex relationships, and knows that neither lighting, nor air diffusion nor acoustical control can be optimized independently. The result: *integrated planning for balanced environment* — and a host of new systems, sub-systems, components, and products to meet the new requirements.

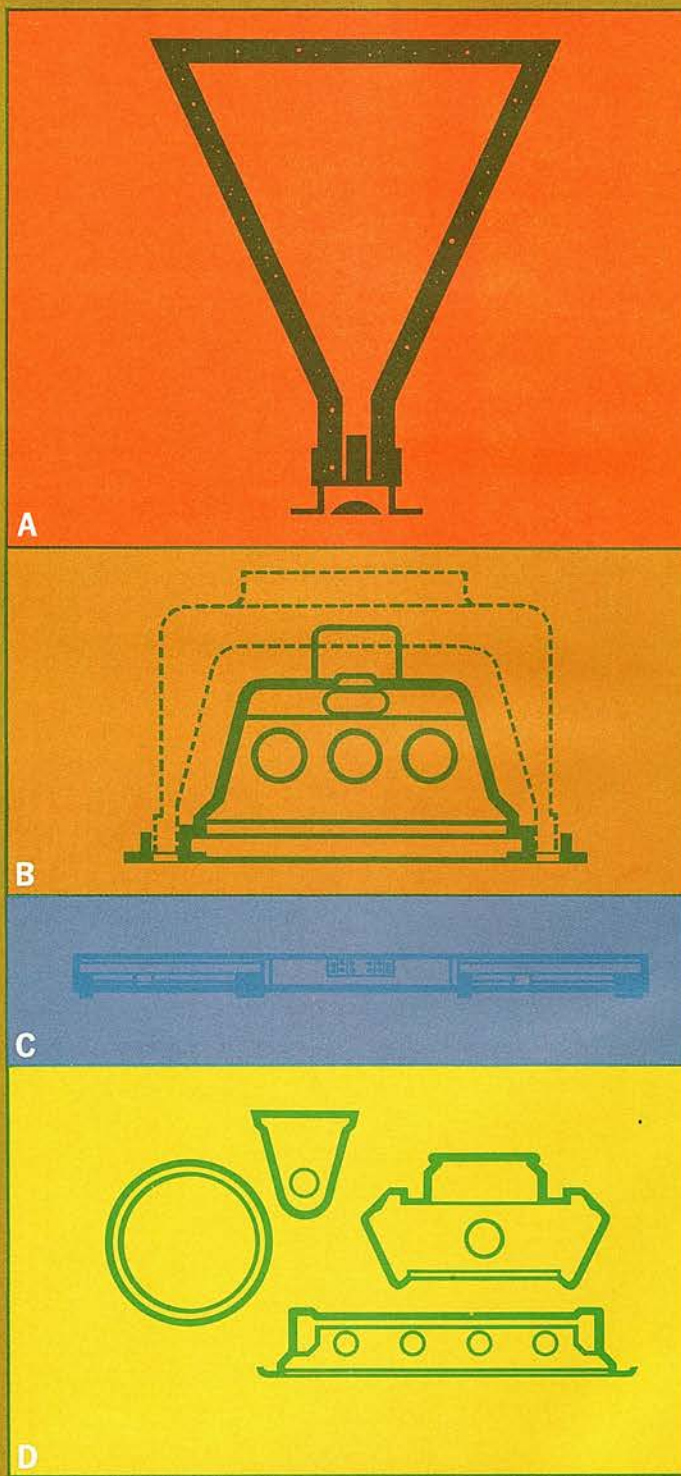
There are some who purport to offer "ultimate" or "total" answers to balanced interior environment. Sunbeam Lighting makes no such claims. To play our role, we added experts in air distribution and ceiling systems to our staff of illumination engineers. Today, after years of effort and planning, Sunbeam Lighting offers a *new approach to environment planning* made up of these ingredients:

**A. The most flexible air distribution suspended ceiling channel system.** Its name is MODU-FLO. Its channel constitutes a creative construction element that makes possible the integration of major interior functions. Pre-fabricated duct carries air to the conditioned space. Directional air control is provided by adjustable vanes in the channels. Lighting fixtures and acoustical tile are supported by the channels, which can also support sound-proof demountable partitions. Most important: MODU-FLO's flexibility allows for a broad variety of forms and effects with an equally broad range of lighting components.

**B. Top performance air/light fixtures that let you select and vary air diffusion for modular requirements.** The name of this flexible line of air-light fixtures is VISIONAIRE-5. They offer optimum lighting performance while being used in conjunction with an air diffuser. They are compatible with a variety of air diffusers when installed. They are also available with the new "heat exchanger" feature, which removes fixture heat to reduce the cost of air conditioning and improve lighting efficiency. VISIONAIRE-5 fixtures can be combined with MODU-FLO systems and other Sunbeam Lighting products to offer new dimensions in environmental planning.

**C. A broad range of specific systems and products for "Special purpose" environments.** Example: Sunbeam Lighting's CENTRON-10 concept to meet the total illumination and service requirements of the patient room in hospitals. This single slim console includes general room illumination, reading light, examination lighting instrument, night light. It integrates major bedside services — from nurse's call system to oxygen/vacuum outlets. Other Sunbeam Lighting products for special purposes include the SIGHTLINE system for classroom and engineering area illumination, a new system of modular lighting components with remote ballast that can be installed in rows or patterns of endless variety and which can take 15,000 lumen lamps for higher levels of uniform illumination, a series of "domed" circular fixtures for skylight effects, even fully gasketed luminaires for kitchen and utility area.

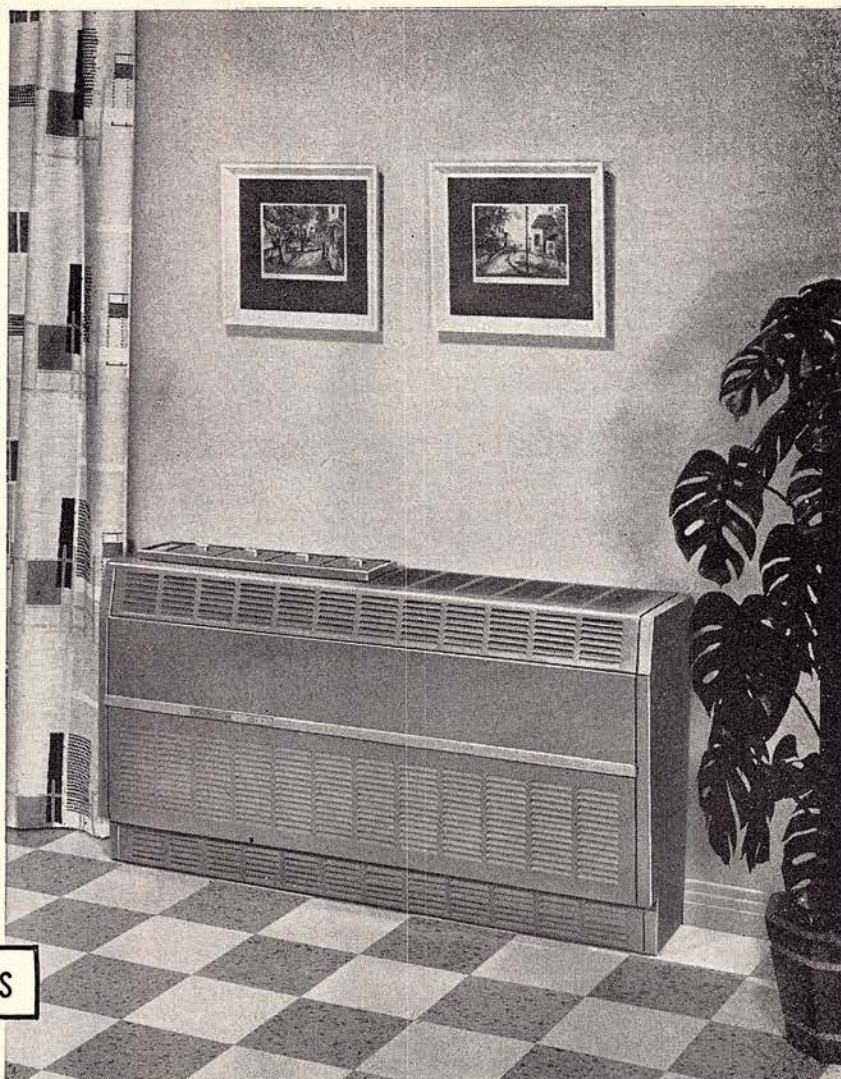
**D. The broadest selection of high quality luminaires with a vast range of light control mediums.** While the fluorescent lighting fixture has moved from its place of an independent product to a component in environmental planning, it remains one of the most flexible tools in achieving a broad range of esthetic effects as well as meeting general illumination and special purpose seeing task needs. Sunbeam Lighting continues to offer the most extensive range of lighting fixtures, compactly styled to please the architect and to meet the electrical engineer's specific illumination requirements. Again, these products are fully compatible with a variety of ceiling structures.





# THRU THE WALL HEATING AND COOLING!

**TEMCO SEASONS**  
ZONED WEATHER CONDITIONER



## For More Profitable Add-On Rooms

The first and only combination gas wall furnace-electric air conditioner . . . with flush exterior grill! Uses only outside air in sealed combustion chamber — exhausts outside. Installs in simple wall sleeve . . . fits nicely under windows . . . is fully automatic . . . has 5 cool and heat selector buttons . . . is tremendously versatile.

**IDEAL FOR APARTMENTS.** Tenants pay their own utility bills—and no ducts to carry sound!

**OFFICE SAVINGS** are great. No flues, pipes, chillers, towers—and no need for a permanent building engineer. Each office sets temperature for their own comfort.

**MOTELS** save the cost of central equipment—and the space to house it. Flush exterior grills eliminate hazards, enhance motel appearance.

**RESTAURANTS** can very profitably use two or more units—and switch from hot to cool as room temperature rises with body temperature.



4-Seasons Division, Temco, Inc.  
Dept. AR, 4101 Charlotte Ave., Nashville, Tenn.  
Send For Full Details Today!

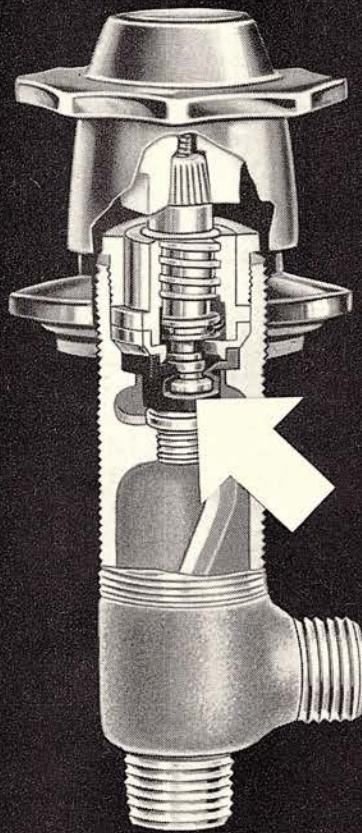
NAME \_\_\_\_\_  
FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**TEMCO<sup>®</sup>, Inc.**

For more data, circle 55 on Inquiry Card



# FOUR MAGIC WORDS:



## NO WASHERS TO CHANGE

Here's a sight rarely seen. It's the Aquaseal® cartridge valve, designed for American-Standard Heritage\* Line fittings for tubs and showers, lavatories and sinks. No one ever has to remove Aquaseal from a faucet to change a washer because there is no washer to change. It's engineered to give years of no-leak, no-drip service without attention. ■ Women recognize the superlative styling of the top-quality Heritage Line in lifetime solid brass. But nothing sways them and their husbands like the words: No washers to change! The Heritage Line is for clients who want maintenance-free operation. Ask your American-Standard representative for more information, or write American-Standard, Plumbing and Heating Division, 40 West 40th Street, New York, N.Y. 10018

\*TRADEMARK OF ARSS CORP.



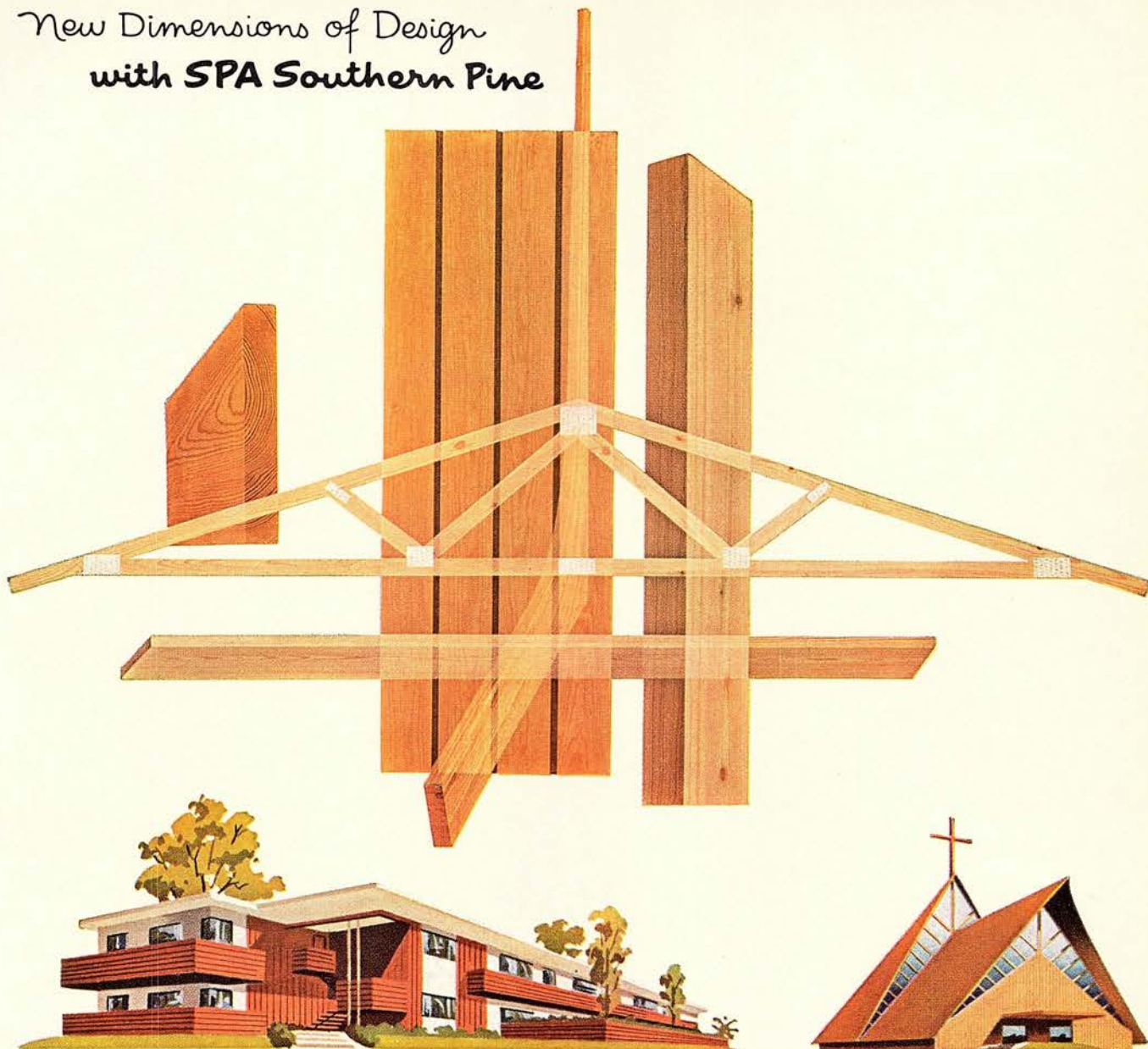
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**AMERICAN-Standard**  
PLUMBING AND HEATING DIVISION

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New Dimensions of Design  
with **SPA Southern Pine**



Today there must be no stop to imagination, no hampering of ideas. SPA Southern Pine anticipates the quest for new designs, new products for apartments, churches, restaurants, shops, every type of building.

\*SPA Southern Pine is ideal for complex laminated members . . . component or conventional framing . . . exposed plank and beam interiors . . . exquisite paneling and trim. And always Southern Pine matches beauty with durability, blends charm with efficiency and

economy. Through rigid standards of manufacturing and grading, through proper seasoning, you are assured:

**Uniform Sizes • Dimensional Stability • Pleasing Texture  
High Resistance to Wear • Exceptional Strength • Maximum  
Ability to Hold Fastenings • All Purpose Grading—No Need  
for Special Grading for Trusses**

SPA technical consultants are available to discuss specifications and uses. For their services write us.

*Send for free copy of "New Dimensions of Design" with color illustrations and descriptions of new techniques for many forms of building. Address: Southern Pine Association, AR-5, Box 52468, New Orleans, La. 70150*

\*Trade-Marked and officially Grade-Marked



# SOUTHERN PINE

***Pre-Shrunk for greatest structural strength***

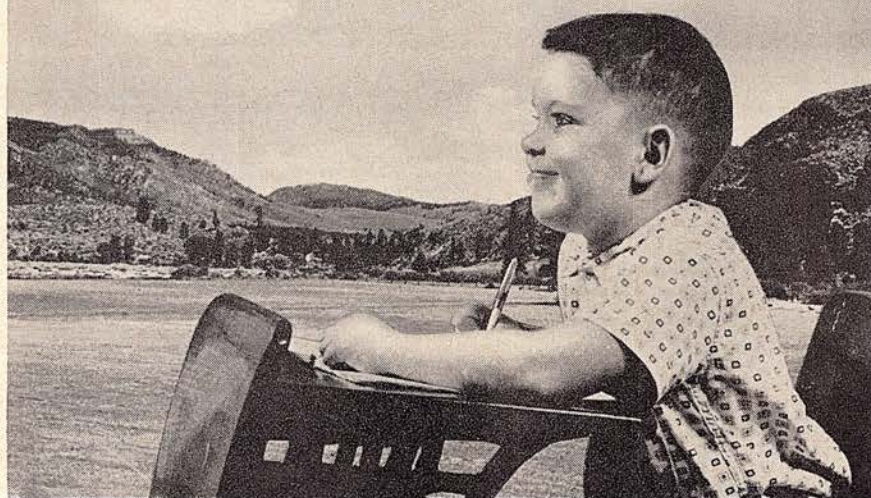
FROM THE MILLS OF THE SOUTHERN PINE ASSOCIATION

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## HELP JOHNNY READ EVEN BETTER!

Bring Natural Outdoor Light into  
Classrooms . . . All Year 'Round!



## PRC. TOPLITE ROOF PANELS

FOR SOFT, UNIFORM, CONTROLLED SUNLIGHTING!!

By utilizing prismatic glass units, Toplite Roof Panels bring into the classroom a maximum of light from the north sky and the low winter sun. The intense heat and light from the high summer sun is rejected to provide glare-free, shadowless light — without heat (about 60% less heat in summer than conventional skylights). This controlled sunlighting also makes TOPLITE Roof Panels ideal for corridors, gymnasiums, cafeterias and shops.

Prefabricated Toplite panels are available in a variety of sizes. The slim silhouette provides lighting flexibility without design change. Mail coupon for complete technical information.

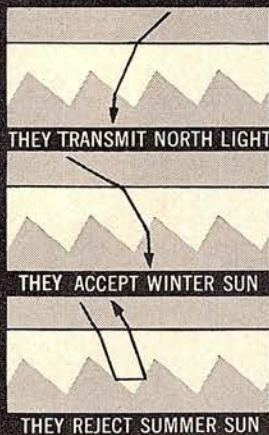
### PRODUCTS RESEARCH CO.



"Research is our middle name"

2919 Empire Ave., Burbank, California  
410 Jersey Ave., Gloucester City, New Jersey

### HOW TOPLITE PRISMS WORK...



PRODUCTS RESEARCH COMPANY DEPT. AR-5  
2919 Empire Ave., Burbank, California

NAME \_\_\_\_\_

FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

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

HAVE REPRESENTATIVE CALL ☐

## Required Reading

continued from page 66

ries. Sight-seeing tourists would find the book useful. The time and prices of admission are listed for the various houses as well as their road routes.

## Hospital Anthology

PROGRESSIVE PATIENT CARE, AN ANTHOLOGY. Edited by Louis E. Weeks and John R. Griffith, University of Michigan, Ann Arbor, Mich. 385 pp., illus. \$5, clothbound.

This compilation of articles, brought together by the University of Michigan's Bureau of Hospital Administration, grew out of a review of current literature preliminary to a progressive care research program at McPherson Community Health Center at Howell, Michigan.

Inevitably in such an anthology, there is some overlap and some reflection of the periodical source. Coverage proceeds from subject to subject with remarkable pace, however, considering the variety of sources. It is a comprehensible summary of both the history and the conceptual elements of progressive patient care. The volume concludes with two original articles by the editors. There is an extensive bibliography, but no index.

## Cities of the World

CITIES. By James Morris. Harcourt, Brace & World, Inc., 575 Third Ave., New York 17. 375 pp., illus. \$6.95.

As a wandering foreign correspondent James Morris spent a decade of his life in cities around the globe. In this book of 74 essays, each devoted to a particular city, he has recorded his sensations and impressions of the looks and moods of the places he visited.

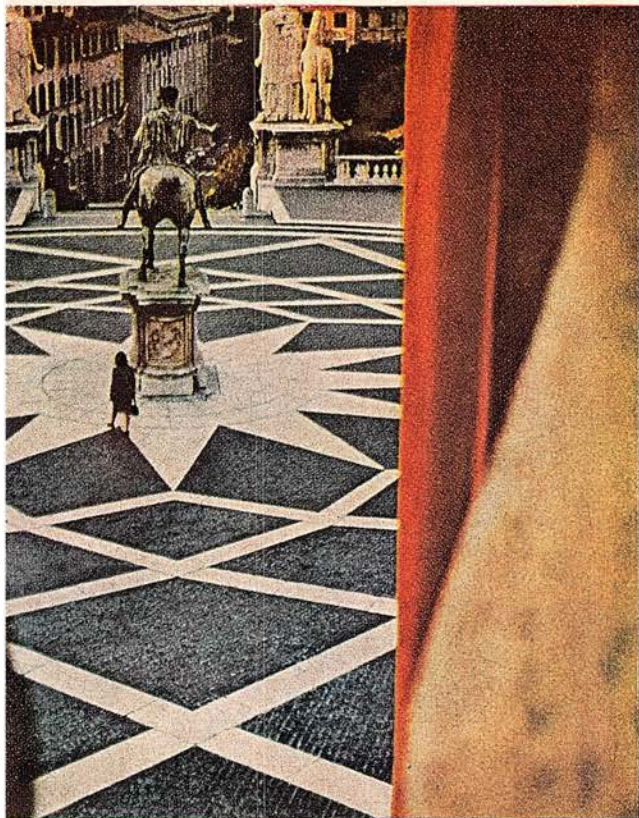
The writer is a penetrating observer and his remarks, though infused with his own exuberance and forebodings, are vivid. Contemporary streams of history are recorded in reflections of the cold war in Berlin, Moscow or Kabul, the blight of Communism in Marienbad and Hong

continued on page 90

For more data, circle 58 on Inquiry Card



**This is Amtico's  
flooring designer,  
Nancy Mayer,  
at Il Campidoglio  
in Rome.**



**This is our vinyl tile: Amtico Travertine.  
What a coincidence!**

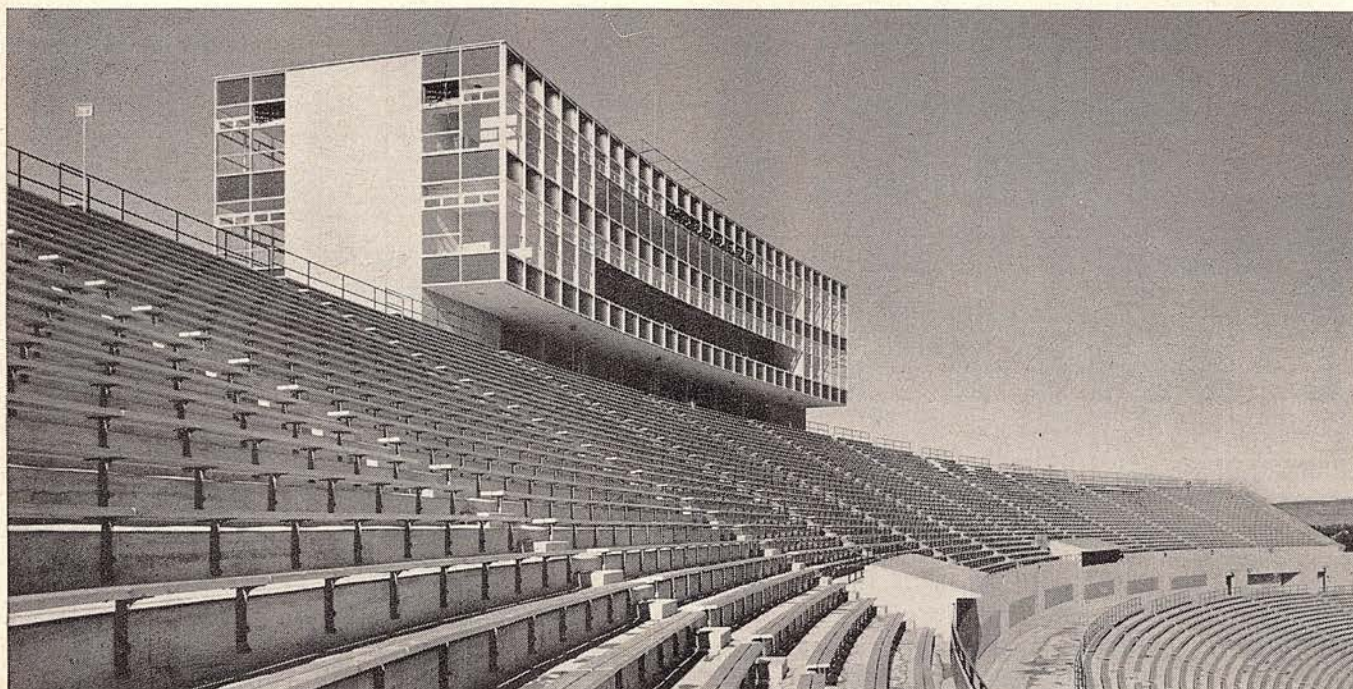
Nancy Mayer did it.  
She captured all the warmth and beauty of age old travertine marble in Amtico Travertine floor tile.  
Both solid vinyl and vinyl asbestos.  
Nancy travels all over the world searching for unusual textures and patterns that she can translate into vinyl.  
She found Travertine in Rome.  
The pattern of the floor at Il Campidoglio was so lovely, Nancy decided to duplicate it in the room above.  
Difficult? No.

She combined Amtico Travertine with Textura Mosaic vinyl tile.  
With a little imagination and Amtico vinyl tile, you can create custom designed patterns, too.  
Send for a free sample of Amtico Travertine and see the actual tile in person.  
That's the only way you can appreciate its remarkable depth, texture and richness. Otherwise, you'd have to go a long way to find such beauty and excitement in a floor.  
To Il Campidoglio, to be exact.





Press box and east tier of seats of Falcon Stadium, The Air Force Academy, Colorado. ARCHITECT-ENGINEERS: Prager-Kavanaugh-Waterburg, New York City, and Gordon Sweet, A.I.A., Colorado Springs. PRIME CONTRACTOR: B. H. Baker, Inc. GLAZING CONTRACTOR: Pittsburgh Plate Glass Co. Both of Colorado Springs.



## DAP® BUTYL-FLEX® handles tough sealing jobs at Falcon Stadium 20% faster, with 50% material cost savings

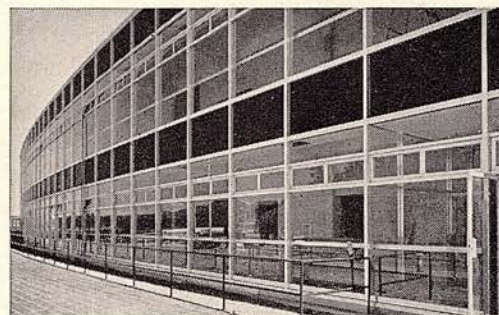
DAP Butyl-Flex was used. Butyl-Flex gives performance equal or superior to materials costing twice as much — and cuts application time 20-25% to boot.

The 48" x 48" mosaic panels at both ends of the Falcon Stadium press box presented a tough sealing problem. There were others, too. Concrete expansion joints—with 300' runs—had to be sealed over an asphalt-base filler. Only the finest-quality sealants would do.

Butyl-Flex also sealed seams in aluminum siding between concrete pillars, and all other press box construction joints. This permanently flexible sealer adheres tenaciously to glass, aluminum, concrete, marble, steel, plastic and most any construction material. *It's a one-part, butyl-rubber based compound with 5 times the service life of oil-based caulks.* Applies fast—no mixing, no special clean-up needed before application; easily wiped up after application. In many applications, Butyl-Flex gives you performance equal to expensive liquid polysulfide polymer sealers—at substantial cost savings.

DAP offers a complete range of finest-quality sealants—butyl-rubber based caulks, glazing compounds, polysulfide polymer sealants, putties and mastic bedding compounds. Write for catalog.

*Aluminum frames around doors and windows in 3-story press box were sealed with aluminum-pigmented DAP Architectural Grade Caulking Compound. DAP Architectural Grade Caulk provides dependably long-lasting, water-tight, air-tight seals.*



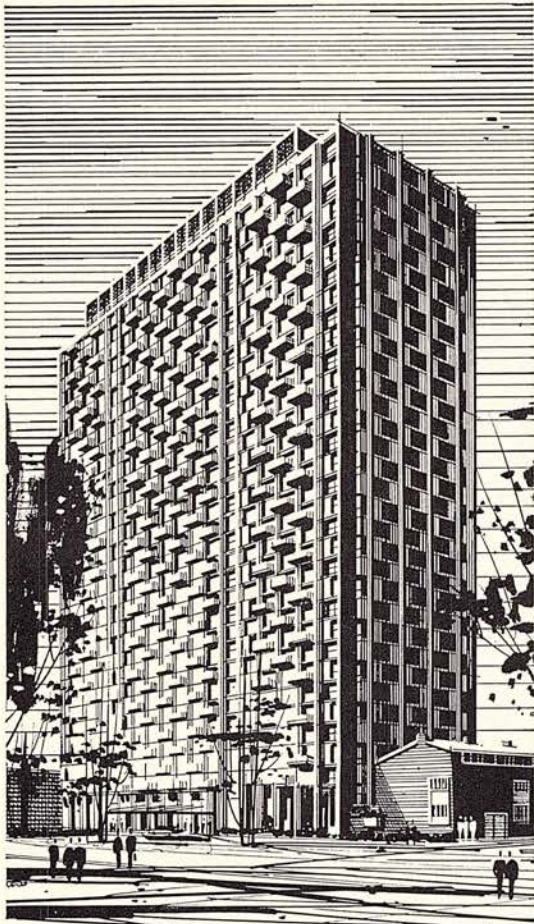
**DAP, WORLD'S LARGEST MANUFACTURER OF QUALITY SEALING MATERIALS, OFFERS YOU TECHNICAL SPECIFICATION SERVICE ON SPECIALIZED SEALANTS FOR MODERN CONSTRUCTION.**



DAP INC., DEPT. AR, GENERAL OFFICES: DAYTON 31, OHIO, SUBSIDIARY OF *Plough, Inc.*, MEMPHIS 1, TENN.

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## HAUGHTON ELEVONICS\*

Brings TOTAL ELEVATOR AUTOMATION to Philadelphia's Newest Prestige Apartment . . . HOPKINSON HOUSE

Total Elevator Automation at luxurious new Hopkinson House means that elevator availability is matched precisely to traffic demand 'round the clock.

A remarkable new automatic computer-control system, created by Haughton Elevonics, constantly monitors traffic demand . . . and relays calls for service instantly to the car-control system in the elevator machine room. Response is immediate. Thus, elevator service is never more than just a few seconds away on any of Hopkinson House's 34 floors. What's more, the ride is a revelation in velvety smoothness and quiet comfort.

Include Haughton Total Elevator Automation in your plans for building or modernization. Ask your Haughton Sales Office (listed in the Yellow Pages) to consult with you, or write to us.

HAUGHTON ELEVATOR COMPANY  
Division of Toledo Scale Corporation  
Toledo, Ohio 43609

**Hopkinson House Apartments**  
Washington Square South, Philadelphia, Pa.  
Winner in 1963 of the AIA Philadelphia Chapter Award for finest design in residential structures, Philadelphia area

Architect: Stonorov & Haws,  
Architects Building, Philadelphia.  
Builder: R. M. Shoemaker Company—  
Hopkinson House, Inc.  
245 South 24th Street, Philadelphia.

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

For more data, circle 61 on Inquiry Card



## New LHR\* TWINDOW® reflects solar energy, vastly reduces heat gain

\*Light and heat reflective.

In this simple demonstration, a 500-watt projector is used to simulate the rays of the sun. It projects a color transparency through an LHR™ SOLAR-GRAY® TWINDOW unit. The image to the left of the unit demonstrates the reflectance characteristics of the LHR coating.

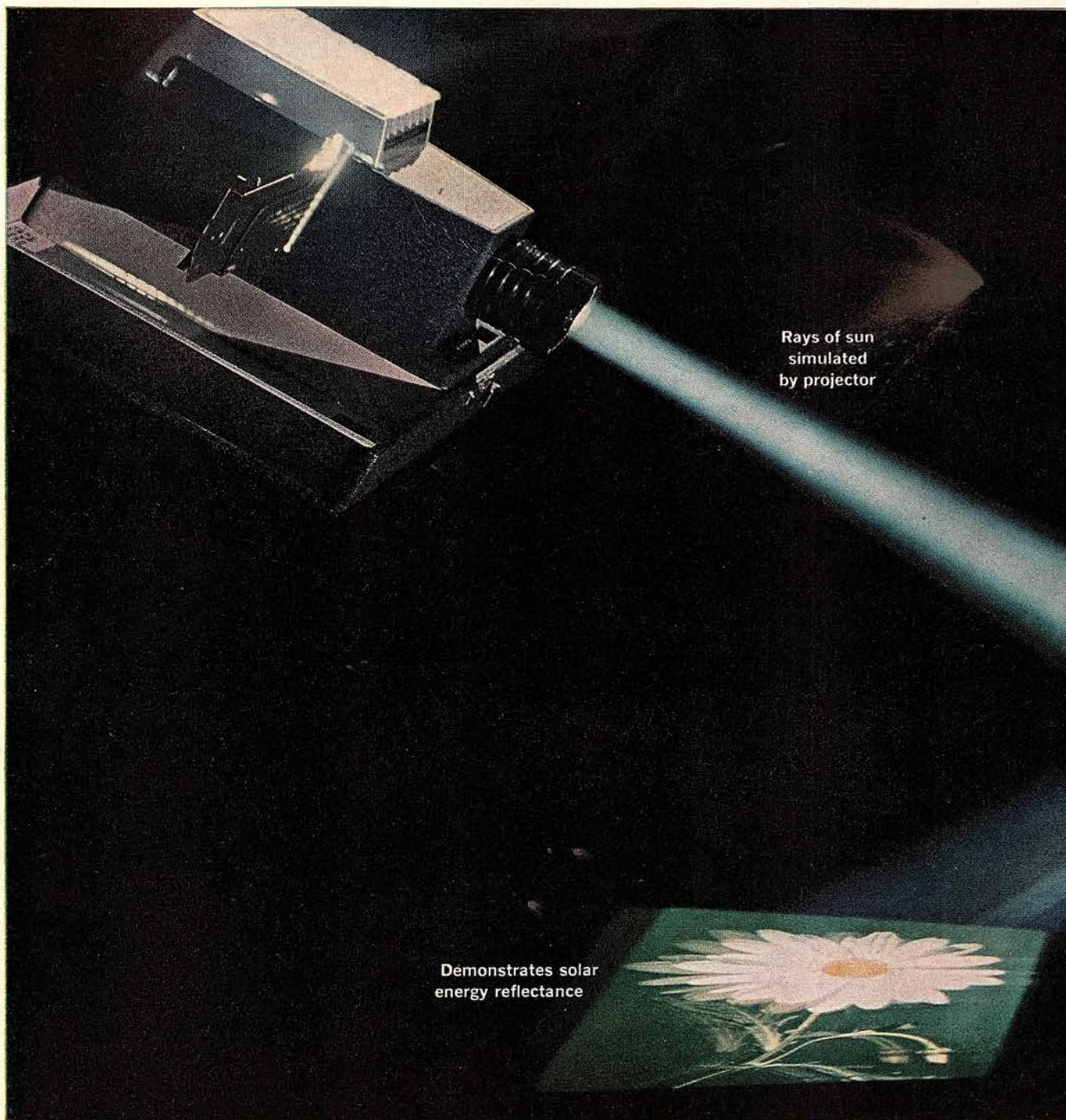
**Glass Conditioning with LHR TWINDOW.** Because it reflects considerable light and heat toward the outside, LHR coated glass substantially reduces the rate of solar heat flow to interiors. Thus, interior temperatures are easier to con-

trol. And, while LHR glass allows for plenty of daylight, it reduces sun and sky brightness to a comfortable level.

As you might expect, the reduced solar heat load lowers air conditioning operating costs. And the insulation value of double-glazed TWINDOW reduces heating costs.

Esthetically, LHR glass has unique appeal. The transparent metal oxide coating fired onto its surface gives it a handsome metallic sparkle.

As a multi-functional glazing material, LHR TWINDOW's environmental





## Glass Conditioning† . . . a new idea from PPG

control properties allow greater latitude in building design and orientation.

For full details, contact your local PPG Architectural Representative or write **Pittsburgh Plate Glass Company**, Room 4016, 632 Fort Duquesne Boulevard, Pittsburgh, Pa., 15222.



® PPG makes the glass that makes the difference

### COMPARATIVE PERFORMANCE DATA—LHR 140 TWINDOW INSULATING GLASS 1-inch, metal edge, ½-inch air space

	Visible Light Transmittance-%	Shading Coefficient <sup>1</sup>	Maximum Heat Gain BTU/hr/sq. ft. <sup>2</sup>
¼" Clear Plate, both sides	77	0.80	170
With LHR, one side	43	0.55	120
With Solargray, one side	37	0.54	115
With LHR Solargray, one side	22	0.40	90
With Solarbronze, one side	45	0.54	115
With LHR Solarbronze, one side	25	0.40	90
With Solex, one side	65	0.54	115
With LHR Solex, one side	32	0.40	90

1 In sun; refers to 1963 ASHRAE guide procedure.  
2 July 21, 40 N Lat., West Elevation at 4 P.M.

†Service Mark

Outdoor Indoor

← LHR SOLARGRAY  
TWINDOW UNIT  
"U" Value = 0.6  
(Single glazing = 1.0)  
LHR coating applied  
to air space side  
of outdoor light



Visible light  
transmitted = 22%

PHOTOGRAPHED IN DARKENED STUDIO WITH TYPE B EKTACHROME FILM, 8" X 10" CENTURY VIEW CAMERA WITH B 1/4" GOERZ DAGOR LENS AT CAMERA SET AT TIME EXPOSURE, LENS APERTURE F11

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Section of wood inlay wainscoting, Chapel of the Chateau De La D'Urfe — 1545-1550. Metropolitan Museum of Art, New York City.



# BEAUTY THAT ENDURES

**Aesthetical, economical answer to room-to-room noise transfer**

Lo-Tone AF (high attenuation factor) tile and board solve the growing problem of controlling sound transmission over movable or other ceiling-height partitions.

Here, with Lo-Tone's traditional *enduring beauty*, is sound attenuation equal to or superior to most standard full-height room partitions.

The special sound barrier built into Lo-Tone AF tile and board retards sound waves that normally pass through the absorption material. The result is greater sound-privacy at very low cost.

Lo-Tone AF ceiling tile and board patterns (see below) match standard Lo-Tone patterns. This enables you to specify AF ceilings only for areas where sound transmission is a special problem.

A new feature on the Fissura tile pattern (both AF and Standard) is the tongue and groove joint which eliminates the need for a breather spline and assures a more level ceiling.

For samples, literature or technical information on Lo-Tone tile or board — AF or Standard, or Fire-Rated — look for your local Lo-Tone Acoustical Contractor in the Yellow Pages, or write us: Wood Conversion Co., St. Paul 1, Minnesota.

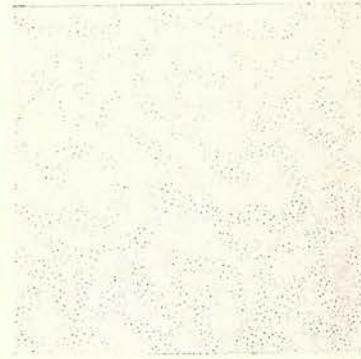
**LO-TONE®**  
AF CEILING TILE AND BOARD



Fissura AF Tile



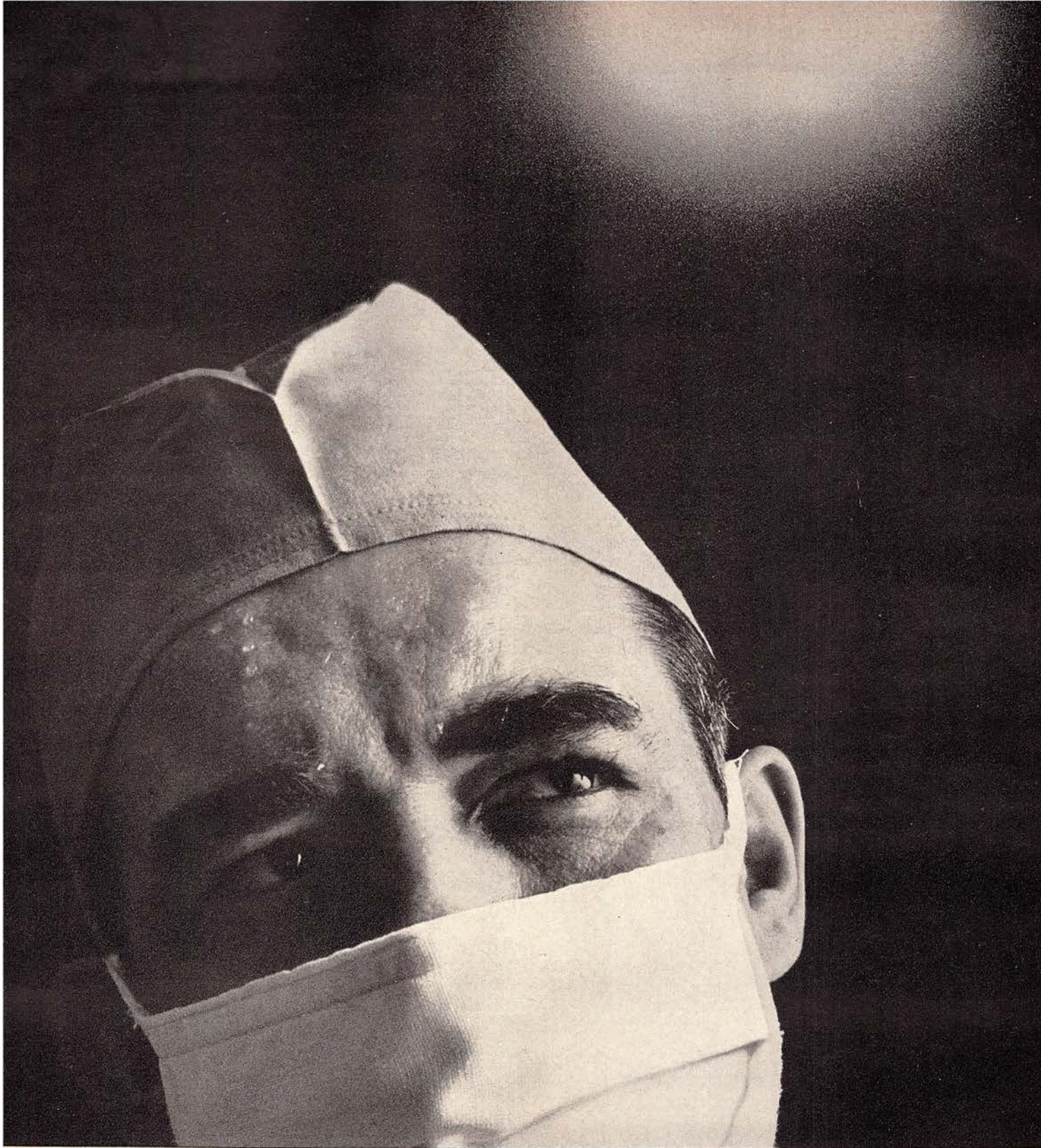
Constellation AF Ceiling Board



Constellation AF tile

For more data, circle 63 on Inquiry Card






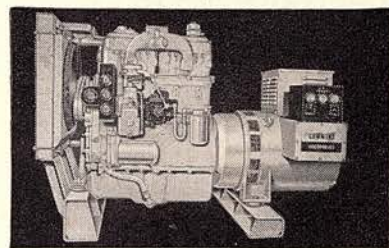
## seconds ago, the power failed!

The patient was placed in a respirator following serious surgery. Then darkness. Power failure. Instantly, a Cummins standby generator set supplied emergency current. In seconds, the respirator was reactivated and lights glowed. A possible tragedy was averted.

This took place at General Hospital, Louisville, Ky. The Cummins Diesel 100 KW generator started automatically the instant regular power went off. John Buschemeyer, hospital administrator, said, "We absolutely must have standby power, and we're keenly aware of its importance. When the Cummins unit was needed, it responded instantly . . . performed reliably."

The diesel, generator and controls are serviced and warranted from one source—your local Cummins Distributor. Make the decision now—contact the Cummins Distributor listed in the Yellow Pages under "Engines—Diesel." Cummins Engine Company, Inc., Columbus, Indiana.

**When you're looking for reliability . . . Specify CUMMINS **





*for best results*

choose a

# BETA PRODUCT



Artist's impression of new  
Los Angeles International Airport,  
coated with BETACOTE Coatings.

No matter what the sealing or coating job, BFC offers a product that will enable you to do the job better.

When it comes to coatings, you can't beat BETACOTE products, such as those used on the Los Angeles International Airport. We offer a full range of architectural coatings that make it possible for you to give every surface a top-quality finish. Our complete line includes acrylic, epoxy, vinyl, urethane as well as all other popular types of coatings and we can offer unique assistance in recommending the product that will provide the best protection for each application.

BETASEAL Polysulfide Sealants, used at Pease Airforce Base, Portsmouth, N.H., were specifically developed for architectural use. Used for curtain or panel wall construction or to glaze, seal or fill any joint or seam, they are particularly suited to joints subject to movement, where other caulks frequently fail. They provide long-lasting watertight seals for glass, wood, concrete or metal.

BFC products are the result of more than twenty years experience in developing specialized coatings. Our extensive production and laboratory facilities assure unsurpassed quality and dependable uniformity. Why not see what we have to offer? Write for data.



**BFC DIVISION**  
ESSEX CHEMICAL CORPORATION  
1401 Broad St., Clifton, N.J.

Please send me information on: BETACOTE Coatings ☐, BETASEAL Sealants ☐

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

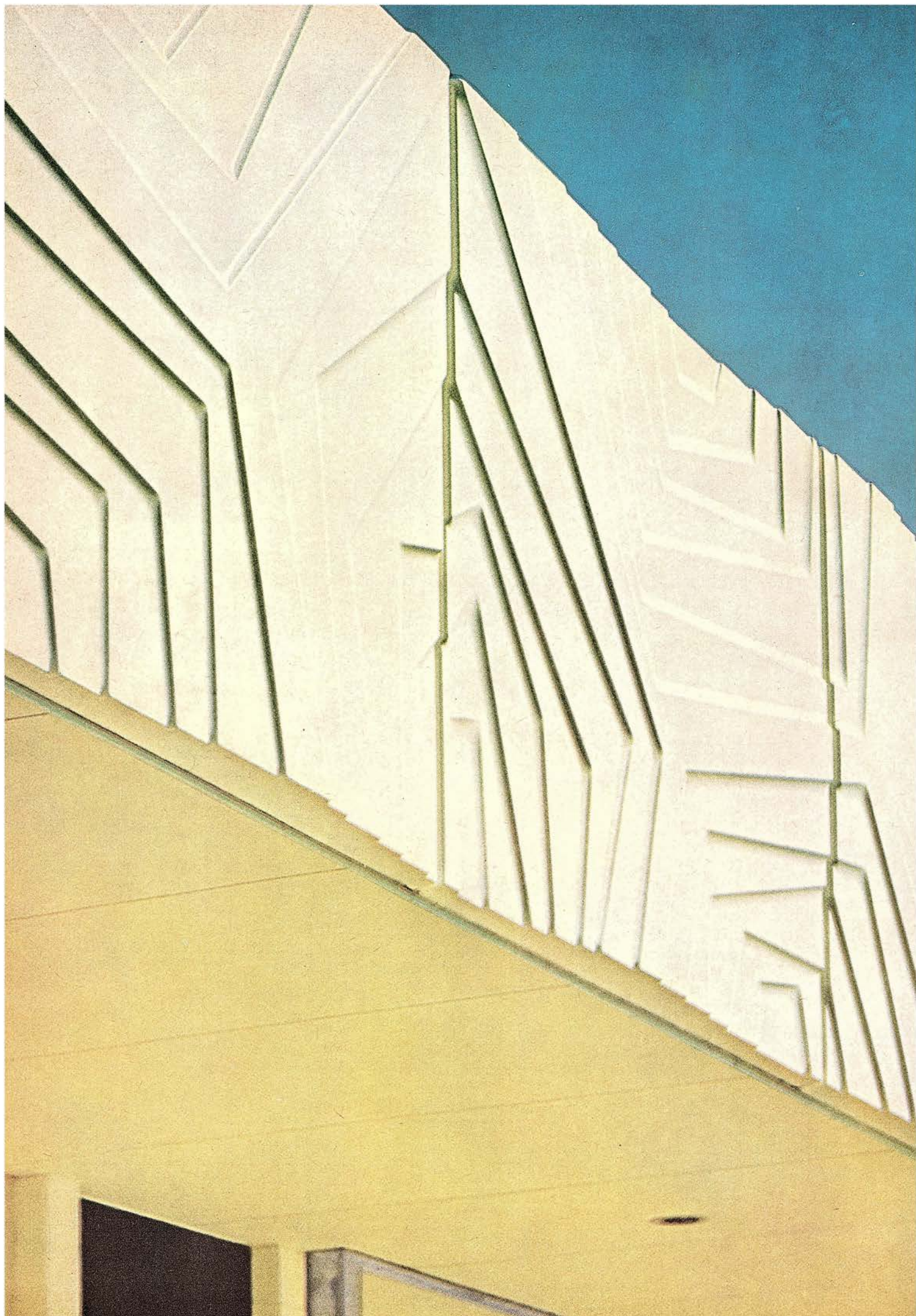
COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

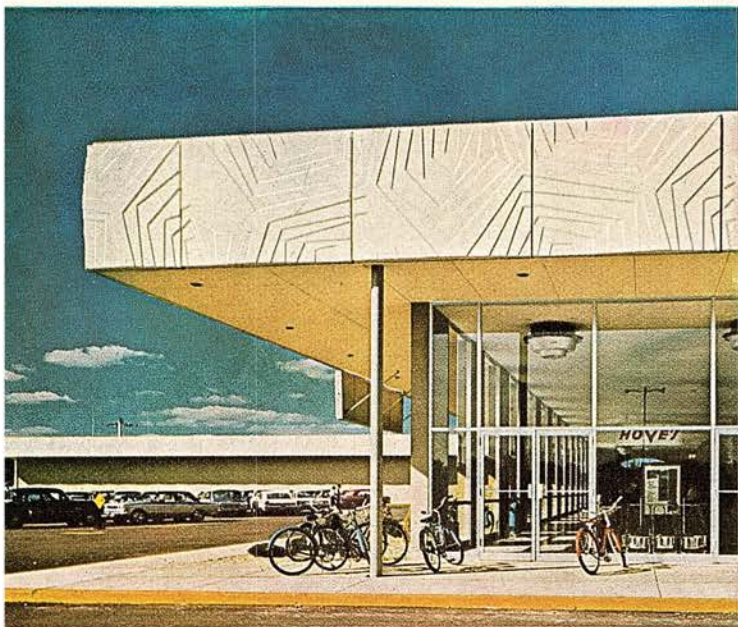
For more data, circle 65 on Inquiry Card







Har-Mar Mall Regional Shopping Center, Roseville, Minn.  
Architects: Thorsen & Thorshov, Inc., Minneapolis, Minn.



Montgomery Ward store, Apache Plaza Shopping Center, St. Anthony Village, Minn.  
Architects: Thorsen & Thorshov, Inc., Minneapolis, Minn.



For sculptured facades...

**Plexiglas**

On these pages you see a few of the design effects which have been achieved through the creative use of formed facing panels of PLEXIGLAS® acrylic plastic. Because of the easy formability of PLEXIGLAS, such facing panels can be produced economically in sculptural shapes that cannot be obtained with most commonly used facing materials. Note the complex three-dimensional patterns in deep, medium and shallow relief shown above.

PLEXIGLAS is rigid, strong and completely weather resistant.



Parke-Davis & Company building, Cherry Hill, N.J.  
Architects: Alexander Ewing & Associates, Philadelphia, Pa.

Yet because of its light weight, panels of PLEXIGLAS can be installed using simple supports and installation methods, resulting in significant cost savings in building construction.

With PLEXIGLAS you can give individual design expression to building exteriors in a formable, colorful, practical material. Our new brochure "PLEXIGLAS for Facing Panels" contains detailed and helpful information. We will be pleased to send you a copy.

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& HAAS**  
PHILADELPHIA 5, PA.

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## Required Reading

continued from page 78

Kong, the consolidation of North America in Chicago and Washington, the maturing of South America in Brasilia and the nuclear shadow in Hiroshima.

Some of the essays are set pieces, while others merely set down episodes or aspects of a city. But anyone interested in cities and their

personalities should be readily enthralled. It is a book to be enjoyed for its text, for its illustrations are few.

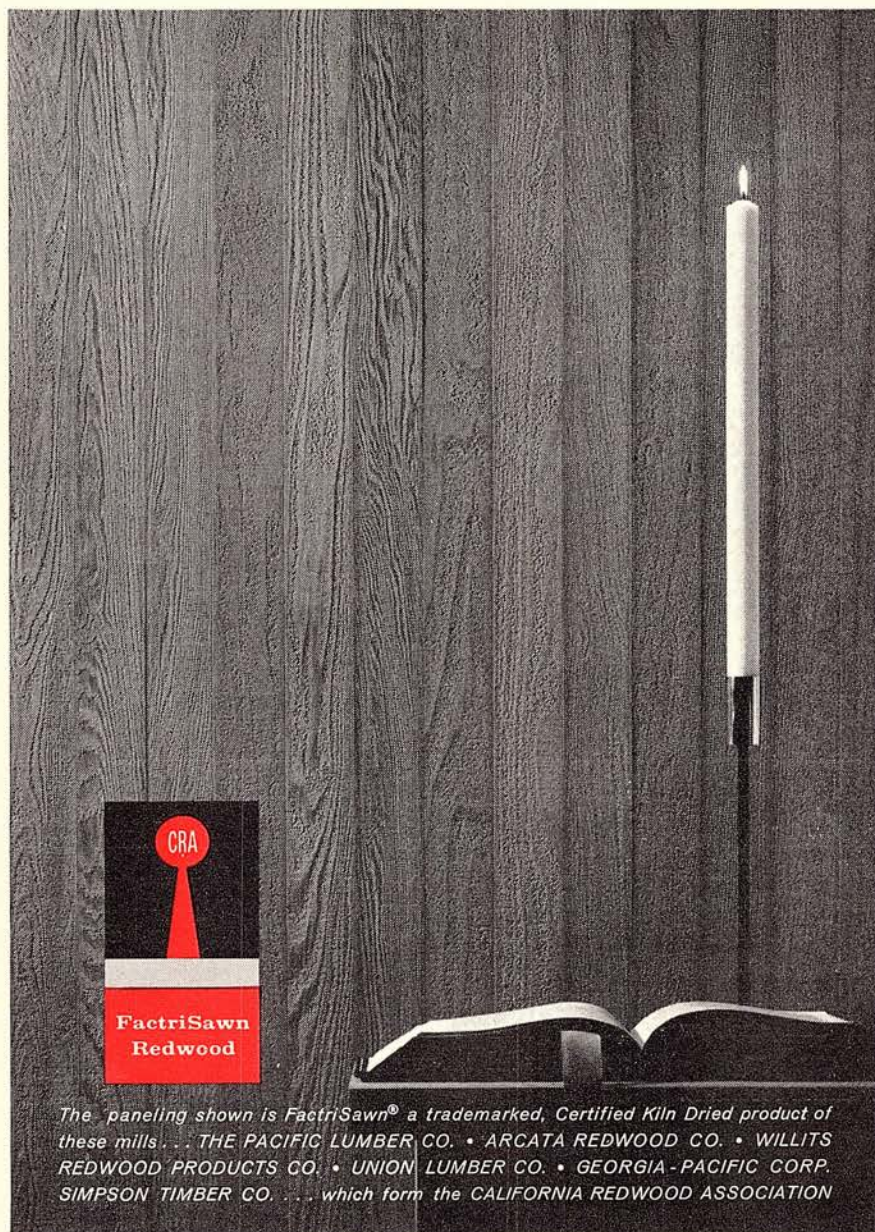
## Guide to Foreign Terms

DICTIONARY OF ARCHITECTURE & BUILDING TRADES IN FOUR LANGUAGES: ENGLISH, GERMAN, POLISH, RUSSIAN. *Edited by A. Zbionski and L. Tyszynski. The Macmillan Company, 60 Fifth Ave., New York 11. 492 pp. \$20.00.*

## REDWOOD...

*what material could be more appropriate for building your new church?*

*For planning materials or architectural data write, on your letterhead: Dept. 23-A, California Redwood Association, 617 Montgomery Street, San Francisco 11.*



The paneling shown is FactriSawn® a trademarked, Certified Kiln Dried product of these mills. . . THE PACIFIC LUMBER CO. • ARCATA REDWOOD CO. • WILLITS REDWOOD PRODUCTS CO. • UNION LUMBER CO. • GEORGIA-PACIFIC CORP. SIMPSON TIMBER CO. . . which form the CALIFORNIA REDWOOD ASSOCIATION

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This dictionary is intended for architects, scientists, civil engineers and building technicians using technical literature in English, German, Polish and Russian. Nearly 8,000 entries from architecture and building as well as scientific terms are contained. Terms relating to building materials and service fittings and installations have been included. The basis of the dictionary is the card register of the Technical Terminology Division of WYDAWNICTWA NAUKOWO-TECHNICZNE in Warsaw.

The dictionary should be of great assistance to readers of foreign publications who are seeking exact equivalents for architectural and building terms.

## Books Received

THE MOSIACS OF JEANNE REYNAL. *Text by Dore Ashton, Lawrence Campbell, Elaine de Kooning, Bernard Pfriem, Parker Tyler and Jeanne Reynal. George Wittenborn, Inc., 1018 Madison Ave., New York 21. 111 pp., illus. \$15.00.*

ART TREASURES OF THE UNITED NATIONS. *By Jacob Baal-Teshuva. Thomas Yoseloff, 11 E. 36th St., New York 16. 71 pp., illus. \$7.50.*

THE WORLD OF ARCHITECTURE. *By Lionel Brett. Thomas Nelson & Sons, 18 E. 41st St., New York 17. 119 pp., illus. \$3.00.*

THE SAARINEN DOOR. *By the Public Relations Office. The Cranbrook Institutions. Cranbrook Academy of Art, Bloomfield Hills, Mich. 63 pp., illus. \$2.00.*

HARRY SEIDLER 1955/63. *By Geoff Danks, Colin Griffiths and Fred Heilpern. Horowitz Publications, Sydney, Australia. Distributed by George Wittenborn, Inc., 1018 Madison Ave., New York 21. English, French and German text. 216 pp., illus. \$15.00 U.S.A.*

WORLD ARCHITECTURE ONE. *Edited by John Donat. Studio Vista Ltd., Blue Star House, Highgate Hill, London N.19, England. 255 pp., illus. 80s.*

THE STORY OF DESIGN. *By Marion Downer. Lothrop, Lee & Shepard Co., Inc., 419 Park Ave., New York 16. 216 pp., illus. \$3.95.*

HEATING HANDBOOK. *A Manual of Standards, Codes, and Methods. By Robert Henderson Emerick. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36. 522 pp., illus. \$14.00.*

A HISTORY OF DANISH ARCHITECTURE. *By Tobias Faber. The American-Scandinavian Foundation, 127 E. 73rd St., New York. 255 pp., illus. \$5.00.*

continued on page 102

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**Protects against the abuse other methods can't  
stop during curing!**

## **SISALKRAFT REINFORCED CURING PAPER**

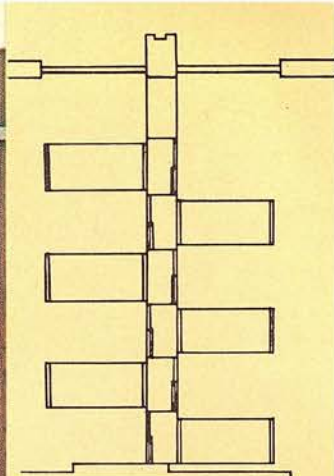
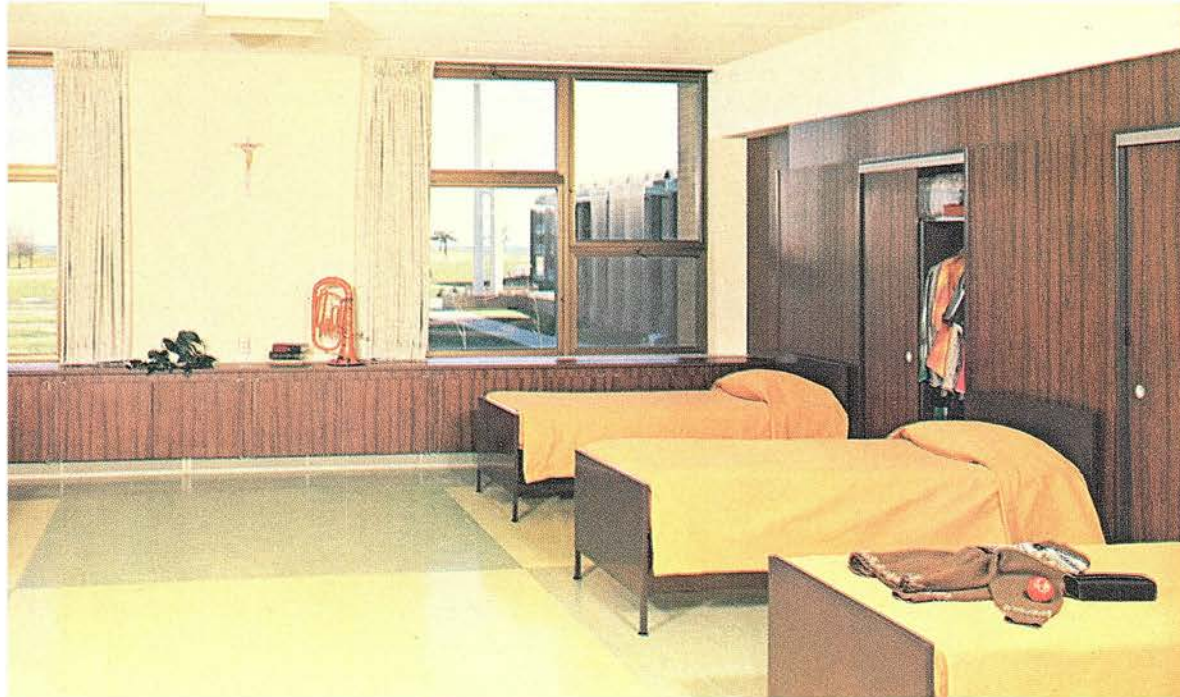
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DIVISION  
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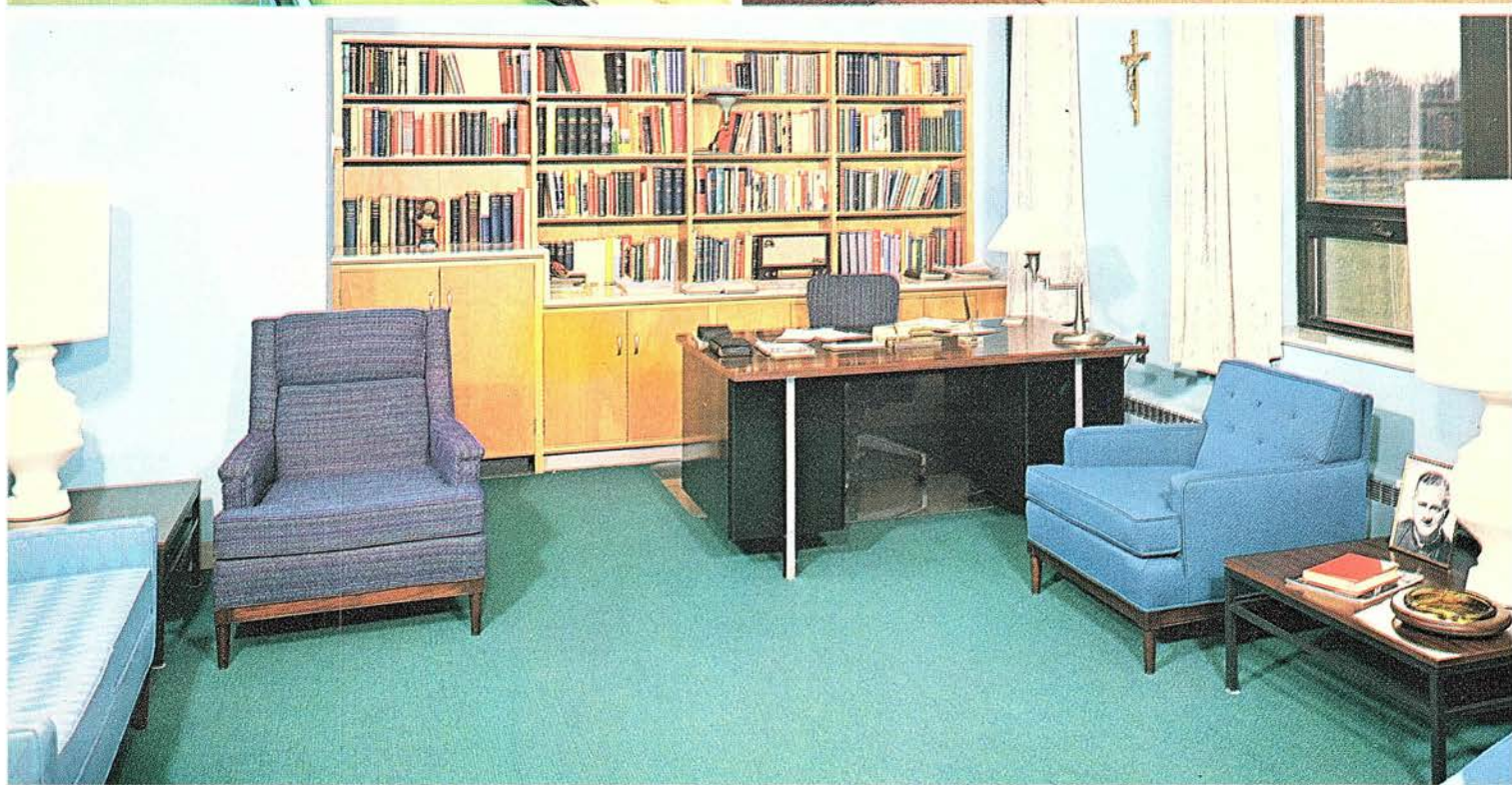
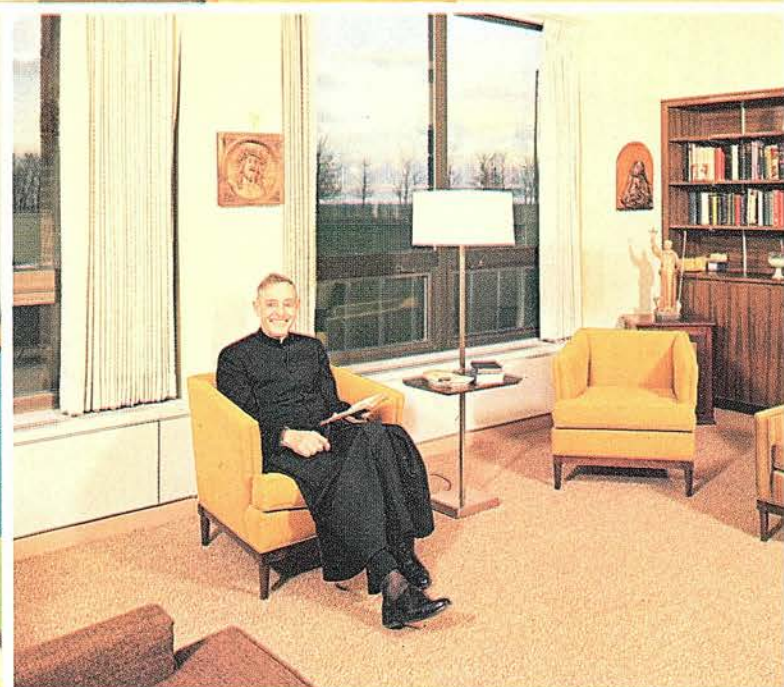
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Construction innovation: Simmons built-in wardrobes form walls in Vianney Hall. Staggered back to back, the wardrobes divide the dormitory into 50 sections. Sturdy Simmons wardrobes hold their shapes through years of hard use.





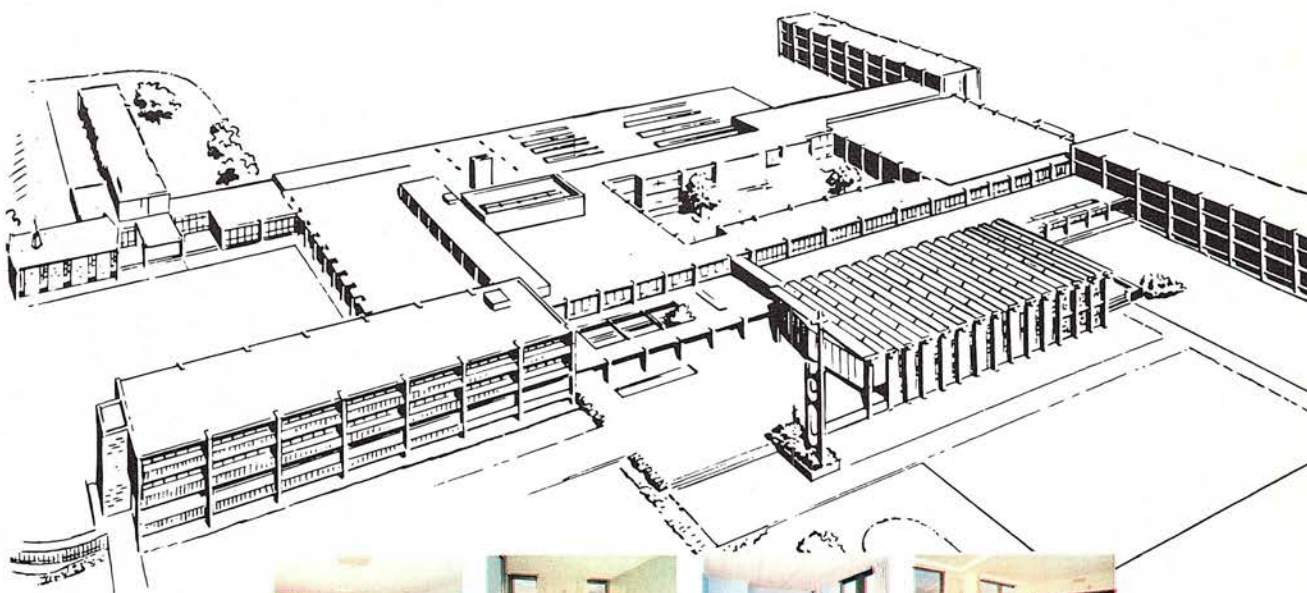
## UNUSUAL DE SALES SEMINARY RESIDENCES FEATURE IDEAS AND FURNISHINGS BY SIMMONS

This De Sales Preparatory Seminary comprises an extraordinary, multimillion dollar complex of eleven interconnected buildings. Each serves an educational, recreational or living requirement of its 650 students.

For all residential sections, school officials chose Simmons furniture—the all-purpose line designed to last through generations of students. The architect and designer incorporated ideas made possible by Simmons Dorm Line units.

Simmons Dorm Line, Office Span® and upholstered furniture bring De Sales these benefits: Simmons units are adaptable—meet any space requirement. Simmons furniture will last—it's built and finished to stand up under active school living. Simmons furniture is good looking—combines clean lines and a variety of fabrics and colors to give warmth and individuality to every room.

Find out why more and more schools are choosing Simmons from doorway to dormitory. Write for free Simmons catalogs today.



De Sales Preparatory Seminary,  
Milwaukee, Wisconsin  
Architects:  
Brust and Brust,  
Milwaukee, Wisconsin  
Interiors:  
Corco, Inc.  
Chicago, Illinois



In Vianney Hall dormitory, Simmons built-in wardrobes form walls between bays. These units won't sag or buckle and their Fibersin surfaces resist nicks and scrapes. Simmons panel design beds finished with high-bake satin enamel, with comfortable Simmons mattresses.



Simmons Dorm Line units furnish the two-man college residence rooms in Aquinas Hall. These movable units permit modified room arrangements for individual needs. All offer sturdy welded steel construction. Fibersin desk and dresser tops are practically damageproof.



Simmons upholstered furniture creates this warm, inviting look in a Proctor's Room at Aquinas Hall. Famous Comfortorc® construction assures years of seating ease and constant use. The desk, with rich-grain laminate top, is from Simmons Office Span group.



Father Leonard T. Busch, Vice-Rector of De Sales, enjoys the comforts of his attractively furnished room. Commenting on Simmons furniture, he points out, "Simmons gives us an important balance of values. It's durable. It's functional. And, very important, it's in good taste."



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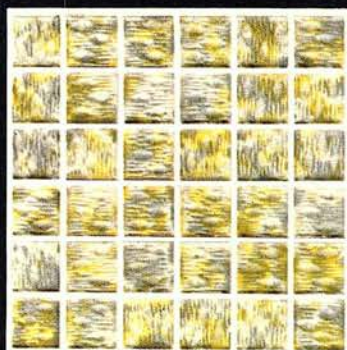
V  
I  
C  
O<sup>®</sup>

Glazed Nuvo-Sheen<sup>TM</sup>  
Ceramic Tile

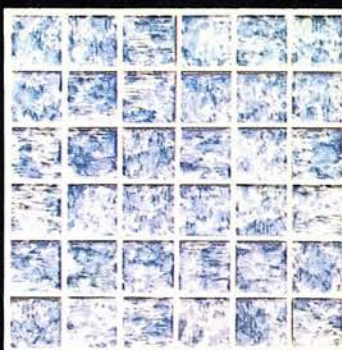




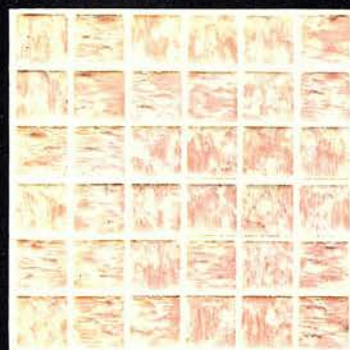
## Glazed Nuvo-Sheen™ Ceramic Tile



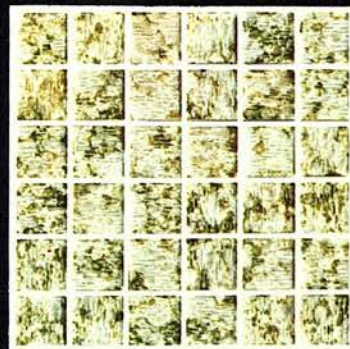
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NST-8



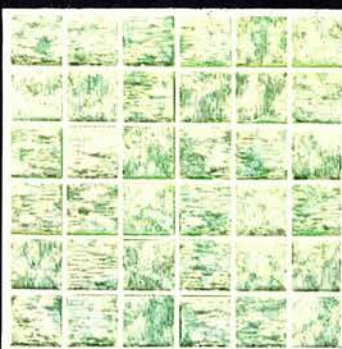
NST-11



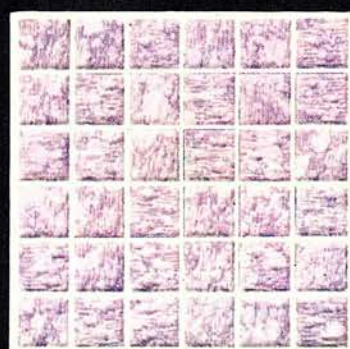
NST-12



NST-20

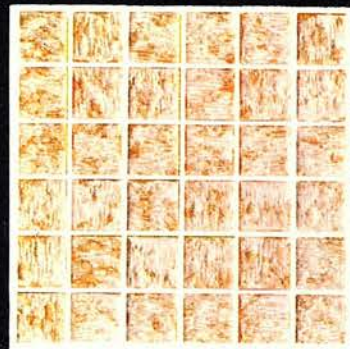


NST-14



NST-25

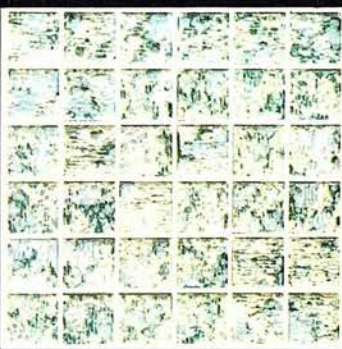
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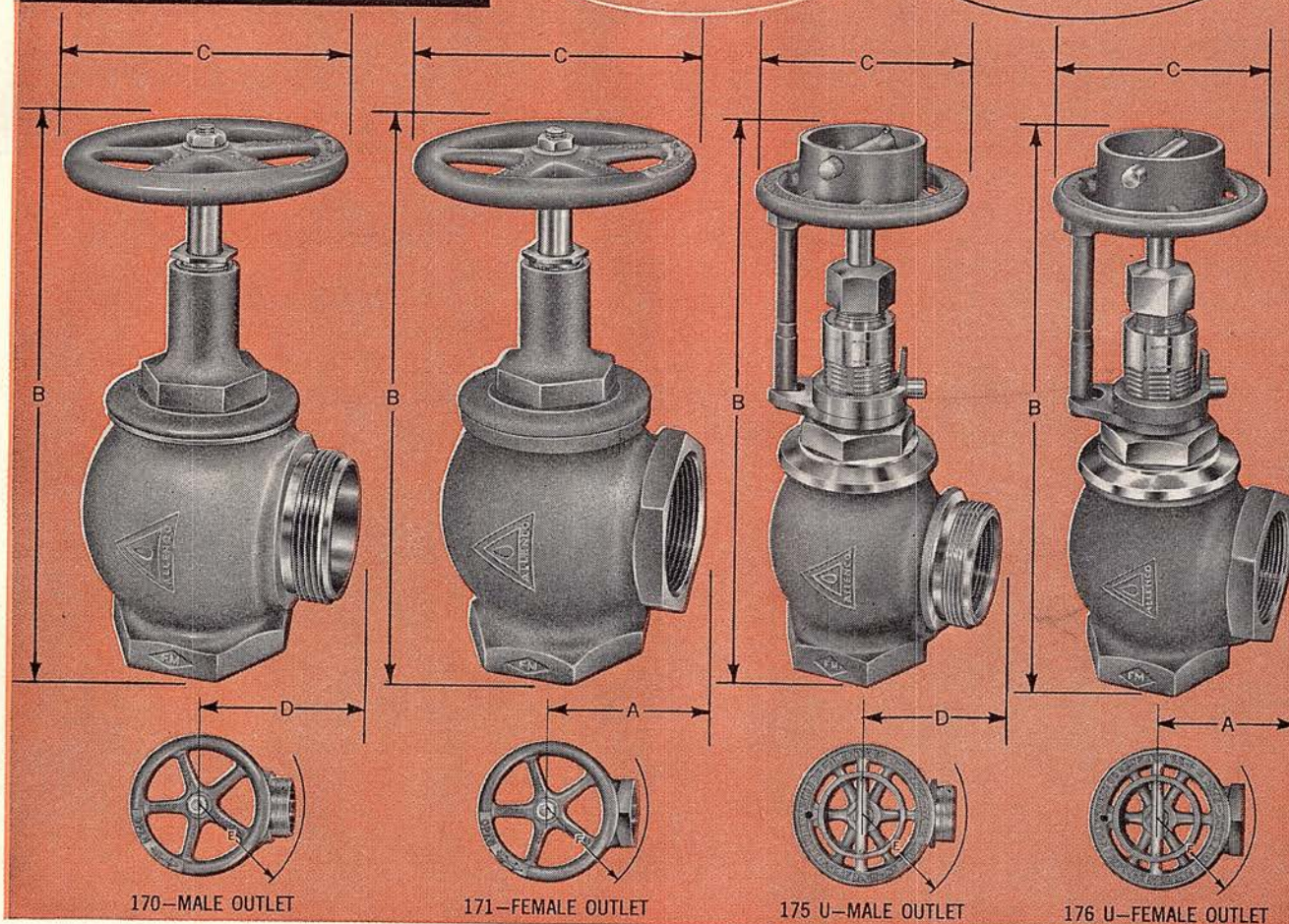


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FOR BETTER FIRE  
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VALVES**

**ARE COMPACT  
EASIER TO  
INSTALL**



Meticulously engineered to be compact, Allen's modern design angle valves install in a minimum of space, accommodate inlet pressures up to 300 pounds. Unique adjusting ring with built-in sight on valves 175 U and 176 U provides finger-tip positioning, simplified installation. Allen angle valves are hydraulically tested to twice rated working pressure; are U/L listed and approved. Ask your Allen representative for complete details or write direct.

**DESCRIPTION AND USES** 170 and 171—Five outlet sizes. 170 Male outlet used when hose rack or reel is attached to wall or stand-pipe. Female inlet is tapered iron thread; specify hose thread desired for outlet. 171 Female outlet used with Allen Bowes racks or Allen Hozegard reels; outlet and female inlet available in tapered iron thread only. Use

"U" for Underwriters Listed; "G" for Government. Specify finishes desired. 175 U and 176 U—Pressure reducing, 2½" outlet only. Specially recommended for inlet pressures up to 300 pounds. Specify hose thread for 175 U male outlet; female inlet is tapered iron pipe thread. Female inlet and outlet for 176 U in tapered iron pipe thread only. Specify finish.

TYPE—WORKING PRESSURE	REGULAR 150 LB.										GOV'T. 250 LB.		UNDERWRITER APPROVED 300 LB.					
SIZE, INCHES	1¼		1½		2		2 x 1½		2½		1½		1½		2½			
VALVE NO.	170	171	170	171	170	171	170	171	170	171	170 G	171 G	170 U	171 U	170 U	171 U	175 U	176 U
DIMENSION A		2		2½		2½		2½		3½		2¼		2¼		3¼		3¼
DIMENSION B, OPEN	8¾	8¾	8¾	8¾	11½	11½	11½	11½	12½	12½	9¾	9¾	8¾	8¾	11½	11½	15¼	15¼
DIMENSION B, CLOSED	7¾	7¾	7¾	7¾	10	10	10	10	10½	10½	8½	8½	7¾	7¾	9¾	9¾	14¼	14¼
DIMENSION C	4	4	4	4	4	4	4	4	5	5	4	4	4	4	6	6	6	6
DIMENSION D	2½		2½		2½		3¼		3¼		2½		2½		3½		3½	
DIMENSION E	2½		2½		3		3¾		3¾		2½		2½		3¾		3¾	
DIMENSION F		2¾		2¾		3¾		2¾		3¾		2¾		2¾		3¾		3¾
WEIGHT, LBS.	4	4½	4½	4½	6½	6½	6½	6½	10½	10½	6	6	5½	5½	14	14	16¼	16¼

**W. D. ALLEN MFG. CO. • 650 SOUTH 25th AVENUE • BELLWOOD, ILLINOIS**

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Drenched, deluged and wind-whipped





# ...at hurricane force and still weather-tight!

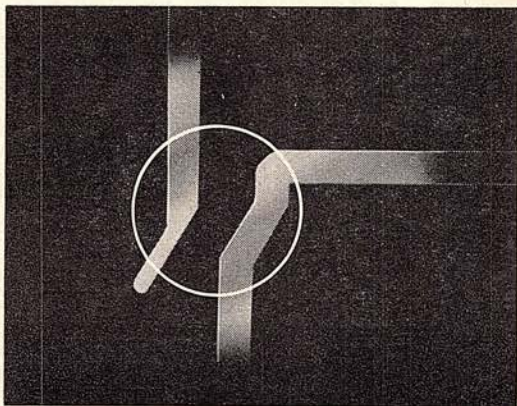
## Independent Laboratory Tests Prove Kawneer Sealair Windows® Solve Weathering Problems!

The new Sealair window is weather-tight even when subjected to winds and rains of 70 to 80 miles per hour according to recent tests by an independent laboratory.

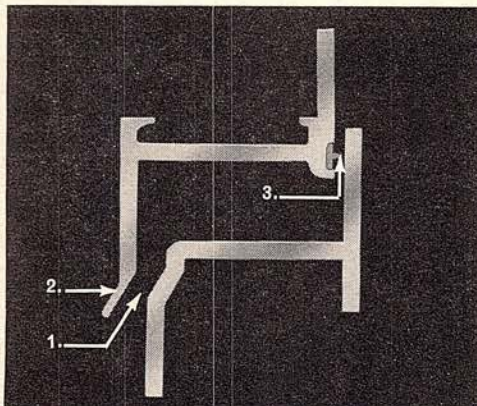
In these tests, the Sealair was installed in a weather test chamber. The window was water drenched as inside pressure was lowered to represent severe weather conditions. Sealair did not leak even when the static load reached 25 p.s.f. Many conventional windows leaked at 3 to 7 p.s.f. The superior weathering performance is the result of a Triple Weather Guard including an exclusive Pressure Equalization Slot. This Kawneer innovation is the most important metal window design change in recent years.

In air infiltration tests, the new Sealair was again far superior, at less than .2 c.f.m., well above industry standards. Here is a window so vastly superior that building interiors remain dust and draft free . . . reducing loads on heating and air conditioning systems. *Get all the facts about this remarkable window. Write for your copy of the Sealair Window File.*

**Commercial and Monumental**—Projected, casement and top hinged Sealair windows are available in commercial or monumental (2") series. Finish: Alumilite is standard—or, non-fading, abrasive-resistant, Anodic hard colors (light bronze, medium bronze and black) are optional.



**Pressure Equalization Slot**—Keeps water out. Pressure within the window sections is equal to pressure outside the building. No pressure difference . . . no partial vacuum . . . no leakage.



**Triple Weather Guard**—1) Pressure equalization slot, 2) integral drip, and 3) neoprene weatherstrip. The Sealair window offers triple weather protection. Weathering where needed, scientifically designed.



**Kawneer Company, A Division of American Metal Climax, Inc.**

Niles, Michigan • Richmond, California • Atlanta, Georgia • Kawneer Company Canada, Ltd., Toronto, Ontario, Canada

\*Patent Applied For

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# LAMSON TRAYVEYOR®



*makes one  
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*serve all  
floors*

Up this slim shaftway come 8 trayloads of piping hot food every minute. Down it, after mealtimes, go all soiled trays direct to the washing area.

Simple. Efficient. The LAMSON TRAYVEYOR cuts through high-cost duplications that traditionally mar institutional feeding.

Gone are the crowded elevators . . . the floor diet kitchens . . . the scattered, scurrying personnel and all the other by-products of decentralized confusion.

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## Required Reading

continued from page 90

PLANNED-UNIT DEVELOPMENT WITH A HOMES ASSOCIATION. *Land Planning Bulletin No. 6. By the Federal Housing Admin., Washington 25, D.C. 64 pp., illus. 50 cents.*

THE BITE OF THE PRINT. *By Frank and Dorothy Getlein. Clarkson N. Potter, Inc., 56 E. 66th St., New York 21. 272 pp., illus. \$12.50.*

I BUILT A STONE AGE HOUSE. *By Hans-Ole Hansen. The John Day Company, Inc., 62 W. 45th St., New York 36. 79 pp., illus. \$3.50.*

TRADITION OF JAPANESE GARDEN. *By Sutemi Horiguchi. Kokusai Bunka Shinkokai, Tokyo. Distributed by East-West Center Press, Honolulu 14, Hawaii. 181 pp., illus. \$15.00.*

ARCHITECTURE: FORMES + FUNCTIONS, Vol. 10. *Edition by Anthony Kraft. George Wittenborn, Inc., 1018 Madison Ave., New York 21. 276 pp., illus. \$10.00.*

LANDSCAPE VOCABULARY. *By Warner L. Marsh. Miramar Publishing Co., 1300 W. 24th St., Los Angeles 7, Calif. 316 pp., illus. \$8.50.*

BYZANTINE AESTHETICS. *By Gervase Mathew. The Viking Press, Inc., 625 Madison Ave., New York 22. 189 pp., illus. \$6.50.*

STATICALLY INDETERMINATE STRUCTURES. *By Lawrence C. Maugh. John Wiley & Sons, Inc., 605 Third Ave., New York 16. 422 pp., diagrams, graphs and charts. \$12.75.*

LAPLACE TRANSFORM TABLES AND RELATED TOPICS ON OPERATIONAL METHODS. *By Paul A. McCollum and Buck F. Brown. The Office of Engineering Research, Oklahoma State University, Stillwater, Oklahoma. 180 pp. \$3.50.*

INDUSTRIAL ARCHITECTURE—FALLOUT SHELTERS. *By the Department of Defense, Office of Civil Defense, Washington, D.C. 56 pp., illus. No charge.*

URBAN REAL ESTATE RESEARCH 1962. *By Jerome P. Pichard and Arlene G. Balaban. Research Monograph 9, Urban Land Institute, 1200 18th St., N.W., Washington, D.C. 72 pp. \$4.00.*

PRESTRESSED CONCRETE FOR ARCHITECTS AND ENGINEERS. *By H. Kent Preston. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36. 196 pp., illus. \$8.50.*

NEW YORK. *By Kate Simon. The Viking Press, Inc., 625 Madison Ave., New York 22. 159 pp., illus. \$10.00.*

MANUAL ON SELF-HELP HOUSING. *By the Department of Economics and Social Affairs, United Nations. United Nations, New York City. 114 pp., illus. \$1.50.*

Technical Book Reviews, page 254

# LAMSON AUTO-TUBE COMMUNICATION SYSTEM

*gets it  
there  
before  
you can say—*



*"Here it is!"*

The increasing need for expediting the handling, distribution, and processing of paper in today's complex business operations places an added responsibility on the architect.

Now, the LAMSON AUTO-TUBE provides a simple, space-saving way to design a rapid communications system into any structure long before ground-breaking ceremonies are scheduled.

AUTO-TUBE makes it possible to deliver enormous quantities of mail and other paper . . . quickly and continuously . . . to any number of locations . . . within any building complex. The operator dials the LAMSON carrier, then puts it into the AUTO-TUBE sending receptacle. The completely automatic system, with its controlled dispatch feature, does the rest.

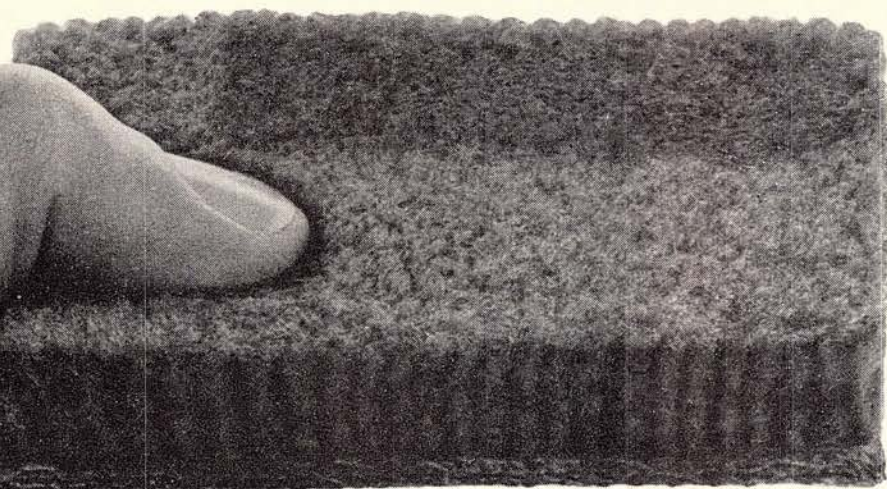
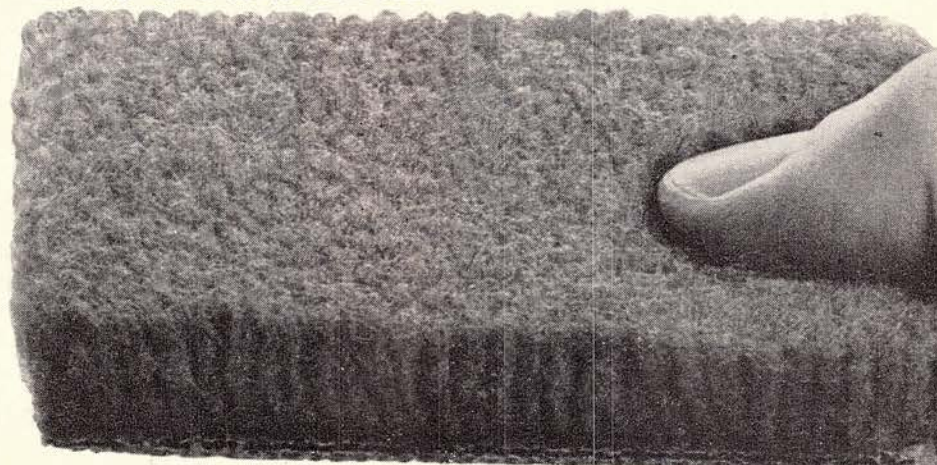
Check LAMSON before specifying any other method of built-in communications. Write 102 Lamson Street, Syracuse, New York.

**LAMSON  
CORPORATION**

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**This is wool.  
It's beautiful.**



**This is Acrilan.<sup>®</sup>  
It looks like wool.  
But it stays beautiful longer.**

For many reasons. Carpeting made with Acrilan acrylic fiber in the pile is more resilient than wool. It retains its deep pile longer. Resists shedding. Colors are purer and remain that way—Acrilan resists fading; Acrilan is easier to clean than wool.

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Acrilan is born moth-proof. Non-allergenic. Will never mildew. These are some of the reasons why architects all over the country are specifying Acrilan for important installations.

Let us tell you more.

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350 Fifth Avenue, New York 1, N.Y.

These are among the mills now licensed by Chemstrand for Acrilan: Barwick, Bigelow, Cabin Crafts, Callaway, Coronet, Crestline, Downs, Forrest, Hardwick and Magee, Hightstown, Karagheusian, James Lees, Loomweave, Magee, Masland, Monarch, Philadelphia Carpet, Roxbury, Wunda Weve. In Canada: Harding Carpets.





# **Toastmaster Electric Cooking Equipment specified for University of Denver's new Centennial Residence Halls Kitchen**

A pleasant contrast to the traditional "halls of ivy" design are the beautiful new Centennial Residence Halls on the University of Denver campus. They are modern in every respect including their electric, stainless steel kitchen which serves nearly 2,000 student meals daily.

Food Service Consultant, John R. Carlson, had a number of problems to overcome in designing the kitchen for this new facility. While the dining area, with a seating capacity of 420, was adequate—space for the kitchen was quite compact. As a result, every foot of floor space had to be used to its fullest for staff and equipment to prepare a widely varied menu three times a day. Performance was another factor. Every meal time, cooking capacity had to serve 12.5 students per minute from each of two serving lines. A low ceiling posed another problem that had to be solved: cooking heat.

Every one of these considerations... *space, speed, heat and ventilation...* was met. Result: a maximum-efficiency kitchen as modern in design and concept as the buildings it serves!



Centennial Residence Halls  
University of Denver  
Denver, Colorado

**FOOD SERVICE CONSULTANT:**

John R. Carlson,

**ASSOCIATE ARCHITECTS:**

Edwin A. Francis, A.I.A., Perkins & Will

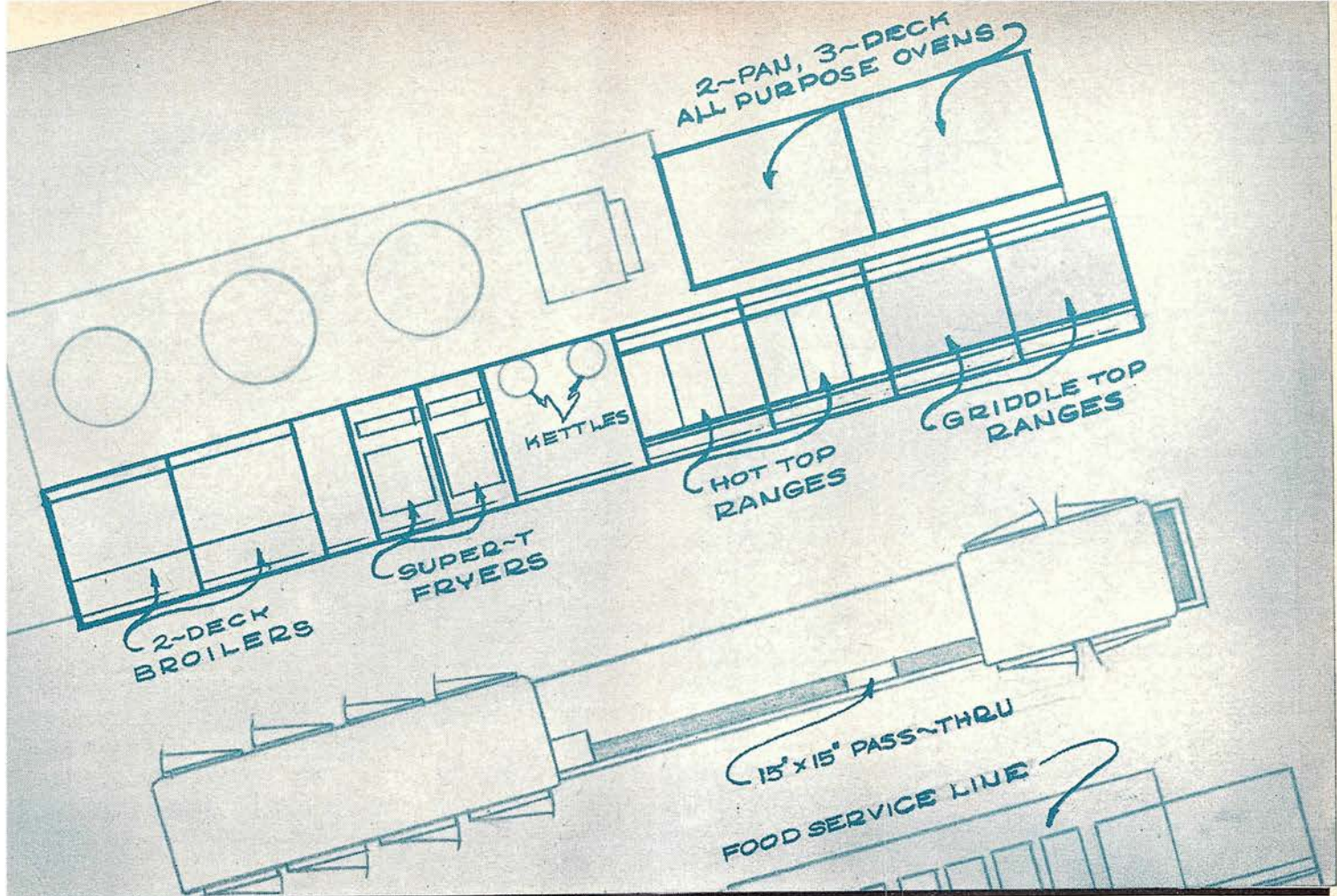
**INSTALLING DEALER:**

J. Zerobnick, Inc.



Breaded veal cutlets, chops and other meats cook to perfection on Toastmaster Griddle Top Ranges. Each is really 4 griddles in one as each 9" of grid width is individually controlled with pin-point accuracy to 450°. Soups, stock, gravies and sauces cook on an adjoining pair of Hot Top Ranges. Beneath each range top is a one-pan size baking and roasting oven. And stainless steel finishes on all Toastmaster cooking equipment means cleaning ease!





Food Service Consultant, John R. Carlson, checks baked potatoes, stuffed cabbage and roast duck that will be part of students' fare for the day. Versatile Toastmaster Heavy-Duty Ovens let you roast or bake . . . prepare many types of food all at the same time. They feature Aluminized Steel oven liners for low cost operation and faster preheating; "Full-View" oven windows, and fingertip pin-point temperature and top-and-bottom "Directional Heat" controls.



New Toastmaster Heavy-Duty Broilers are a favorite with Centennial cooks. Instead of "cranking up" a heavily-loaded grid assembly—new "Floating Action" handles lower heat down to the meat and give it that glamorous *branded* look! These new stainless steel beauties are ready to broil in only 6 minutes from a cold start. Capacity is big . . . controls are conveniently located. And Toastmaster design and engineering makes them easiest to use and clean!

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# HOW ONE LARGE OFFICE USES CONSTRUCTION COST ESTIMATES

A summary of views and procedures at

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

By William B. Foxhall

The importance of utmost accuracy in construction cost estimates at every stage of project development cannot be over-emphasized, said Robert F. Hastings, president of Smith, Hinchman & Grylls Associates, Inc., in a recent interview. Furthermore, he pointed out, the changing climate of responsibility of architects toward their clients' budgets is calling for stringent interpretations of standard forms of agreement between owner and architect.

Current A.I.A. forms (B131, B211 and B311) commit the architect to periodic "statements of probable project construction cost" and to detailed estimates in some cases, but they specifically exempt any statements of probable construction cost from a *guarantee* of accuracy. This exemption, Mr. Hastings stressed, is a practical matter of legal terminology rather than an invitation to inaccuracy. One has only to consider the spread between high and low bidders on identical sets of bidding documents to recognize the impracticality of giving the legal status of a guarantee to the exact dollar amount of any prior estimate of probable construction cost. The key word here is *probable*.

But there is nothing "probable" about the client's budget for a given project, Mr. Hastings emphasized. It is a firm commitment usually established long before bidding documents are prepared. It has the character, if not the legal status, of a guarantee. At the Smith, Hinchman & Grylls office, in fact, an estimate based on "final preliminary" working drawings and outline specifications very often is actually guaranteed as a limit not to be exceeded by bid costs. It is this commitment to a firm budget during a period of growth and change, both within the project itself and within the construction field in general, that has made the practice of estimating more demanding than ever.

Obviously, the accuracy of the cost estimate can increase as the details of design development and specifications progress. Meanwhile, however, the architect's operating budget for a given job must be based upon his probable income which in turn is based upon his probable construction cost.

There are, then, two concurrent systems of calculation involving the construction cost estimate. One is the external responsibility of setting up accurate and adequate budgets for the client's approval. The other is the internal control of the architect's own operat-

ing procedures so that the job will advance on a budgeted schedule adequately covered by the payments stipulated for each stage of project development.

Construction cost estimating at Smith, Hinchman & Grylls is the responsibility of a department headed by Jack Greenberg. Although Mr. Greenberg is capable of bringing to the very earliest budget conference a kind of intuitive authority (which he calls informed guessing) built up over 40 years of cost experience, his actual procedures are far from guesswork. They are founded on constant and minute attention to massive detail. The data from which he works include not only current prices of materials and labor but also case histories of every Smith, Hinchman & Grylls project, up-to-the-minute surveillance of local labor and construction activities, and a wary eye on the general economic trends.

In the progress of a project from acceptance to construction, there are four stages at which a cost estimate is required: (1) in early conferences relating the project program to an acceptable general order of budget; (2) during development of schematics; (3) during preparation of preliminary drawings and outline specifications; (4) as a component of bid documents comprising working drawings and specifications. Figure 1 (page 110) shows the sequence of these stages and intervening approval conferences.

Every architectural project invokes the dual talents of the design staff and the translators of design into construction in place. At Smith, Hinchman & Grylls these talents are represented throughout negotiations by two individuals, a chief designer and a project manager for each project. Once a project has been accepted, the chief designer and project manager work out with the client details of program and budget which can be effectively translated into schematics. While the designer has the responsibility of translating the program into form relationships, the project manager brings a considerable generalized knowledge of costs and of the client's operating needs and limitations to bear on the feasibility of design proposals. He is also familiar with and calls expertly upon Mr. Greenberg's resources.

Once program and budget are accepted, the project enters into the schematic phase of development. Sketches, models and drawings are developed show-

*continued on page 110*



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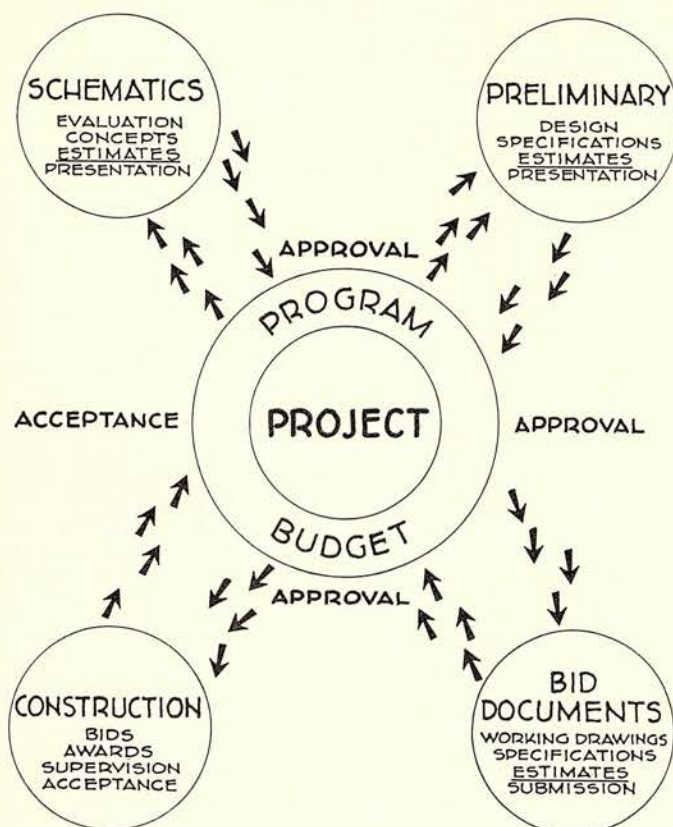


Figure 1. Sequence of job phases

Figure 2. Form for cost approximation

B _____ 1 _____ 2 _____ 3 _____ 4 _____ P. H. _____	COST APPROXIMATION	Project No. _____ Date _____ Project _____
SIZE: Area Per Fl. _____ Total Area _____ No. of Stories _____ Usable Area _____ Eff. _____		
<u>Item</u> Superstruc. Wls. Substruc. Wls. Piles Sheet Piling Caissons Figs. Struct. Steel Misc. Metal Fireproofg. Conc. Struct. (Supp.) Excav. & Fill Slab on Ground Roof Ceilings Floor Fin. Lobby & 1st Fl. Vault (Conc. only) Doors Stairs Partitions Kitchen Equip. Sash Glass (Solar Grey) Painting Misc. Stairs, etc. G.C. & C. Sub-Total Bldg. Work		
		$CSF \times AREA = TOTAL COST$
BLDG. WORK GROUP 1 MECH. WORK ELEC. WORK ELEV. WORK SITE WORK REMOVALS TOTAL		
Not included: REMOVALS, DUST PROTECTION, WEATHER PROTECTION, PREMIUM TIME, SHORING, UNDERPINNING ALTERATIONS ( ), TUNNELS ( )		

continued from page 106

ing the massing and general outline. Types of materials and system concepts are evaluated, and a presentation package is prepared which includes a preliminary cost estimate. Mr. Greenberg prepares this figure with as much care as can be related to the tentative nature of the design at this stage. He uses an itemized form on which he can translate some 16 construction items such as foundations, walls, floors, etc. into a fairly accurate index of general cost per square foot. This form (Figure 2) is headed "Cost Approximation" and purports to be just that.

Since Mr. Greenberg's estimate of construction costs at the schematics stage enters into the office budgeting system, it is necessary that he bring to it every refinement at his disposal even though it is, in fact, a cost approximation. It is more than a simple up-dating of actual in-place costs of similar project components. It takes into account the natural growth rate characteristic of the kind of building under consideration, the expected frequency of change orders, the degree of innovation in design which can affect the rate and cost of office production, the probable time interval between the current estimate and the completion of bidding documents. Mr. Greenberg must relate all of these factors to their probable effect on dollar amounts at the expected bidding date, which may be one or two years or more after the date of his computation.

One of the devices which contributes to his skill in making such extrapolations is the cost index which Smith, Hinchman & Grylls has developed and plotted continuously since about 1910 in parallel with other well-known national indexes, such as the Engineering News Record building cost index and the building commodity index of the Bureau of Labor Statistics (Figure 3).

The Smith, Hinchman & Grylls index is of different components from the other two indexes. It does not call their accuracy into question. It is particular for the actual buildings and localities represented by the work done by the company. It is based on tangible factors of building material costs, freight rates, hourly rates of skilled trades and unskilled labor plus intangible factors of labor efficiency, contractor profit margins, bidding competition and contractor overhead, taxes, availability of materials and labor. It can be used only with the same understanding of its components and statistical applicability that pertains to all such indexes.

Perhaps the chief value of the index, so far as actual cost estimates are concerned, is in the exercise of its compilation which familiarizes Mr. Greenberg and his staff with a broad spectrum of factors and the dimensions of the effect of those factors on the estimating problem confronting the department at any given time.

As soon as the earliest cost and area approximations are made, the Smith, Hinchman & Grylls production control department, under P. P. Petkoff, has









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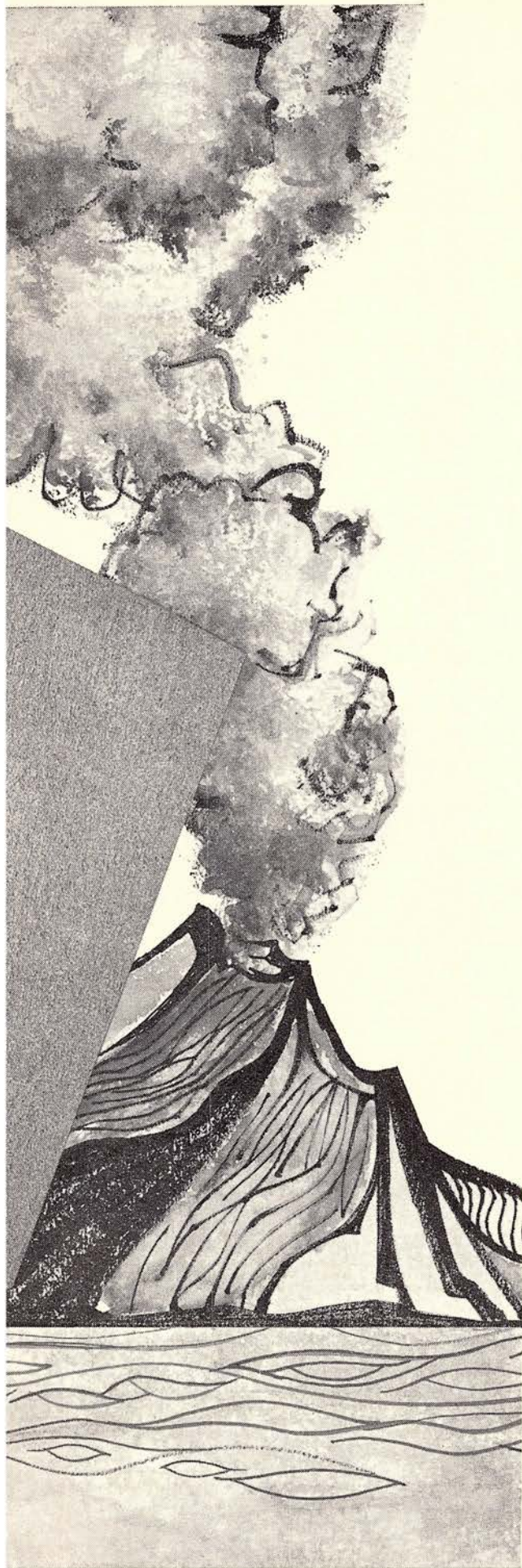
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continued from page 111

At this point, Mr. Greenberg prepares a detailed cost estimate, similar to the previous check list but in closer detail. This estimate is most important and must reflect final construction cost as closely as possible, because very often it is a figure guaranteed by Smith, Hinchman & Grylls as *not to be exceeded* by final construction cost of the building. The figure is based on well-developed drawings, and a modified take-off of materials from outline specifications.

To assure agreement on all elements of this estimate Smith, Hinchman & Grylls policy insists that a record copy of the estimate and a record set of drawings and outline specifications upon which the estimate is based must be initialed at each stage by the principal in charge, by the project director, by all department heads and by the production coordinator.

The latter (Mr. Petkoff) meanwhile has been receiving detailed reports of the man-hours spent on each phase of the project by each of the departments listed in the left hand column of the chart at the bottom of Figure 4. He compiles a weekly report summarizing for each department and each phase: (1) labor cost to date, (2) hours this week, (3) hours to date. These he compares with his estimated quota of hours allotted to the project. It is a running check which spots very early any tendency of the project to get off the track.

A further check is in a monthly recap of the items

Figure 5. (Below) Form for building work cost estimate

Project	Date	Mat'l's per	File No.
Based on: Sch. or Prelim or W.D.		Future	
Area			
1. Wall Area			Gr. 1
2.			B. W.
3. Sh. File or File			M. W.
4. Exc.			E. W.
5. Fill			Sl.
6. Fins.			Site
7. Grd. Sns.			Tot.
8. Bapst. Walls			Gr. 2
9. Tunnels			Tot.
10. Str. Stl.			
11. Misc. Metal			
12. Conc. Slab on Grd.			
13. Supp. Floor			
14. Supp. Floor			
15. (Al. Ins. Panel			
16. (Brk. & Blk.			
17. EXT. (Panel Wall			
18. WALLS (Plate Glass			
19. " (St. Sash			
20. (Tr. Steel			
21. (Conc. Blk.			
22. Partit- (Cer. Tile			
23. tions (Gl. Tile			
24. " (Lead Lining			
25. " (Toilet Part.			
26. CLOS. (Pl.			
27. (Ar.			
28. Rf. M. D., Conc., Precast			
29. (Cem. Fin.			
30. FLOORS (V. A., A. T.			
31. (G. T., Cer. T.			
32. Doors			
33. Stairs			
34. Painting			
35. Misc.			
36. GEN. COND.			
37. GR. 1-Casck. Refr. Ster.			
38. Kit. Expat. Misc. Expat.			
39. NIC: Gr. 11			
40. SITE (Roads, Parking			
41. (Landscaping			
42. (Walks			
43. (Ex. Fill, Ret'g. Walls			
44. (Mech. Site			
45. (Elec. Site			
46. Removals			
47. Dust Protection			
48. Weather Protection			
49. Premise Trim			
50. Shoring			
51. Alterations: B. W.			

MONTH	1/31/63	2/28/63
EARNINGS		
COST		
COST: SCHEMATIC		
PRELIMINARY		
WORKING Dwg.		
FOLLOW UP		
FIELD SUPV.		
SUB-TOTAL LABOR		
EXTRAS POINT 1		
POINT 2		
POINT 3		
POINT 4		
SUB-TOTALS EXTRAS		
TOTAL ALL LABOR		
CASH CHARGES		
TOTAL ALL COST		
FEE: CONSTRUCTION COST		
GROSS FEE		
RESERVE: CASH CHARGES		
RESERVE: FIELD SUPV.		
EXTRAS		
NET FEE		
EARNINGS:		
% COMPLETE		
FIELD SUPV.		
EXTRAS O. T.		
SUB-TOTAL EARNINGS		
CASH CHARGES		
TOTAL EARNINGS		
PROFIT OR (LOSS) TO DATE		
PERFORMANCE TO DATE		
PERFORMANCE THIS MONTH		

Figure 6. (Above) Monthly recap

listed in Figure 6. A single sheet carries 12 such monthly summaries so that the experienced eye can view the trend of performance. When Mr. Greenberg's detailed, "guaranteed" estimate is available at the end of preliminary working drawings, Mr. Petkoff has a firm basis for detailed review of performance and for any action that seems needed.

It should be noted that at this point corrective action can be taken *before* the heavy work load budgeted for the working drawing phase is undertaken. It can be done, also, while both the chief designer and project manager are equally engaged and familiar with the project.

After approval of preliminaries, the project moves into working drawings. This represents a major company investment, but it is a phase in which the designer begins to withdraw and the project manager remains as the moving force. The cost of change and unresolved error becomes extremely high as this phase advances; hence, the value of a very accurate cost estimate at the close of preliminaries.

During the working drawing phase, a final construction cost estimate is made updating the preliminary estimate and showing any deviation from it. This final estimate is based on specific materials and final dimensions room by room. Specification and bid documents are examined to be sure there are no duplications of items or work for more than one contractor. This estimate is prepared as close to the bid date as possible, but allowing sufficient time (one or two months) for the development of construction alternates if it appears they may be needed.

At the end of the working drawing phase, estimates and bidding documents receive two final checks; one by the job captain for each department, and one by a correlation checker who is not familiar with the job and hence approaches his task with a fresh and expert eye.

All of this attention to concurrent systems for accurate cost estimating, both internal and external, reflects a basic concern of Smith Hinchman & Grylls management for the best ultimate and continuing service to clients. The system, says Mr. Hastings, has been developed to make the most effective use of all funds available for design and construction and the most effective use of the talents of creative people. Keeping program and budget constantly in focus during all phases of a project permits the architect and his client to put their best efforts into development of the most creative design concept and preparation of the most effective contract documents. Although the system must be rigidly enforced to work well, a particular job may warrant flexible application. A design adventure, an unusual engineering treatment, a jewel or challenge—each may be worth doing for its own long range value. It would be folly to submerge them in a rigid operating system. It would be equal folly to forsake the system which makes them occasionally possible.





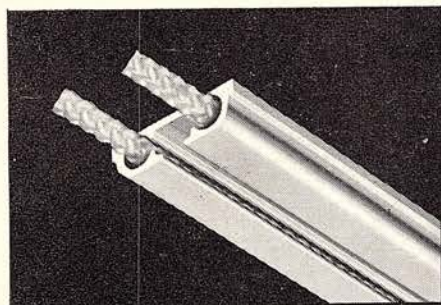
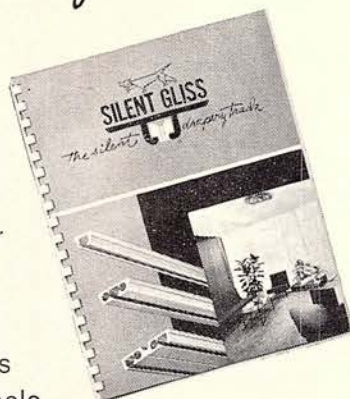
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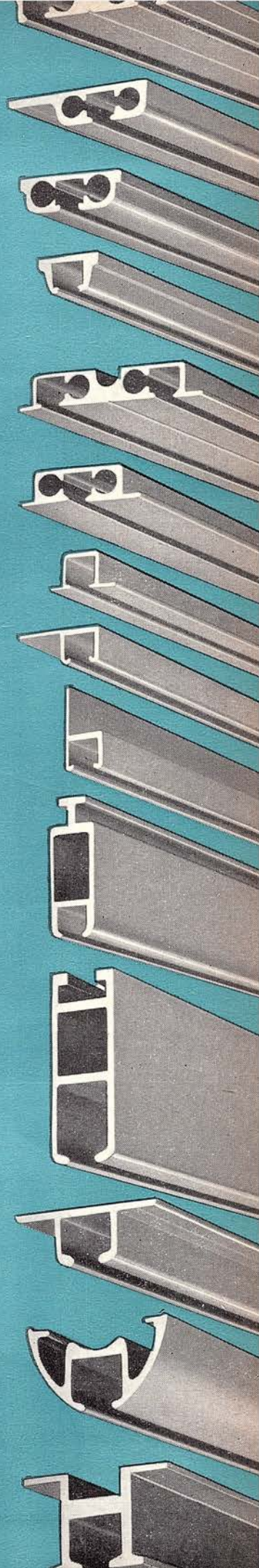
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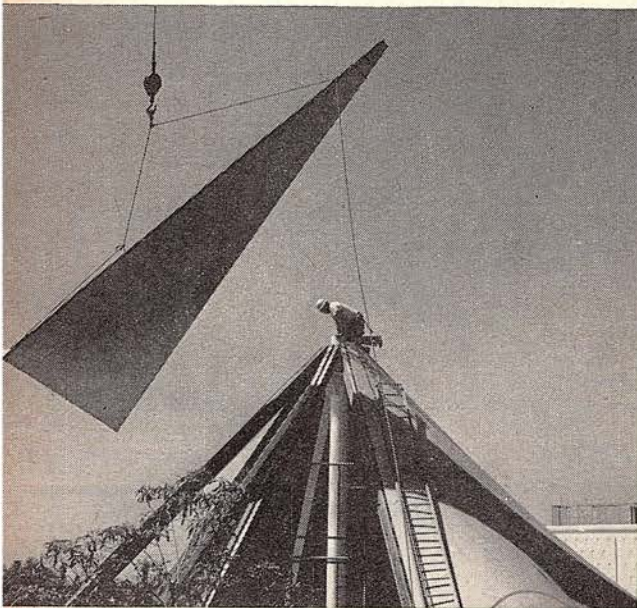
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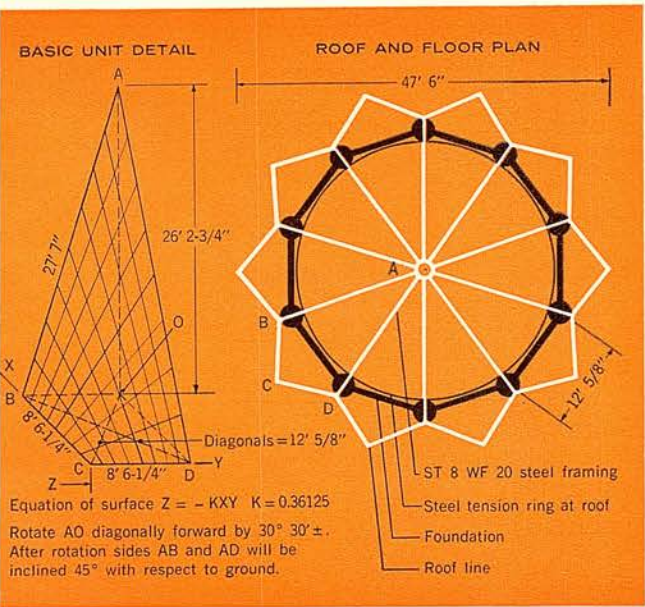
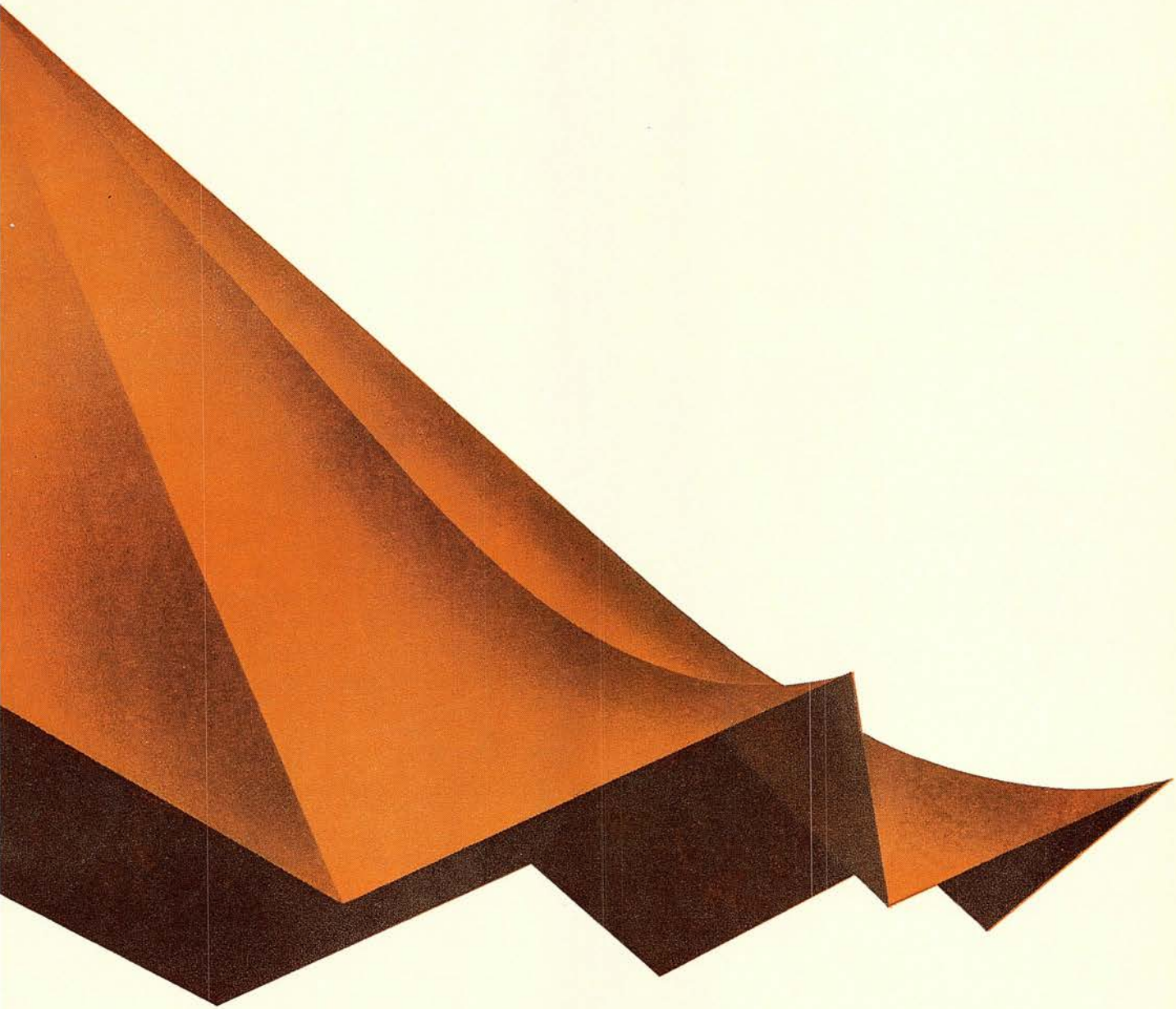




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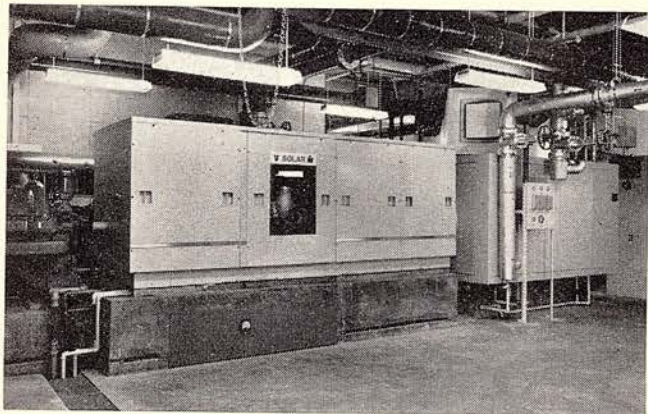


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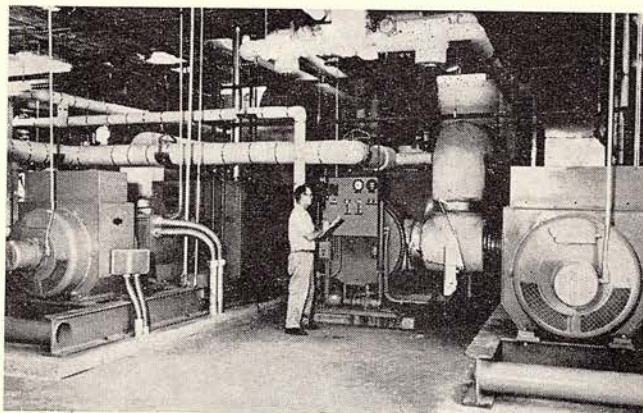
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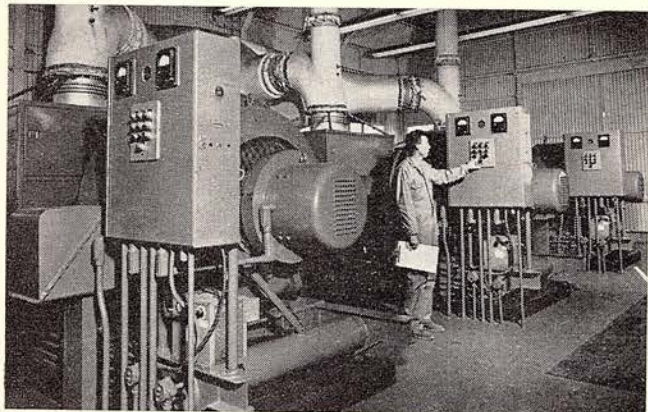




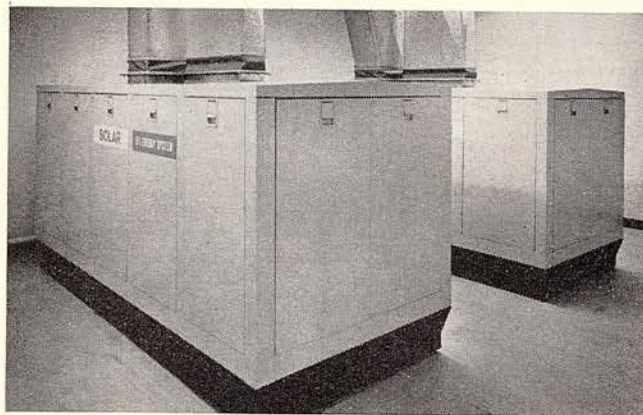
*Washington Natural Gas Company in Seattle*



*Gas turbine energy system at McAllen High School*



*Warren Petroleum Corp. refinery, Monument, N. M.*



*T-350 gas turbine energy system for Standard Pipeprotection, Inc.*

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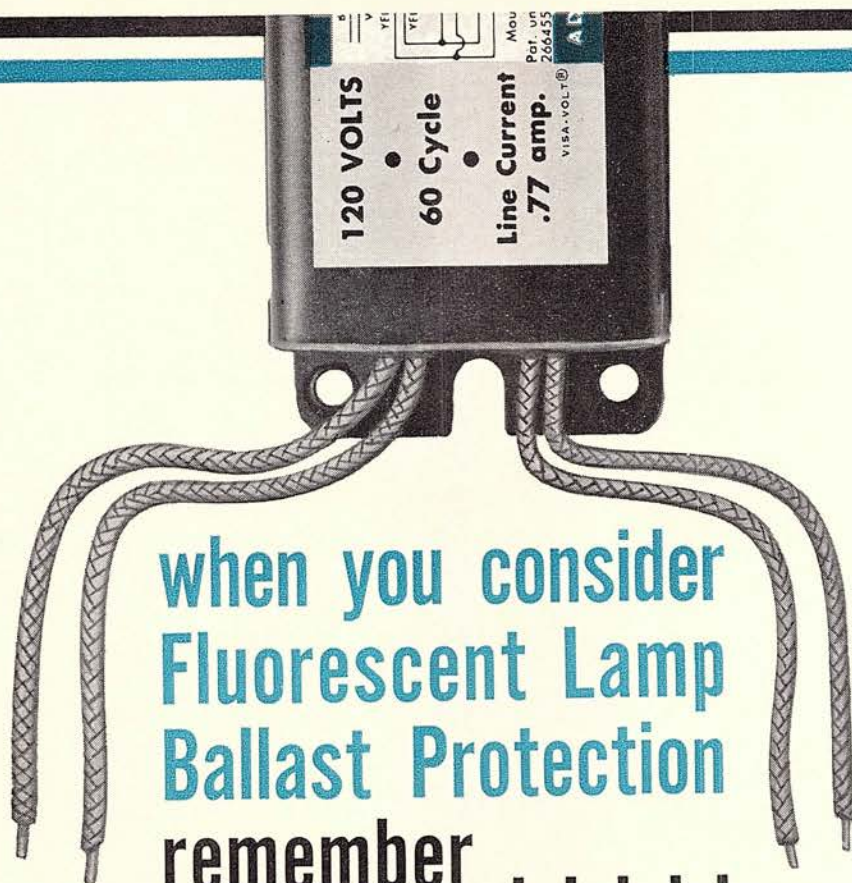
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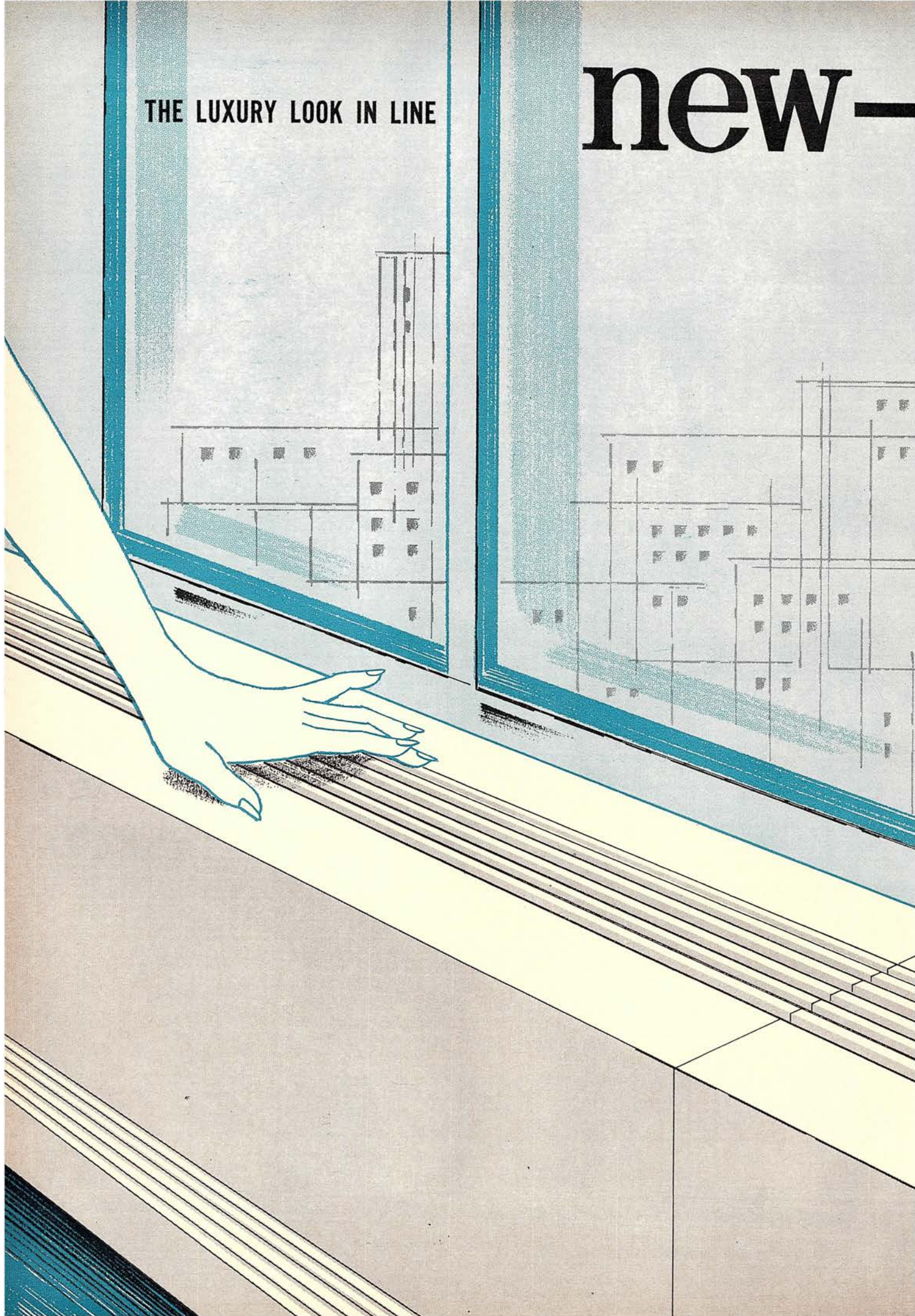
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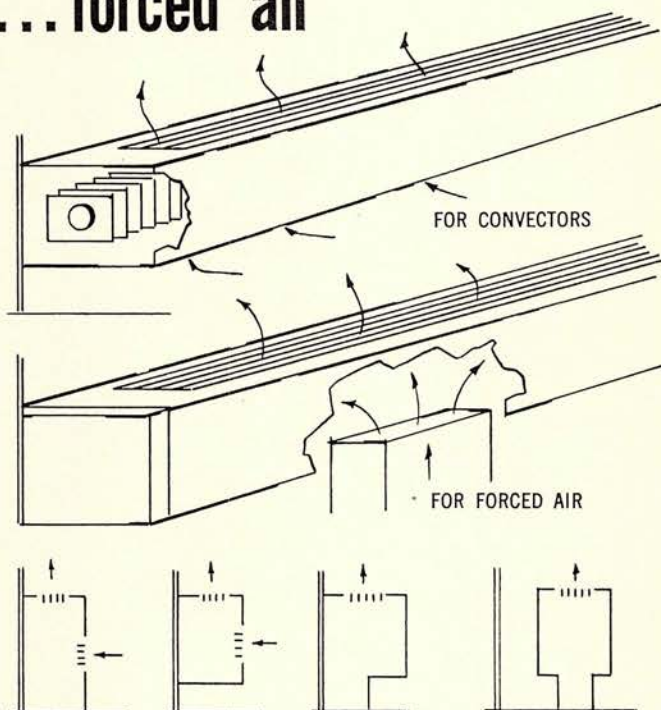
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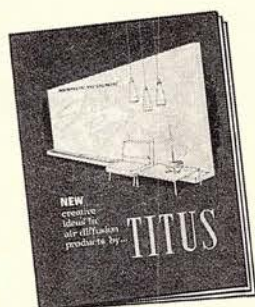
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# GACOFLEX

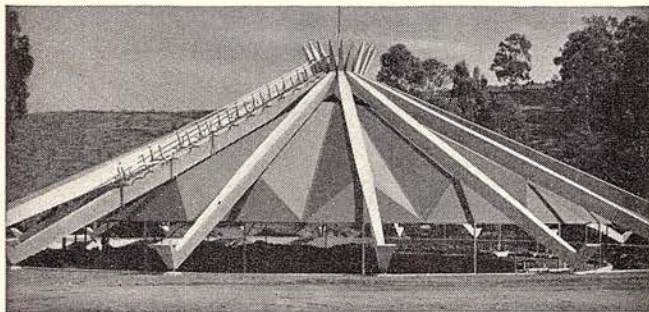
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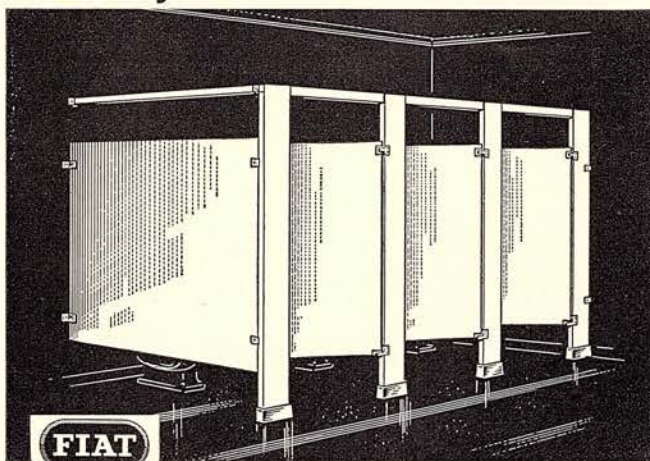
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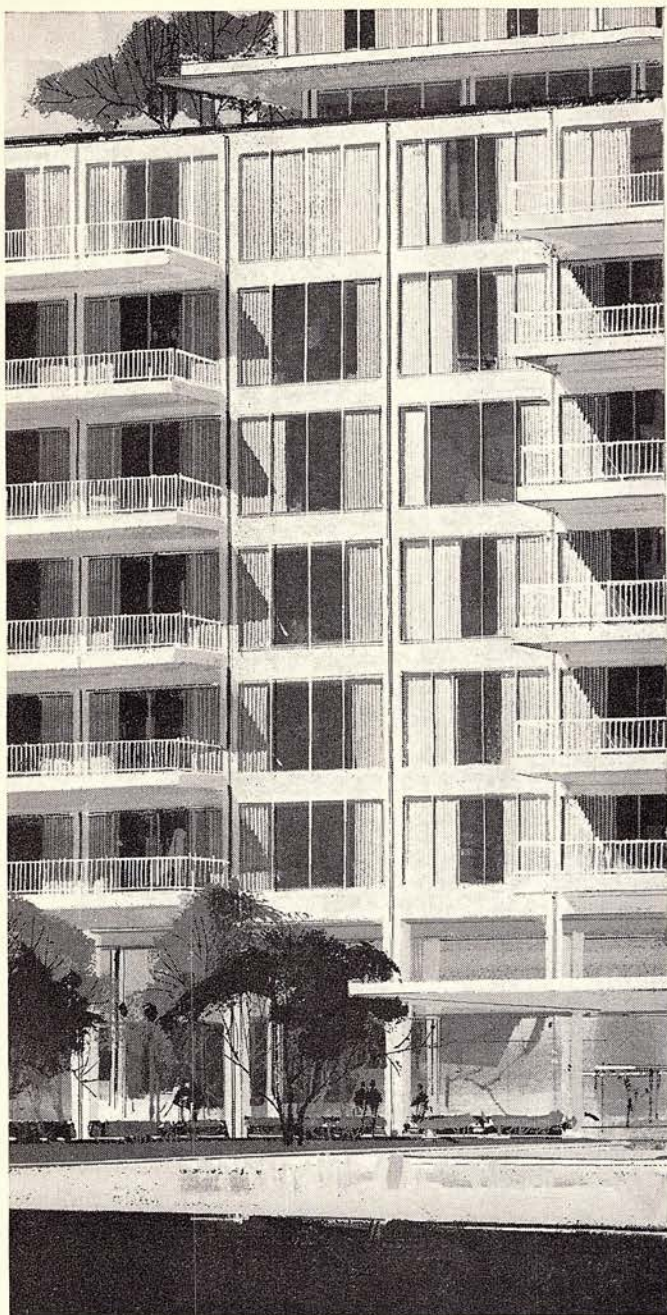
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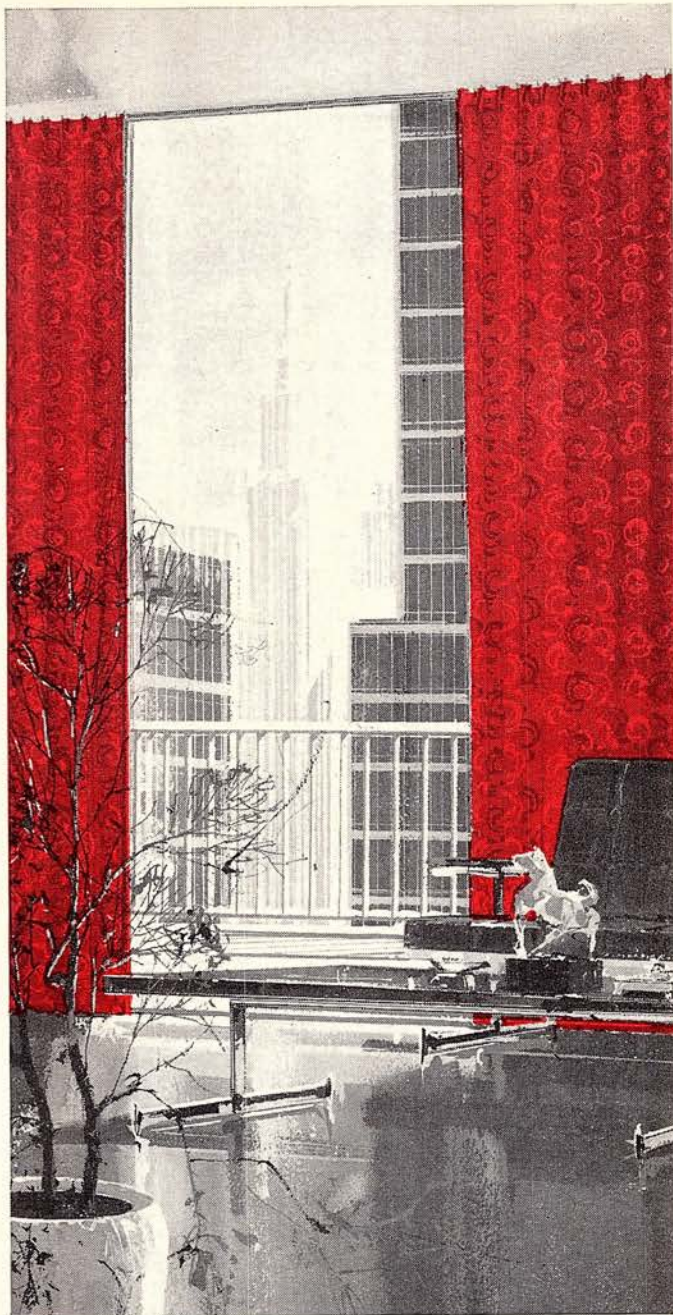


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## lets tenants individualize.

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**Kirsch**  
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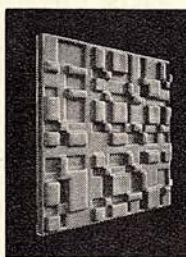


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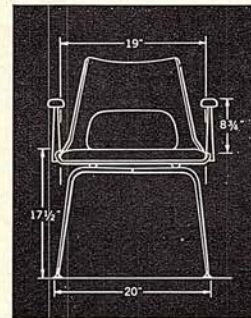


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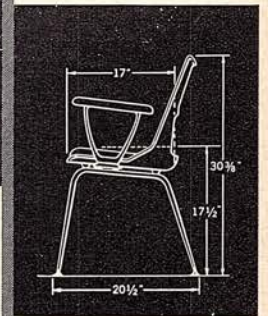
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# New LPI Vee-Lens is the best way to light a corridor

LPI's Series II Vee-Lens with butterfly distribution provides excellent lighting for corridors, library stacks, and stock room aisles.

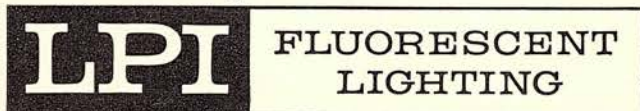
This new luminaire delivers high levels of light to corridor walls. It produces proper brightness ratios for relief of ceiling contrasts, and it controls brightness for glareless, down-the-hall visual comfort.

In addition, the Vee-Lens II is UL-listed for surface mounting—without spacer brackets—on combustible low-density cellulose fiberboard ceilings.

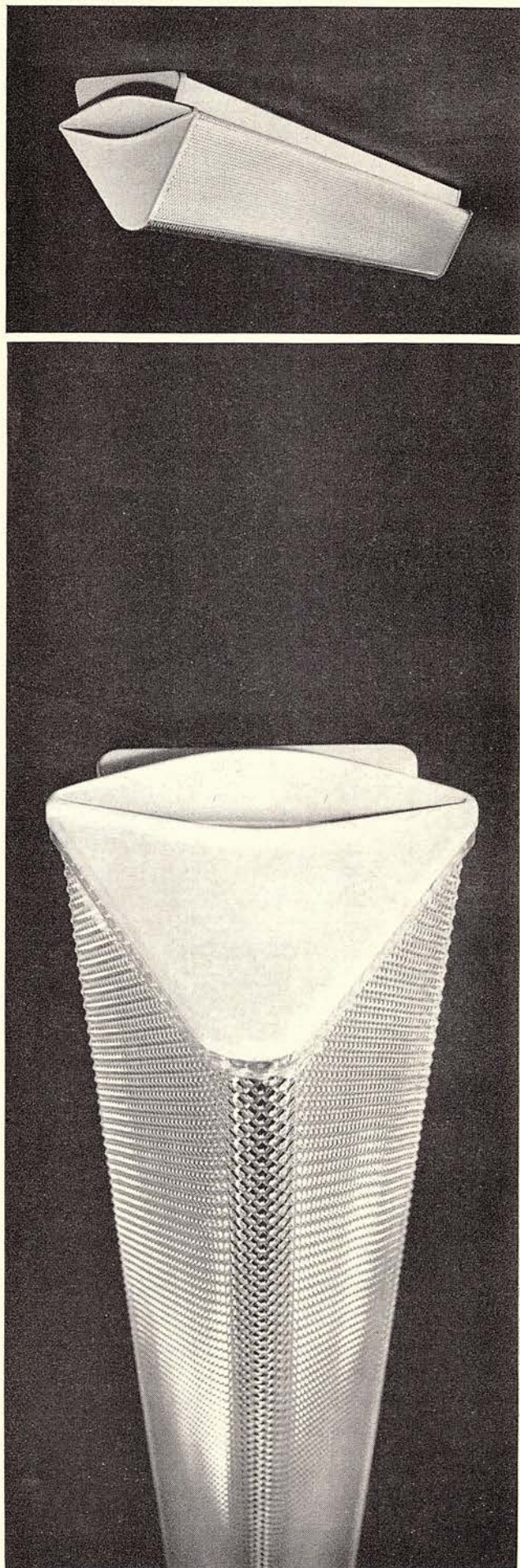
Distinctive trim caps enhance the luminaire's handsome styling, and clear plastic end caps permit a clean, unbroken luminous effect when the luminaire is mounted in continuous rows.

The next time you have a corridor to light, ask your LPI representative about the Vee-Lens, or write for full information.

LPI-4-212



Lighting Products Inc., Highland Park, Illinois 60036

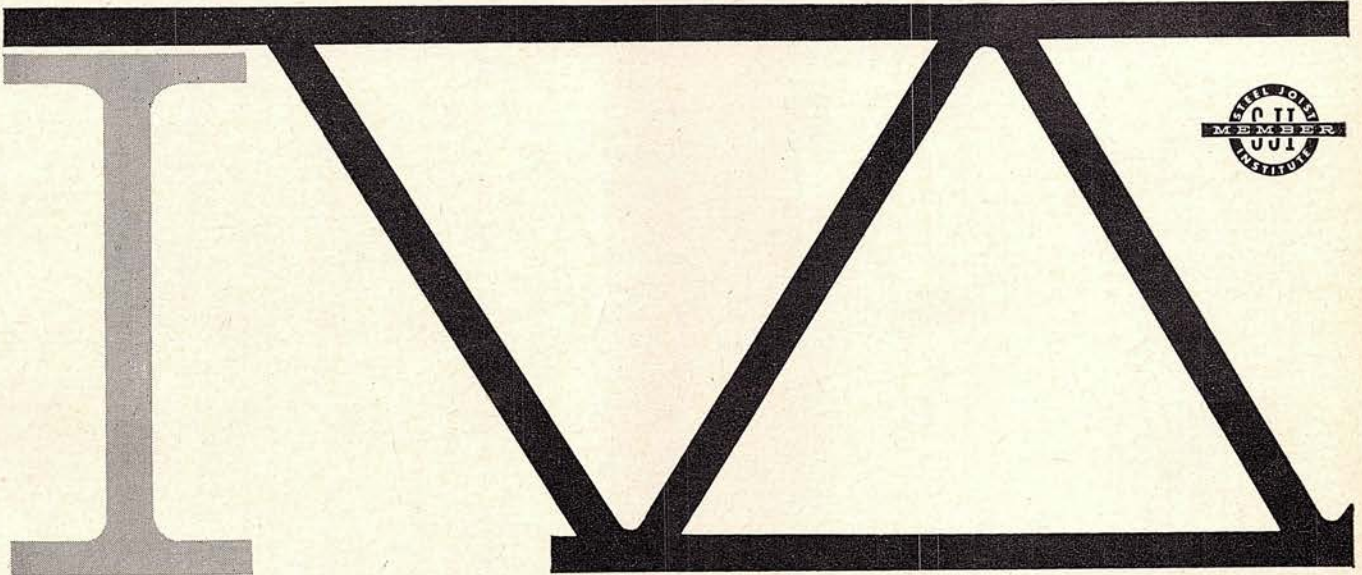
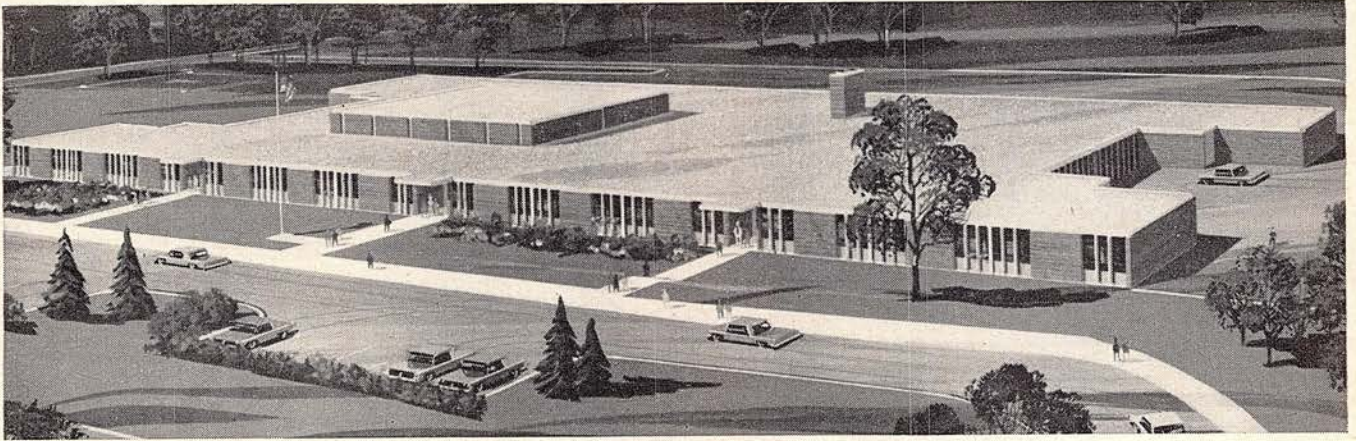


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Architects: Monroe and Lefebvre, Kansas City, Missouri  
Owner: Elementary School District No. 49, Overland Park, Kansas  
Structural Steel Fabricator: Havens Structural Steel Company, Kansas City, Missouri  
Contractor: R. L. Henry Construction Company, Grandview, Missouri



## How 52 tons of steel joists cut weight in this school

Roof structure for this new elementary school in Overland Park, Kansas, consists of 499 Sheffield Open Web Steel Joists. They are high strength joists—H-Series—made with modern Sheffield Steels having a minimum yield strength of 50,000 psi. Total deadweight is 52.5 tons. Because the architect elected to use the most modern design concept, employing

the high load-carrying capacity of H-Series Joists, deadload was substantially less than with the older, widely accepted J-Series Joists.

Designing with high strength H-Series Sheffield Joists can bring economies to structural frame designs and foundations, too. There's less deadweight to hold up in the air. For data on Sheffield Open Web

Joists, including H-Series and J-Series, see our catalog in Sweet's Architectural File, or write for your copy of the latest Sheffield Joist Catalog. All Sheffield Joists meet the widely accepted specifications of the Steel Joist Institute. **Sheffield Division, Armco Steel Corporation, Department S-1154, 7000 Roberts Street, Kansas City, Missouri 64125.**

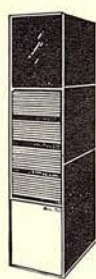


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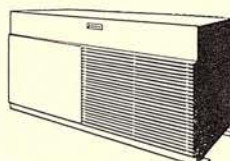
Gas Furnaces



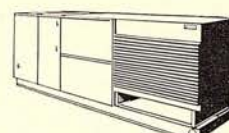
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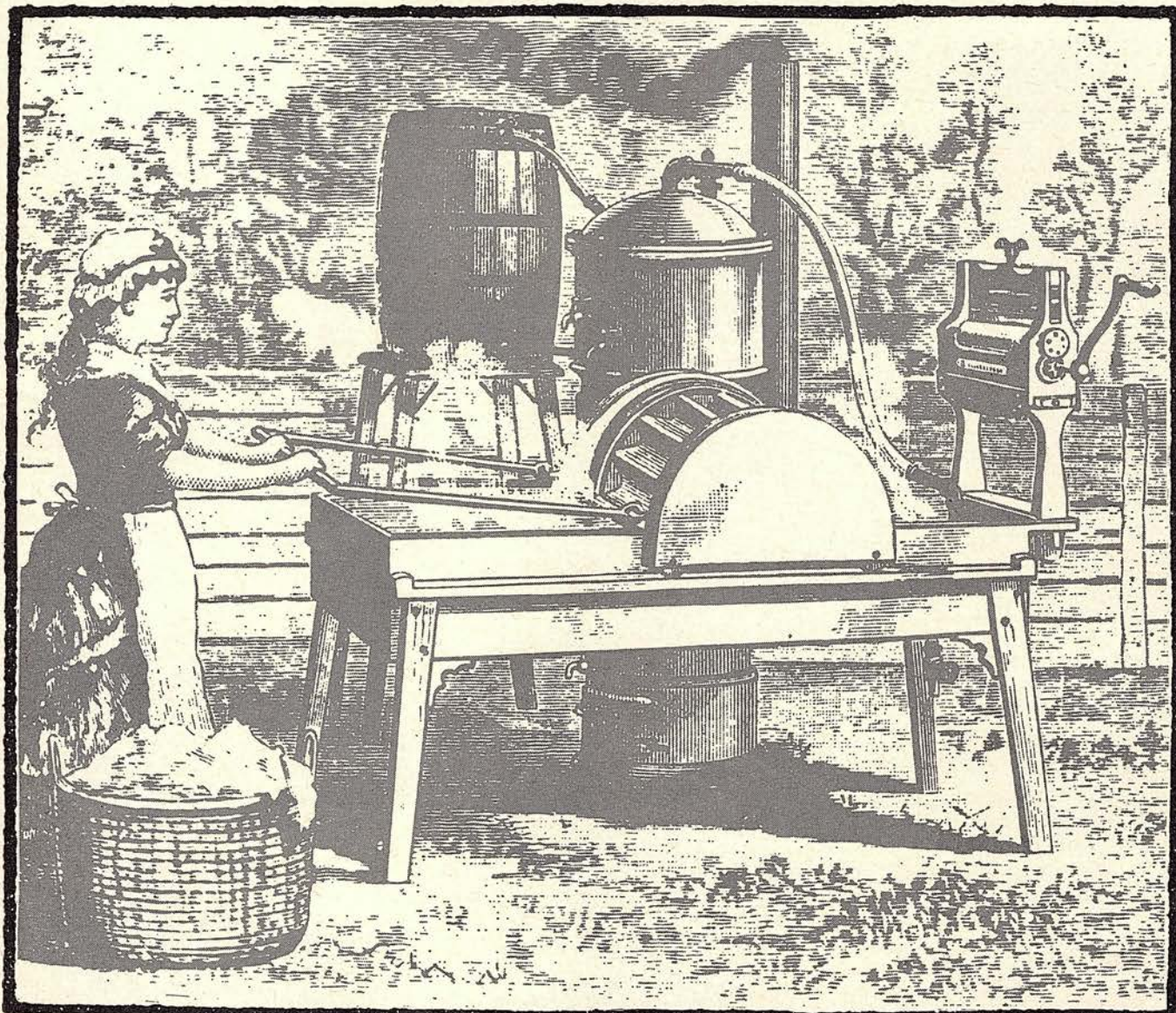
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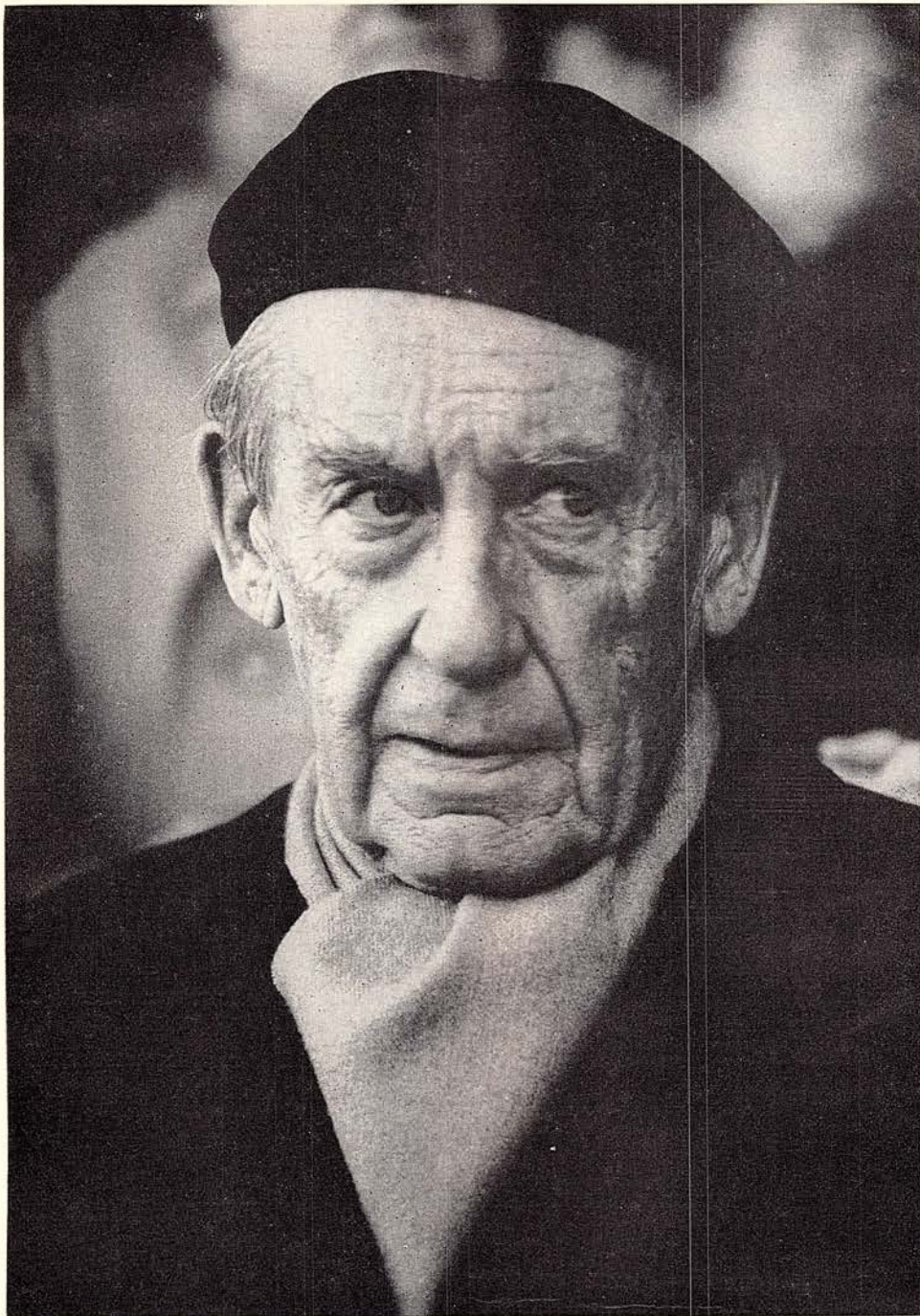
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Wolf Lücking

## TRADITION AND CONTINUITY IN ARCHITECTURE

In a noteworthy recent address  
given at the Boston Architectural Center,  
Walter Gropius re-examined the great themes of his career.

In a three part series beginning this month,  
ARCHITECTURAL RECORD presents his talk in full





Arnold Eagle

*"... and we had better admit that visual documentation of our specific way of life is still largely haphazard and inconclusive."*

*There is no past which we should long to resurrect,  
There is eternal newness only, reconstituting itself  
Out of the extended elements of the past  
And true yearning should always be towards productive ends  
Making some new, some better thing.—GOETHE*

## Part 1

It seems to be desirable in our period of rapid transformation of values to stop, look, and listen from time to time. If we sharpen our own criteria, we may be able to better judge our own contributions and to see how they relate to the characteristic manifestations of the society we live in. We may find confidence and direction, so indispensable in the face of the confusing complexities of our modern life.

Looking at our state of democracy today, we realize that improvement of our society can come only from a greater effort to educate ever-stronger, independent individuals who will be capable to develop, simultaneously, a group consciousness among them. From such group consciousness—as history shows—develops tradition and continuity. The more outspoken the individuals of a society are and the more they are willing at the same time to abide by commonly recognized group characteristics, the stronger will be their cultural manifestations. No doubt, length and depth of the historical development of a people are reason for the greater or lesser stability of their tradition. In the United States, the famous melting pot of so many races and nations is still in a state of fermentation. Small wonder then that no consistency of approach is yet noticeable in modern American architecture. In fact, we grope in many directions to find our own. Cultural group consciousness is not yet strongly in evidence. Since the history of our civilization is still young, this is quite natural, and we had better admit that visual documentation

of our specific way of life is still largely haphazard and inconclusive.

How can we bring the diverging lines of development into better focus, so that our hands become firmer in drawing the outlines of a recognizable image of our society as it reveals itself in its buildings and planning habits? How can we assess our own contributions in the light of traditional values and the idea of continuity in a cultural sense?

Ever since we have placed ourselves on the fast-moving vehicle of scientific progress, we have only allowed our minds to be dragged along by it at an ever-increasing speed, while our souls got off at an early stage, hurling loud protests after the "infernal machine." How are we going to join our parted selves again and to balance the impact of the vehicle? Certainly not by embellishing the scene with architectural "gems" which, by eclectic overtones, strive to create a link with an emotionally meaningful past. It isn't that easy.

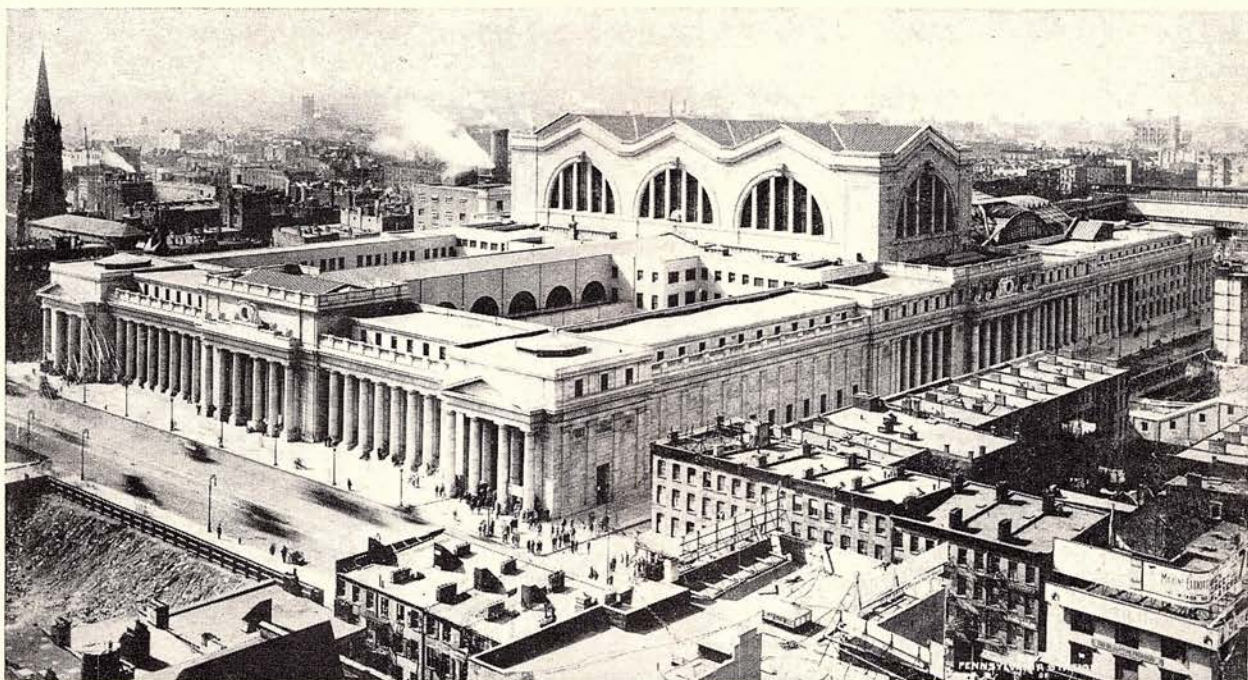
When I came to this country 27 years ago, I found a naive but confident belief among the average people that everything new was better than everything old. This belief has undergone a considerable disillusion in the meantime, and lately some arbiters of "taste" have let it be known that almost anything old is preferable to anything new. The free-roaming spirit of adventure has curled in on itself. This is where we stand now, our hands uncertain because our minds are; with diminished confidence because



*"In the beginning of this century architects were misguided into believing that their duty lay in disguising the raw facts of the new industrial urban life that had sprung up around them."*



*Brown Brothers*



*Brown Brothers*





Florence, Piazza S. Spirito, from "Italy" by Martin Hürtimann, courtesy Thames and Hudson, London

*"What we should gain from studies of the past is an admiration for the direct, unsentimental and exuberant solutions which have been found in the past not necessarily by famous architects only, but by ordinary people who obeyed necessity in an inspired way because they identified themselves wholeheartedly with their own times."*

our conscience tells us that we have not fully played our part in the great task of this century: the transformation of the inarticulate, drifting masses of democratic citizens into individuals aware of their own potentialities and responsibilities. Accusing the general public of cultural inaction will only retard the recognition of the deeper cause for our frustration: our hesitation to stand up heart and soul to the tasks this century has imposed on us and to see them through to a seemly end. Only this would be of historical relevance, and nobody is going to remember the half-hearted and the strays.

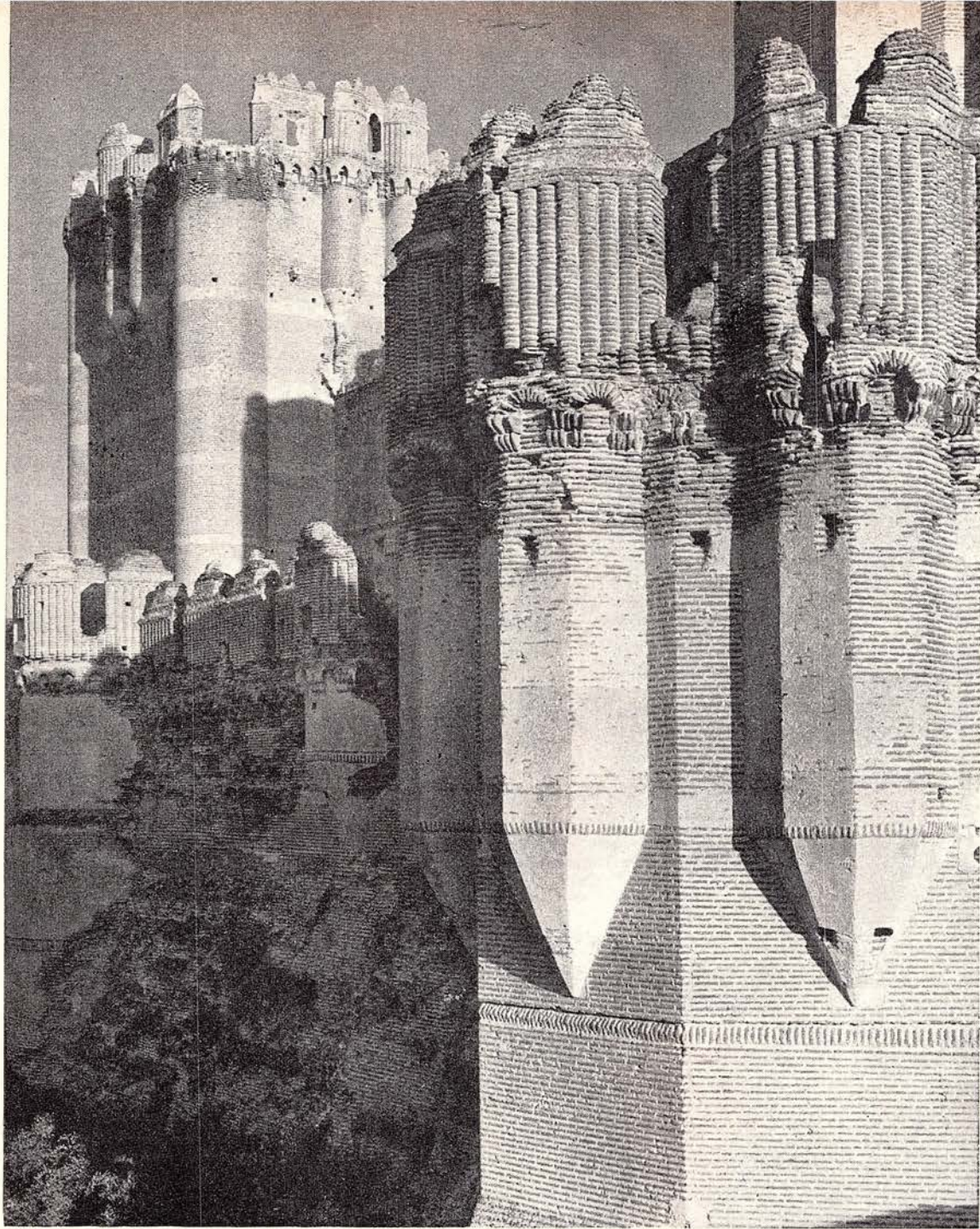
In the beginning of this century, architects were misguided into believing that their duty lay in disguising the raw facts of the new industrial, urban life that had sprung up around them and that they must guard the continuity of immutable esthetic concepts as they had been developed by the centuries preceding them. They lost sight of the fact that this misapprehension of their role in society gradually reduced their activities to the well-to-do fringes of society where the preaching was easy and where their standing as elegant arbiters of taste was assured. I grew up in that atmosphere. When in 1910 I had my first premonition that all this would be wholly inadequate to establish a true, historically valid expression of the needs of our own time, I felt strongly that it would be necessary for the architectural profession to throw itself fully into the creation of an architect-controlled production of all the innumerable building facets which combine to make up the setting for the whole of 20th-century society. At the same time, I felt it should help to revolutionize the *visual* education of the young.

In the pursuit of these aims I bloodied my nose re-

peatedly in my attempts, first, to give prefabrication for the mass market an early, architect-controlled start and, second, to put visual education on a much broader and more contemporary basis as we finally succeeded in doing at the Bauhaus. These efforts I continued in different countries and on different levels, but among professional ranks there was scant sympathy for this early effort at giving direction to the ominously gathering forces of mass production before they were going to swamp us. The sight of the strait jacket into which architects proceeded to maneuver themselves had worried me and other architects already before World War I, but, as you know, the majority of them continued at that time to confine themselves to the limited demands of the decorator's craft and today, 50 years later, prefabrication is still largely unattended by architects and visual training is far from being on an equal level with other subjects of education.

But despite this poor record in foresight and anticipation of an inevitable development, architects never hesitate to berate the dastardly citizen for his ignorance in matters of architectural design. This became a matter of public record recently again when the shameful taxation of the Seagram Building—which amounts to a penalty being paid for excellence in design and good craftsmanship—was imposed. This barbaric decision should indeed be protested, but it seems too easy to accuse the general insensitivity of an anonymous culprit, the city officials, the courts, or the unenlightened businessmen when architects must really share the blame for these shortcomings, together with all those others who failed to read the signs of the time. If we had pressed long ago for a more profound visual training of the





Coca, Castillo, from "Spain" by Martin Hürlimann, courtesy Thames and Hudson, London

Alberobello, from "Italy" by Martin Hürlimann, courtesy Thames and Hudson, London







Fairchild Aerial Surveys, Inc.

*"... prefabrication is still largely unattended by architects."*

average school child, who, though born with the ability to *see*, must be trained to develop his ability to *perceive*; if we had been fully alert to the changing demands of the times, we might be nearer to a meeting of minds when we have to map out a general strategy for the appearance of our common habitat.

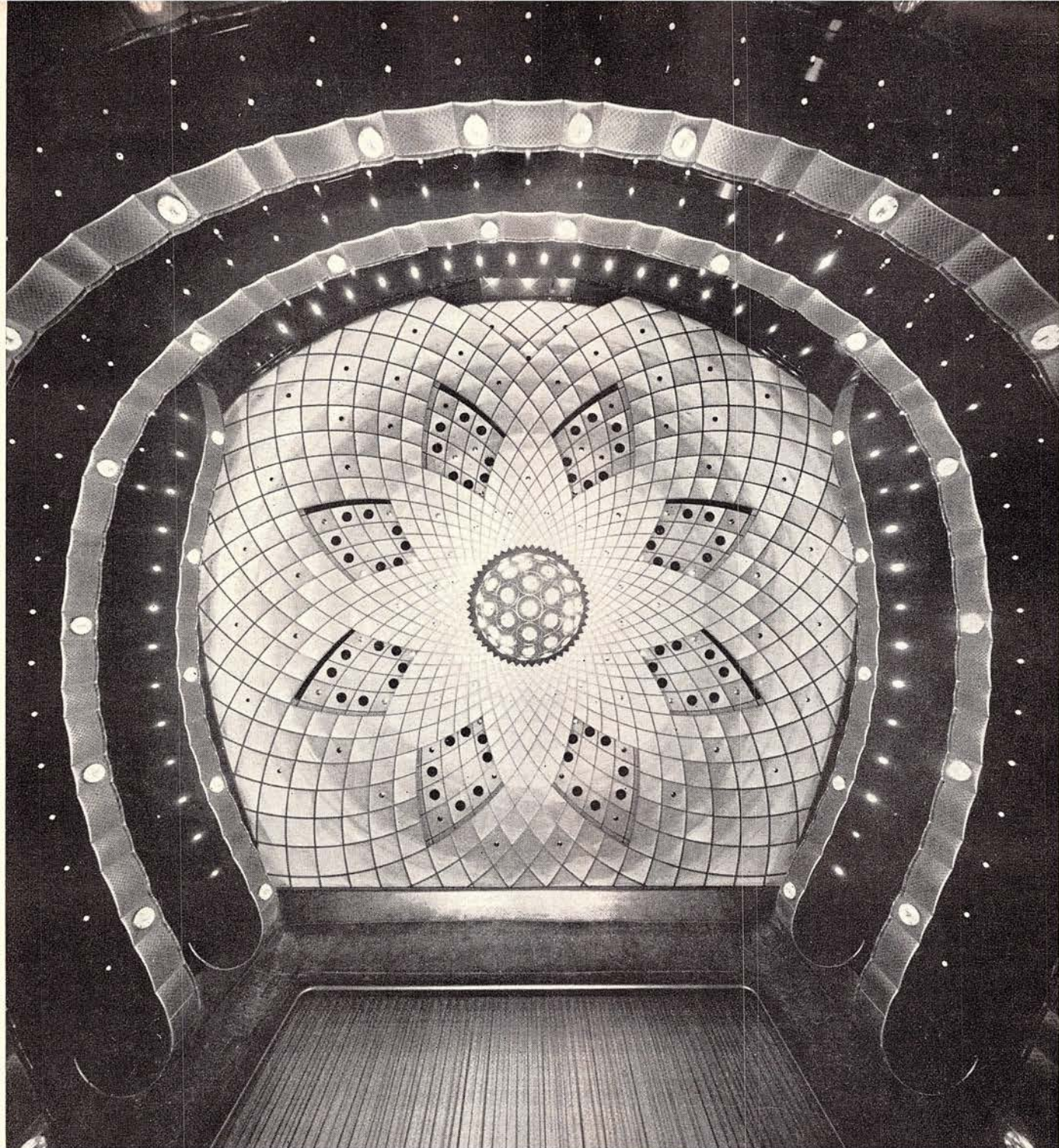
Have architects learned from this defeat? Not too eagerly. In fact they are beginning to become susceptible again to the exhortations of those devoted advocates of the past who acknowledge the present only when softened by accents of some romantic disguise or another to give it the appearance of legitimacy. The word "tradition" is bandied around again for the superficial purpose of ennobling this or that piece of "mood-architecture" and to construe facile "links with the past" for the half-educated.

The word "tradition" comes from the Latin: *tradere*, i.e., transmit, carry on. This certainly does not mean that the study of an old successful house type, or an old successful town structure would necessarily equip one to construct a house or city area fit for *this* century; in fact, too deep absorption in it might hinder, instead of help, an immediate and fresh response to our modern problems. What we *should* gain from such studies is an admiration for the direct, unsentimental and exuberant solutions which have been found in the past not necessarily by famous architects only, but by ordinary people who obeyed necessity in an inspired way because they identified themselves wholeheartedly with their own times. This group-instinct, as I have said before, is by no means fully developed in this country, and the influence some of our intellectuals have taken does little to knit individuals together for a common effort. Highly cultivated themselves, in esoteric apartheid,

they let the realities of our contemporary scene enter this life only in the safe, symbolic form of modern painting and sculpture. By creating islands of culture for themselves in putting up museum buildings and other tokens of civilization in the midst of otherwise shapeless hodge-podge towns, they make themselves believe that they have done their part in carrying the cultural message among the unenlightened. But they carefully stay away from those areas where the actual face of our time reveals itself in its depressing ugliness, and they do not share in the labors of those who are trying, at this late date, to develop a new "blueprint for living" for the multitudes who have been vainly waiting to see an image of their own society arise which they can believe in. So, by and large, the cultural message is lost to the inhabitants of Shantytown.

This country has just watched the tragically short performance of one of the few people who seemed singularly at home in *this* century and who never doubted that we could make something of it that would prove ourselves to be responsible protagonists of our own phase of history. President Kennedy was neither frivolous in his optimism nor did he allow any washing of hands in the face of our mountainous problems. At home in the present, but familiar with the traditions of the past, he cast his thoughts far ahead of himself and gave new articulation to the American image which the whole world has become aware of. He understood also that true democracy needs, as a basic requirement of life, its own flowering of art as a powerful equal to science and the economics of affluence. His scope of understanding for the unity of life in all its phases is a challenge to all professions.





Erza Stoller Associates photos

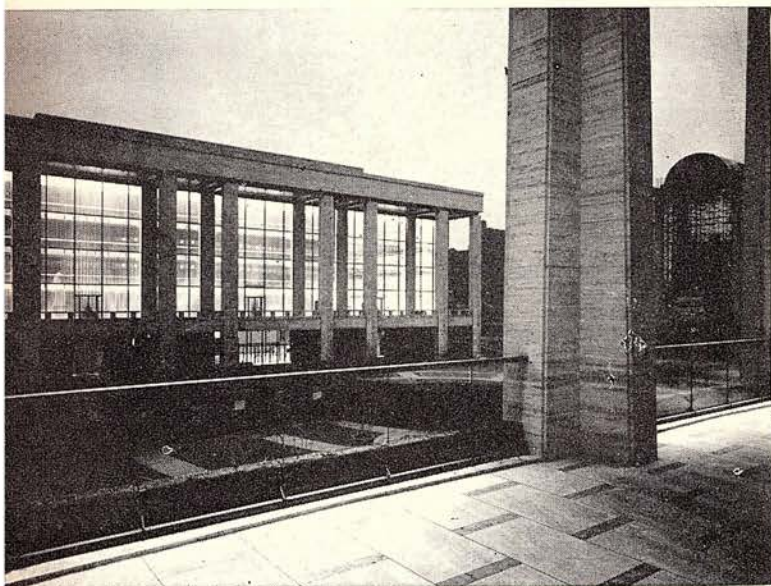
# THEATER GLAMOUR AGAIN

Architect Philip Johnson combines red plush, gold leaf and crystal to great effect in Lincoln Center's newest theater

The missing qualities of glamour and sumptuousness have been reintroduced as important elements in theater design with the opening of the New York State Theater at Lincoln Center. This theater is glamorous, romantic—nostalgic, if you will—and deliberately so. Its large, 2,729 seat hall for the

dance, operetta and musical comedy is carried out with sophistication and style, and takes its place as one of the most elegant spaces in New York City. Its elaborate and festive air is due in part to the architect's choice of materials and colors: the elegance of red plush, the richness of gold leaf and the

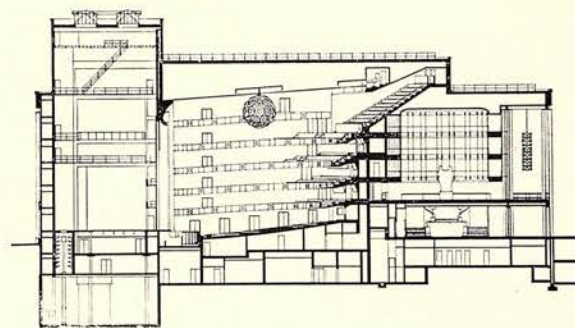




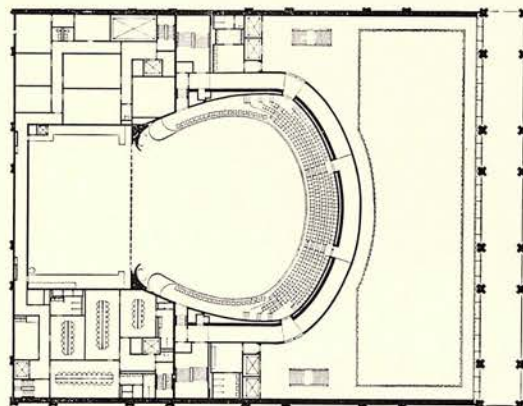
glitter of crystal. But the repeated golden curves of the horseshoe (or lyre-shaped) balconies—the classic pattern of the 17th- and 18th-century Baroque theater—have much to do with pulling the large space into unity and giving it human scale. Architect Philip Johnson says: “The lyre shape seems best for a *Volkstheater*, and this is to be the low-priced theater of Lincoln Center. It is good because it brings many people together in a festive room where everyone can see everyone, where the room will look relatively intimate because the walls are papered with people. It will look intimate, moreover, because more than half the audience will be behind the faces of the balconies which themselves create the psychological walls of the room. The top balcony is outside this psychological space, and if empty, will not give the hall that deserted feeling which is so awkward in a single-level house.”

The orchestra has continental seating, with no middle aisle and rows of seats 40 inches apart serving as cross-aisles. Ten entrances and exits provide for rapid clearing of the house. Johnson says: “The reason behind a cross-axis theater, besides the obvious one of getting everyone closer to the stage, is to give the audience more of a feeling of enjoying a common experience than one can have in a deep rectangular theater or in a wedge shaped house.”

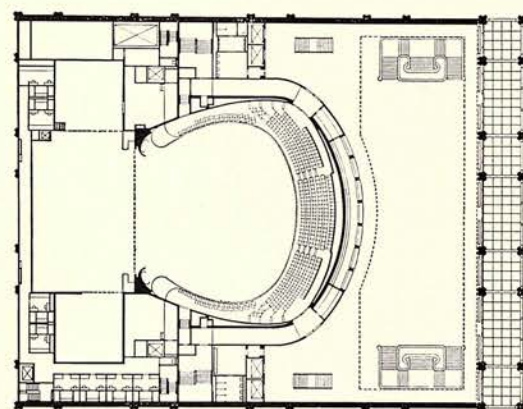
The New York State Theater will serve as the home of both the New York City Ballet and the Lincoln Center Music Theater, under the direction of Richard Rodgers, which will present musical comedy and operetta.



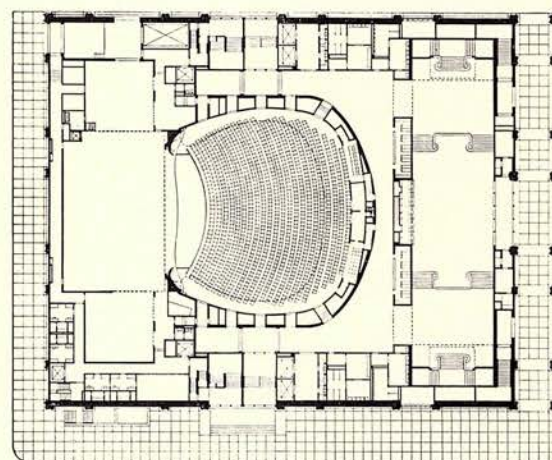
LONGITUDINAL SECTION



THIRD RING



FIRST RING AND PROMENADE

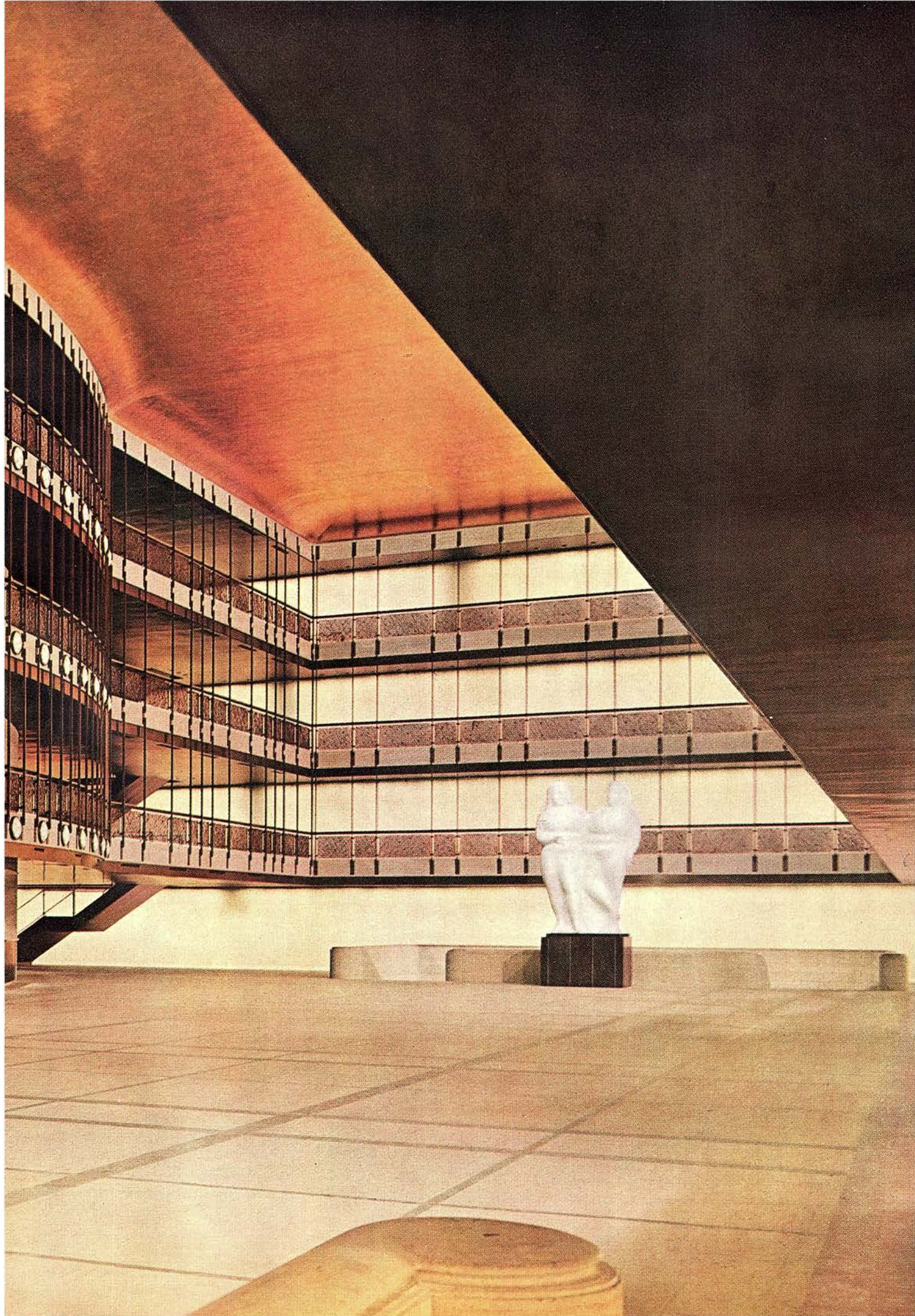


ORCHESTRA AND LOBBY

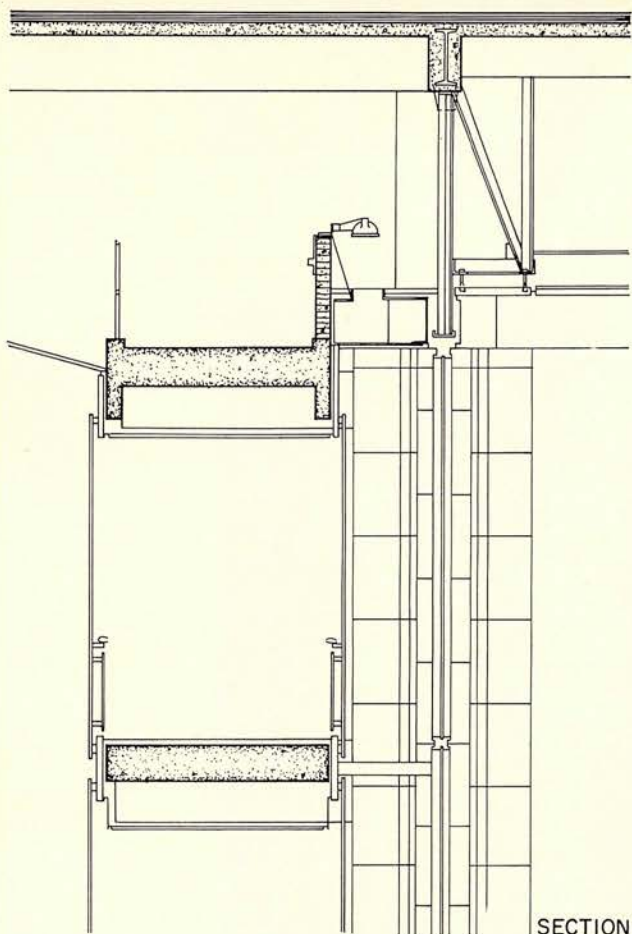




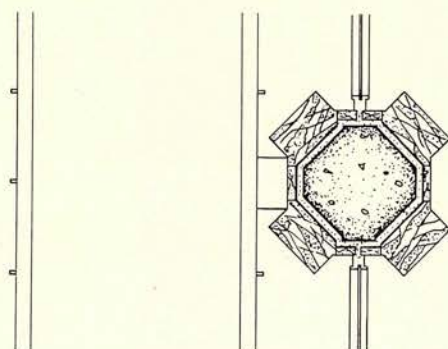
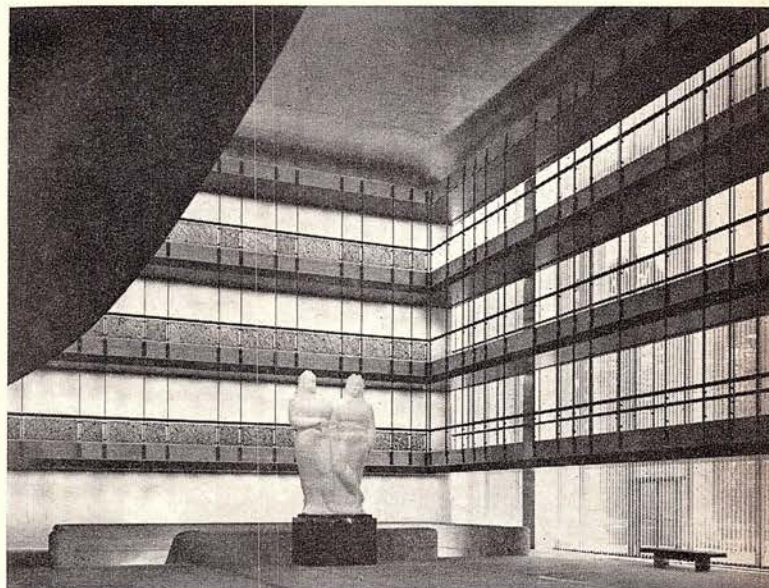




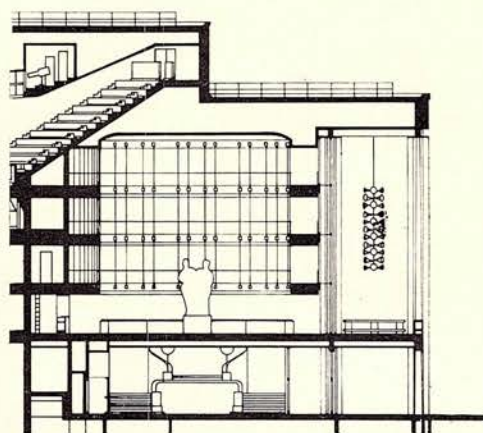




SECTION

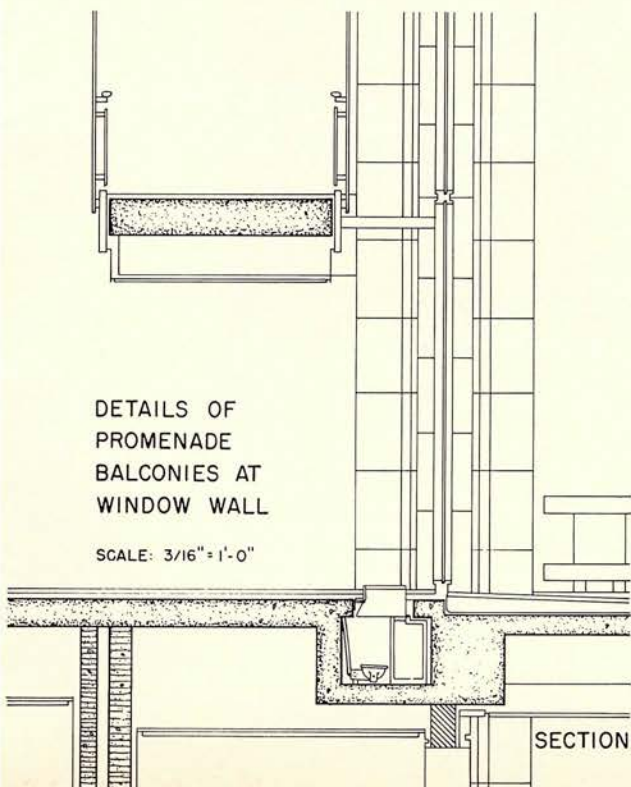


PLAN



DETAILS OF  
PROMENADE  
BALCONIES AT  
WINDOW WALL

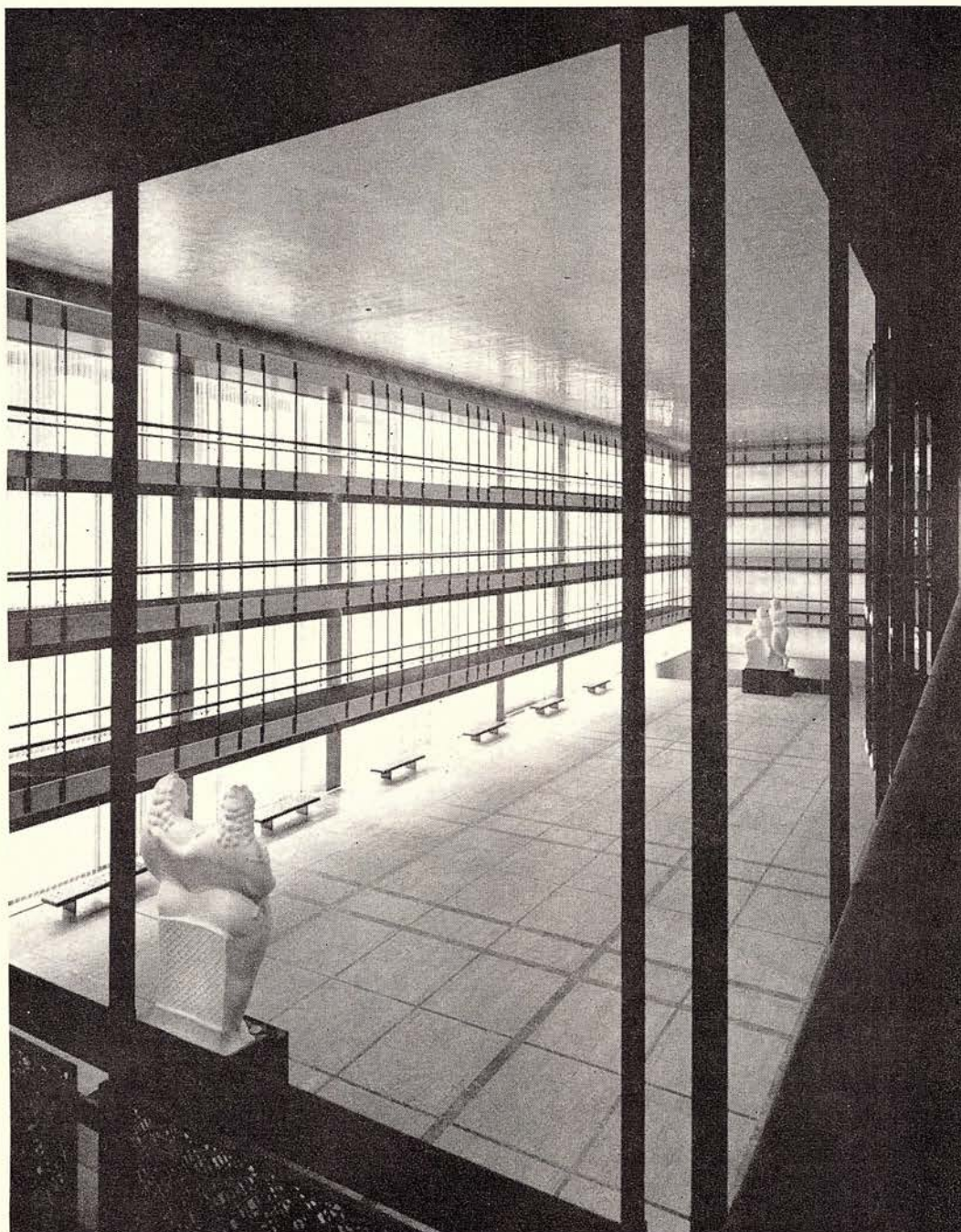
SCALE: 3/16" = 1'-0"



SECTION

**THE LARGE PROMENADE** will be used for official receptions, state and civic banquets, and of course as an intermission gathering and refreshment place. Through the glass wall of this elegant space one may look out to the main plaza or walk out to the portico balcony. The room contains a long refreshment bar along its theater side. The walls are covered with beige carpeting; the ceiling is gold leaf over plaster; the floor is of red Rosso Merlino marble and travertine; the balcony railings are of bronze with decorative metal panel inserts; the glass wall is covered by a shimmering curtain of gold-anodized aluminum beads. The two heroic sculptures at either end of the space are by Elie Nadelman. The kitchen facilities will take care of a banquet of 600 persons, as will the promenade space





*The New York State Theater, Lincoln Center for the Performing Arts  
New York City*

ARCHITECT: *Philip Johnson Associates*

STRUCTURAL ENGINEERS: *Severud-Elstad-Krueger Associates*

MECHANICAL ENGINEERS: *Syska and Hennessy*

CONSULTANTS FOR THEATER ARCHITECTURE: *Ben Schlanger and Werner Gabler*

STAGE CONSULTANTS: *Donald Oenslager and Walter Unruh*

ACOUSTICAL CONSULTANT: *Vilhelm Lassen Jordan*

LIGHTING CONSULTANT: *Richard Kelly*

CONTRACTOR: *Turner Construction Company*



# ARCHITECTURE AS TOTAL COMMUNITY: THE CHALLENGE AHEAD

A series of seven articles examining the contemporary crisis in human environment and presenting strong, frequently controversial, convictions on planned development as guiding principles for community order with diversity, beauty and humanity

By ALBERT MAYER

in consultation with CLARENCE STEIN

## 3. URBAN RENEWAL AS CREATIVE CATALYST

We now deal with the quality and scope of the work of the Urban Renewal Administration, the development of its range and vision and actual performance in its 14 years, and its possible future course. Let us first have a look at the background of legislation which set it up in 1949. But one may say initially that here, as in the Public Housing Administration under Commissioner Marie McGuire, the thinking and the vigor and the action of the last few years, under URA Commissioner William Slayton, have far surpassed the previous pedestrian plodding and irresolute intent, under that and subsequent legislation. Mr. Slayton has had an important part in galvanizing the municipal renewal agencies, which as in public housing are the determinants of the character of the actual programs.

In some ways the Housing Act of 1949 and, later, the Act of 1961, marked an exciting stride forward in the philosophy and policy and legislative framework for the social-physical development of our cities and metropolitan areas. It provided for "the realization as soon as feasible of a decent home and a suitable living environment for every American family, thus contributing to the development and redevelopment of communities and to the advancement of growth, wealth and security of the nation." A superb aspiration and intention, which it must be our daily challenge to bring alive, to transform from verbiage into action.

In Title I, the Magna Charta of Urban Renewal, it is provided that the Administrator "shall encourage the operations of such local public agencies as are established on a state or regional or unified metropolitan basis or as are established on such other basis as permits such agencies to contribute effectively toward the solution of community development or redevelopment problems on a state or regional or unified metropolitan basis."

Thus, the first quoted provision was extending the public housing operation to include as part of the obligation of supplying a decent home, provision of better environment and community. And in the second quotation, we see the dual intention to further the solution of community development problems on a much broader basis than merely housing, and to promote metropolitan action.

### *Objectives vs. Practice*

These two sets of objectives being included in the same act, it would seem certain that the two administrative agencies to carry them out would have felt that they were essentially complementary or dovetailing. However, this has not in fact been the case. As an index: the latest figures show that by June 1964 the total area of urban renewal projects will in 1964 have reached 120,000 acres or 185 square miles in 1,560 projects. By the end of 1962 the total housing construction cost estimate for these areas was: *private* housing, \$2.1 billion (say, somewhere around 70,000-80,000 units); *public* housing, \$83 million (say, something over 5,000 units).

These figures speak for themselves as to stratification, as to lack of integrated attack by the two agencies. And they shed some light on the severity of the relocation problem, particularly in view of the fact that by far the largest part of this 185-square-mile area consisted of residential slums. There is a somewhat growing rapprochement in Washington, and varying degrees of it locally around the country. But it is only rarely a full and genuine symbiosis.

The intention and quoted language of the Act encourages local agencies on a metropolitan basis. Urban renewal as it operates is strictly on a political-city basis. Of course, this is a terribly tough nut to



crack and we cannot strongly blame the URA for failing to crack it. At the city level, urban renewal is in some places making a serious contribution: in coordination and in synchronizing activity of municipal departments. This includes the enforcement side of the building and fire departments, health and sanitation; in some cases, housing and planning policy, open space and park activity. In short, as in Boston and New Haven, a sort of Vice-Mayor for development.

A last point here: Title I provisions call for elimination of slums and blighted areas, and for maximum redevelopment by private enterprise. Congress in calling for slum clearance so emphatically had not learned from accumulated experience in public housing, that "slum clearance," while civic-emotionally and visually satisfying, produces grave negative effects socially, because it entails maximum social-community disruption; and in an era of scarcity of low-rented housing of *any* kind has maximized the total of families that had to be relocated and minimized the available supply of housing.

So much for the background. Within the framework, let us see what are the pluses of urban renewal, what are its minuses, and what we should do.

### *Positive Efforts by URA*

In general, the main interest of the roughly 750 cities that are engaged in urban renewal is two-fold: to tear out several visually disreputable and socially-economically underdeveloped areas, especially near the center of the city, and to replace them with a glittering galaxy of buildings and spaces; and secondly, to re-attract presently centrifugal commercial and shopping volume, to "fight back" against the suburb. The URA has made a mighty effort to take this somewhat crude and simple thinking and action, to broaden it and deepen it.

To begin with, URA has insisted on the *Workable Program* as a prerequisite. This is in effect a demand for some kind of over-all city plan and program: a plan for dealing with segregation; and some proof of citizen involvement on a city "power structure" basis and/or on a locality basis, particularly in areas where conservation or rehabilitation is involved.

URA has also introduced the concept and practice of *General Neighborhood Renewal Plan* and *Community Renewal Plan*. In capsule identification, these are breakdown and particularization, area by area, of what is proposed to be done to the whole city on a long-term basis, and rough time-scheduling.

In some cities, these requirements encourage and buttress the already-present urge, e.g. Philadelphia, New Haven, Baltimore, Newark. This is a very fruitful situation. In most cities, these moves would not otherwise have been made at all seriously, but they are still superficial. A fine step forward. But these plans and corresponding developments are well in the future, at varying points in the future. In essence and pragmatically, and with the creative exceptions of such cities as those just listed, urban renewal consists of one or more fairly unrelated large projects mostly in areas that were slums and now, due to the city's development since these slums originated, have become areas where private enterprise sees or thinks it sees profit for minimum or zero investment, and for a quite different economic group or purpose.

Note, too, that even in the more forward cities, the confused traffic-bedeviled character is not being unscrambled and re-structured by urban renewal. I know of only one exception. Eastwick, the huge vacant-land renewal in Philadelphia, appears to be attaining both an economic-social mix, and considerable industrial and other local employment so that travel and cross-haul are likely to be substantially reduced.

Again on the plus side: the efforts of URA in behalf of high quality of site-project planning and architectural design are imaginative and frequently successful, particularly when compared with private enterprise not under its aegis. And encouraged by URA, different cities have worked out different theories and procedures for evoking excellence in conception and design, which are valuable in themselves, and even more valuable in comparing the results. Some architects have contributed a great deal to this rather encouraging situation, by their creativeness in conceiving or helping to conceive programs.

### *De-development by Relocation*

But the essential project-discrete nature of urban renewal, and its essential private-profit character, mean essentially middle-high rental housing and office buildings. And this means: massive RELOCATION of the previous inhabitants, who by and large can afford only very low rents, and are, in the vast majority, a color minority. Very much improved measures for humane relocation since the early devil-take-the-hindmost days are a tribute to massive local democratic protest and to URA responsiveness and pressure. There are sizable moving allowances; everybody finds some kind of reasonably good roof, probably a sizable number even improve their



*"Reciprocal developments would be plotted out, and scheduled for carrying out, simultaneously with the initial 'key' development. . . ."*

shelter. But, from the point of view of city development and of social tensions, the results are, by and large, definitely deleterious. Visually, everybody in the city power structure is happy and can point with pride to the new glistening project areas which have replaced the old junk. But the vastly greater "non-project areas" of the city, the "invisible parts," are being *de-developed* because there are haphazard influxes of displaced families into many, many non-spotlighted localities, with negative social effects on those displaced and on the recipient areas. And this haphazard de-development, resulting from continuing displacement by renewal and other public operations (highways, public buildings, etc.), makes the ultimate real renewal or revitalization of the city as it finally gets around to such areas much more difficult. What to do?

### *A Proposal for "Reciprocal Renewal"*

I have these suggestions. First, I propose the concept of *Reciprocal Renewal* (or Redevelopment) undertakings. At present we have large renewal projects on land redeveloped mainly by private enterprise, public institutions and sponsors of cultural-civic-governmental centers. However, by and large, the miscellaneous previous occupants—the families displaced and the displaced commercial and industrial users—are re-accommodated in the same area only to a minor extent or not at all. They are scattered haphazardly or go out of business. The concept of Reciprocal Development would mean that for each redevelopment of the glittering kind, there would be several corresponding developments so conceived and so located as to offer the displaced persons and entities not just non-leaky shelter located haphazardly *anywhere*, but new quarters *more advantageously* located with respect to places of work, to social resources, to recreation.

An analysis would initially be made of the types and places of work of those to be displaced. Some would be found to be working in service jobs near their existing homes, near the center, who should be rehoused there or nearby. Many would be discovered to be working in recently decentralized industry near or beyond the outskirts, in large single concentrations or in industrial parks. A similar analysis would be made of the (usually small) industries. On the basis of these analyses, the "reciprocal developments" would be plotted out, and scheduled for carrying out, simultaneously with the initial "key" development or the several "key" developments.

Thus the large glittering developments would have a number of counterpart developments so located that they would in, say, four or five locations, begin to effectuate the elements of a rational city and transportation plan. Thus the immediate urban renewal program or galaxy would consist of one or several of the "glittering" variety—which would in themselves then usually have a greater income range to take care of those of lower incomes whose employment nearby and whose other relationships justified it\*—plus the "reciprocal" developments strategically located to meet not only the living-working-social needs of those displaced but the healthy development of the city plan and districts within it for the ranges of incomes and uses that the plan should have. Thus, instead of a sort of undated or post-dated check which the Community Renewal Plan represents, there will be vital nucleated inter-related development of a plan, *by means of* the renewal process.

This concept, is, of course, more complex and less spectacular than the present single "glittering" projects whose *sine qua non* is profit or the prospect of profit with minimum or no investment, and which in effect and by themselves cause widespread unmeasured and obscure but grave detritus elsewhere, as here outlined and as observable. And, of course, it means that a large part of urban renewal will not appeal to the professional private developers as it is now, by and large, doing. That problem has to be faced, and should be faced at the earliest moment, for a number of reasons and in a number of ways.

### *Problems of Private Development*

In the first place, the essential dynamics of urban renewal as of now is in the hands of the private developer, modified by the creative controls noted above. Whether by demolition and new construction, or by rehabilitation, it depends in residential buildings on the upper and middle reaches of the market. Where it has tried to meet a substantially lower income group, as in Longwood in Cleveland, it has not worked out.

And even if it did barely work out, it is not these razor-close situations that appeal to the professional

\* A substantial example of this is the West Side Urban Redevelopment in Manhattan where, due to strong local pressures, something like 2,500 units of subsidized low rent housing are to be included, in a total of some 11,000 units of new and rehabilitated units, of which the remainder will be high-rental and middle to low-middle rentals made possible by Mitchell-Lama low-interest rates and partial tax exemption. This is one of the few urban renewal efforts reasonably integrated in the economic sense, and hence making integration possible in actuality in the racial sense.



developer, in any sizable quantity.<sup>1</sup> His kind of building is in situations of zero or close-to-zero equity, and for a narrow market now well on the way to being over-built in spite of the generally optimistic market analyses that are always forthcoming. This applies to both his favorite building types, residential and office building construction; also to an extent, to in-center industrial development. This is not yet fully evident, because in most cities there is some unsatisfied demand to start with, and the first operations skim this cream. So for the moment there is in general no violently evident situation, though there are even now some serious ones.

There can still be room for the professional developer, and he can go further down into the residential market by FHA's 221 (d) (3) and Mitchell-Lama in New York State. But the tacit and the spoken-active premise that he is the prevalent mainstay of non-institutional urban renewal and that mainly projects should be selected on which he can be expected to submit a bid, stands in the way of the program's becoming a true sword-arm or positive-development arm of urban planning.

### *Development BEFORE Slum Clearance*

Second—actually preceding the first as part of the same thinking and planning—carefully located and planned residential reservoirs, particularly low rental, should *precede* slum clearance. Thus, instead of the constant endemic shortage of low and low-middle rent accommodations, we would be liberated from the squeezing in and squeezing around process. In extreme cases as of now, people are relocated in one area, and a few years later are again relocated by clearance. The Public Housing Administration is bedeviled by the same problem. URA has to a minor extent gone in for vacant land redevelopment. Perhaps a complete change of legislative intent is necessary here to permit both agencies to undertake a realistic re-approach. And they should do it together. The vacant land may be available within the city. OR, more probably it is not, in adequate quantity; and this becomes one more reason for pounding out a metropolitan housing setup.<sup>2</sup>

A consequence of the policy of groups of reciprocal projects, which I am urging, and of freer use of vacant land, is that slumminess or degree of slumminess is no longer the principal factor in choosing locations for urban renewal. This is in truth a distorting factor, because there is absolutely no causal or logical connection between the factors that make

for suitable and advantageous locations in the future, and the fact of past slumminess. I know of one extreme case where the selection for the first urban renewal of 100 acres of slum *adjacent* to the Central Business District, but not in it, will seriously delay or make impossible the redemption of the very shaky, blighted, weak and gray 100 per cent blocks and the C.B.D. proper, because the land demand in the center of the city simply is not large enough to absorb both, for a good many years at least. And while we all welcome the happy contrast of the big tax assessment gain between the slum and the new development, the much-needed over-all increase will anyway accrue to the city, because the real gain is in the value of the new enterprise, which may well be greater if more advantageously located.

But, however more delicately and maturely and "reciprocally" urban renewal proceeds, there will be some displacement, with social tensions of many kinds. Having in the last decade found out the deeply negative factors at work in these indiscriminate, wrenching situations in our cities, we have got to take much more positive account of them: not only stop ignoring them, but also deal with them creatively through social analysis and social work. This must be in three situations: among those being displaced, both in preparing them and in helping them after relocation; in observing and preparing the localities into which this in-migration is moving and will move; and in generally helping to keep buoying up the continuing in-migrant situation in the "de-developed" localities.

Both local housing authorities, in the case of public housing, and urban renewal authorities have in one way or another embryonically and quite inadequately managed to begin to get into this area of social thinking and action. Much, much more is needed in both, to produce effects on people and environments. Pressure must be brought to bear to make massive efforts along these lines. Every form of development requires recognition of the intensity of these negative factors, and of the great positive, regenerative opportunity. If it requires special legislative authorization, this must be passionately sought.

### *The Resurgence of Civic Pride*

There is one very positive contribution by urban renewal, or at least of the time-spirit in which urban renewal has been born. And certainly it has been fostered by the URA's operational requirements—workable program, etc. This is a spiritual-social one:



*"Carefully located and planned residential  
reservoirs, particularly low-rental'  
should precede slum clearance. . . ."*

a new or renewed feeling of pride and allegiance to the city as a concept and as a place to work and live, or for one's own part of it and for it; and a determined effort to make it better to live in. This appears on both the city level and on the locality or neighborhood level. The Daily News in Philadelphia articulated this fervidly: "We are showing the nation, again, leadership in meeting problems in the 20th century, as we did in the 18th century."

The finest case I know of, on the neighborhood or sub-city scale, is in the Upper Roxbury Section of Boston, now known as Washington Park, a deteriorating and deteriorated neighborhood. Here citizens of all levels and colors have participated, "to promote a program of community betterment and brotherhood" as it is put by Freedom House, the local settlement house spark-plug. A team of social workers began with an idea and wound up with a strongly supported and officially accepted urban renewal plan covering some 500 acres. The final public hearing by the Boston Redevelopment Authority was attended by 1,200 local people. A vote was taken and all but three voted in favor. The ingredients of the plan had been developed block by block, initially by the citizens in that block, and ultimately by and with the Redevelopment Authority's planners. Here also the applied intimate *community process itself* produced tremendous human values and growth, long before the renewal project got physically under way: as contrasted with the usual uncertainties and tensions and resentments.

While such an instance is unusual, it is not unique. The vast Philadelphia effort, for example, has based its progress on citizen participation and citizen acceptance. To cite one current program there, the West Philadelphia Development Corporation of the University of Pennsylvania and Drexel Institute has in four years of existence held well over a hundred citizens' meetings to discuss boundaries, clearance, land re-use and rehabilitation. The corporation has declared its intention "not to create a single-class community, sterilized of the cultural, ethnic and racial differences that make urban society dynamic."

While citizen support can have its darker side—often having a class character, tending to be more developed among upper-income groups and to be more genuinely prevalent in the power structure than in the neighborhoods—I think the resurgence is a notable mid-20th century fact, and that it is our job to further change its too-usual power orientation. The assignment is to take hold of it and to make its permeating effects more people-oriented, less property- and investment-protection oriented.

### *The Need for Representative Support*

The fact is that URA's requirement for representative citizen support has not stipulated just what *representative* means. In most of the cities that mean business (I am here using the phrase in two senses) a power structure has emerged, or rather has formalized itself into tight compact continuous structure, from a probably long-standing *ad hoc* sporadic existence. This, by and large, consists of members of business and industry, banking and real estate. This group can and does lay cash on the line for research, market analyses, campaigns for bond issues and/or cultural centers, etc. They may be thought of as sublimation of the Chamber of Commerce type of interest and outlook on the development side, with however a much smaller more potent and compact membership, each representing much greater economic scale and concentration, i.e., much more of an oligarchy. As noted, this has long existed informally in most cities, formally in the case of the firmly entrenched Dallas Citizens' Council (which incidentally has no urban renewal). The new insights and requirements of urban renewal and redevelopment have produced the new systematized form, and have made clear who has the say. In keeping with the usual style of the members of the new oligarchy, the decisions are not made in "smoke-filled rooms," but in elegant air-conditioned rooms.

This is a potentially dangerous crystallization, and its implications for planning deserve consideration. While quite civic-minded within its lights, there is no doubt that such a group tends to see the problems of displacement and relocation of low-income and minority tenants and of small businesses as the inevitable price for what it considers the vastly greater benefits. But as Lowdon Wingo has said: "The critical policy question is not only how much the community is prepared to give up to realize the goals implicit in the master plan but *who* gives up *how much* so that the fruits of the plan can be realized—quite frequently by others. This perspective has led the uncritical liberal to the implicit conclusion that the importance of the social goals realized by the planned transformations of urban environ-

<sup>1</sup> I am here not speaking of private enterprise of quite a different type, such as insurance companies, pension funds, etc., for which a much broader role in urban renewal is to be outlined in the next article

<sup>2</sup> The Urban Renewal Administration has begun to attain a notable stride in acquisition of permanent open land for recreational and conservation purposes, as authorized in later legislation. This must not be confused with the policy here advocated, for acquisition of vacant land expressly for building. Nor is it to be confused with the recommendation for regular setting aside of park area as part of *every* renewal project.



ments always outweigh the current individual and group values which must be foregone. It is by no means obvious that this is the case.”\*

A requirement needs to be set up, and methods evolved, by which the excellent mechanism and experience of this power group are opened up to include intimately and effectively the other elements in the civic equation such as representatives of labor, of minority groups and of “consumers” of shelter. It won’t be so smooth an operation as the present first steps are. But it may avoid the explosions that take place when such elements are ignored, and suddenly wake up. There are enough illustrations of the positive to warrant expectation that we can get the positive, if we discriminatingly recognize the actual differences, though all under the one label. It might be worth while to trade the initial time advantage for a permanently satisfying method and result.

As far as I know, there have been no adequate studies of the physical-social effects of displacement and relocation, or of the state of mind of people displaced, nor of the state of mind of the vastly greater numbers of people—i.e., city people generally, not directly involved at all—particularly those adjacent to or near to an urban renewal enterprise which on the material side greatly upgrades its own internal area, with its handsome or pretentious buildings, swimming pools, terraces. Very many of these not directly affected will be at the very bottom of the Community Renewal Program time-totem-pole. The minor sprinkling of minority occupancy they see in these new upper-priced situations will not seriously make the psychological-physical situation of these many, many thousands any happier.—Remember the play “Dead End”?—And the figures showing how favorably the tax-and-revenue position of the city is affected by urban renewal will, I would guess, not greatly change their view.

No one measure will change this situation. I have already proposed some major policies and measures along this line: “Reciprocal Renewal,” and creation of more low rental housing before slum clearance.

### *Creative Dispersion of “Renewal”*

Now for some other measures, on a different but pervasive scale, and of quite different character, by which the city’s population can much more generally share *currently* in the now highly concentrated improvements, by some installments as it were.

In the first place, all our cities are terribly lacking in park and recreation areas: in particular, fairly small ones near at hand. I would propose that every

urban renewal enterprise that gets Title I or other government aid must set aside a given area for public park (i.e., not just the private open spaces). This should be the case in business and industrial areas as well as, of course, for residential areas. For the former there are in our cities far, far too few examples, such as Bryant Park in the heart of New York, and Lytle Square in Cincinnati. Even though postage-stamp size (four to five acres actually), they are delightful oases which with their counterpoint of green and shade and momentary leisure do so much (with so little) to provide relaxation from the city’s work-a-day tensions.

Another proposal applies particularly to renewal areas, including universities, which are, as of now, sharp gouged-out blocks or enclaves sharply demarcated psychologically and physically from their surroundings. I advocate that in place of the sharp straightline edges, our urban renewals have fuzzy edges—on *both* sides. That is, on the “residual community” side, occasional quite little squares and park spaces, a spill-over of the new project atmosphere, as it were. And reciprocally, I want to develop minor casual public-oriented elements just within the enclave side, so that there are definite planned-and-casual contacts between the two areas. Thus, to epitomize it, a kind of Grecian-border-ish edge on both sides: an edge-interpenetration of the new aura; a sharing, psychologically and physically.

And now I go a great deal further—though I am still in the realm of relatively minor expenditure. We know that it will be 10, 15, 20 years before urban renewal really permeates the square miles of the GREAT NON-RENEWAL MATRIX, what I have called the bottom of the CRP totempole. In these great wastes of undated-check CRP, we must immediately undertake and effectuate a master plan of small architectural-functional foci or sub-foci which will be visible evidence of ultimate intention, local allegiance-arousing magnets, emotional lift to drab areas. Sometimes they will be as small as just handsome expanded bus shelters-cum-sitting areas; sometimes a square with a refreshment kiosk or two. I cannot further describe these here. I hope to have space in the last chapter of this series to do so. I have done or helped catalyze and create a number. So, on a much more diffused and self-help scale, Karl Linn has done and is doing.

BUT, not just occasional specimens in less than a handful of energetic and imaginative exceptions. BUT, a movement: individually small-scale but universal. And teams of architects-social workers to plan with the people.



*"We must immediately undertake and effectuate a master plan of small architectural-functional foci or sub-foci which will be visible evidence of ultimate intention. . . ."*

Thus, a series of psychological-social-physical elements. Physical-economic renewal, yes of course, but RENEWAL above all of the spirit and spirits of people. Thus, democratization of urban renewal. A counterpart, as it were, of the Roxbury type of people involvement in a decentralized but intimately local way. Note that as conceived and executed, these small individual efforts involved a spirited partnership—financially between city government and private local people—and involving maximum local people-participation in conception and actually working. Particularly important are these functional-visual-sub-foci in rehabilitation and conservation areas (as well as, mainly, in untouched areas), which, with virtuous code-compliance and paint-up activities alone do not have the necessary staying power and lasting verve. This small-scale multi-centered renewal has the seeds of continuing self-renewal and self-help, as the habit of local self-appraisal and self-confidence takes root and germinates.

The Baltimore Urban Renewal and Housing Agency has in part recognized this need in saying: "In parts of the urban renewal areas where projects have not yet been designated, an interim or hold-the-line program is in progress. The enforcement of the City's health and building codes, combined with the development of neighborhood pride, are doing a great deal to prevent downward trends until formal renewal treatment can be undertaken." The thinking is good. But the situation requires creative crystallization in tangible-spiritual form as capstone to the process.

### *Center City and the Future*

One serious urban renewal weakness characteristic especially of middle-sized and smaller cities has not yet become compellingly and alarmingly evident. It must be reviewed here briefly, and will be more fully considered in a later article. I assert that it is a delayed-action nemesis which has in it the seeds or actualities of boom-and-bust. The Central Business District has generally deteriorated for various well-known reasons, and lost ground to the peripheral centers, in terms of shopping, or residence, and to a smaller and probably growing extent, of office buildings. The characteristic answer of the middle-sized city is to improve highway access to the CBD by a loop limited-access highway off the Interstate System; increased parking within this loop; sometimes a pedestrian-mall main shopping street. The endeavor here is to offer convenience equivalent to

what is available in the outlying centers. On the side of positive content—i.e., land development—the "standard" uses are new office buildings, revamped or rebuilt stores, tall apartment houses and a cultural-civic center. The assumption is that this set-up will re-attract some of the shopping and business volume that has decentralized, and some of the additional future volume that is going to come with increase in metropolitan population. There is also a belief that the pleasanter conditions will attract apartment occupants: the older people who no longer need or want a house because their children have grown up, young married people, some families. These assumptions or conclusions are backed by optimistic market surveys.

I think this is a typical picture and is quite unsound, the more dangerous in that its unsoundness may not be apparent for some years, because in most such situations there is some backlog of demand which fills the first few buildings. But the boom will build up, based on that, and I think the kind of volume visualized cannot be sustained.

The typical new or re-born standard attractions of the CBD listed above are simply not potent enough to cause re-centralization of shopping. In the middle-sized city the difference in variety and chic of the shopping between the main center and the peripheral centers simply is not enough. And when real outstanding style differentials are sought, there are in most locations major cities not excessively far by car or plane, where the real glamour lies.

For a statement of several other factors, I will quote from Louis Winnick, a penetrating analyst:

"Regional and suburban shifts in population and economic activity have been highly unfavorable to the market for real estate in the typical older city. The demand for office space, for example, has become exceedingly selective. In the 1920's and earlier, office construction was quite diffused, reaching into nearly all cities of 50,000 and over. Today, largely as a result of improvements in transportation and communication, a sizable amount of administrative office space is being built in only a handful of cities.

"The potential market for new downtown retail facilities is even poorer; disinvestment is more common than new investment. . . .

"We must continually remind ourselves that the dramatic renewal plans now being drawn in so many cities have yet to meet the stern test of the market. We should not be deluded by the initial rush of pri-

\* CITIES AND SPACE, The Future Use Of Urban Land, published by the Johns Hopkins Press. Edited by Lowdon Wingo Jr. Excerpt from: Urban Space in a Policy Perspective, page 5



vate sponsors into renewal. The individual sponsor is concerned with the success of his own venture. He may well fill his new office building, hotel or apartment house."

He then goes on to say that from the viewpoint of long-run and over-all economic viability, the picture may turn out to be quite different. Also, we must note that the assumed large new demand for apartments has still to prove itself, and has in some cases already failed to do so.

Beyond this, it is also to be noted that in general, at presently allowed densities, and with the amount of land available in the CBD and in excellent locations adjacent to it, or leading out on main local arteries, we really have a surplus of land and will experience a blight of surplus in the core, unless we re-study allowable building densities, devise and adopt new and magnetic land uses, both to creatively utilize the potentially excess areas, and by the magnetic land uses to be suggested, enhance the potency and nature of attraction which the standard uses by themselves do not do. In short, we create a center whose strength and attraction is to supply elements of a kind that the outlying centers cannot do, in addition to the usual cultural-civic center, and concentrate less on a possibly hypothetical level of demand in the "standard" elements in which the outlying areas have certain, and in certain ways increasing, advantages of their own.

This is a necessarily very short-hand description of what is likely to happen and what to do, if we are not to get into a financially and urbanistically bust situation. In our regional article we will come to grips with what the metropolitan key center of the future can really hope to be, and should be, in the light of the forces operating in the second half of the 20th century; what new or special land uses should contribute to its new status vis-à-vis the outlying centers, rather than to "fight back" against what is a new balance of forces. It may be said here that one of the pragmatic handicaps facing the adoption of such "magnetic" developmental conceptions is the shibboleth that in urban renewal, private enterprise must do all but a very minimum. Some of the necessary new creative elements are just not private enterprise's dish. They are either somewhat experimental, or inherently not profitable. But they are humanly expanding. And this is what the city owes to itself and to the region.\*

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### *The Issues in Urban Renewal*

I want to end this installment by re-stating and pointing up certain matters. Indeed this whole discussion has not attempted a full balanced exposition

of urban renewal under Title I, but rather a selection of elements and analyses of a number of the less obvious and under-the-surface factors.

We have noted that the quality and content of urban renewal vary vastly from city to city, in two respects: from the spottiness of one or several single large projects, to a quite high degree of concatenation and comprehensiveness of a physical city pattern; and in the type of its content ranging from the mainly visual of the large-scale real estate transformation, to a high degree of social concern, local-social involvement, social growth in the course of both the process itself, and of the result. To put this another way, there is great variation, from the common viewpoint of property improvement and tax increase to a more genuine and not just verbal preoccupation with the city's people directly or indirectly affected (or not affected at all until we manage to get around to them).

The fact that some cities have gone so much farther than others in these respects, under identical Federal requirements, is both encouraging and discouraging. This should have a great deal of searching attention by the URA and a great deal of self-searching attention from the cities themselves. The fact that we *can* do as well as we do in some places leaves no excuse for us not to do very much better in the others.

But even in the most sensitive Baltimores and Philadelphias we have need of a system or systems of more deliberately "reciprocal projects," and of more vacant land operations (Philadelphia with Eastwick scores a sizable PLUS in this); we have need of much more of skilled social diagnosis and practice; and even in cities with the most searching Community Renewal programs with their time-tabling in terms of decades, there must be NOW a series of permeating local-focal-functional undertakings in communities all over the city and particularly near the urban renewal projects, as an immediate earnest of the city's concern for *all its* areas and people, and not just the lucky or (unlucky) concentrations of renewal; and to involve those people creatively, which experience has shown we can do. We must, it seems to me, buy the necessary time for the long range Community Renewal Program to be consummated, and meantime build up a growing vital participation, from small-scale up.

Finally, there are several issues raised which will be further discussed in subsequent sections. One concerns the future function of the city center of the major city in the metropolitan region, and in particular the conviction that in middle-size cities and regions we must evolve a more fertile array of stimulating land uses, diminishing current reliance on rather hypothetical need of more-of-the-same-only-better standard uses. The other issue is the indispensability of metropolitan scope, if our high expectations of urban renewal are to be attained.

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\* For anyone interested at this point in fuller consideration, reference is made to three mimeographed memos by me to John R. Searles of the Metropolitan Development Association of Syracuse, during 1962 and 1963



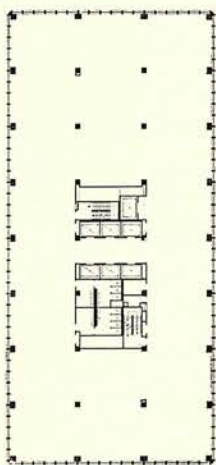


## ECONOMICAL OFFICE TOWER

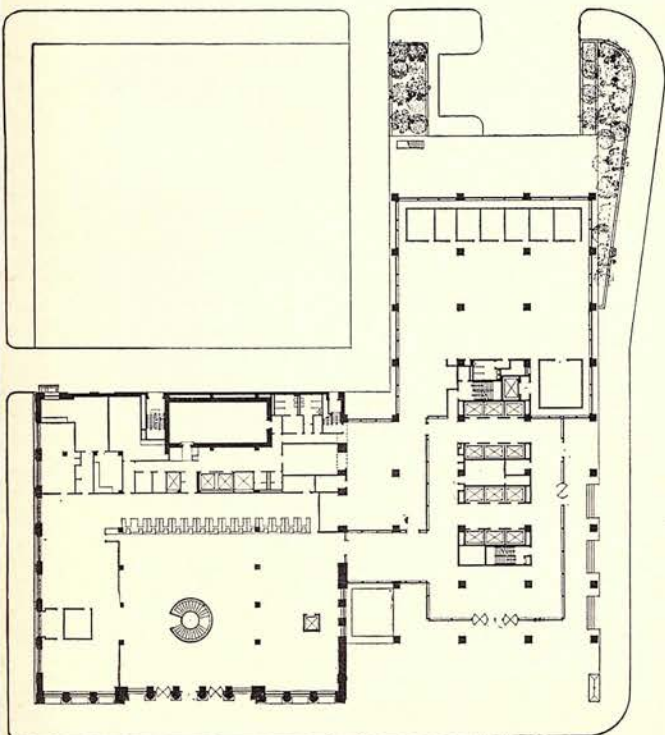
Detroit bank gets headquarters "addition" with room for expansion while landlord-investor gets twice the space for rental—and structural economy benefits both



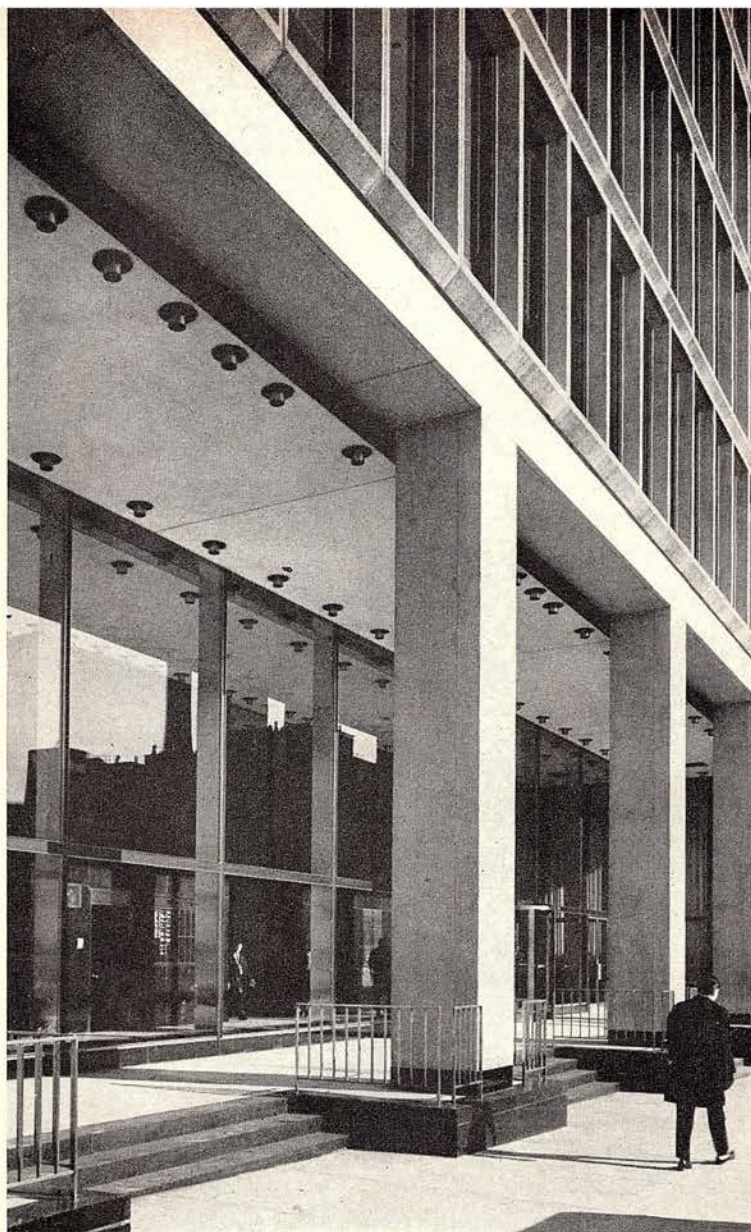
*Detroit Bank & Trust Company*  
*Detroit, Michigan*  
ARCHITECTS AND ENGINEERS  
*Harley, Ellington, Cowin and Stirton*  
LANDSCAPE ARCHITECTS  
*Eichstedt and Grissim Associates*  
INTERIORS  
*W. B. Ford Design Associates*  
GENERAL CONTRACTOR  
*Minskoff-Detroit Construction Company*



Typical Floor

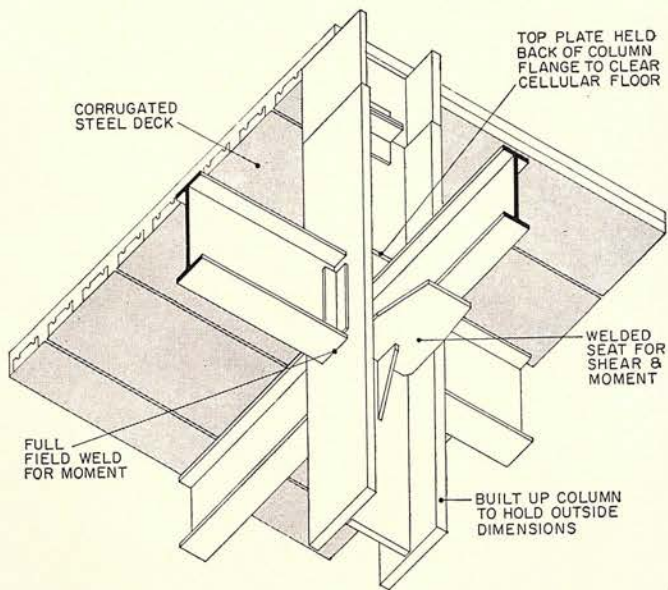
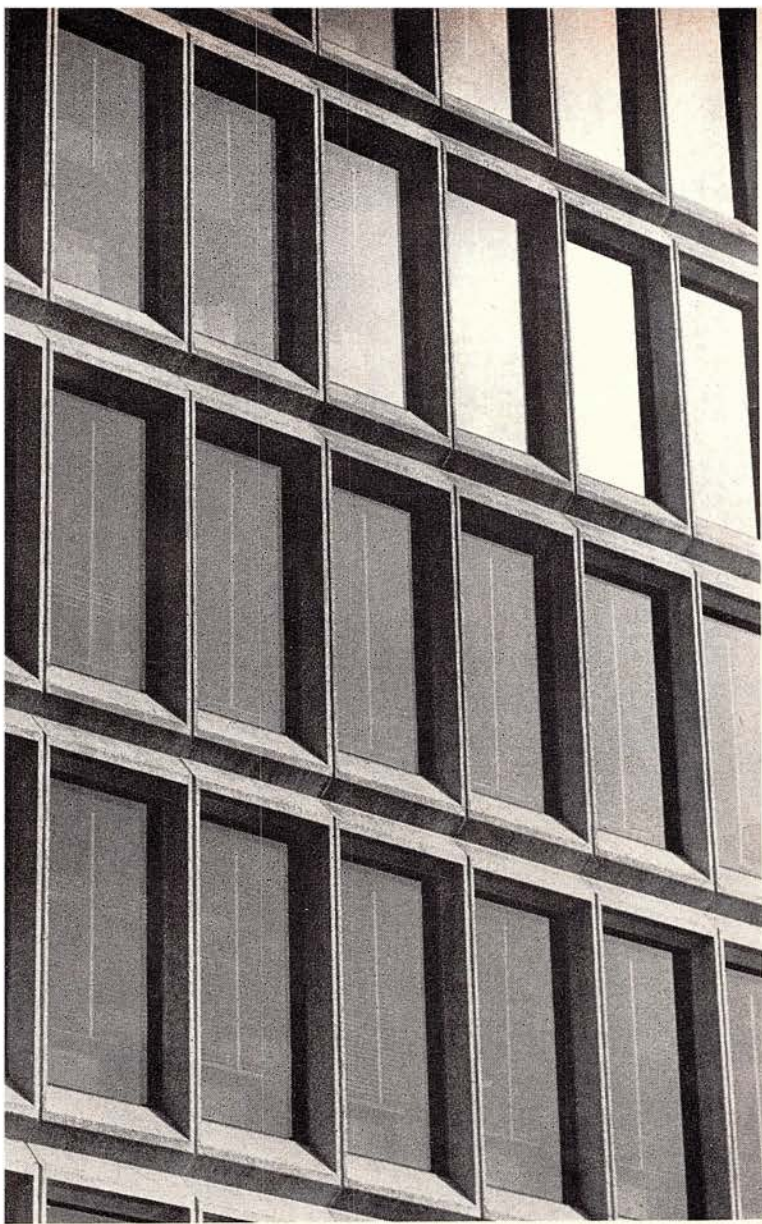


Ground Floor

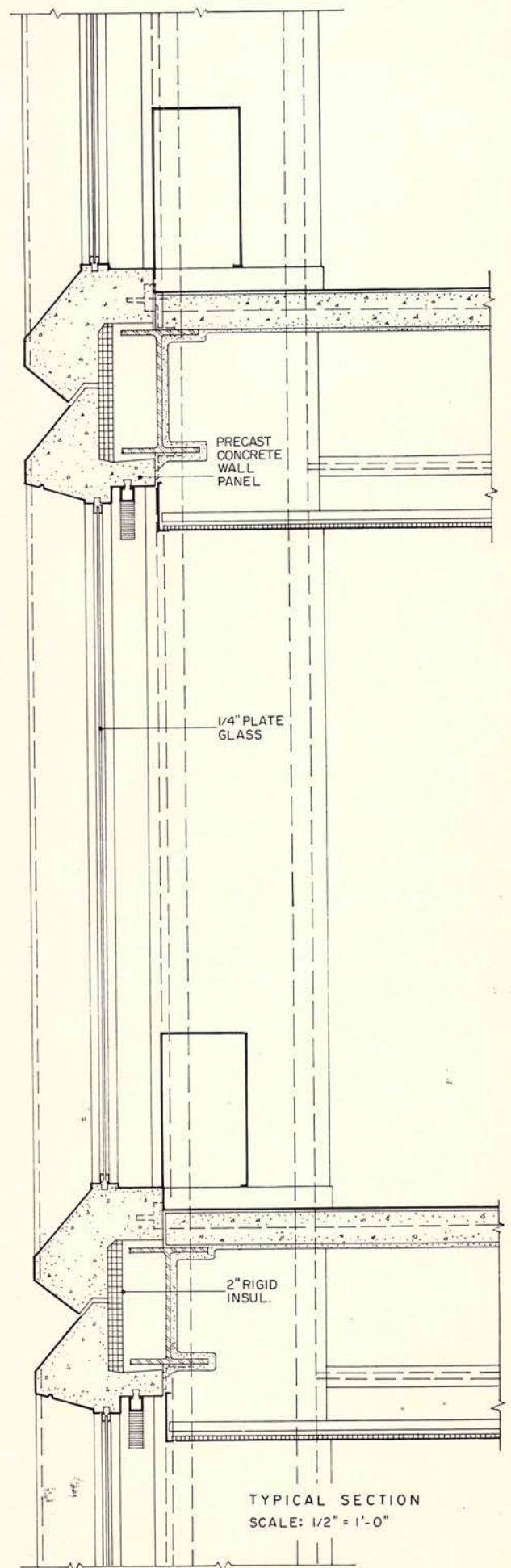


A 28-story "addition" to its four-story neo-classical building of the twenties gives the Detroit Bank & Trust Company the expanded headquarters it needed (some 185,000 square feet of added space) while providing the owner and constructor, Sam Minskoff and Sons of New York, with some 370,000 square feet of prime rentable space in downtown Detroit. The bank had originally envisaged completely resurfacing the older structure and constructing a 10-story addition solely for its own use; later considered a 14-story addition which would initially provide some rental space to become available for the bank's own later expansion. When the Minskoffs became interested, the bank sold the property and became prime tenant in an expanded scheme. In the new concept, the older structure is being completely renovated within while retaining its neo-classical facade. By means of a glass-enclosed link, it connects at four levels—for unity of internal function—with the new tower. By setting top of steel girders flush with top of corrugated steel deck, floor-to-floor height in the tower was reduced to 11 feet 8 inches, thus giving maximum ratio of rentable to cubic area. Further economy (and increased investment return) was achieved by eliminating spandrels and making curtain wall simply an assembly of rectangular precast concrete frames filled in with gray heat-resisting glass.

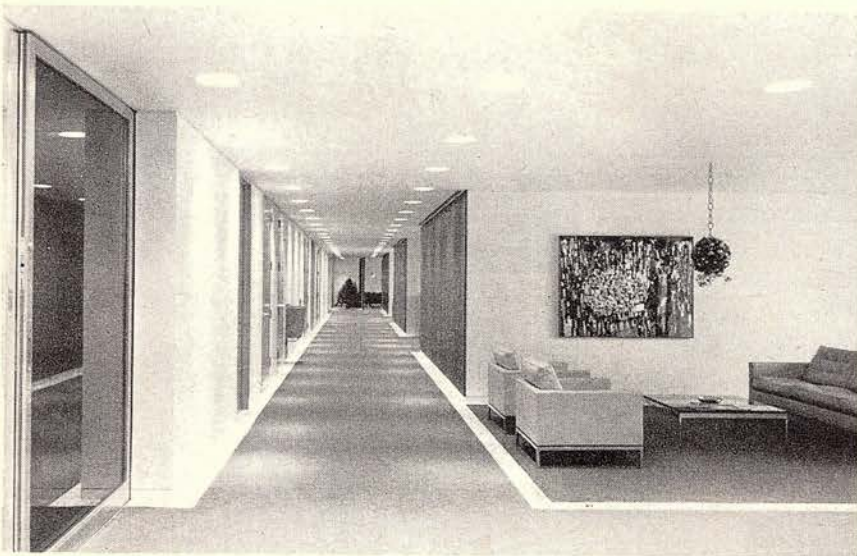




TYPICAL INTERIOR COLUMN CONNECTION

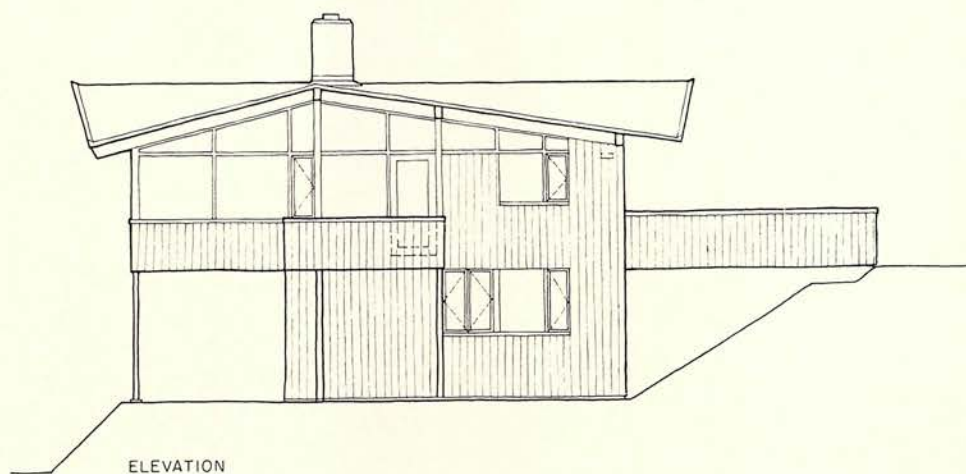






*Top:* Lobby of new tower (glass "link" to old building at left) has 14-foot ceiling height of old lobby. *Center:* Fourth-floor executive reception area—teakwood paneling, travertine border for floor, acoustical plaster ceiling. *Left:* Office of chairman of board has special lighting over desk and conference area

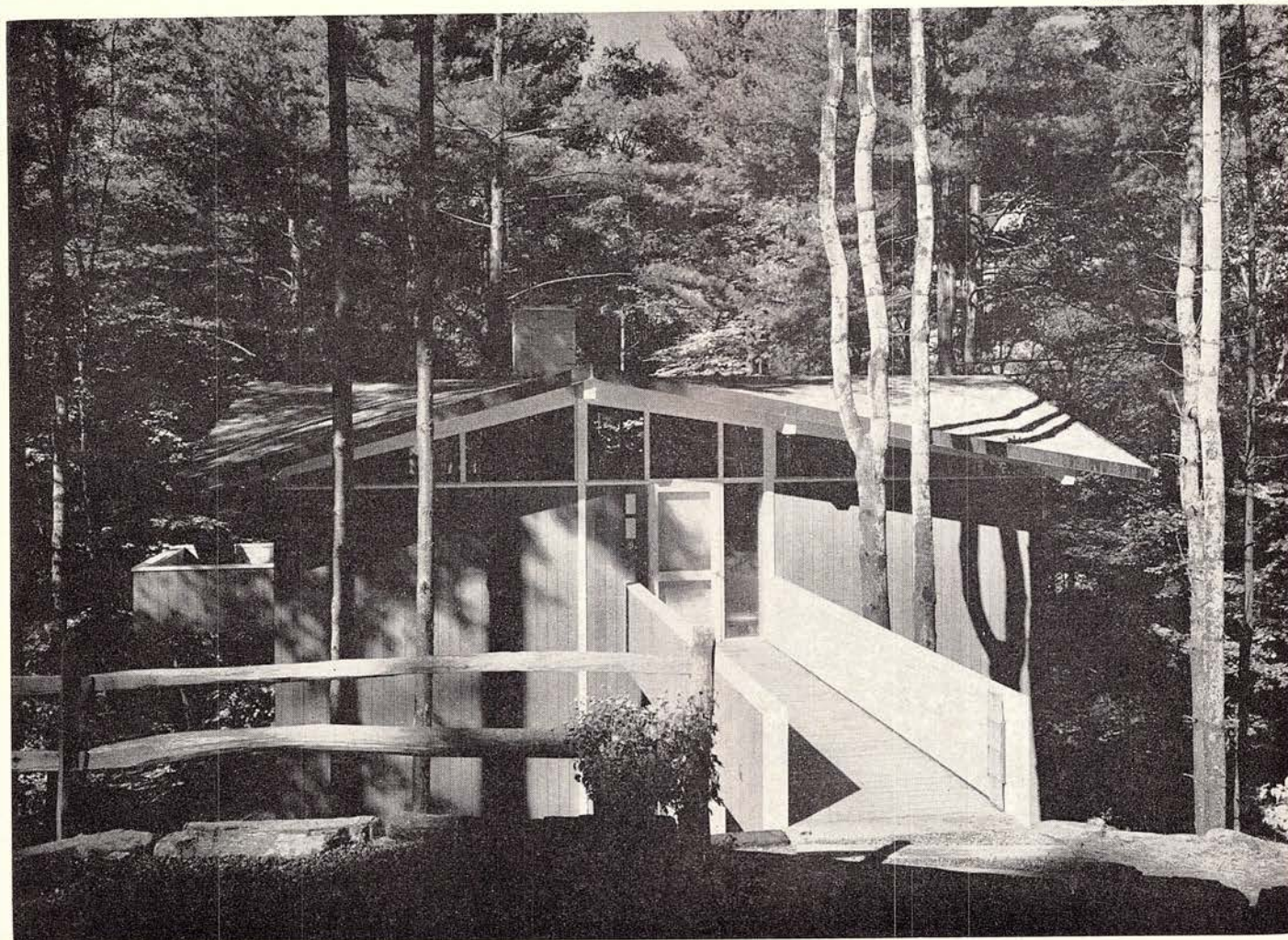




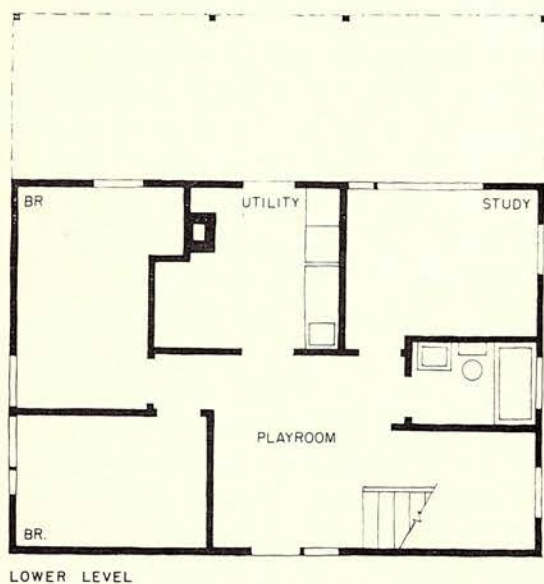
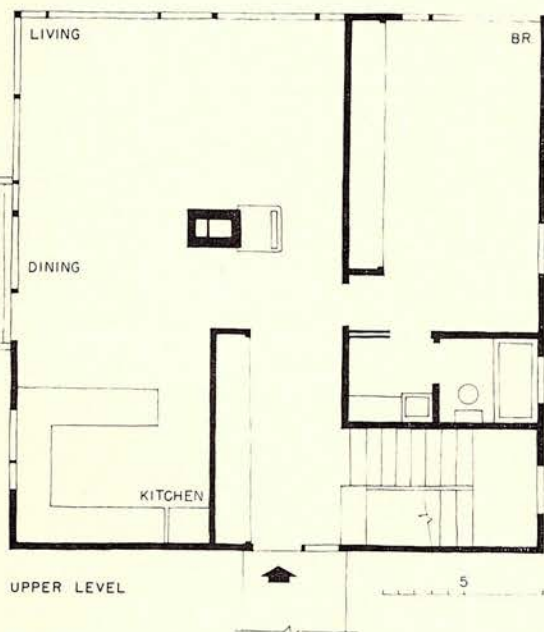
## A COMPACT SADDLE-ROOFED HOUSE THAT EXPLOITS A DIFFICULT SITE

E. H. and M. K. Hunter design a sophisticated little house for a steep, wooded slope

*Joseph W. Molitor photos*





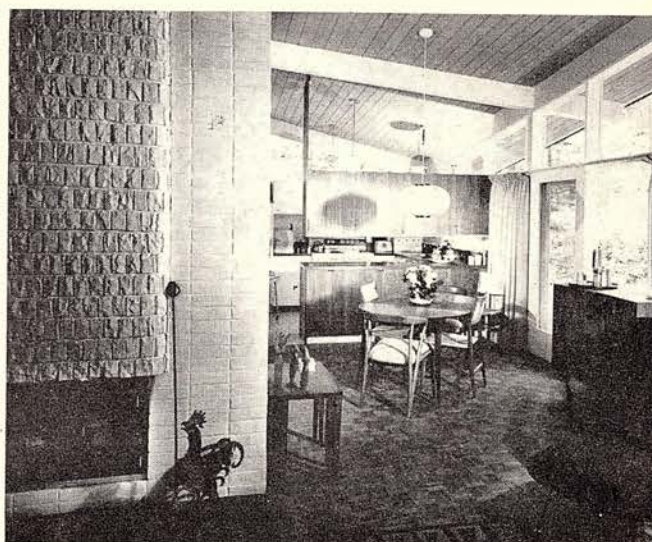
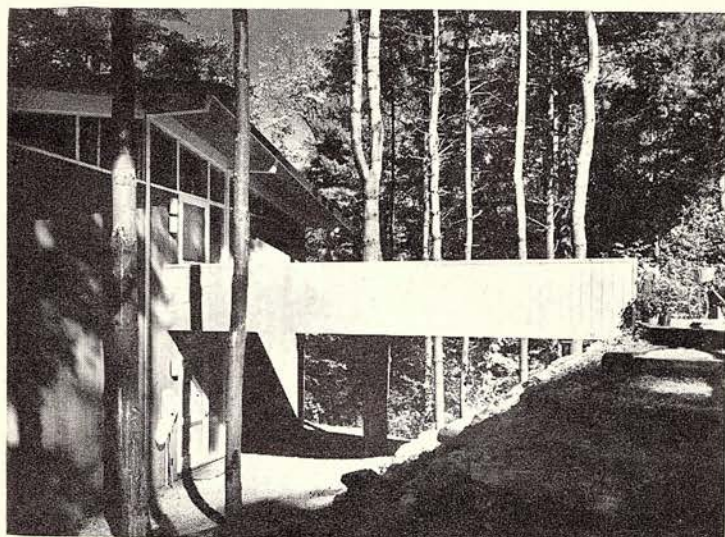


An off-centered saddle roof, with canted edges, forms the major design emphasis for this compact little house. Placed as it is on a densely wooded, steep slope—the house is approached and first seen from above. From this angle, a light, hovering quality is given to the distinctive roof by the use of glass under the eaves on all sides of the house.

The structure is a variant of a post and beam frame, with the members exposed and painted white for accent. Exterior walls are of vertical red cedar siding.

The house measures about 32 by 32 feet, and has a very workable and well-zoned plan in these compact limits. The lower level, which has its own access to the outdoors, is devoted to the children's areas: two bedrooms, a bath, a study and a "play hall." The heating and laundry room are also on this level. At the back, the upper floor is supported on steel lally columns, providing a 12-foot covered play terrace.

The principal living areas are on the top floor, along with the master bedroom suite. An extremely open plan is used for the living areas to add a sense of space: even the kitchen is open to the dining area, with a curtain provided for shutting it off when desired. The exterior walls of these areas are mostly glass, with fixed panes flanked by casement vent sash. Interior partitions are gypsum board. The long wall separating the living room from the master bedroom and bath is surfaced with cork for added quiet. Ceilings on this level are exposed wood decking. Floors are mostly vinyl asbestos tile on plywood, with carpeting for the master bedroom, and cocoa mat on the stairs and landing. The lower floor has a 4-inch concrete slab and cane fiber tile ceiling. The roof has a built-up surface.







*Residence for Mr. and Mrs. Thomas Roos  
Hanover, New Hampshire  
ARCHITECTS: E. H. and M. K. Hunter*





The Roos house provides brightly daylighted interiors, in spite of the dense foliage of the surrounding woods, as can be noted in the photos of the entry (*left*) and the stair well (*above*). A little bridge links the main level of the house with the road to make the formal entrance to the house.

In addition to the terraces provided on the lower level, outdoor sitting space adjoining the upstairs living areas is provided by a cantilevered balcony.

The upper level is fitted with two long banks of closets—one ranging the entire wall between the master bedroom and the living room, which also adds some sound isolation; and a door-high bank which partitions the kitchen from the entry, yet permits even daylighting





Joseph W. Molitor photos

## Integrated Campus for Boston University's Landlocked Site

The new additions to the Boston skyline along the south bank of the Charles River as seen in the above photograph taken from the vantage point of a bridge, are, from east to west: the almost finished office skyscraper for Prudential, and Boston University's Law and Education Tower and University Union. The five-story tenement structure between the two campus buildings will soon be replaced by a central library, the final element which will complete the master scheme for the university's main academic campus developed in planning studies begun by the architectural firm of Sert, Jackson & Gourley in 1959.

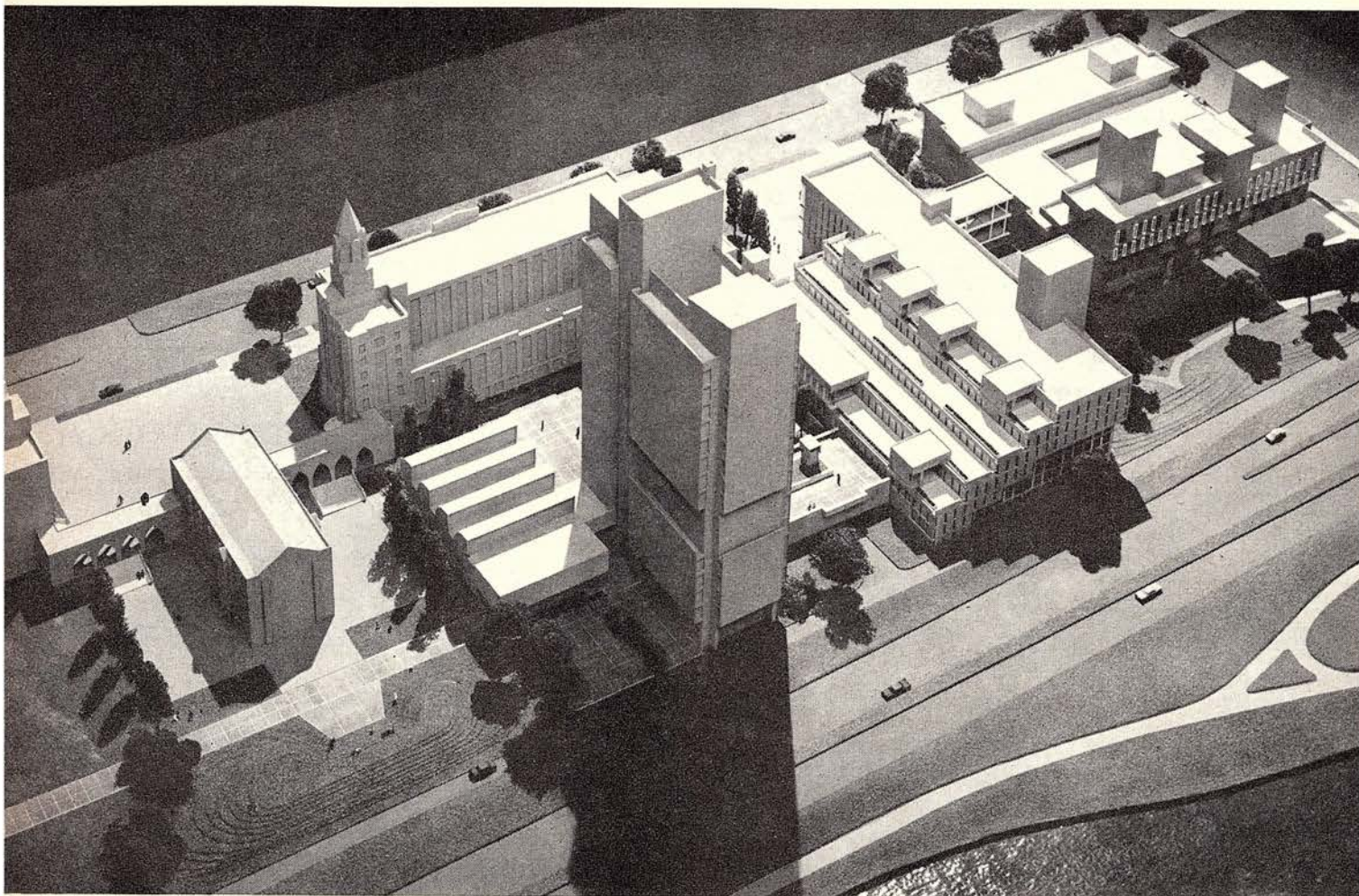
Sert, Jackson & Gourley (in association with the firm of Hoyle, Doran and Berry, the successors to Cram and Ferguson) was first commissioned to design the Student Union somewhere within the confines of an elongated narrow site bounded on the

north by the Charles River and Storrow Drive, on the south by Commonwealth Avenue, to the east by a Gothic chapel of the twenties, so positioned on the site as to preclude the placement of new buildings anywhere near it, and to the west by a well-traveled street.

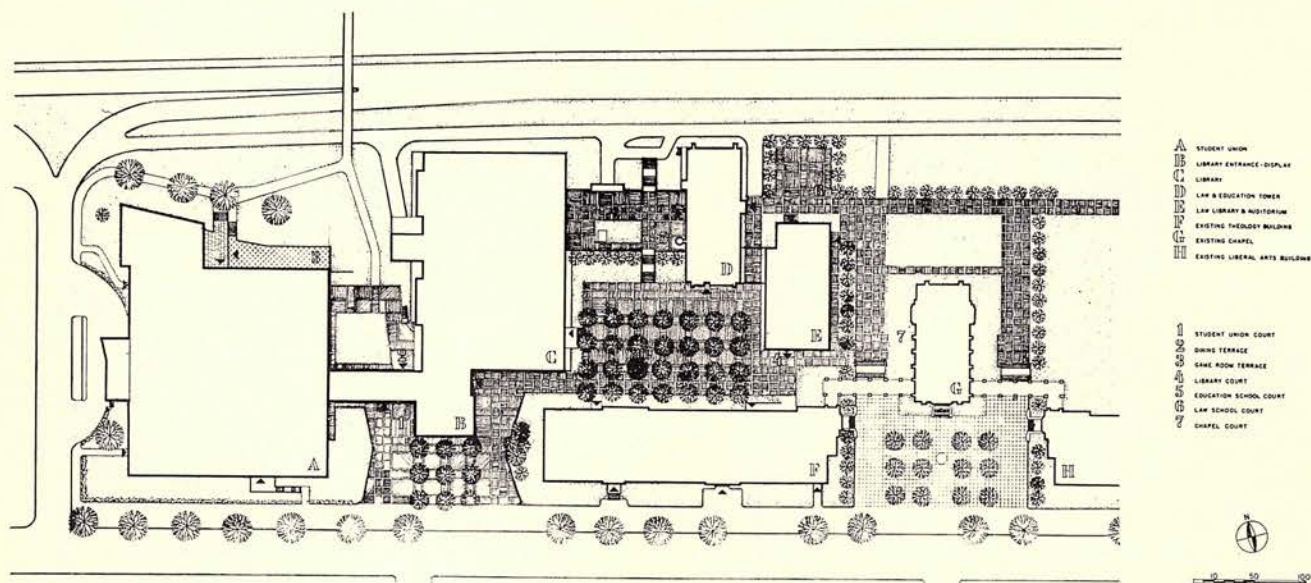
To determine the proper location of the Student Union on this available property and to work out adequate land coverage and access, it was necessary to make a study of the development of the entire site. In the process Sert, Jackson & Gourley carried out accommodation studies to appraise the capacity of the university's other urban land holdings to handle space at maximum density. The creation of a satellite campus outside the city was considered unsuitable to the particular functions of an urban uni-

*continued on page 167*





Robert D. Harvey



The linear quality of the site posed unique planning problems. The series of spaces formed by the juxtaposition of the new buildings with the existing ones are developed as terraces and plazas to make maximum use of the limited land areas for free circulation by the students. The river, a great urban asset, is visually possessed by the campus through the siting of the new buildings in relation to its banks. Boston University's new skyline south of the Charles River is intended to relate with the new skylines of Harvard and the Massachusetts Institute

of Technology taking shape north of the river. Terraces of the Union cantilever toward the river, the Central Library steps down toward the main quadrangle. The chimney of the heating plant is attached to the Law and Education Tower, its roof becomes an entrance terrace. The Law Library and Auditorium is linked to the tower by a bridge at the third floor. Its size was carefully controlled in order not to overpower the chapel, which had been the focal point of the earlier composition and retains a significant position in the new scheme

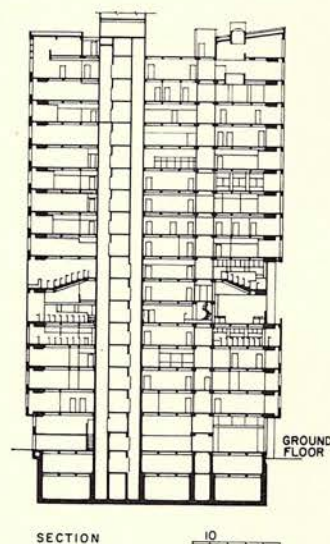
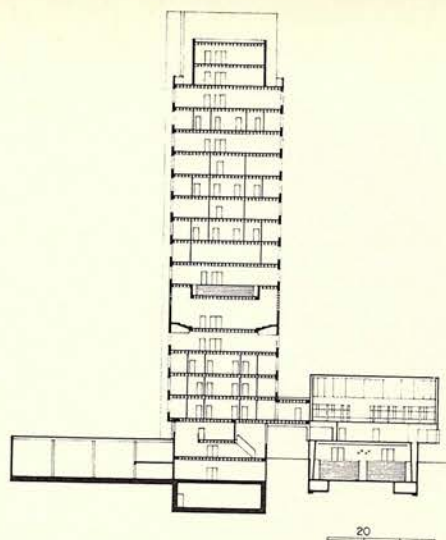
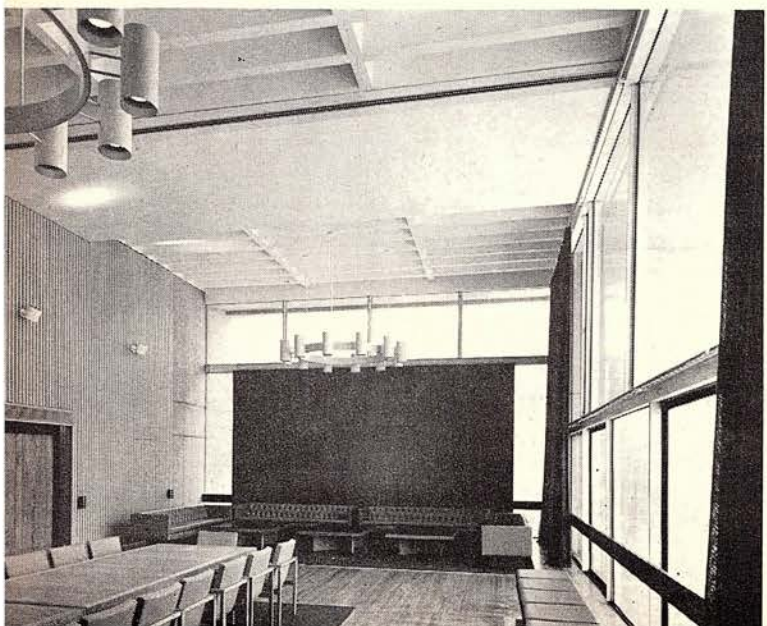
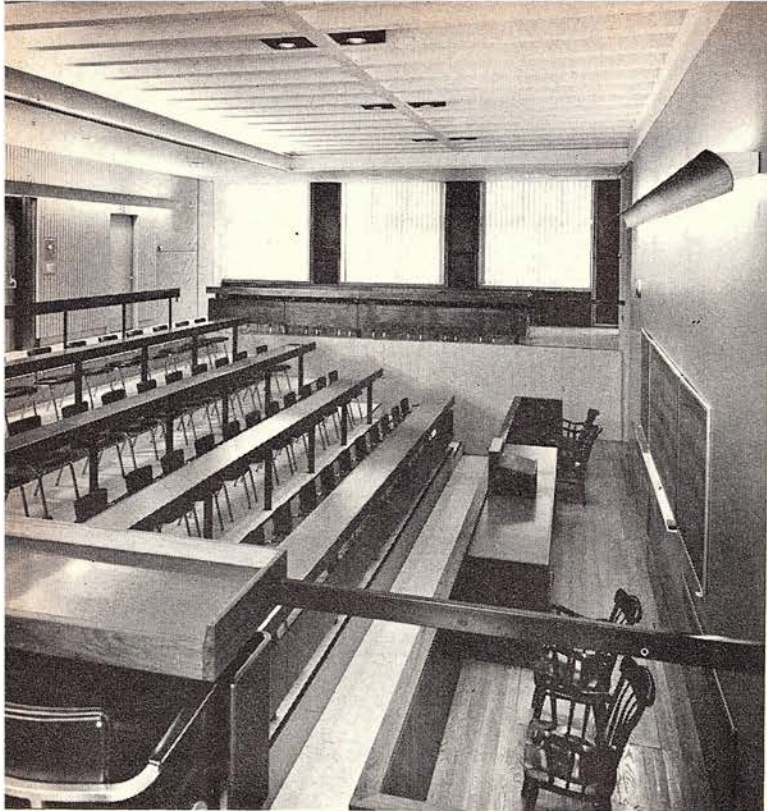




Spaces in the Law and Education Tower were grouped in size, function, degree of utilization and effect on elevator traffic. The Law and Education Departments each have separate entrance lobbies and elevator systems. The extraordinarily vigorous tower facades are partially the result of this grouping by size and function which is expressed in the fenestration. The building is divided vertically by the elevator shafts and

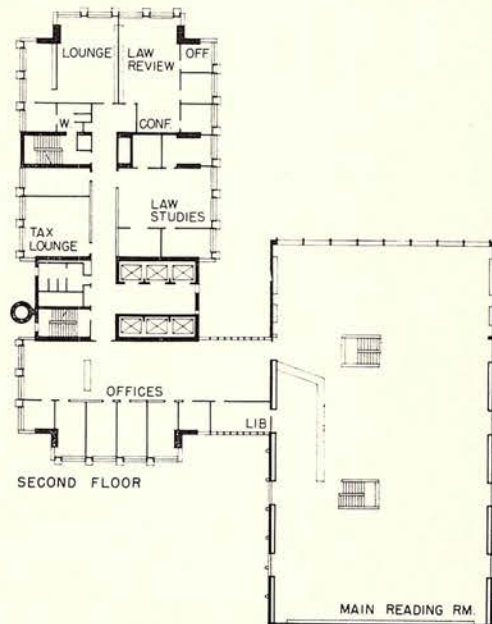
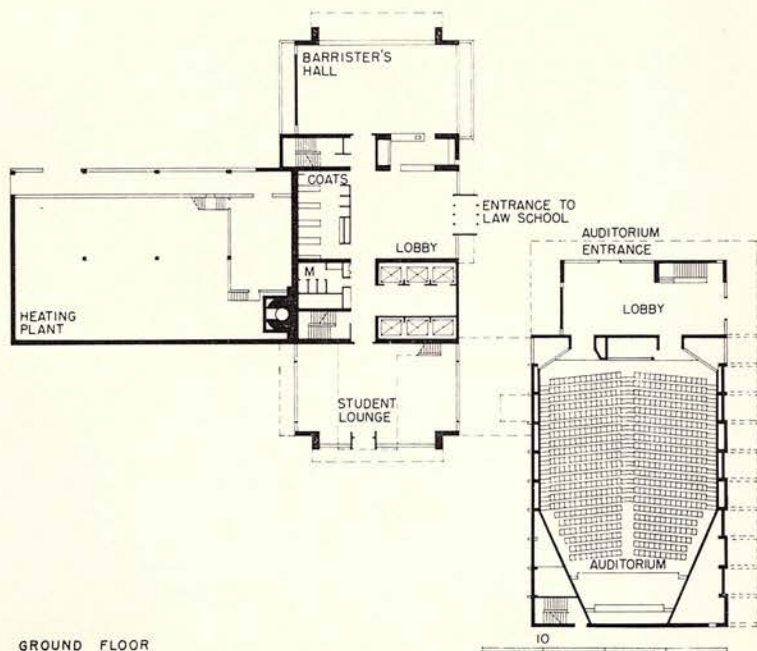
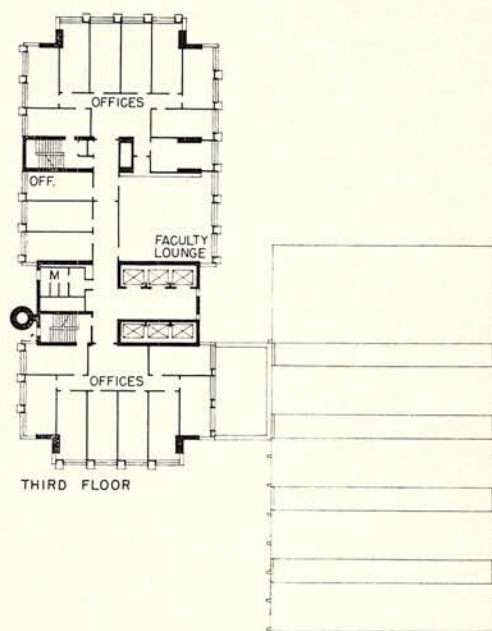
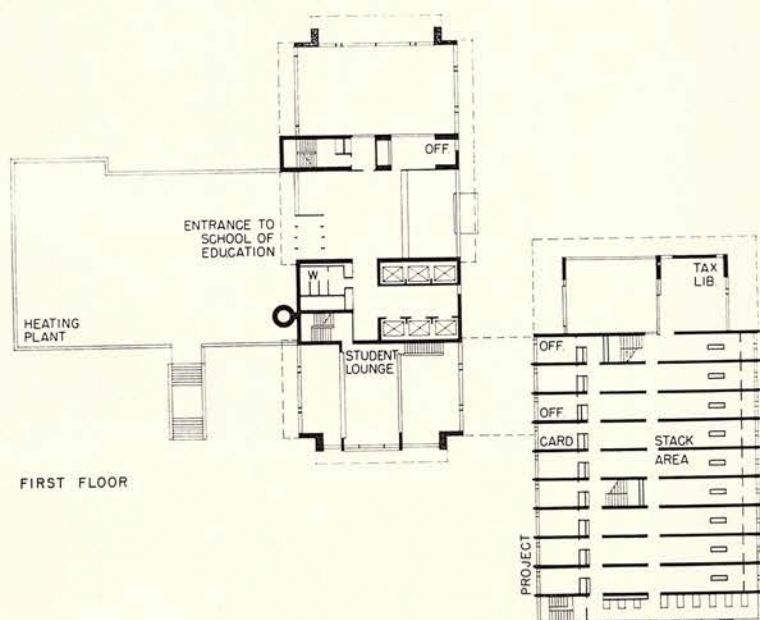
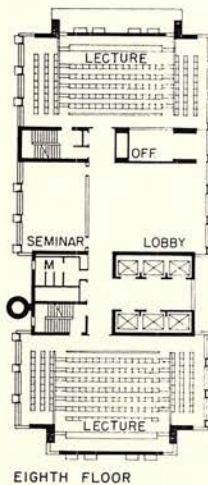
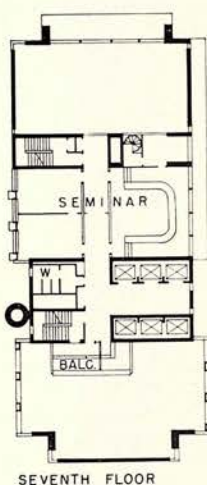
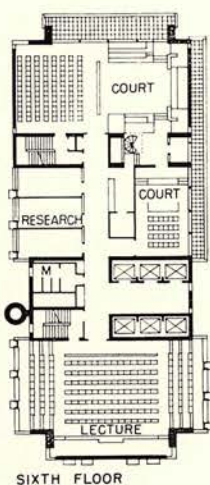
horizontally by the larger classrooms and mock-court which are double height spaces. The School of Education library rooms occupy the penthouse floors which provide ceiling heights without modular limitations and a sloping ceiling for the largest room. The over-all height of the 18-story structure is 265 feet. In the foreground is the Law Library and Auditorium; main School of Law entrance is adjacent





The School of Law required its own library and this element, together with an auditorium for 600 persons which is also used as a supreme court, was handled as a separate but attached entity. Separation of the two schools within the same building was a planning factor of first importance and was achieved at the entrances by making a double-height volume of the first two floors and allowing law to enter on the lower and education on the upper. With the exception of the education entry foyer, the first eight floors are occupied by the School of Law, and the ninth is shared with the School of Education. All large volumes, such as lecture halls and lounges, are grouped at the top and the bottom of the law segment with the more cellular units, such as offices for faculty, research and administration, sandwiched between them. Among the large volumes are a moot court of law, an appellate court, a barrister's hall and student lounge. The School of Education has its entrance on the second floor and occupies the ten floors from 9 to 18. The layout of these floors differs in concept from that of law in that the faculty offices are grouped around the larger teaching spaces—this hierarchical pattern is repeated throughout the whole school. The only exceptions are the audio-visual suite, general purpose rooms, and the School of Education Library which terminates the building by occupying the 16th, 17th and 18th floors. A variety of ceiling heights was achieved within the vertical tower module. The floor slabs are formed from one-way pans and wherever possible they are exposed as ceiling soffits, the suspended ceilings being used only as "lungs" to feed the mechanical system. The mechanical core is located in such a way that it divides all floors into two areas of different size. This was governed by the size and positioning of the larger classrooms. The concrete surrounding the mechanical core and the L-shaped angle columns hold the one-way ribbed floor slabs

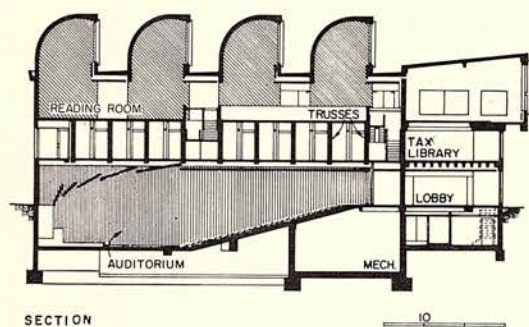




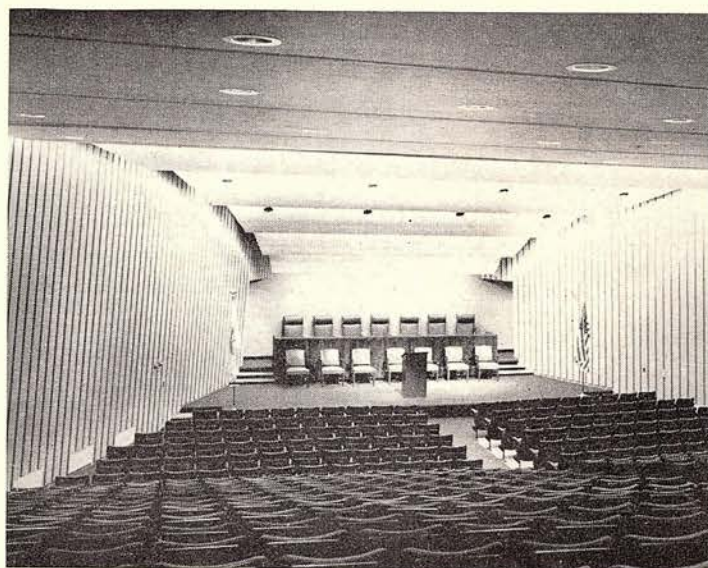




Law School Library



The Law School Library and Auditorium form a three-story structure. The space between the girders which span the auditorium roof is used as an additional floor for stacks. Concrete shells spanning the library create a fine interior space and provide diffused lighting



Law School Auditorium



*text continued from page 161*

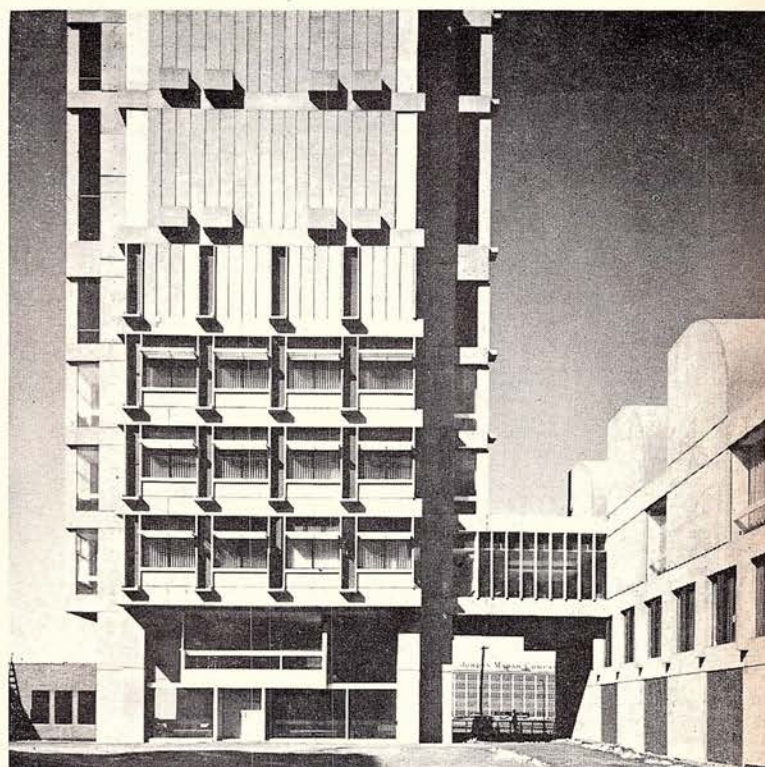
versity. Their analysis led to the recommendation that the university concentrate its facilities where possible in high vertical structures.

Educational towers are not new. Harvard and M.I.T. have recently been going vertical. New York University and Columbia began to construct buildings of 10 to 12 stories in the twenties, and in 1927 the University of Pittsburgh's famed 42-story "Cathedral of Learning" was completed on a 14-acre site appraised at the time at \$300,000 per acre. In Pittsburgh the land saved became a great lawn, the focus of the city's cultural center; now and in the future, urban campus land spared by vertical as opposed to horizontal development will be intensively utilized. This is not surprising when it is considered that several years ago one well-known urban university paid \$1,800 per front *inch* for two city blocks on which to expand.

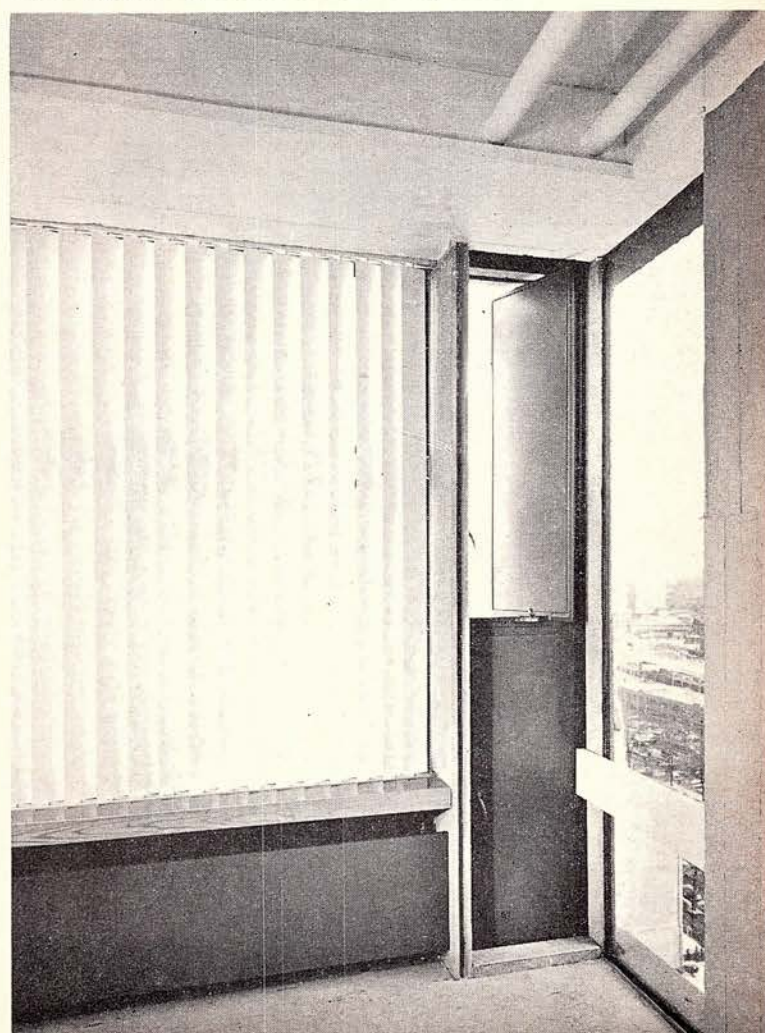
Even suburban and rural campuses which are not so land poor may begin to lose their over-scaled, wide open spaces. As James J. Morriveau points out in "Bricks and Mortarboards," a recent publication by Educational Facilities Laboratories, Inc.: "The campus is beginning to lose its excessively open character through both design and necessity. Some planners have heeded those critics of city planning who argue that a variety of comparatively small open spaces between buildings is perhaps more desirable than large spaces that create excessive distances between buildings and a disconnected suburban-type campus. Intensive development of the site is no longer regarded as something to be shunned by all but the big city institutions."

Now that it is almost complete, Boston University's new academic center with its single tower surrounded by tightly related interconnecting lower elements forming small plazas can be considered a valuable prototype for just this kind of concentrated planning.

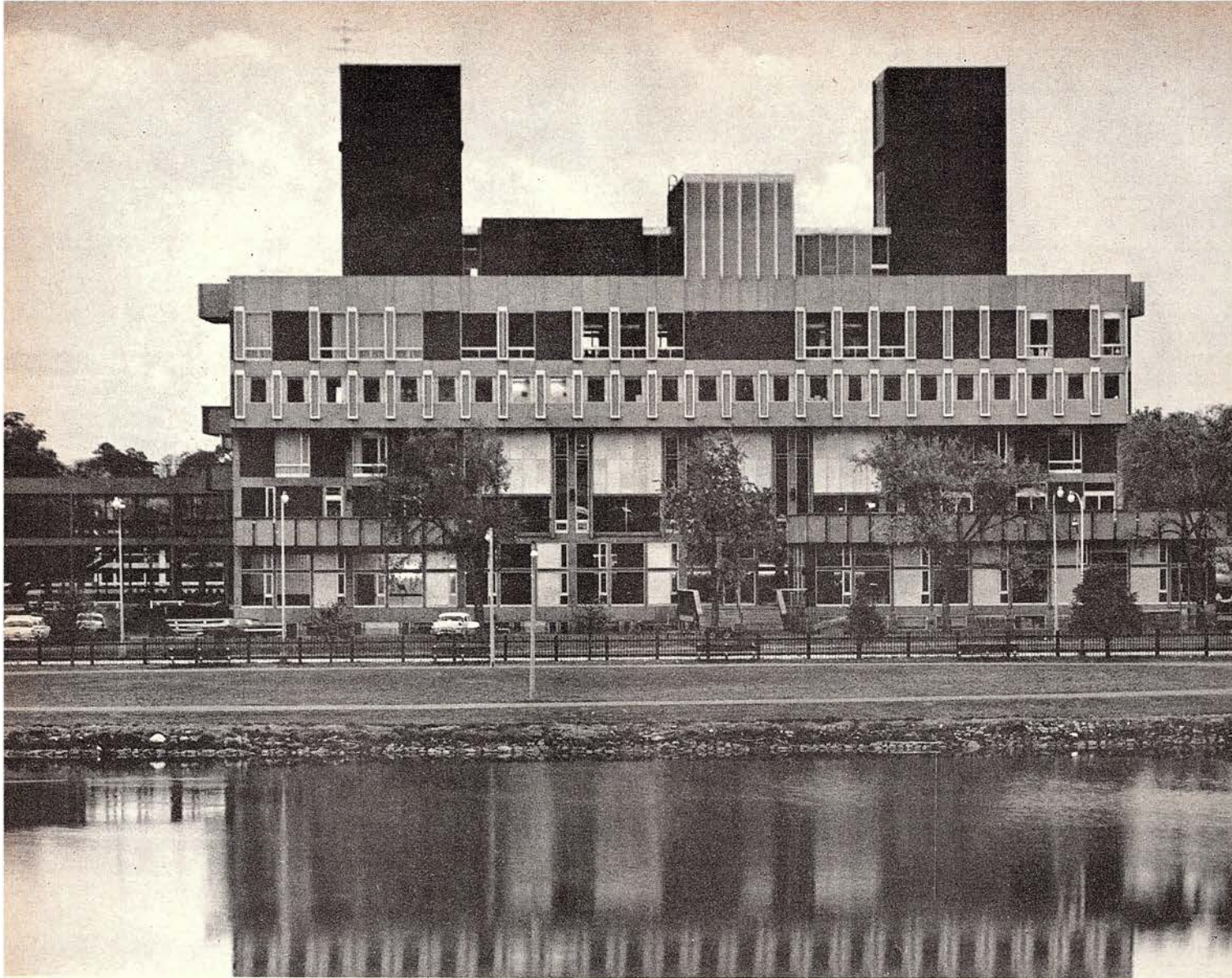
The earlier campus, designed like the chapel in a Gothic of the twenties, faces Commonwealth Avenue. Sert's new structures, which evoke LeCorbusier, politely face the other way, overlook the Charles and present a unified entity as seen from across the river on the Cambridge side or from Storrow Drive which borders the site at the river's edge. Sert, Jackson & Gourley were not concerned with dormitory structures or parking, neither of which were programed for this site. The buildings, which include the Student Union, the not yet begun Central Library, the Central Heating and Equipment Plant, the Law and Education Department housed in the tower, and the Law Library and Auditorium, were studied as one large complex. Sert has said: "None of them could stand alone; their volumes, shapes and textures would not be the same if they were placed in large, landscaped sites with plenty of space between them."



Reinforced concrete structural elements are sand-blasted on the outside. Inside the impression of the board forming remains. Non-bearing walls and window frames are precast. Windows are fixed but are interspersed with floor to ceiling steel ventilators painted green or barn red. The projecting sills at the base of ventilators facilitate window cleaning. The building is not air conditioned due to cost. Heating is by hot water convectors combined in the larger spaces with warmed air. Glass enters concrete jambs by means of neoprene gaskets



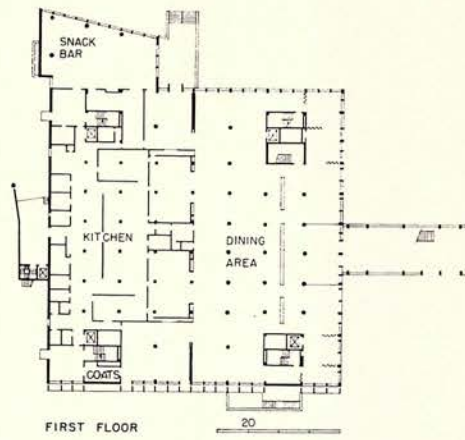




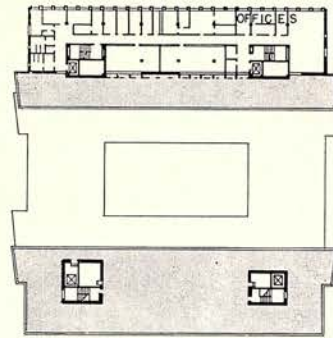
Diverse program requirements for the Union Building and scarcity of land caused the architects to design a building cross-section composed of a series of planes which recede upward and outward from the heart of the building. These planes provide terraces open to the sun and protected from the wind. The heart of the building is an elevated main courtyard flanked to the north by the lounge and to the south by the multi-purpose room. The dividing walls between these spaces can be drawn aside to create a single space for large social functions. Below are two floors primarily devoted to dining facilities and recreation rooms. Above are three floors housing meeting rooms, student organization offices and the faculty

club. Some mechanical equipment is in the basement but most of it is placed on the roof giving the building a complex skyline. The reinforced concrete frame is clad externally with precast concrete slabs of gray granite in a dark gray concrete matrix. The infill between the frame alternates between a dark gray-purple brick and glass. The glass is both clear and translucent and is punctuated with insulated metal ventilator panels enameled in clear colors. The south facade is shielded from the sun by white cast stone sunbreakers composed as a large-scale frame. The building is air conditioned and has radiant ceiling panels for heating. Materials used on the interior were chosen for durability and ease of maintenance

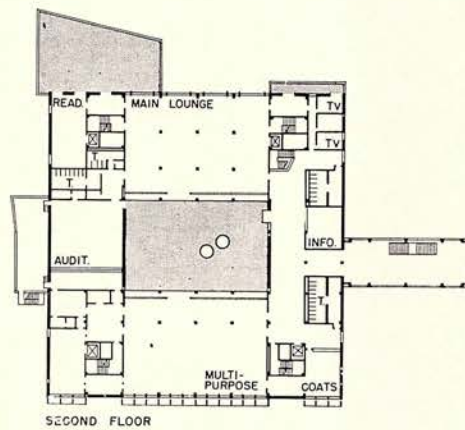




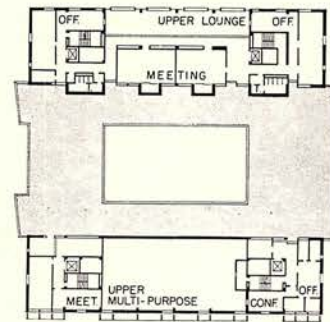
FIRST FLOOR



FOURTH FLOOR

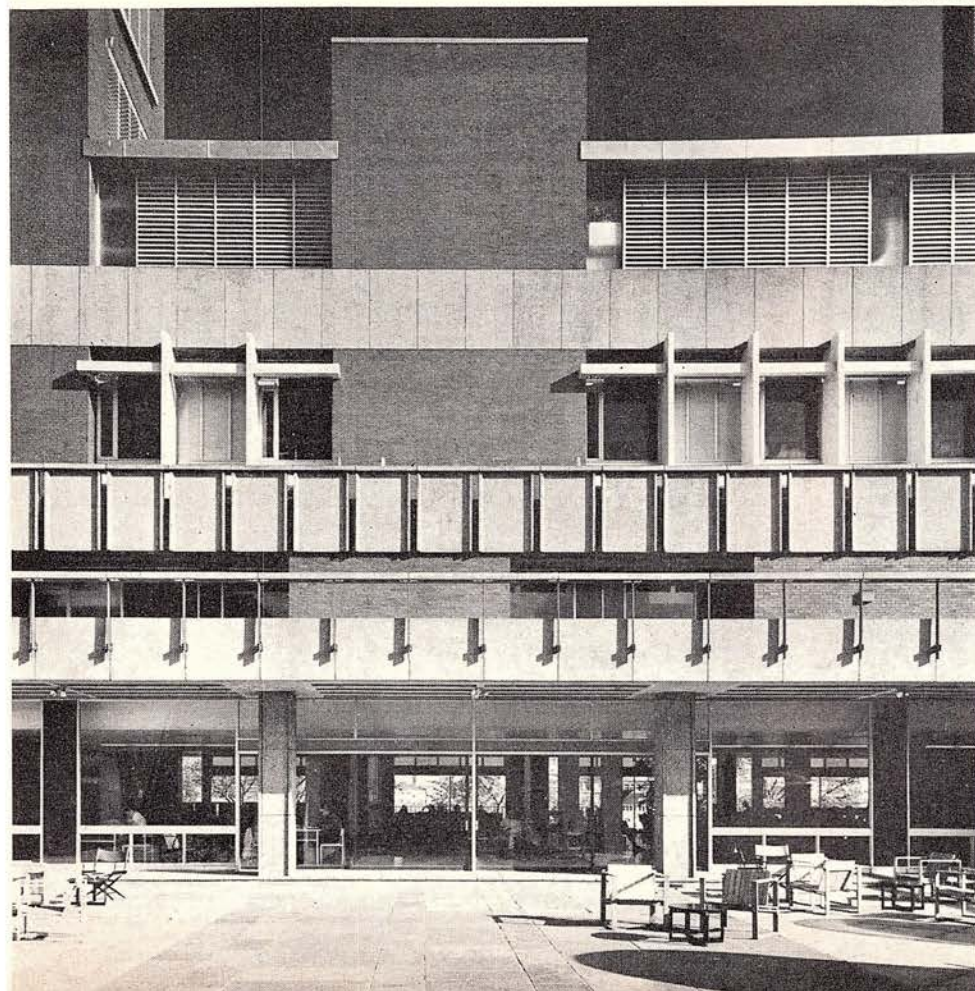


SECOND FLOOR



THIRD FLOOR

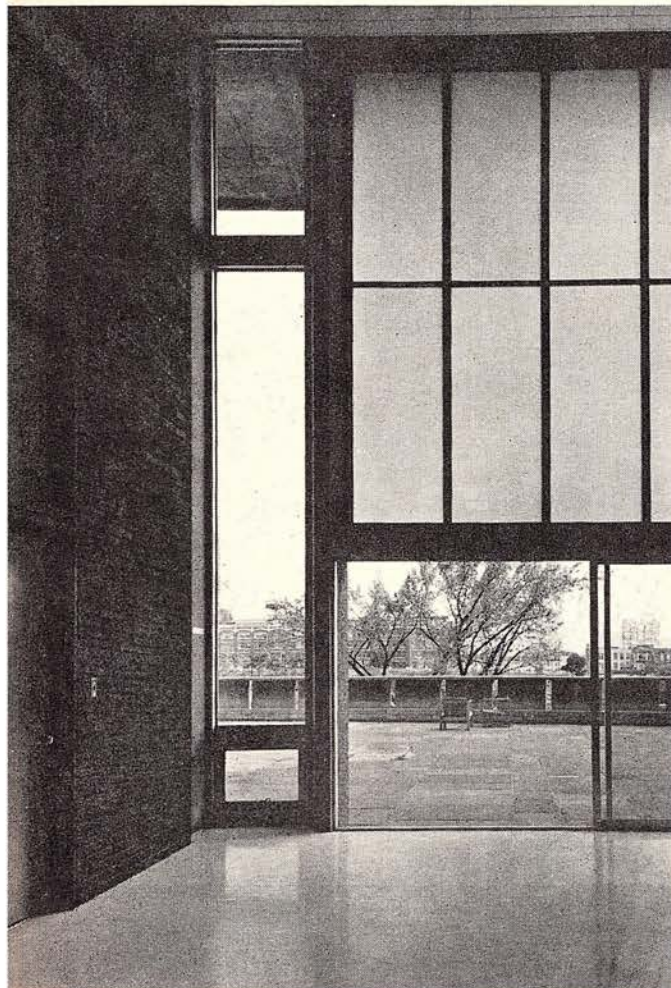
Louis Reens







Terraces of Union Building; amenities where land is scarce



*George Sherman University Union, Boston University  
Boston, Massachusetts*

ARCHITECTS: *Hoyle, Doran & Berry*

Partner in Charge: *Frank E. De Bruyn*

ASSOCIATED ARCHITECTS: *Sert, Jackson & Gourley*

Associate: *Joseph Zalewski*; Job Captain: *Terrence Mullen*

STRUCTURAL ENGINEERS: *Hoyle, Doran & Berry*

Partner in Charge: *Nisso T. Aladjem*

HEATING AND VENTILATING ENGINEERS: *Buerkel & Co., Inc.*

PLUMBING ENGINEERS: *Robert W. Sullivan, Inc.*

ELECTRICAL ENGINEERS: *Thompson Engineering Co.*

HEATING AND VENTILATING CONTRACTOR: *Limbach Company*

GENERAL CONTRACTOR: *M. S. Kelliher Company*

PLUMBING CONTRACTOR: *P. J. Riley & Company*

ELECTRICAL CONTRACTOR: *Wm. Gens & Son*

*Central Library, Boston University, Boston, Massachusetts*

ARCHITECTS: *Hoyle, Doran & Berry*

Partner in Charge: *Frank E. De Bruyn*

ASSOCIATED ARCHITECTS: *Sert, Jackson & Gourley*

Associate: *Joseph Zalewski*; Job Captain: *Gerald Howes*

STRUCTURAL ENGINEERS: *Hoyle, Doran & Berry*

Partner in Charge: *Nisso T. Aladjem*

HEATING AND VENTILATING ENGINEERS: *Buerkel & Co., Inc.*

PLUMBING ENGINEERS: *Robert W. Sullivan, Inc.*

ELECTRICAL ENGINEERS: *Thompson Electric Company*

LIBRARY CONSULTANTS: *Library Buildings Consultants, Inc.*

*Law and Education Building and Pappas Law Library  
Boston University, Boston, Massachusetts*

ARCHITECTS: *Sert, Jackson & Gourley and Edwin T. Steffian*

Project Manager: *W. S. Mallory Lash, office of Edwin T. Steffian*

Associate: *Joseph Zalewski, office of Sert, Jackson & Gourley*

Job Captain: *Gerald Howes, office of Sert, Jackson & Gourley*

STRUCTURAL ENGINEER: *Paul Weidlinger*

CONSULTING ENGINEERS: *Cleverdon Varney and Pike*

SOILS MECHANICS CONSULTANTS: *Arthur and Leo Casagrande*

ACOUSTICAL CONSULTANTS: *Cambridge Acoustics*

SPECIFICATIONS CONSULTANT: *Mario Pfaff*

GENERAL CONTRACTOR: *Vappi and Company Inc.*



## Campus Planning for the State University of New York

In the New York Times of April 4, 1964 a brief item on the financial page read as follows: "The big housing issue is a \$93.1 million offering of New York State Housing Finance Agency bonds . . . Proceeds will be used to finance 23 projects on 16 campuses of the State University of New York. The university has estimated that its capital construction program will cost about \$700 million from 1963 to 1971." Behind this announcement is a comprehensive state-wide campus planning and construction program of scope, quality and great architectural promise.

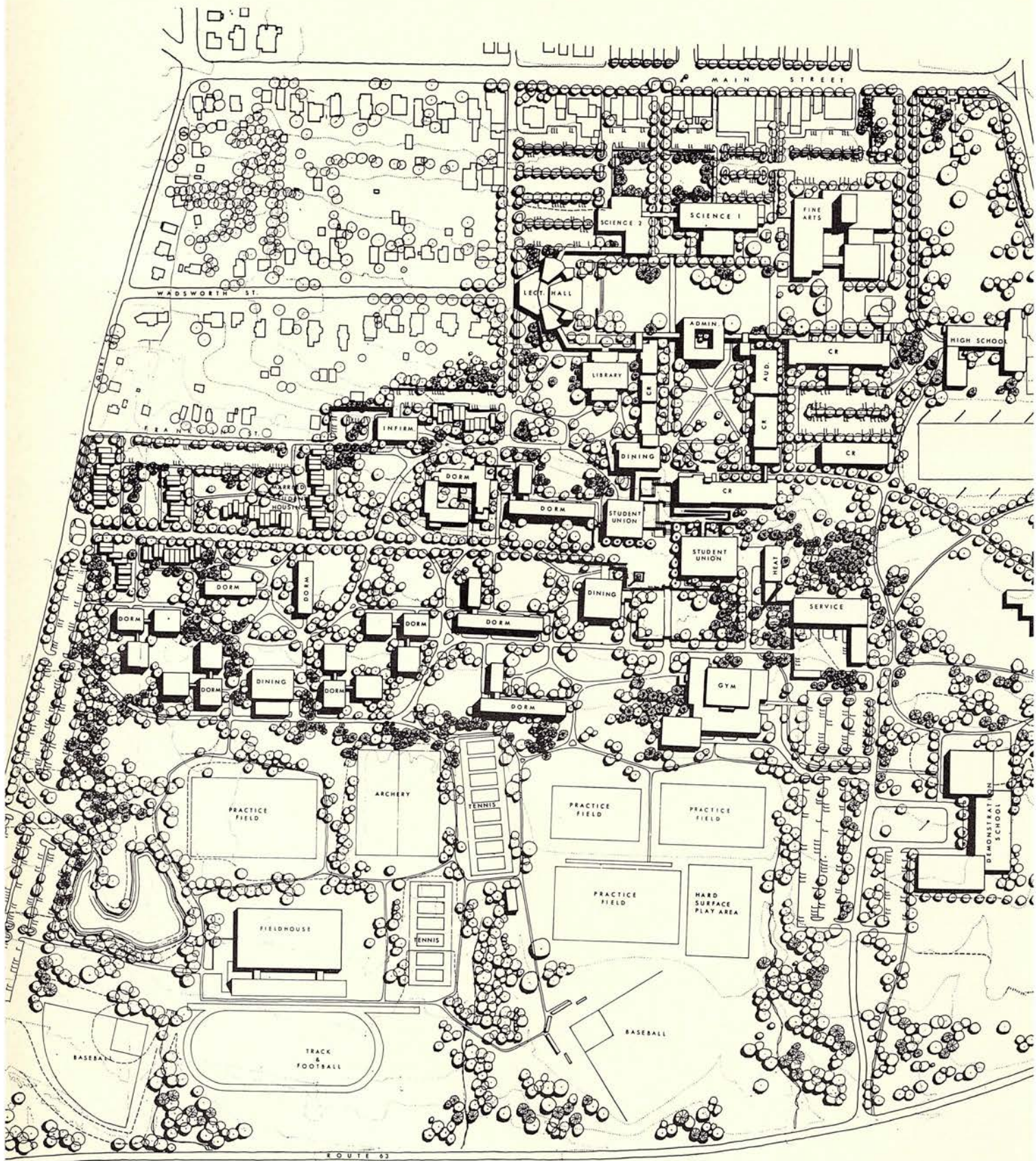
The State University of New York is responding to the expected pressures from the maturing population born during and at the end of the war years, which first forced a boom in elementary school construction, then went surging on to fill the junior and senior high schools rapidly built to accommodate them, and now are ready for college. New York will double the current enrollment of 53,000 in its State University System by 1970. It is establishing four new university centers, creating new community colleges, and converting its teachers colleges into larger liberal arts institutions. Private colleges and universities within the state are making an effort to preserve their special character and are carefully limiting their expansion plans, thereby increasing the pressures on the State University. Only UCLA, which will have spent \$370 million between 1949 and 1967 on its system of public universities, two-year community colleges and state colleges, and Illinois, which is spending \$195 million, have plans which are comparable in magnitude to New York's.

For a construction program of this scope and with this deadline, it is pretty clear that the common practice of locating each new campus building on any prominent spot, so that all may admire, results

in more chaos than ever. It is also apparent that to assemble lands piecemeal prior to the construction of each new facility would be disastrous for both long- and short-range convenience and economy. Master planning is essential, and fortunately for the State University, the men in charge of the crash program of campus development know it.

In the spring of 1962 the legislature at Albany passed a bill sponsored by Governor Rockefeller which set up the State University Construction Fund, "a corporate governmental agency constituting a public benefit corporation," as a means through which the new campus construction could be financed. The new organization, in addition, was devised as an answer to long-standing complaints from the State University trustees and the Board of Regents over the time required to construct college buildings when everything was handled by the Department of Public Works. The new body has been charged with the planning and construction of the needed state-wide campus facilities. It hires the architects, planners and engineers, and coordinates their work with the requirements of the State University. It has made itself responsible for the development of master plans to meet the physical requirements of the expanding campuses and so far over 20 have been produced. A number of these schemes are brilliant and hopefully will be fully implemented. The design and construction of individual buildings is, in many cases, well underway, and the laying of sewers and other mechanical facilities in terms of long-range considerations is the first real transfer of the master plan image from paper to land. These underground tracings of the schemes will, as much as anything else, help to assure the growth of the campuses as conceived.



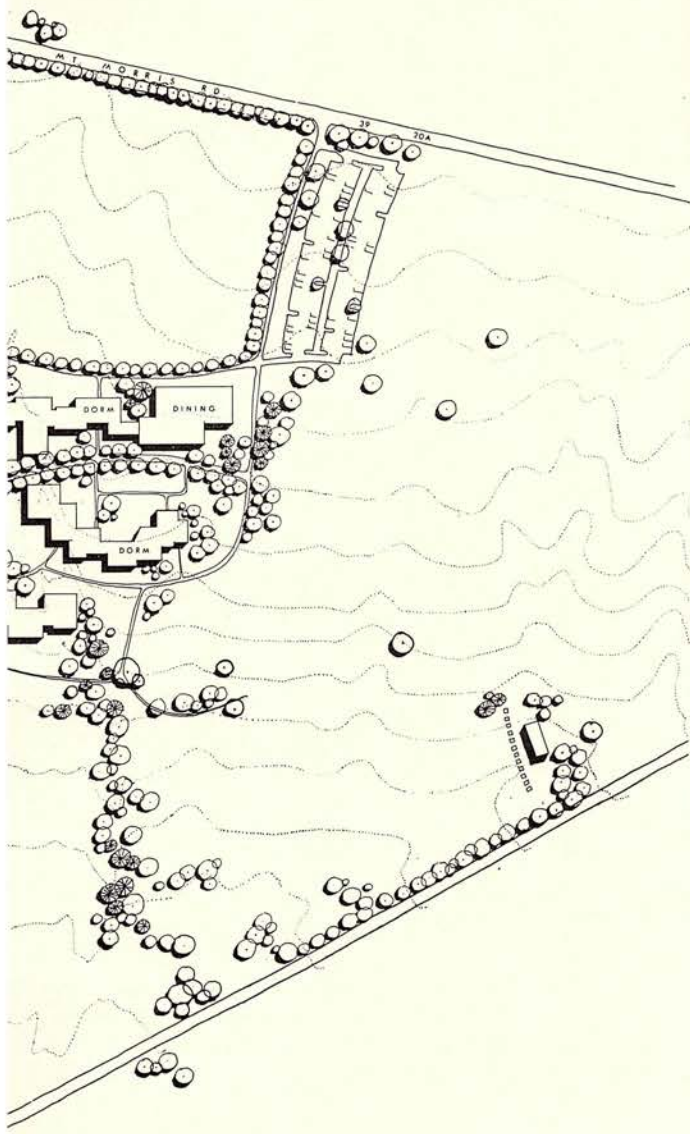
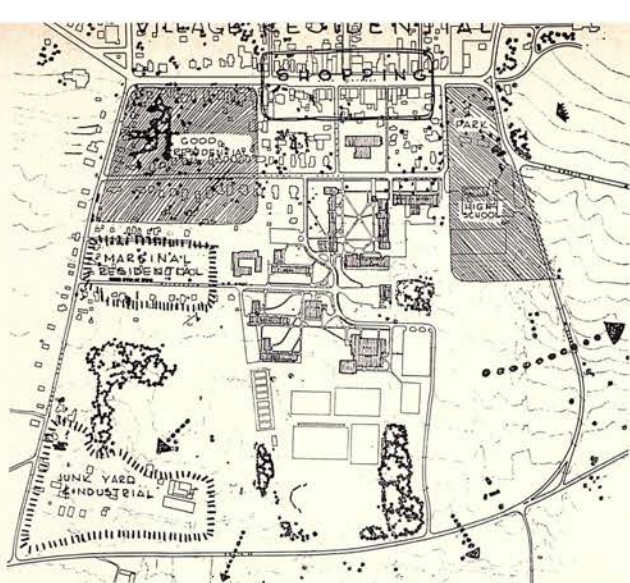


Composite architectural and site development for 1970

plaza                      quadrangle                      mall                      court                      alley                      vill



Area plan (right) shows factors which determined the direction of campus expansion. Note position of existing campus buildings and manner of placement of new elements to create well scaled open spaces as an easy transition down the slope



## Designing for Campus and Town

In an address made to the New York State Association of Architects at their annual convention last fall, George A. Dudley, a trustee of the State University Construction Fund, spoke of the efforts of MST Architects and Planners Associates (architects Rolf Myller, Richard W. Snibbe, Edgar Tafel) to integrate the plans for the college at Geneseo with the almost contiguous town.

"In a community such as Geneseo the unit of the State University was originally a Normal School in one building with a handful of students—a fraction of the town's population. By 1930 the enrollment was 200 with the town population 2,300. By 1963 the two were just about even at 1,850 each. We project that the college will grow to a population of 3,400 in 1970, and an ultimate 4300 in 1980, with the town population remaining at 2,000. Some growth will probably occur outside the town line.

"What happens? Do we build in the blighted backyards of the Main Street buildings? Do we design our own buildings to turn their backs on theirs? Do we stay within the small-scale street pattern set a century and a half ago? This is why we set up the long-range campus plan processes, procedures and contracts. In Geneseo, for example, this provided impetus to the beginnings of local town planning and a joint plan has been developed where the impact of the 'explosion' of the campus is no longer, we hope, a brutal invasion of the structure of the town. It will be a momentum which the town is utilizing to revivify its own Main Street with common arcades bringing town and gown together, a designation of common parking areas and some streets closed."

Fine Arts Building (below left) and Lecture Hall Building (below right) designed by MST Architects and Planners Associates for Geneseo College





## A Comprehensive Plan for the College at Potsdam, New York

The following analysis of the master plan for the State University College at Potsdam was adapted from the report made by the architect, Edward Larrabee Barnes, to the State University Construction Fund.

The new comprehensive campus plan is compact, an advantage for a "winter campus." More important, it is a direct expression of the organic structure of the college. The key buildings, the Library and Student Union, are placed in dominant central positions.

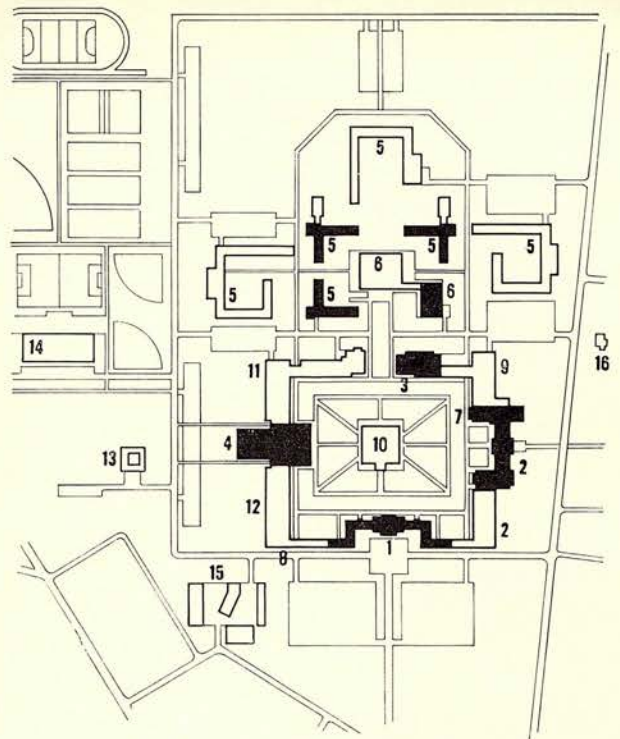
The Library will stand in the middle of a court. Around it will be the academic and administrative buildings. New classrooms and lecture halls will close the corners of the existing open court, so that the outdoor space is now concentrated and defined. The Library is designed so that students will be encouraged to walk through it as they criss-cross the new Academic Court to and from classes.

The Student Union is also on the main axis; and since it serves both resident and non-resident students, it is placed near the Academic Court. Like the Library, its location symbolizes its importance. A plan which is functional often finds a form that is symbolic, and the classic position of these two buildings—Library and Student Union—symbolizes the two poles of student activity.

According to the new comprehensive plan, the dormitory expansion will take place on three sides of the Student Union. There will be five centers—each with integral dining facilities and each with separate dormitory buildings for men and women. Each center will have its own outdoor court and each will have a six-story-high building in the area.

The land area on which the college is located is flat and the widely spaced buildings already define a symmetrical campus. However, the distances between the buildings are enormous and, quite apart from the unsuitability of such great spaces in a severe climate, there is at present no containment or definition.

In 1970 there will be a campus, generally low on open ground, where numerous trees will compliment the buildings. Slightly above this tree line will project the roofs of only the key structures—the Library, the Student Union, and the high building in each residential unit. The college profile will be that of a friendly, sheltered campus, where the spaces between the buildings are as important as the buildings themselves. It will be a place where the order of daily study and play will find a direct expression in the complete architectural design.

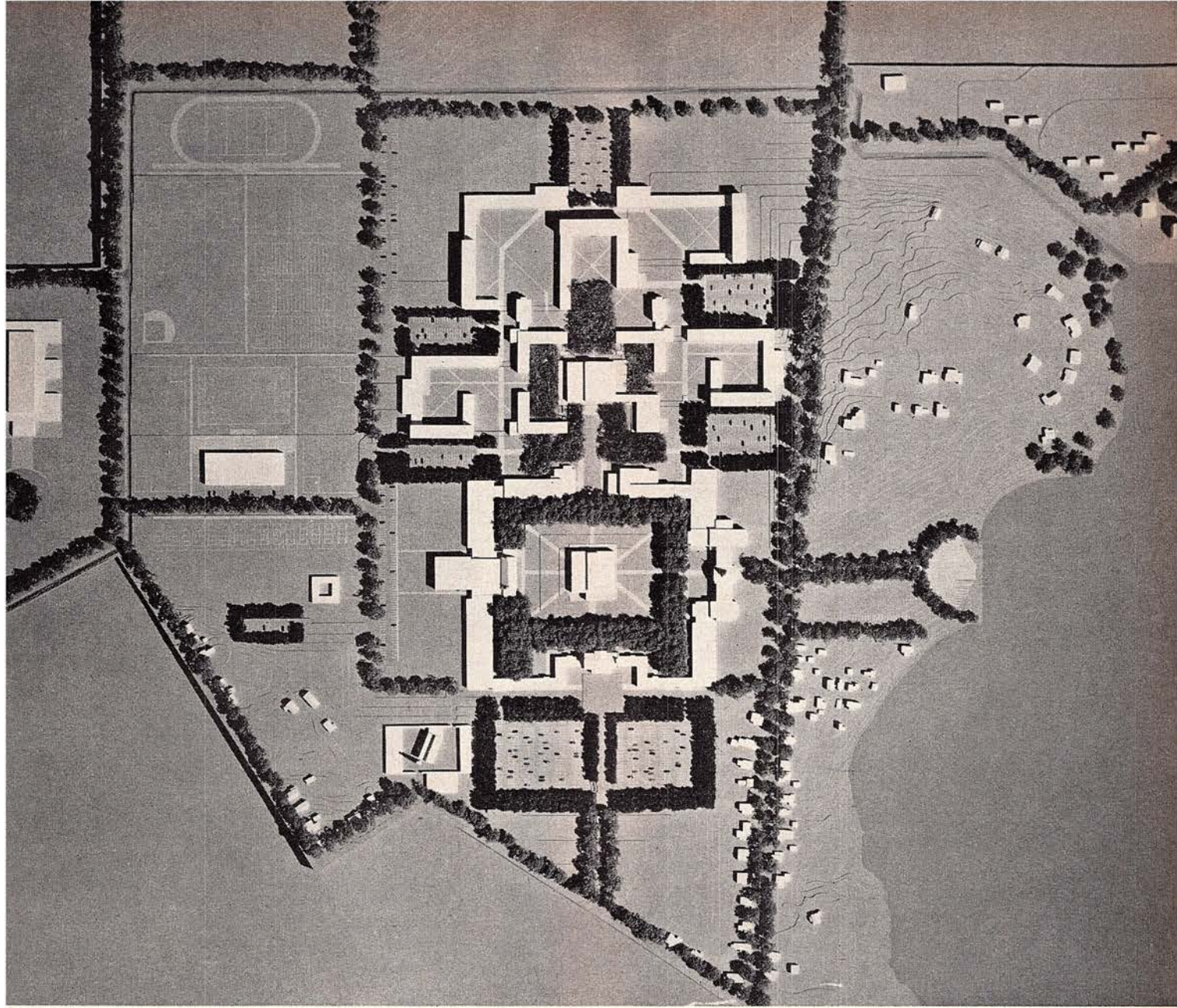


- |                       |                           |
|-----------------------|---------------------------|
| 1. Administration     | 9. Fine Arts              |
| 2. Classrooms         | 10. Library               |
| 3. Music              | 11. Science               |
| 4. Physical education | 12. Lecture Hall Center   |
| 5. Dormitory          | 13. Infirmary             |
| 6. Student Union      | 14. Field House           |
| 7. Auditorium         | 15. Service compound      |
| 8. Faculty office     | 16. President's residence |

The question of the relationship of college to community brings up the question of the entrance. The present comprehensive campus plan shows a new major entrance from Potsdam to the north. There is already some pedestrian circulation in that direction since Clarkson and Potsdam college students see each other socially and occasionally share library facilities. From the parking lots, there are three entrances to the campus. The central one, chiefly for visitors, leads to the Administration Building, which is approximately on axis with the Library and Student Union. The two side entrances will be the major student entrances. High archways open into the great Academic Court. These two sidewalks are closed to all traffic except for service and emergency vehicles. They will be major pedestrian ways for students serving both sides of the Academic Court as well as the five residential centers. Other parking areas serving the residential centers will also open onto this same restricted walk. Parking space for 890 vehicles will be available by 1970. All of these parking entrances will be concealed within coniferous screens so that with the buildings they effect a wall within the campus. There are three kinds of circulation routes. Around the whole academic and residential campus is a road system open to visitors composed of an avenue to the west and new interior roads on the other three sides. Threaded throughout the campus is a ring walkway described above which is open to limited vehicular traffic. Finally, in the center of the campus there are paths, and paved courts and terraces open only to pedestrian traffic.

State University Construction Fund, Albany, New York. Edward Larrabee Barnes, A.I.A., architect; Planners Collaborative, planners; Cosentini Associates, consulting mechanical engineers; Eitington and Schlossberg, associate electrical engineers; John J. Baffa Associates, associate site engineers; Dan Kiley, landscape architect; Severud-Elstad-Krueger Associates, structural engineers; McKee-Berger-Mansueto, cost consultants; Geotechnics and Resources, soil consultants.





*Louis Checkman*

Air view of existing campus





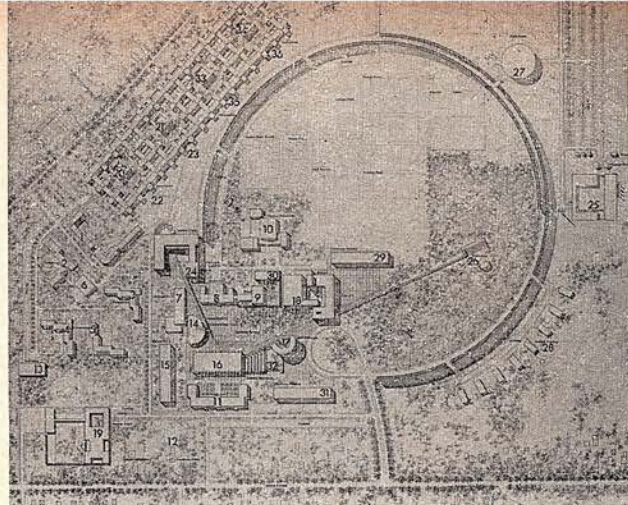
## I. M. Pei's Master Plan for the College at Fredonia, N. Y.

This statement of the objectives and concept which form the basis of this highly original scheme is condensed from a memorandum to the State University Construction Fund by Henry N. Cobb, I. M. Pei & Associates partner in charge of the design of the Fredonia campus.

"Campus planning—a special case of the town planning art—has as its ultimate goal the creation of an apprehensible and meaningful order in the physical structure of the college community. Such an order, endowed with a liberating rather than a coercive force, gives plastic expression to the educational ideals of the institution which it serves, and evokes in students and faculty alike a spontaneous awareness of the values underlying their common purpose. It is in the nature of the problem that the order which we seek must embrace the dimensions of time as well as those of space. For the processes of growth and transformation—natural to the life of any community—are nowhere more evident than in that of the 20th-century American university.

"Within the super-block which contains it, the Fredonia campus is seen to float aimlessly in an extraordinarily bland and featureless landscape. It lacks a coherent form, both internally, in the organization of its parts, and externally, in its relationship to the surroundings. The only articulate element of order within the campus is the axial relationship which exists between the two main academic buildings, and it is order of a very primitive kind. Beyond the campus proper no significant topographic feature—no lake—relieves the monotonous flatness of the site. There are indeed a few substantial groups of trees, the largest of which lies some distance north of the existing campus. But the college grounds themselves are almost barren of planting.

"In a conceptual sense the order we have devised for Fredonia is extremely simple and is composed of three principal elements—separately identifiable but entirely interdependent—which have one essential characteristic in common. Each possesses within the context of the plan not only a clearly defined functional significance, but an articulate formal and spacial significance as well. These three fundamental elements are the circular roadway, the spine and the terrace."



1.-5. Dormitories	15. Science Building	26. Music shell
6. Dining Hall	No. 2	27. Field House
7. Science Building No. 1	16. Library	28. Student housing
8. Mason Hall	17. Administration	29. Classroom building
9. Music studios	18. Fine Arts Center	30. Music studios
10. Physical education	19. Campus school	31. Classroom building
11. Fenton Hall	20.-21. Dining Hall	32. Library expansion
12. President's house	22.-23. Dormitories	33.-34. Dining Hall
13. Infirmary	24. Student Union	35.-36. Dormitories
14. Communications Center	25. Service	

"The circular road provides access to all major activity zones of the campus from a single, easily-comprehended circulatory system. The simplicity and clarity of its form confirms the essential unity of the campus community.

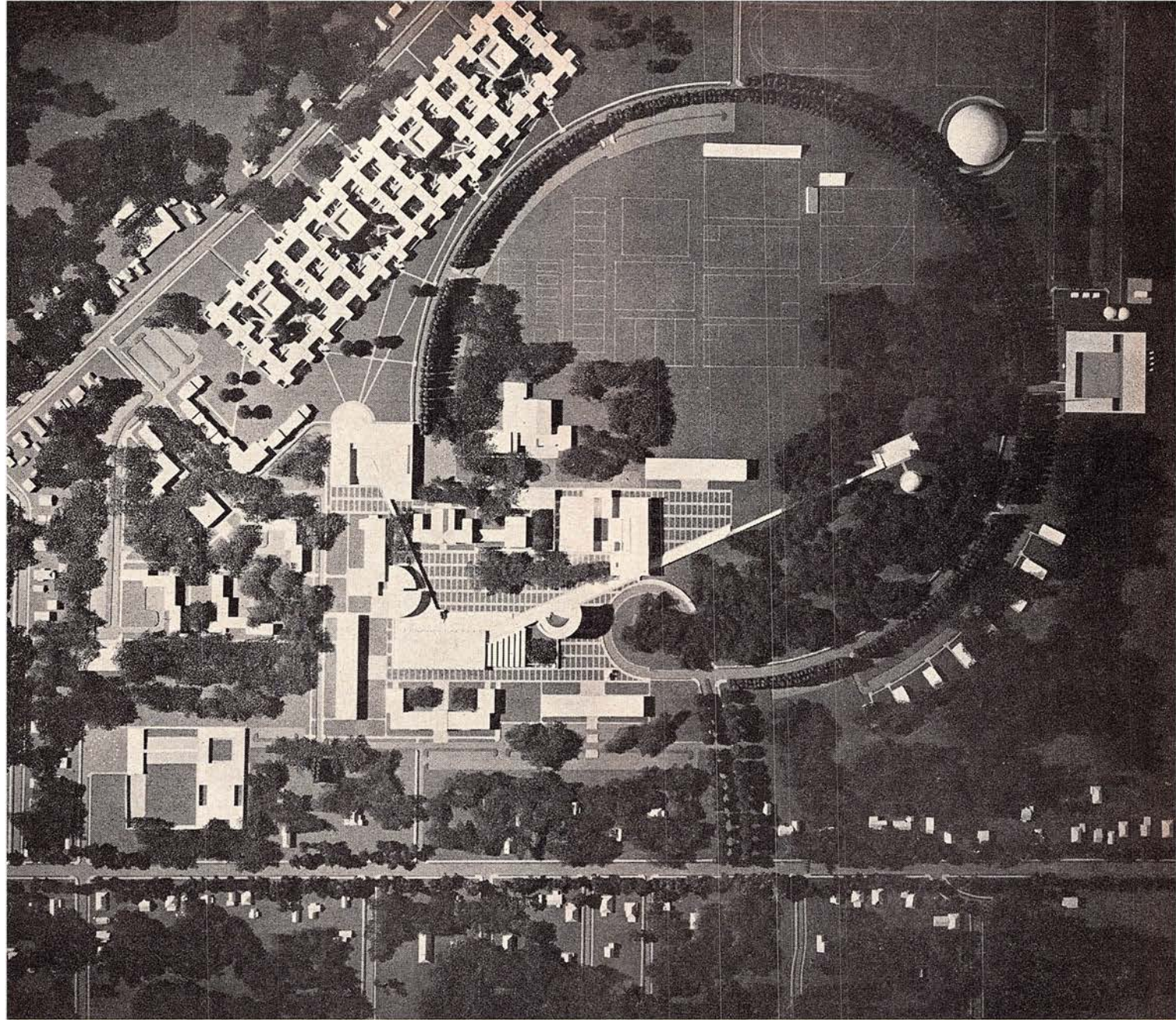
"The spine is a system of straight-line paved pedestrian ways, which provides a direct path of pedestrian movement linking the major centers of activity and congregation within the campus, and permits the development of a two-level circulation system within and between the academic complex.

"The deliberate integration of the spine into those buildings which are used by all the students in common (student union, lecture hall center, library, administration and fine arts center) intimately affects the form and architectural vocabulary of those buildings, so as to identify them as the heart buildings of the campus and set them apart both from the existing classroom buildings and from those which will be added in the future. This is particularly important as it provides the key to the solution of the most difficult architectural problem which we face; namely, how to introduce the major new structures in such a way that the existing buildings are not excluded from the spatial and architectural ambience of the new academic campus.

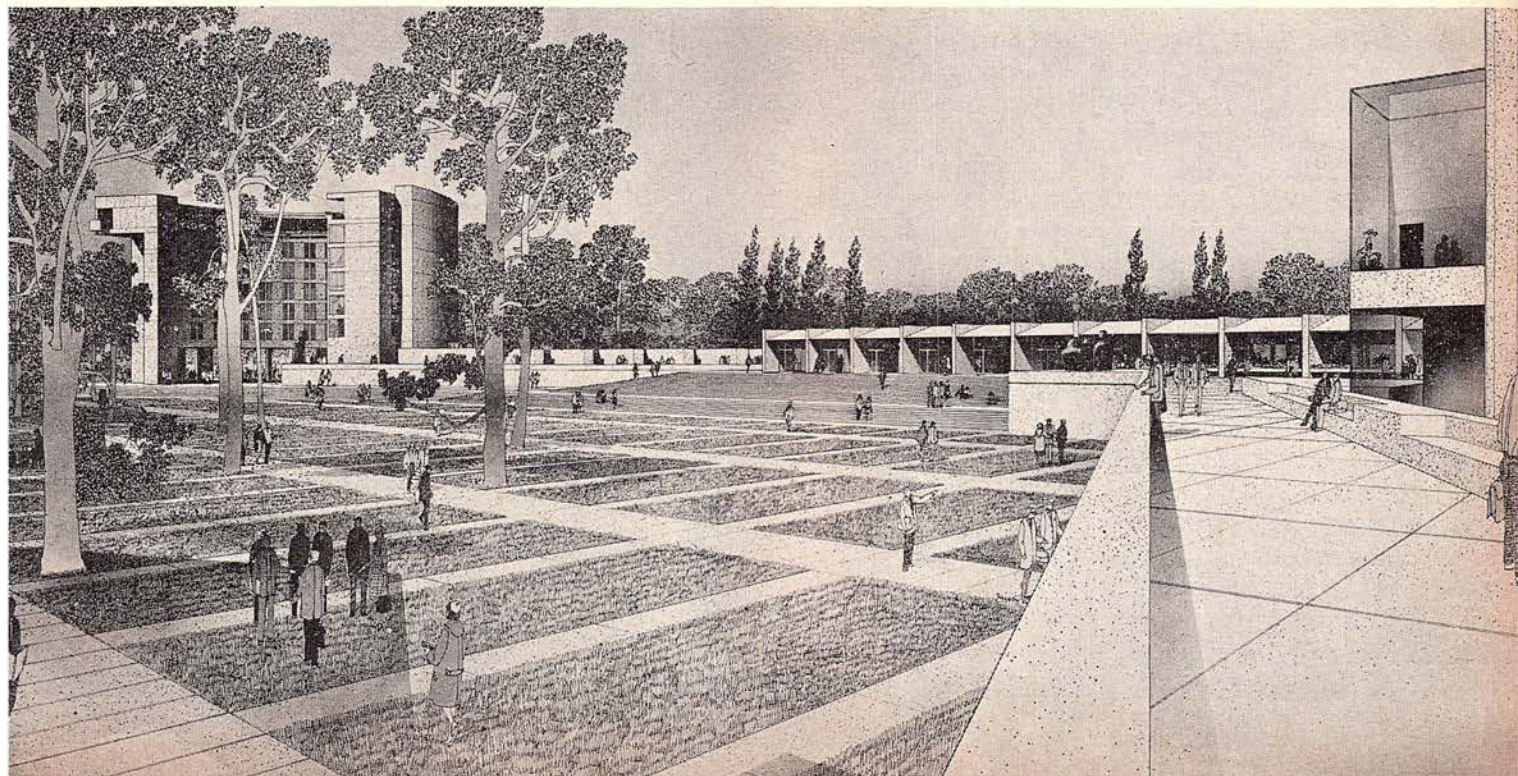
"The terrace is an organized grid of paving blocks set in grass and encompassing the most heavily-trafficked ground area of the campus. It is, in effect, a highly concentrated and organized path system. The configuration of the terrace provides for future growth in that it creates natural frontages for the classroom buildings which may be added in the post-1970 period. The proportion of its modular unit (the root-5 rectangle) corresponds to that set up by the diagonals of the spine and becomes the basis of a harmony of proportions extending throughout the buildings which rise from its surface."

The campus plan for the New York State University College at Fredonia was prepared for the State University Construction Fund by: I. M. Pei & Associates, architects and planners; Henry N. Cobb, partner-in-charge (design); Werner Wandelmaier, project manager; August Nakagawa, city planner; Theodore J. Musho, senior designer; assisted by McCrosky-Reuter, planning consultants; Office of Dan Kiley, landscape consultants; Segner & Dalton, consulting engineers (mechanical); Garfinkel & Marenberg, consulting engineers (structural); Mueser, Rutledge, Wentworth & Johnston, consulting engineers (subsoil)

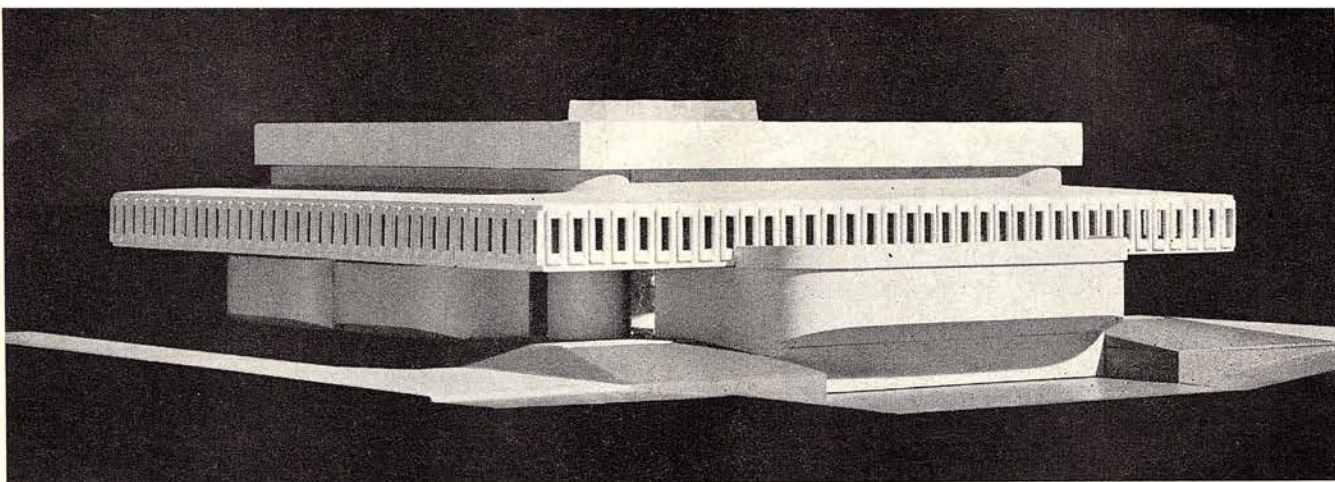




*Below:* The academic area will look like this by 1966. To the left is the Administration Building, in the center the Library and to the immediate right a portion of the Communications Lecture Hall







The winning design by Perkins & Will

## Design for Mechanical Learning

Too many students, too few teachers, higher faculty salaries, rising educational costs per student, dwindling philanthropy . . . these factors combine to encourage the growing use of electronic teaching aids in schools and colleges. Shown are four of six designs for a college electronic communications center developed for a limited architectural competition held by Rensselaer Polytechnic Institute

"With teaching talent in short supply, we can no longer waste professors on mere exposition of facts. Increasingly, they will deal with values, concepts, the meaning of it all—in very large groups or very small. More and more, students will get 'the facts' from inanimate dispensers—books, films, tapes, television and teaching machines—rather than from living teachers. Campus facilities, particularly the lecture hall and individual study spaces, must be adaptable to these new technological carriers of knowledge." This view was expressed by the editors of "Bricks and Mortarboards," a recent publication of the Educational Facilities Laboratories, Inc. E.F.L. aided Rensselaer in the preliminary studies of audio-visual uses which led to the competition, joined Rensselaer as competition sponsor, and has just published the results in the case study report "New Building on Campus."

The aims of the Communications Center as expressed in the competition program are to:

1. Enable engineering and science teachers who are already experimenting with new curricula and new concepts to quicken the pace of subject matter and concurrently to experiment with more efficient instructional techniques.

2. Enable Rensselaer to educate its proportionate share of engineers and scientists required by industrial and research organizations and the nation's defense system.

3. Educate effectively the increased number of students without a proportionate increase in the number of faculty.

4. Show how the quality of instruction in engineering and science can be increased.

5. Present increasingly complex material so that

there is a fuller and quicker understanding of it.

6. Design educational facilities that make full use of technological advances in the learning process.

7. Demonstrate how to raise the status and salary of teachers by relieving them of duties which can be automated or handled by technicians.

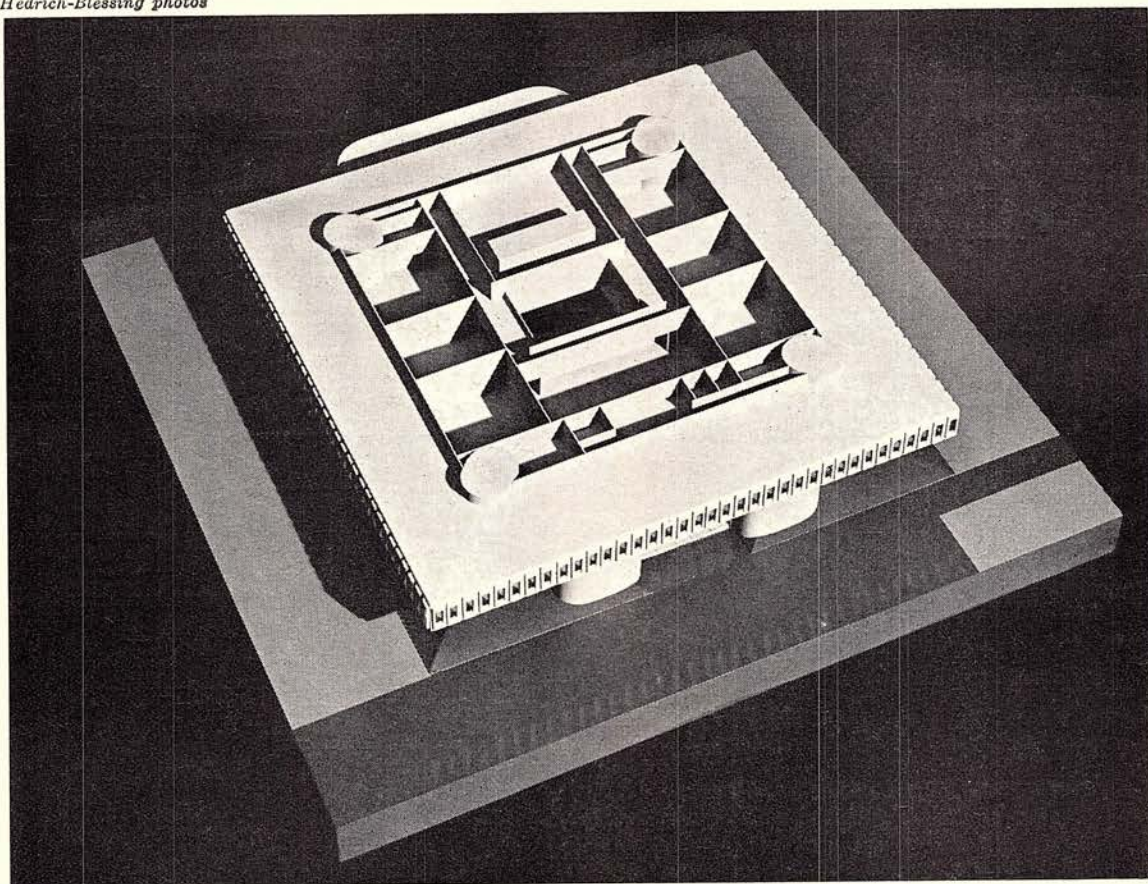
In a program established in 1956, Rensselaer faculty members were encouraged to experiment with new teaching methods. As a result, to date the school has been able to hold its educational costs per student practically constant and yet has succeeded in raising compensation to its faculty by 30 per cent. From this basis of experience the school has great hopes for its new center.

The winning design is by Perkins and Will. When constructed it will become the nucleus of a new science complex currently under development on the Rensselaer campus. All six designs merit study by those who must program and design similar centers on other campuses. They demonstrate remarkably varied solutions to the program. The State University of New York plans to include facilities similar to those programmed for Rensselaer in a number of the colleges in its expanding state-wide system.

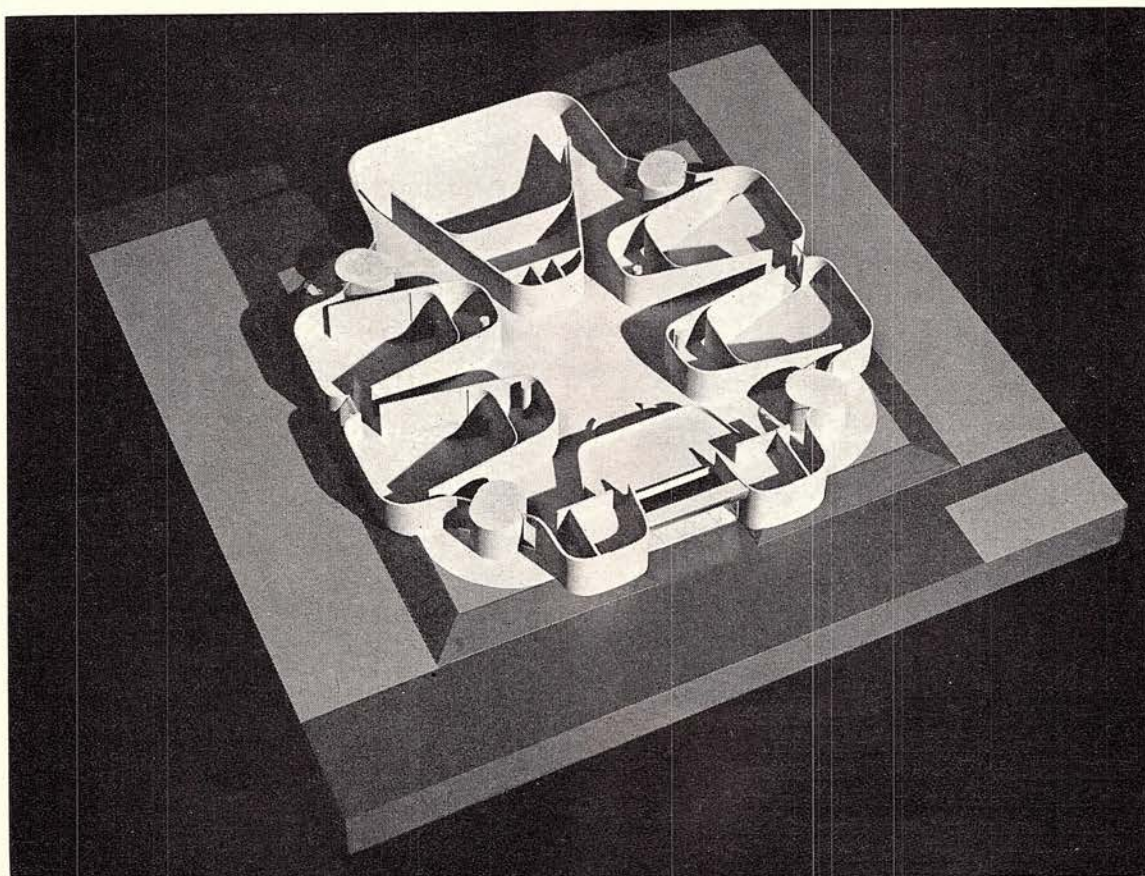
The competitors were: Perkins & Will, The Architects Collaborative, O'Neil Ford & Associates, Hellmuth, Obata & Kassabaum, Kump Associates and Richard W. Snibbe. Michael M. Harris, an associate partner of Harrison & Abramovitz, served as the architectural adviser and George H. Dudley, dean of Rensselaer's School of Architecture, served as chairman of the jury. Members of the jury were John O. Amstutz, life trustee of Rensselaer, George D. Stoddard, chancellor of New York University, Thomas F. Creighton and Edward D. Stone.



Hedrich-Blessing photos

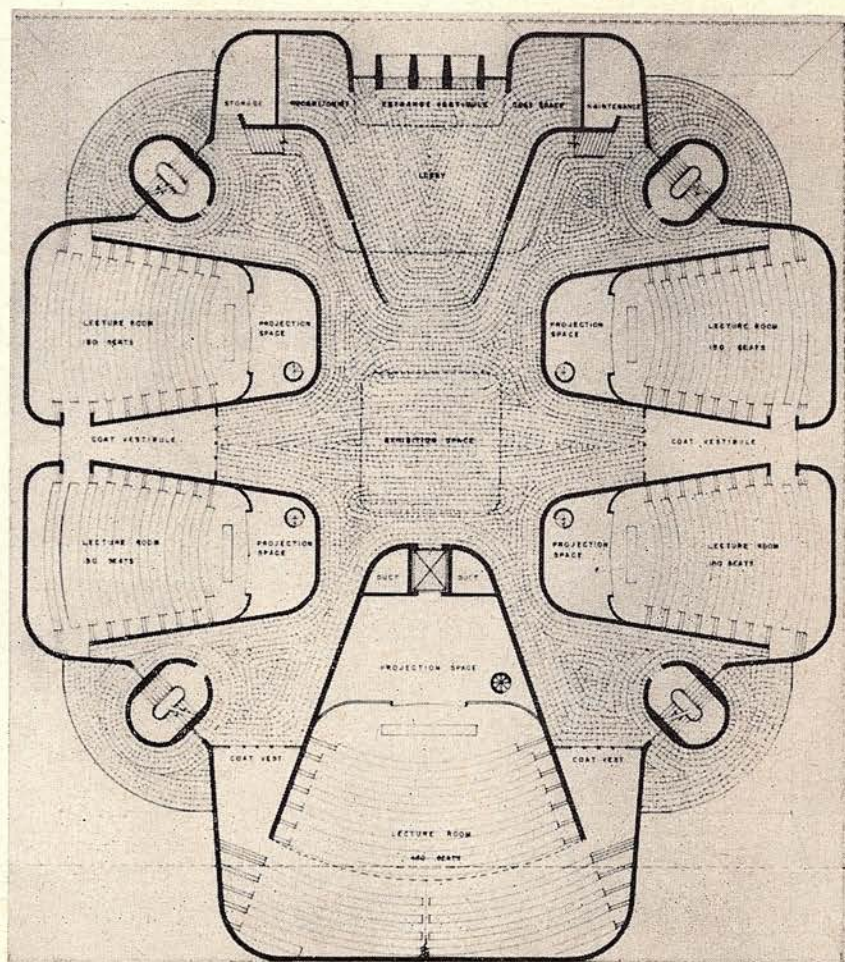
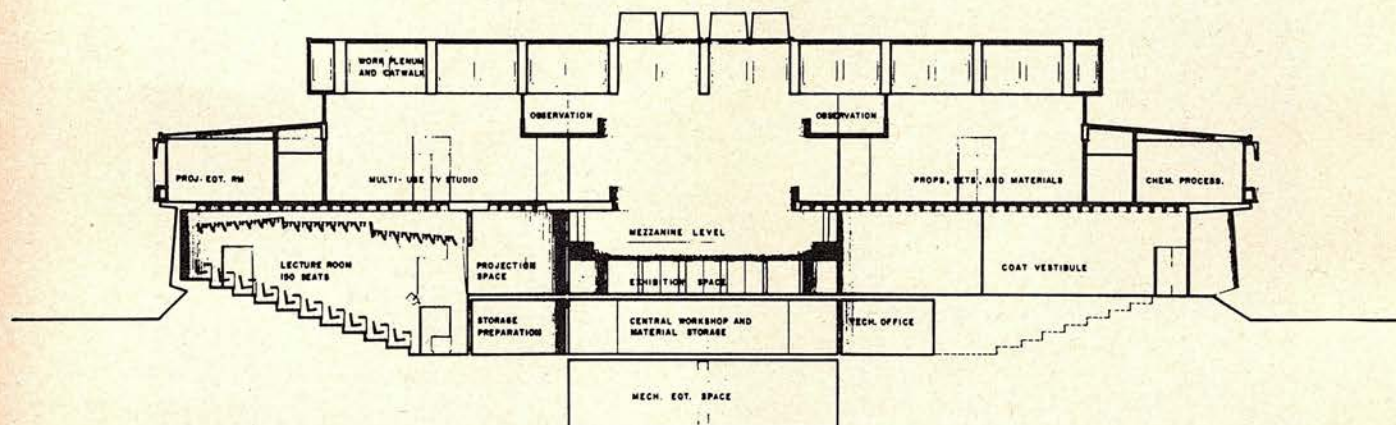
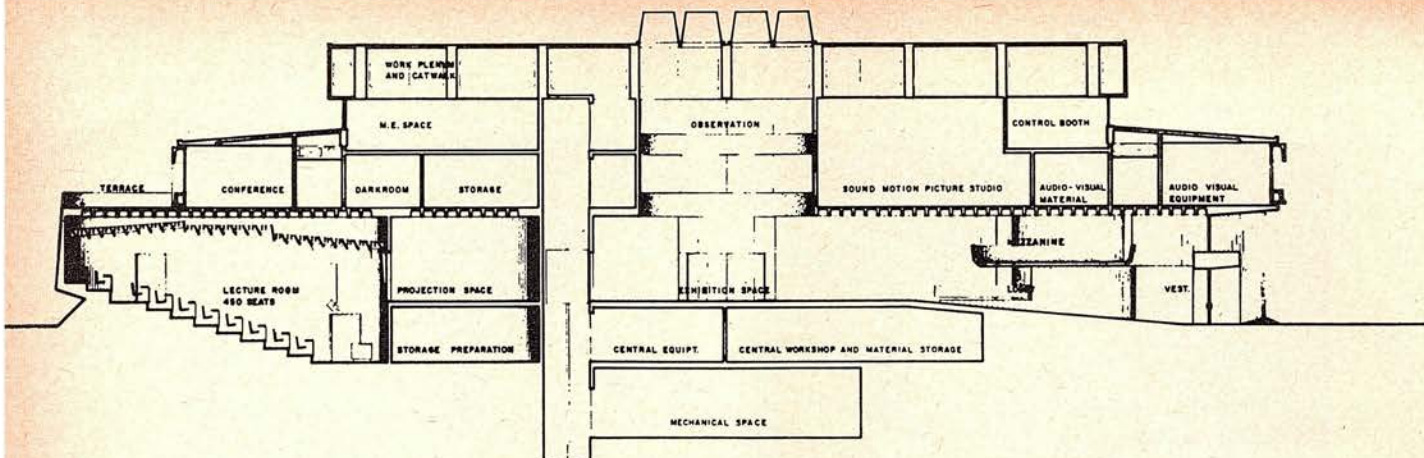


Production spaces are in overhanging rectangular story



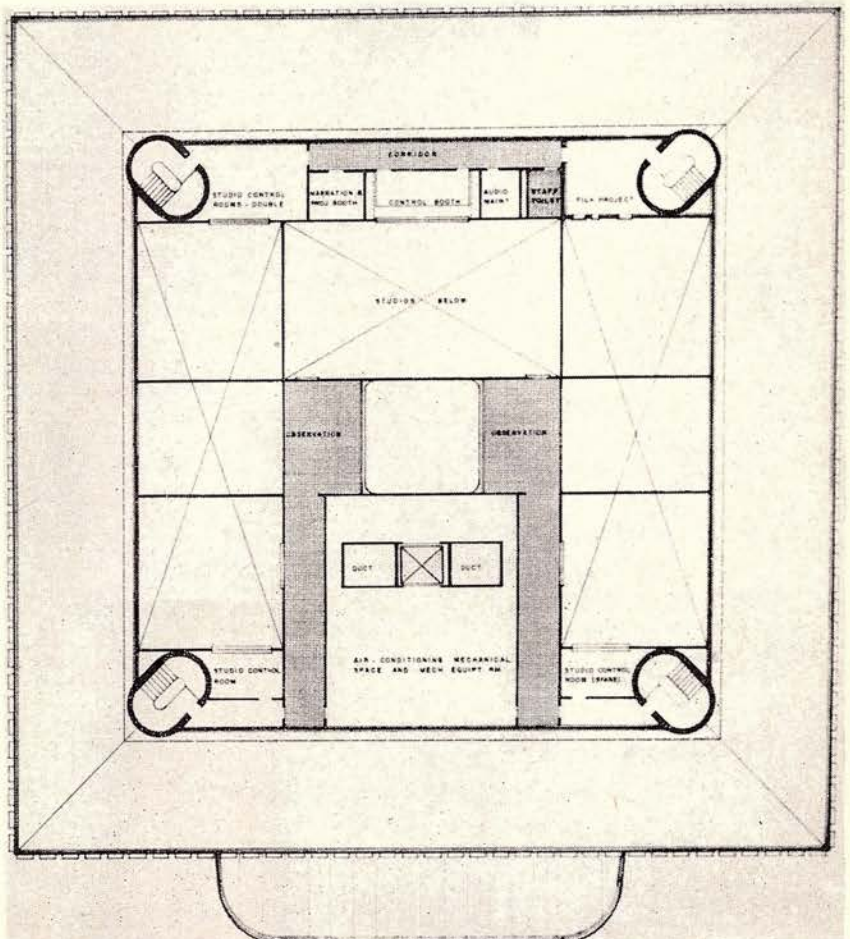
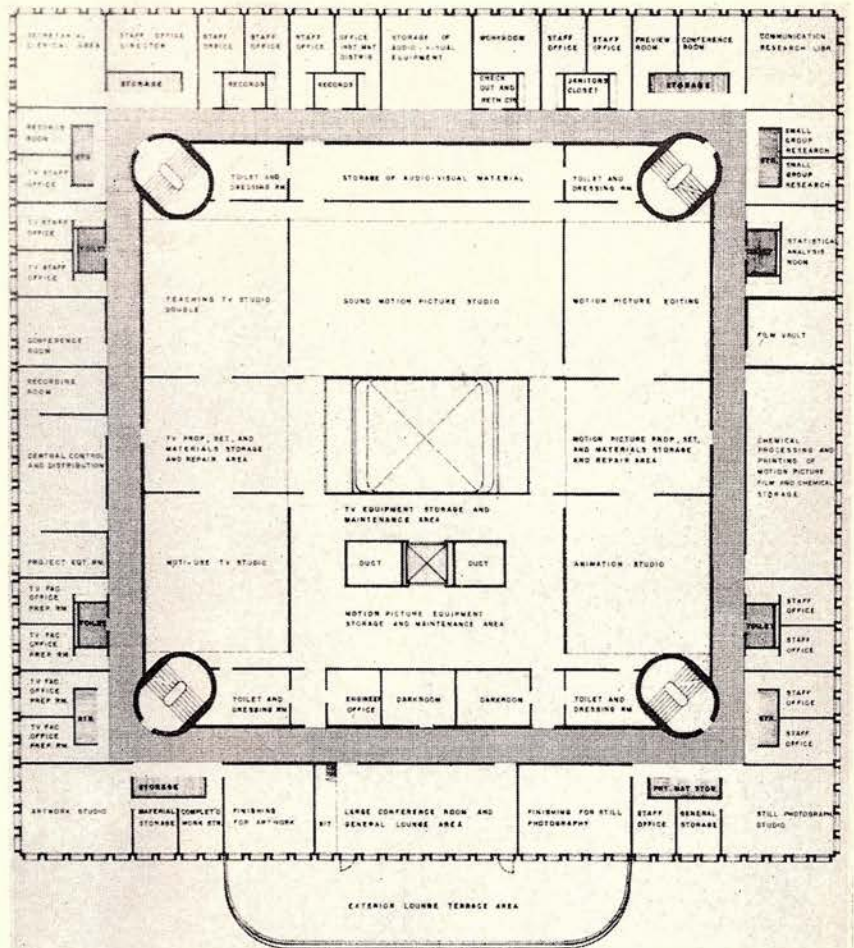
Instructional spaces surround central exhibition space in winning scheme





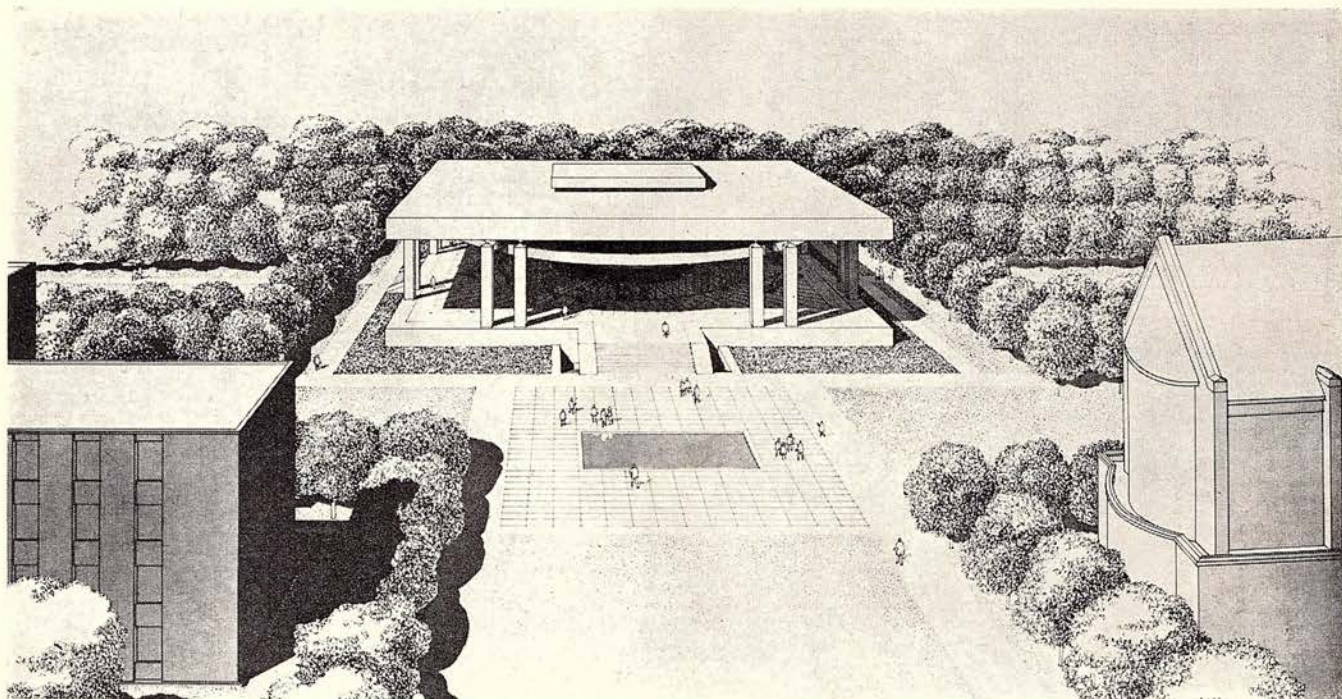
Curved forms considered ideal for lecture spaces form an exhibition area interestingly shaped for individual exhibits. Separation of elements which are appropriately curvilinear from those on the floors above, which are ideally rectangular, is the key to the success of this plan. Projection space in each lecture hall is connected by circular stairs to storage and preparation facilities below





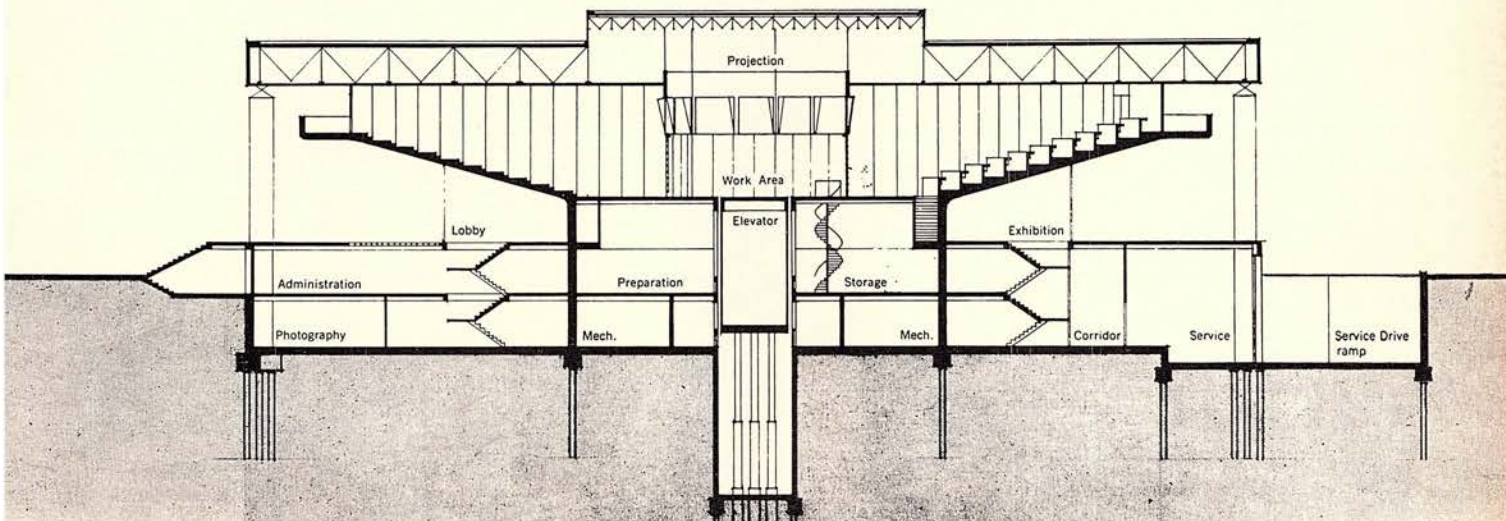
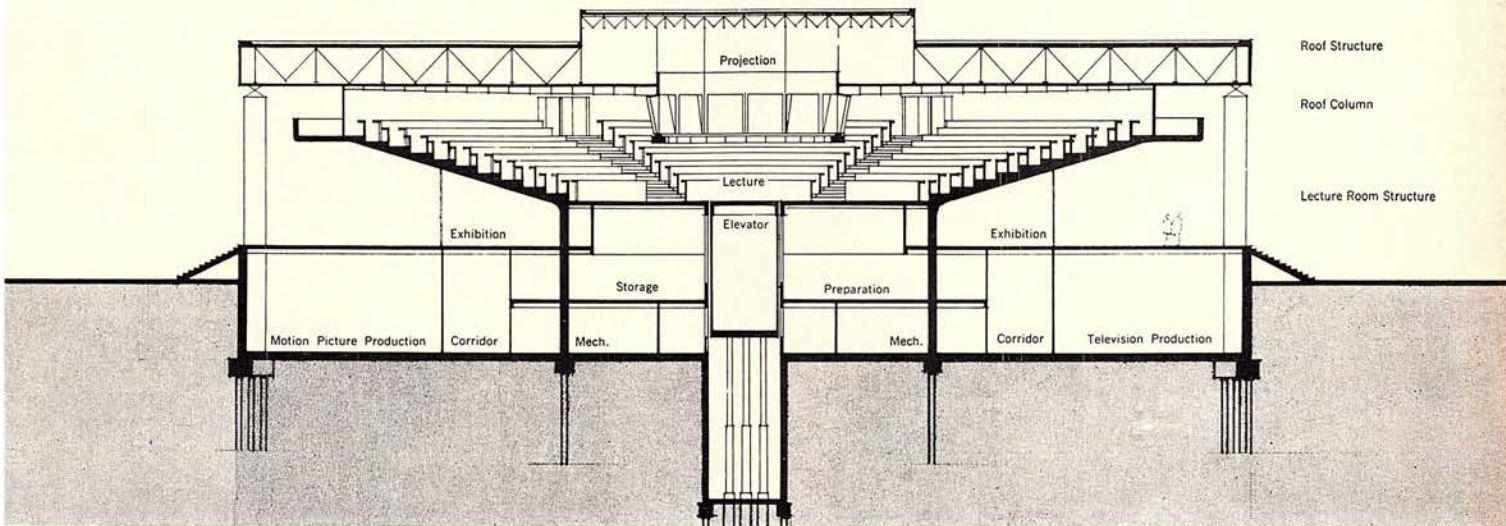
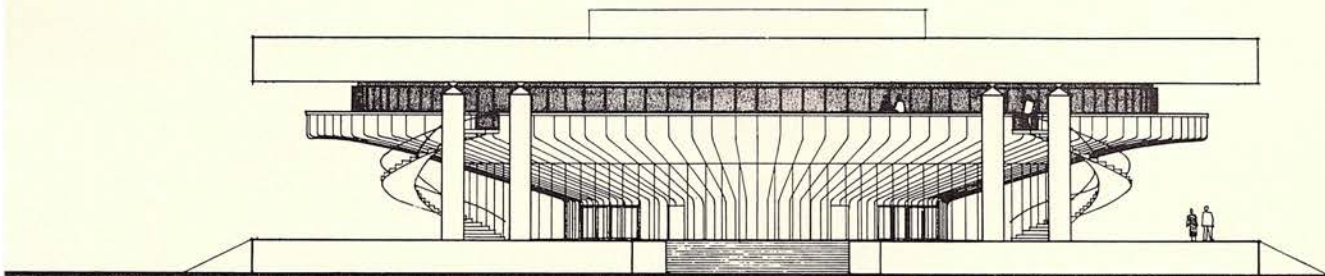
Studios and property rooms which require height are extended to the roof in the central core. Offices, conference rooms and spaces for small-scaled technical operations which require lower ceiling heights because of their smaller size are on the perimeter where they belong. Windows are needed here, and their vertical rhythm is a handsome accent to this rectangular element, which reads on the exterior as a thick cornice



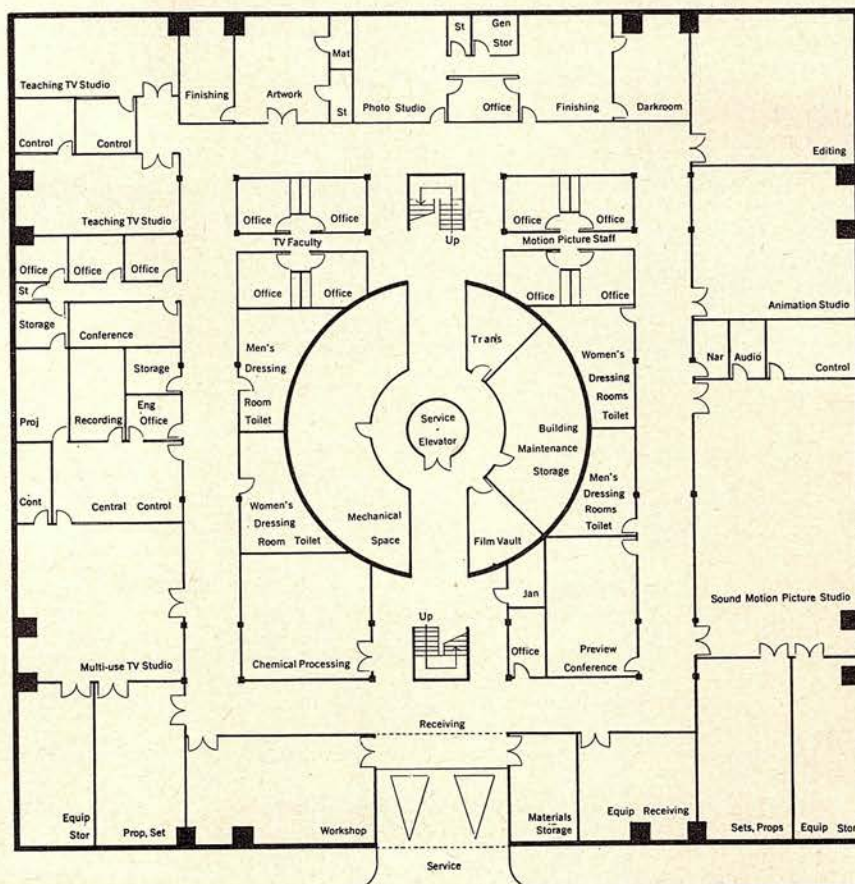


Like Perkins & Will's, Hellmuth, Obata & Kassabaum's scheme also skillfully reconciles curvilinear and rectangular elements. The raised podium conceals production and office spaces. The central elevator connects production spaces with the work and preparation area upon which lecture halls converge. Film and slide projection is from catwalk. By removal of partitions, wedge-shaped lecture halls can be joined to become larger amphitheaters as shown in sections (*across-page*)



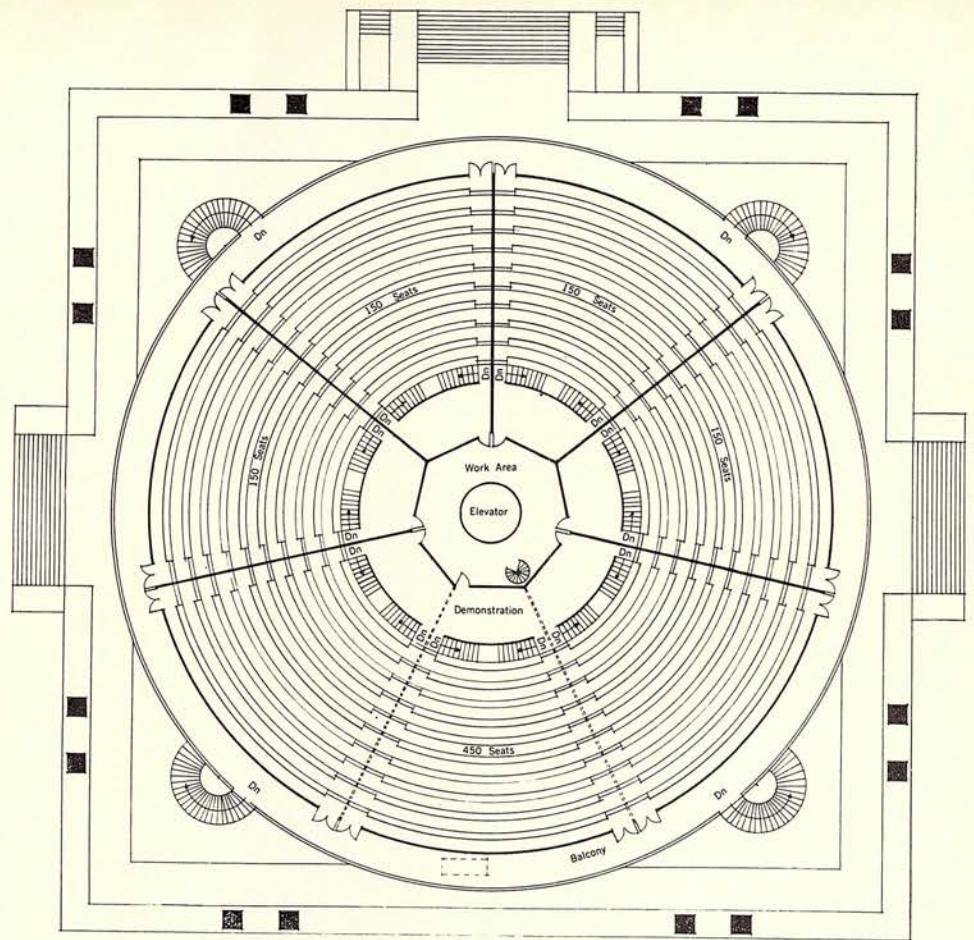




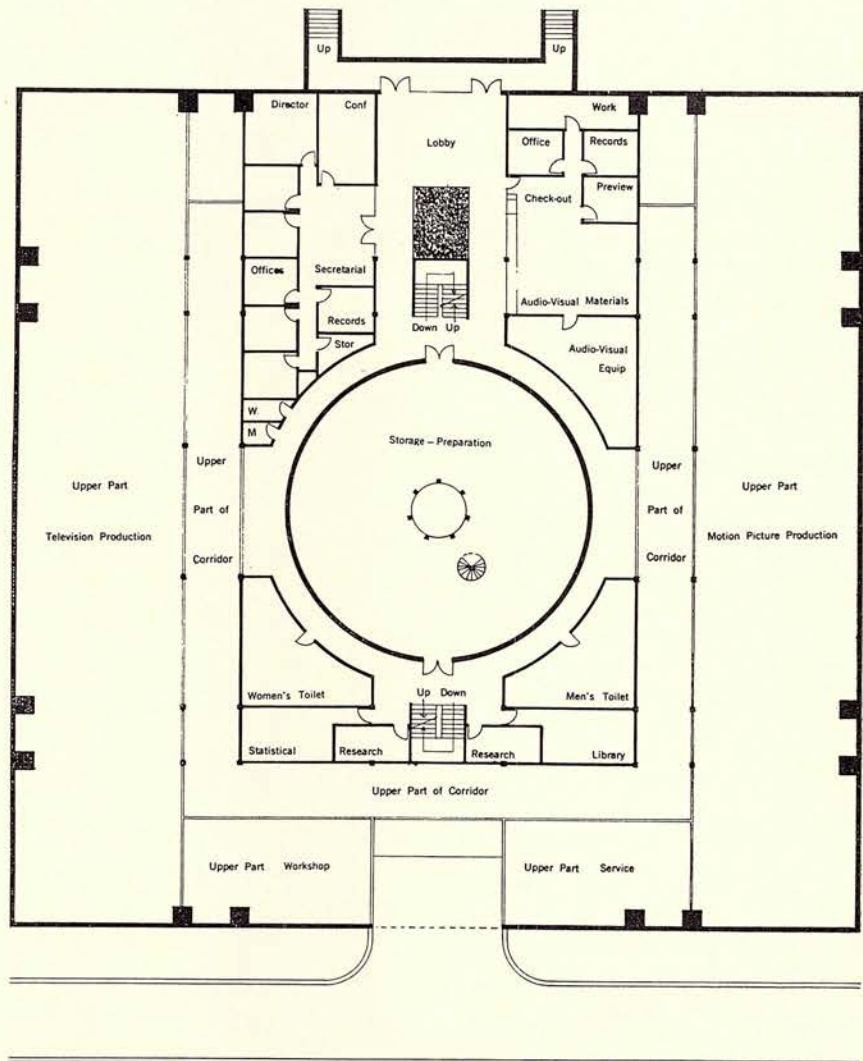


← Service Drive Ramp Dr



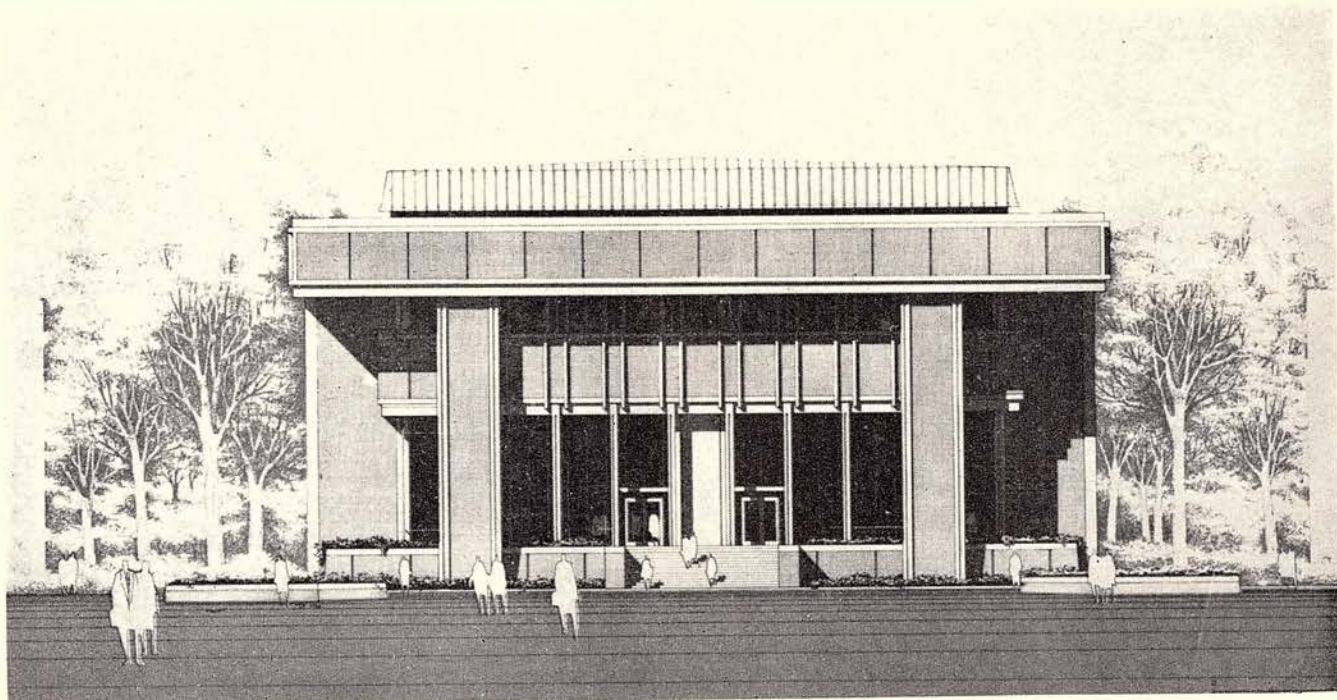


Lecture floor: Halls can empty quickly by means of perimeter balcony and four exterior stairs



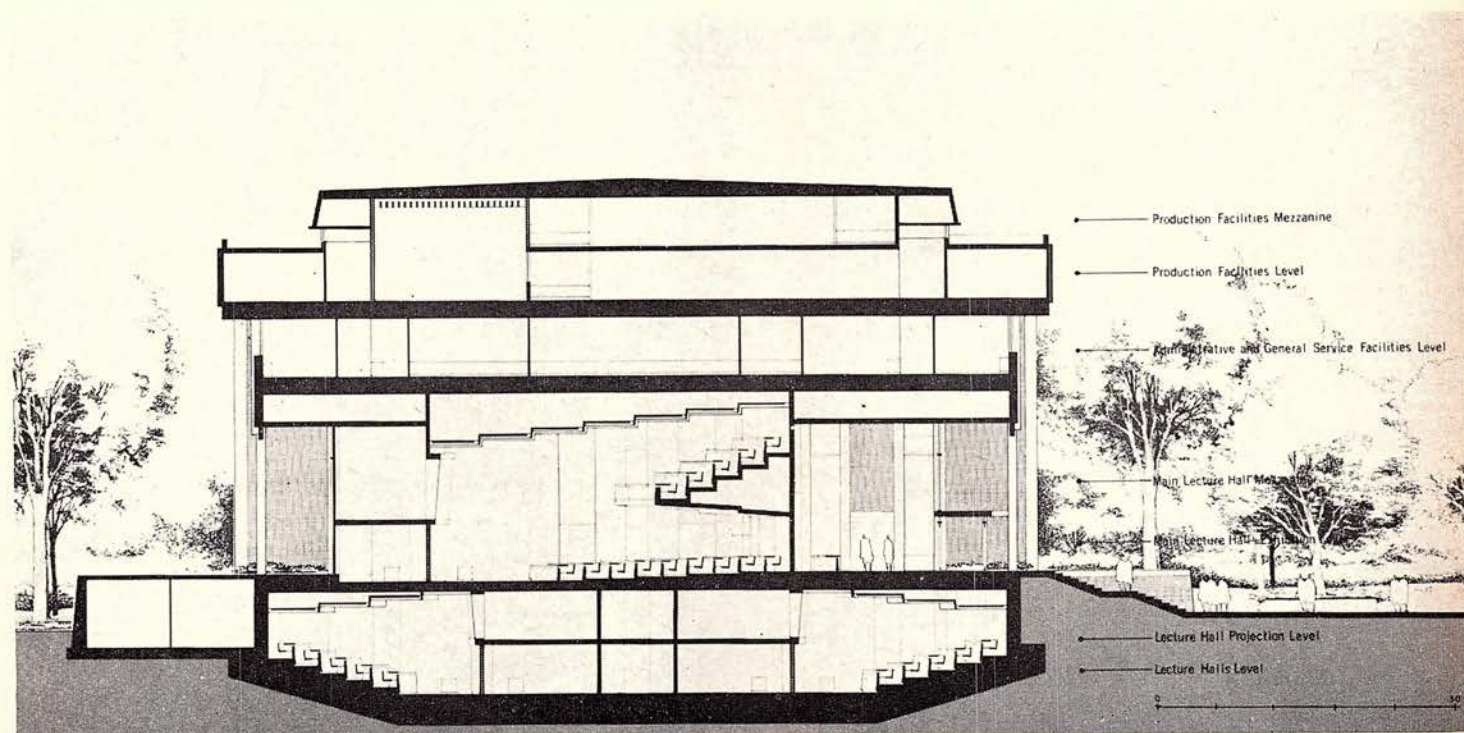
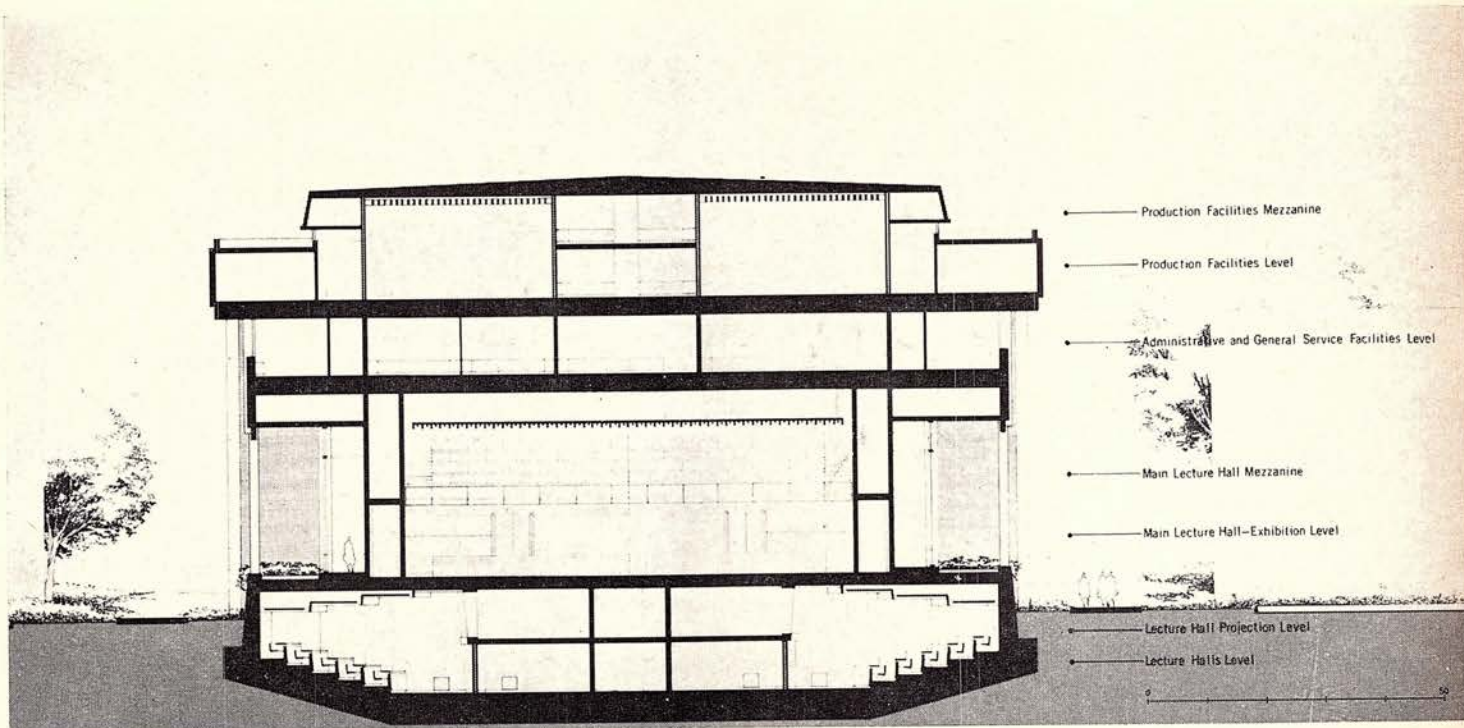
First floor: Low ceilinged administrative elements surround storage-preparation core. Motion picture and TV studios require higher ceilings. Here on the perimeter they go the full height of the podium





The Kump scheme composes the elements within a square and is essentially symmetrical. Vertical piers contain mechanical spaces. The four small lecture halls required by the program are located in the basement, the large lecture hall with mezzanine is at the entrance level. Projection facilities are not confined to a central core. Administration and production are on the top floors

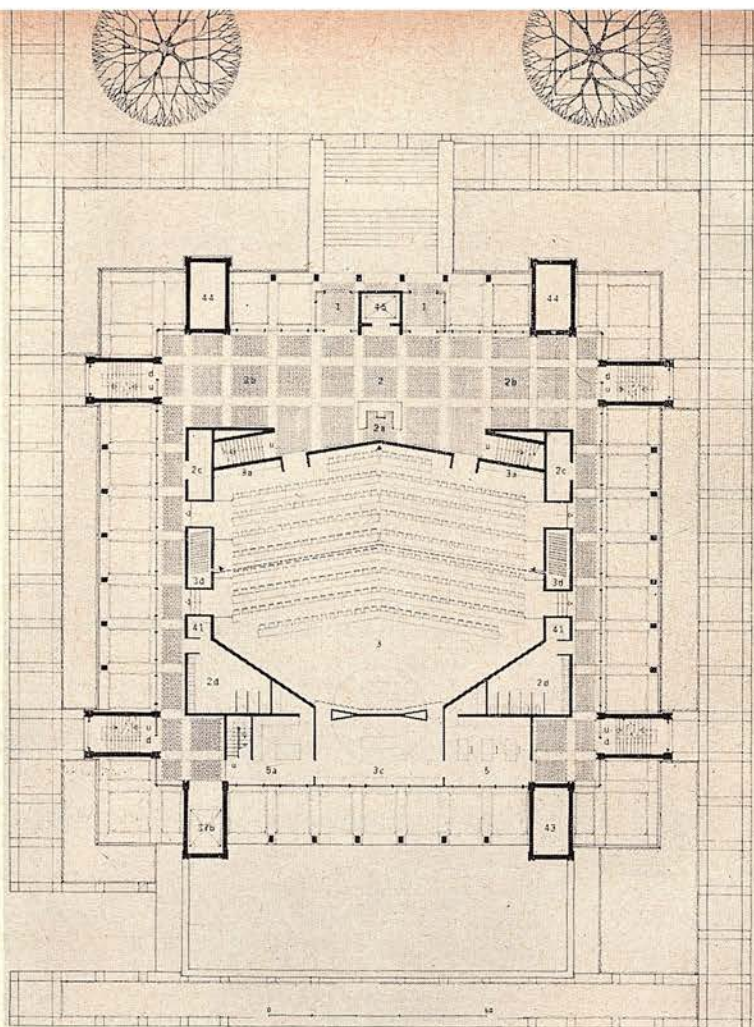






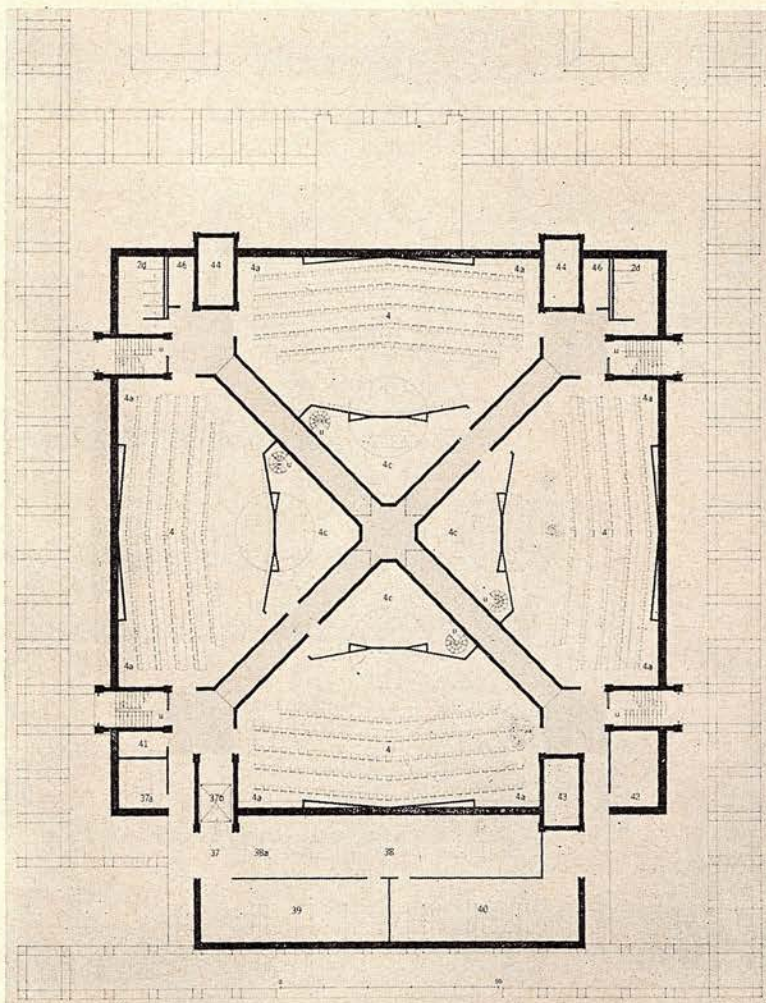
## MAIN LECTURE HALL-EXHIBITION LEVEL

- 1. Entrance vestibule
- 2. Lobby
- 2a. Receptionist
- 2b. Exhibition space
- 2c. Coat space
- 2d. Public toilets
- 3. Lecture room science and engineering
- 3a. Coat space
- 3c. Storage preparation
- 3d. Dividing partition closet
- 5. Technicians' office
- 5a. Work room
- 37b. Service elevator
- 41. Janitor's closet
- 43. Air-conditioning mechanical space
- 45. Passenger elevator



## LECTURE HALLS LEVEL

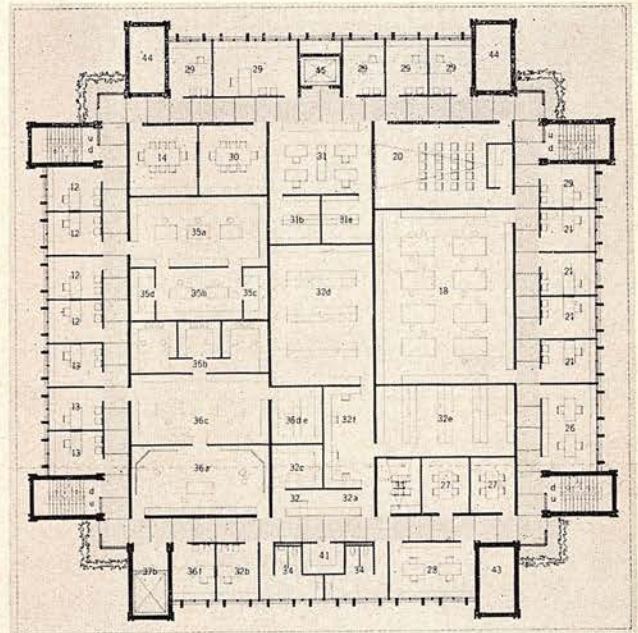
- 2d. Public toilets
- 4. Lecture room
- 4a. Coat space
- 4c. Storage preparation
- 37. Central receiving and shipping area
- 37a. Office records
- 37b. Service elevator
- 38. Central workshop
- 38a. Materials storage
- 39. Central equipment receiving and maintenance
- 40. Building maintenance storage
- 41. Janitor's closet
- 42. Transformer room
- 43. Air-conditioning mechanical space
- 44. Heating mechanical space
- 46. Electric and telephone closet





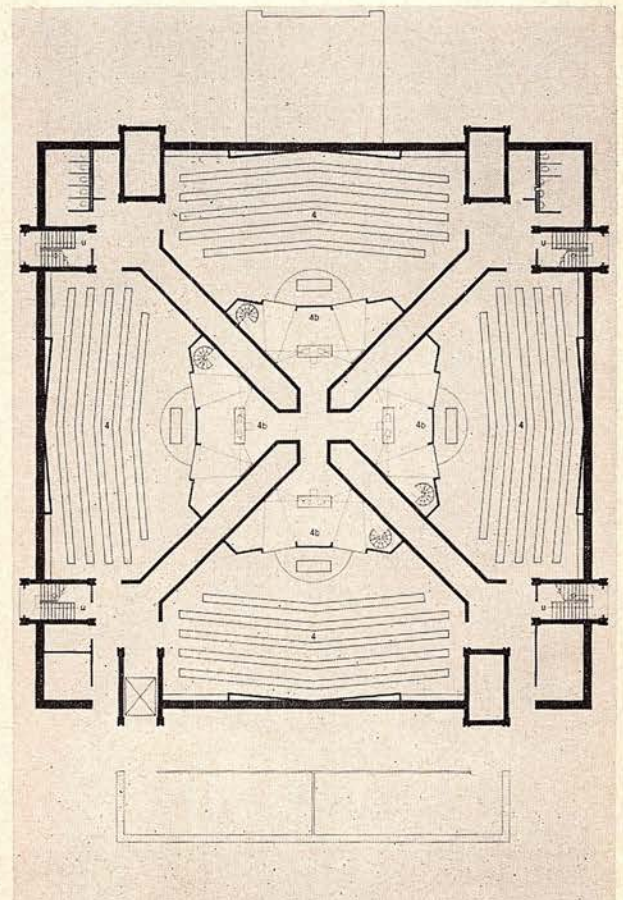
# ADMINISTRATIVE AND GENERAL SERVICE FACILITIES LEVEL

12. TV faculty offices—preparation rooms
13. TV staff offices
14. Conference room
18. Motion picture editing
20. Preview and conference room
21. Motion picture staff offices
26. Communications research library
27. Small group research rooms
28. Statistical analysis room
29. Administration staff offices
30. Conference room
31. Secretarial-clerical area
- 31a. Storage office supplies
- 31b. Records
32. Instructional materials distribution
- 32a. Check-out and return counter
- 32b. Office
- 32c. Records room
- 32d. Storage of audio-visual materials
- 32e. Storage of audio-visual equipment
- 32f. Work room
33. Previewing room
34. Staff toilets
- 35a. Artwork studio
- 35b. Artwork finishing
- 35c. Artwork materials storage
- 35d. Artwork completed work storage
- 36a. Still photography studio
- 36b. Still photography darkrooms
- 36c. Still photography finishing
- 36d. Still photography photographic material storage
- 36e. Still photography general storage
- 36f. Still photography staff office
- 37b. Service elevator
41. Janitor's closet
43. Air-conditioning mechanical space
44. Heating mechanical space
45. Passenger elevator



# LECTURE HALLS PROJECTION LEVEL

4. Upper part of lecture hall
- 4b. Projection space

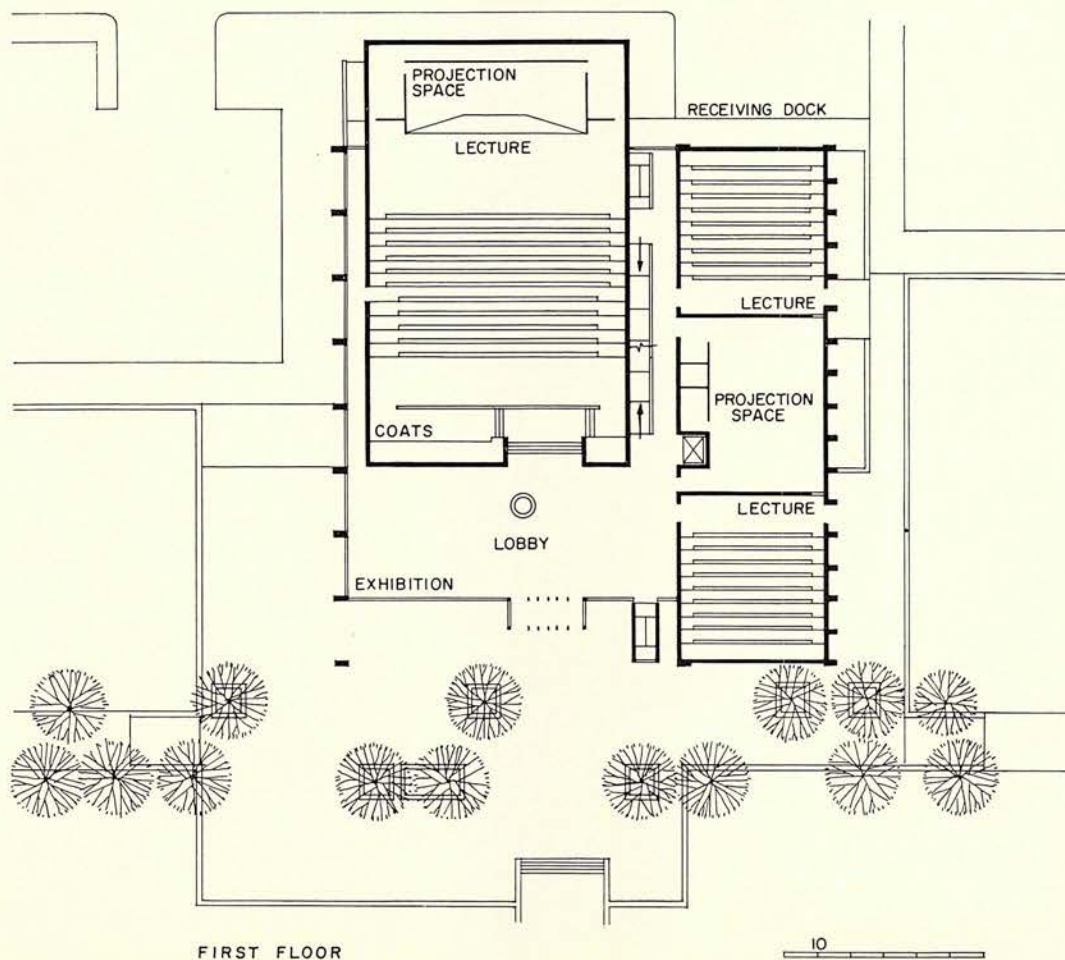
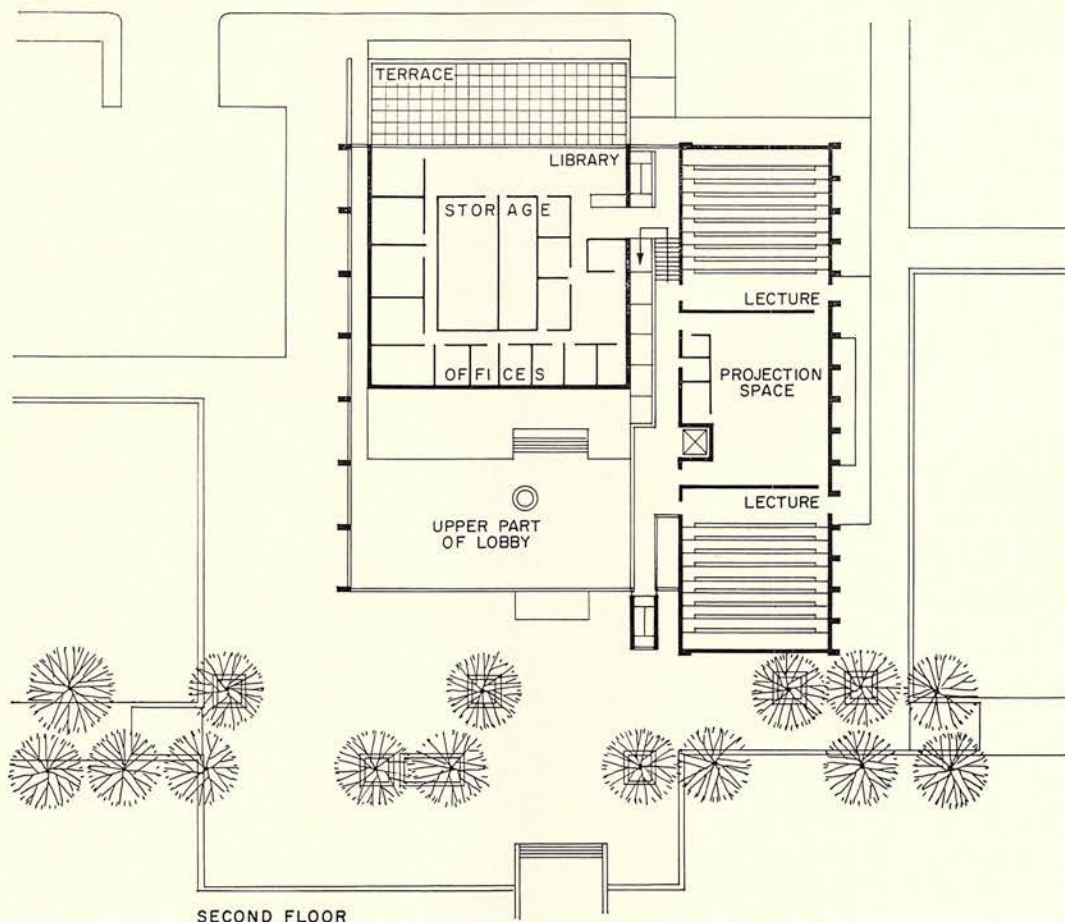




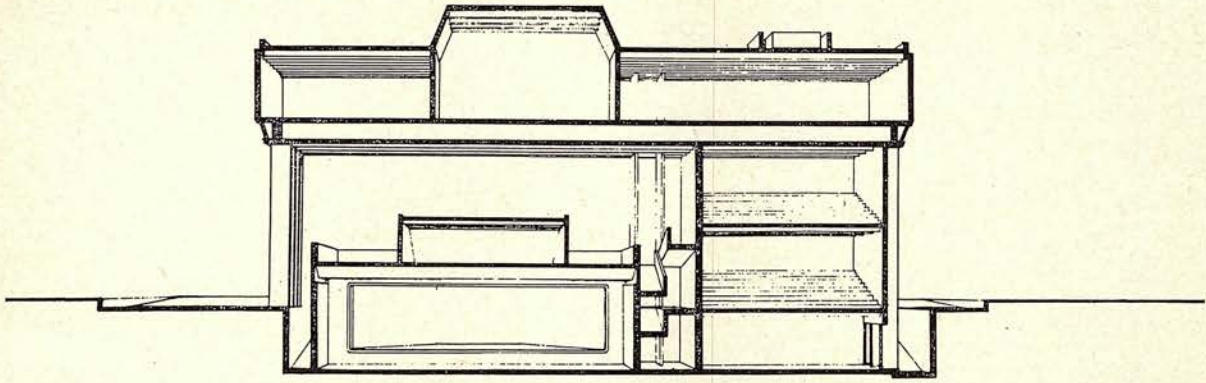


The thick cornice element conceals spaces devoted to TV studios and control rooms, a motion picture production studio, animation studio and film editing and processing rooms, also the general service facilities which include artwork preparation and processing and still photography rooms. The basement holds maintenance and mechanical space and workshops. Other areas required by the program are disposed as shown in the plans (*across-page*)

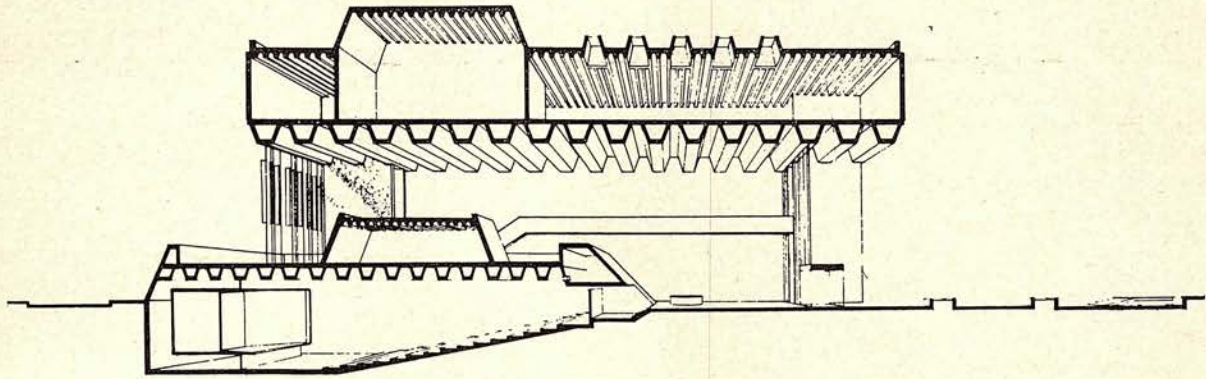




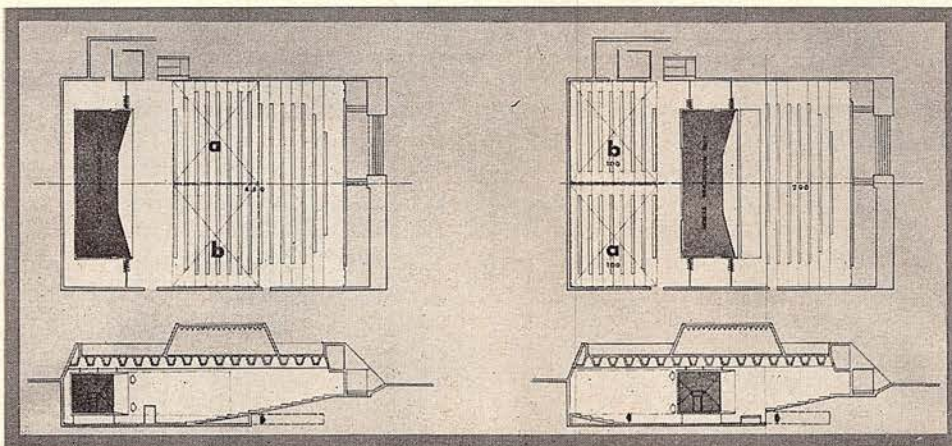
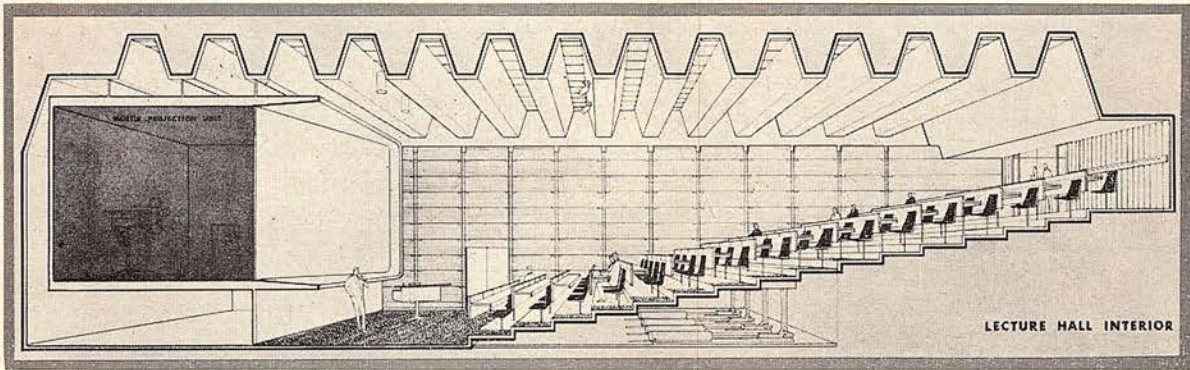




Cross section: High element on top floor is motion picture studio



Longitudinal section: Sloping walled room above the main lecture hall is for instructional materials distribution and storage



Projection unit moves back and forth. The first nine rows of seats can be moved to alternate positions making it possible to subdivide the large lecture room into three units with the addition of the partitions shown in the diagrammatic plan (above)



# Architectural Engineering

## Planned Noise For Privacy

Technology is not entirely on the side of invasion of privacy by "private eyes and ears," despite Vance Packard's exposé in "The Naked Society." The use of planned masking noise to achieve sound isolation is an equally impressive science. William R. Farrell, of the acoustical consulting firm of Bolt, Beranek and Newman, Inc., tells us that this science employs, among other devices, "white noise generators"—a "noisy" vacuum tube spits out a random pattern of electrons which produce a popping sound when collision occurs between electrons. (Because electrical signals are equally strong at all frequencies, the noise produced is dubbed "white noise." A more pleasant "pink" noise, similar to the noise of an air diffuser, is achieved by partially or totally screening out certain frequencies.) Mr. Farrell cited several instances where white or pink noise, played over a loudspeaker system, is employed in the pro-privacy campaign. Such a system is being designed in a Catholic church for the area surrounding the confessionals. The priest has found that in this rural location it is very easy for people waiting to make their confessions to overhear those in the booths. To achieve adequate privacy, the masking noise will raise the background noise level from an abnormally low level to what most people would consider normal. In another case involving a large engineering office, many thousand square feet of floor area has been immersed in pink noise played over ceiling-mounted loudspeakers to provide privacy for open bull-pen type offices. In this instance, the occupants seem to prefer the above-normal level of masking noise required to effect privacy, to the disruption caused by intelligible sounds from their neighbors. In most privacy problem cases, however, Bolt, Beranek and Newman's experience seems to indicate that the best masking noise is one that is made by a mechanism which serves the occupants in some positive fashion, such as the noise of air diffusers.

## Computer To Run Trains

A fail-safe, electronic, computerized train control system will be tested in the spring of 1965 on a 4.4-mile test track for application on the 75-mile rail rapid transit network being built to serve the San Francisco Bay Area. The "master-mind" of the system is a solid-state digital computer which controls all operations including scheduling, dispatching, routing, speed control, running time and removal from service of all trains used on the track. Communication modules, containing voice and data communications stations, monitor whether all systems are operating. Average schedule speed of the lightweight trains, including station stops, will be approximately 50 m.p.h.—twice as fast as any existing rail transit system. Despite this higher speed, this computerized system is expected to provide smoother acceleration, deceleration and running operation. The Westinghouse Air Brake Company is developing the system.

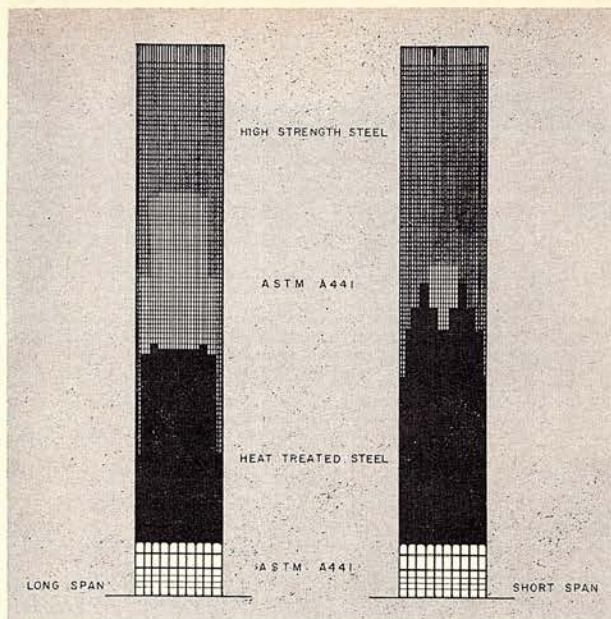
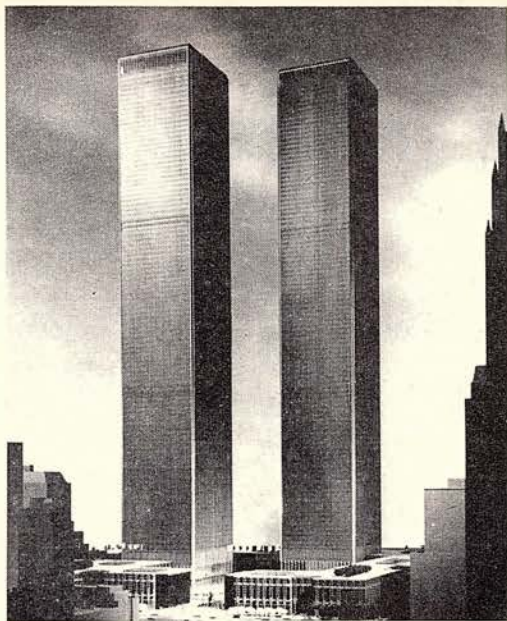
## Experiments in Shelter Design

What protection is offered by various structures against radiation produced by nuclear explosions? Experiments to determine more precise empirical answers than are presently available are being conducted for the U. S. Department of Defense at Oak Ridge National Laboratory, which is operated by the Union Carbide Corporation. These experiments will give information about designing important shelters such as command posts and control centers for public utilities. The reactor at Oak Ridge's Tower Shielding Facility has been modified to produce neutron and gamma ray radiations typical of a weapon but much less intense. Two concrete bunkers, with either front or top face shield thicknesses varying from 4 to 20 in., have been constructed near the reactor. Measurements have been made to determine the buildup of radiation intensities within the rooms by scattering from the walls, and the transmission of radiation down a tunnel with two right-angle bends.

## This Month's AE Section

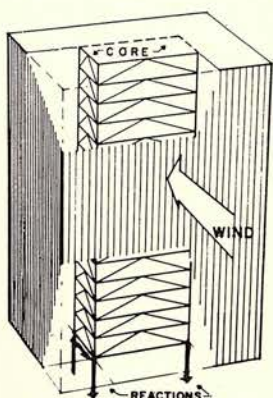
*THE TALLEST STEEL BEARING WALLS*, p. 194. *AIR-CONDITIONING DESIGN GUIDES FOR LABORATORY FACILITIES*, p. 197. *C.P.M.—WHAT FACTORS DETERMINE ITS SUCCESS?*, Part 2, p. 202. *BUILDING COMPONENTS: Prefabricated Parapet Flashing*, p. 209. *Products*, p. 211. *Literature*, p. 212. *Technical Book Reviews*, p. 254.



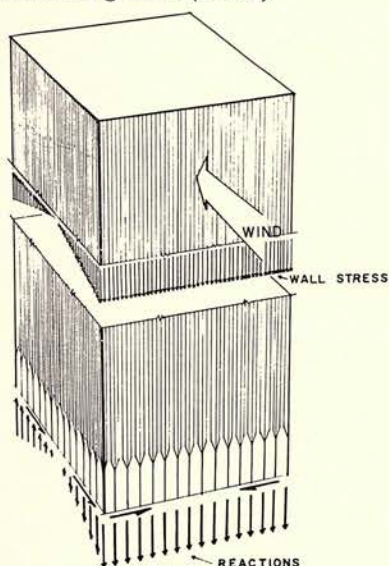


## THE TALLEST STEEL BEARING WALLS

This bold structural concept takes the exterior walls as the sole wind-resisting elements



Most tall buildings rely on a trussed core to provide wind bracing (*above*). Overturning effect in The World Trade Center is resisted by walls bending like cantilevered girders (*below*)



Undoubtedly the boldest application of the modern bearing wall concept\* to tall multistory buildings is the design for the two 110-story towers in New York's proposed World Trade Center. These 1,350-ft towers are slender, rigid boxes, made so by closely spaced exterior columns which are rigidly connected to the spandrel beams.

It is these exterior walls, essentially Vierendeel trusses fixed at the base and free at the top, which are the sole wind-resisting elements of the towers. This is in contrast to the conventional method in many steel buildings of putting wind bracing in the core of the building, making it awkward to penetrate the core for doors and shaft openings.

The towers resist wind loads this way: force of the wind blowing on one face of the building is transmitted through the floor structure, a stiffened diaphragm, to the two perpendicular walls. These walls, then, which have been designed as deep cantilevered Vierendeel trusses cantilevered at the base, carry the wind

loads down to the foundation. Gravity loads are shared by exterior walls and the core, but the core takes no wind load.

Adding to the sophistication of the structural design is the manner in which various grades of high-strength steels have been disposed in the exterior wall frames according to the stress levels in the columns and the spandrel beams, from bottom to top and corner to corner.

Column areas and plate thicknesses were sized in accordance with the gravity load stresses. But the metallurgy (or yield point) of the grades of steel were determined by wind loads in combination with gravity loads.

In the top halves of the towers, the grades of steel range from 42,000 to 65,000 psi yield points, but in the lower halves, where overturning moment due to wind is highest, heat-treated, low-alloy steel having 100,000 psi yield strength is required. At the very base, the larger columns permit a 50,000 psi steel. In all, 12 different grades of steel will be used for exterior framing.

The finely grained columnar texture of the exterior walls makes them efficient wind-resisting elements. The judicious disposition of steel alloys cuts down the bulk of the columns and produces an economical design.

But it is particularly important

\*The modern *bearing wall* has been defined as a vertical structure which supports loads applied in its own plane, and in which the elements have a spacing established by structural requirements. In a *bearing frame*, the elements are determined by functional requirements. (See "The Return of the Bearing Wall", by William J. LeMessurier, ARCHITECTURAL RECORD, July 1962)



that the columns on any one floor work at equal unit stresses under the effect of gravity loads. The reason is that while high-strength steels can take more stress before they yield, they also will shorten more working at higher stresses (modulus of elasticity for all steel is approximately the same). Thus if core columns were stressed just to 15,000 psi (since they carry only gravity load), but exterior columns were stressed to 45,000 psi, the exterior columns would shorten more, and floors would slope down toward the outside walls.

Now if we took a 110-story building with columns designed as above, the floors would slope regardless of the fact that the builder had leveled each floor as he proceeded upward. The maximum slope between core and outside wall would be as much as 6 in., occurring at the 66th floor.

While individual columns may carry different gravity loads, their areas must be proportioned to produce the same unit stress. The excess strength of the exterior wall columns can be used to resist the moments and shears induced by high winds.

Engineering analysis showed that the most economical solution for core columns would be to have them all in A36 steel. For the exterior wall columns, each will be designed for a range of stress levels to determine most economical selection of steel grade. Since there are a total of 35,000 columns it was obvious that this should be done by computer (a column preliminary design program has been written for an IBM 7094 computer).

A brief examination of the loads on exterior walls may help explain, in simplified fashion, the pattern of steels. Obviously gravity load is zero at the top increasing to maximum at the bottom. Overturning moments, too, increase from top to bottom, but do so at a faster rate than do gravity loads. Thus the structural requirement for resisting wind load increases more rapidly than that for gravity loads. Hence the stronger grades of steel are used toward the bottom of the building.

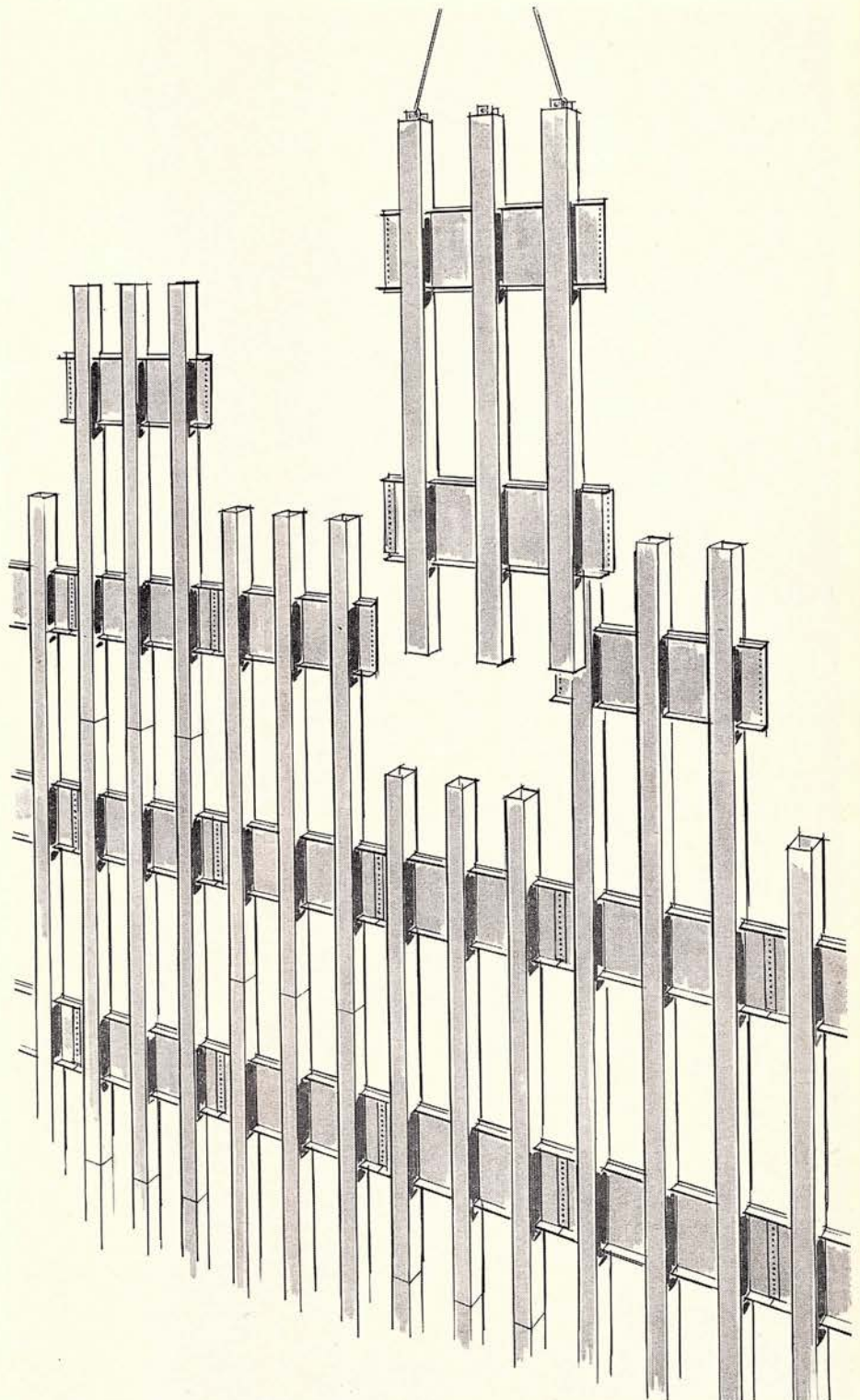
The towers of The World Trade Center have an inherent capacity to resist unforeseen calamities. This stems from the nature of the Vierendeel truss systems, and is enhanced by the use of high strength steels. The Vierendeel wall has the capacity to distribute stress from points of

*The World Trade Center, New York City, New York*

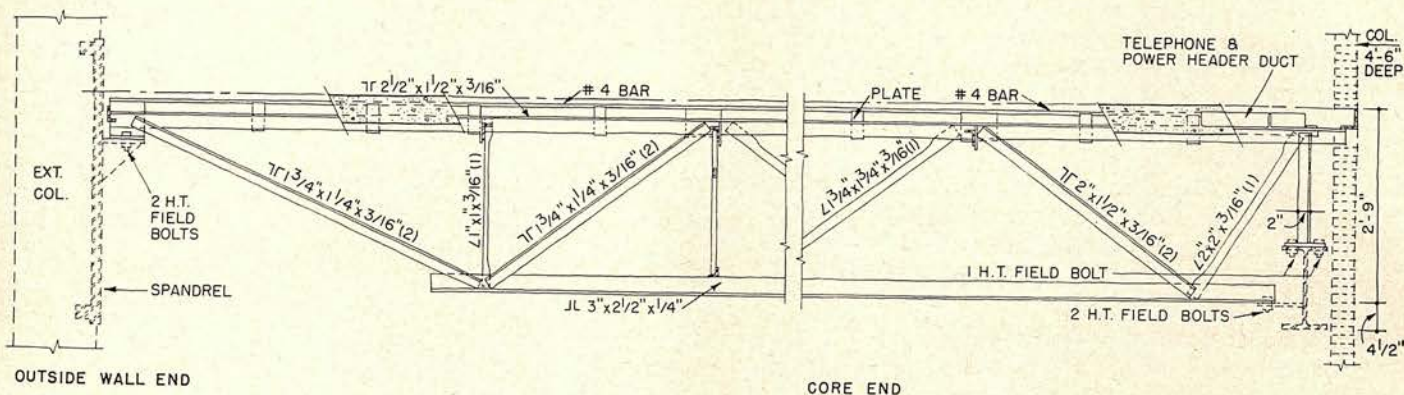
ARCHITECTS: Minoru Yamasaki and Associates and Emery Roth & Sons

STRUCTURAL ENGINEERS: Worthington, Skilling, Helle and Jackson

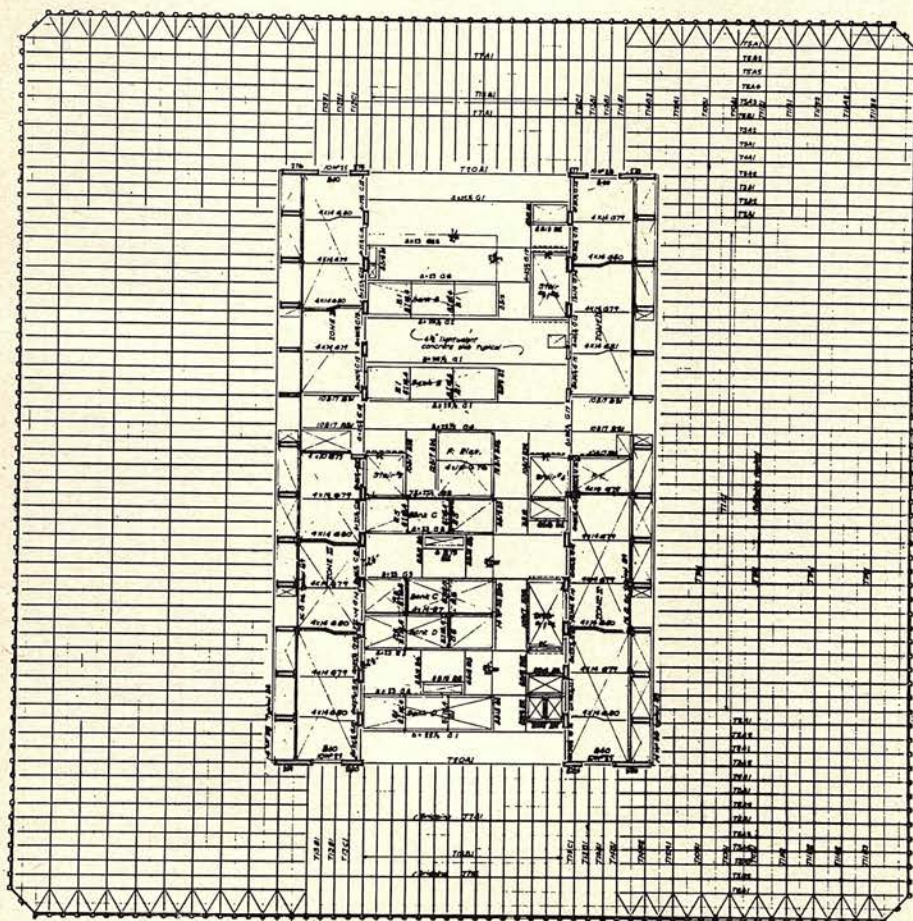
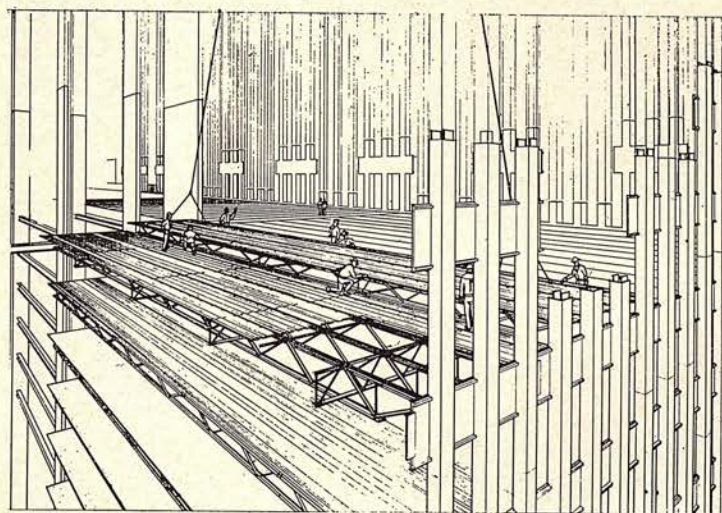
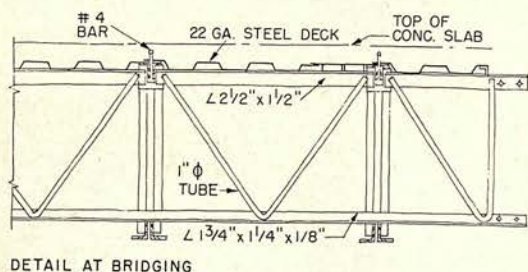
OWNER: The Port of New York Authority







The floor consists of a series of one-way trusses along the sides, spanning 60 ft, and two-way trusses at the corners. The one-way trusses are braced laterally by tubular bridging. The floor slab is made composite with the trusses, and acts as a top chord of the structural floor.



overload to areas of strength. As an example, 60 columns could be cut away on a floor near the base where column loads are about 800,000 pounds, and the structure could still withstand wind speeds over 100 mph.

Typical columns are 12 by 14 in. and are spaced 3 ft 3 in. on center. Columns at the base are 32 by 32 in. Plate thicknesses of the box-shaped columns vary from  $\frac{3}{4}$  to 3 in. The box shape of the columns provides maximum torsional and bending resistance. While the floor diaphragm serves to transmit wind loads from one wall to the two perpendicular walls, a prime function of this diaphragm is to provide an interconnecting system which will stabilize the columns (1,350 ft high) against buckling. Columns and spandrel beams will be prefabricated in units two stories high by 9 ft 9 in. wide. Column sections will be butt welded during construction. Spandrel beams are to be either bolted or welded. The floor structure is a one-way truss system along the sides and a two-way truss system at the corners. The one-way trusses are stiffened by bridging.



# AIR-CONDITIONING DESIGN GUIDES FOR LABORATORY FACILITIES

High heat loads and ventilation requirements call for careful design to keep costs down

By Alfred Greenberg, P. E., Consulting Engineer

Since the basic functions of laboratories and research centers involve experimentation and development in all fields, the details of building design and engineering facilities may vary substantially from one field to another. However, there is one thing they all have in common, and that is the need for flexibility in services to insure their ability to function effectively with the development of new techniques and procedures.

Before ventilation or air-conditioning requirements for laboratories can be properly determined, it is first necessary to become familiar with the general arrangement and purpose, the equipment which is to be installed and the time and manner of its operation.

## Design Criteria

Most types of laboratories and work rooms in research centers produce noticeable quantities of odors, heat, contaminants, irritants, dust, etc. which must be removed in order to maintain satisfactory working and possibly even experiment conditions.

In general, laboratories and work rooms should be designed for a minimum of 12 air changes per hour. They will also have to be maintained at a negative air pressure of about 10 per cent. In special cases, the room heat loads may be so great that the number of air changes will exceed 100 per hour. Whenever the air changes rate exceeds 30, perforated ceiling air supply should be considered to avoid drafts.

The heat loads developed in laboratories have been steadily increasing and, at present, many university, hospital and industrial establishments have installed connected equipment loads including electrical appliances, bunsen burners, hot plates, etc. of 30 watts per sq ft of laboratory area. In addition, lighting loads can add from 6 to 10 watts per sq ft. Population loads are low, however, averaging less than one person per 100 sq ft. With a total load of approxi-

mately 40 watts per sq ft, rooms will require over 6 cfm per sq ft when the air-conditioned air enters the room at 20 F below room temperature; over 30 air changes would be needed for a 10-ft-high room.

In a building with many laboratories, air-conditioning and ductwork requirements are very large. Therefore, it is very important that loads be accurately determined and room usage closely ascertained so that reasonable diversity factors may be applied which will enable the size of the air-conditioning systems to be cut down without reducing the air-conditioning requirements for those spaces which will need conditioned air.

Studies have indicated that in many university and some industrial research centers, not more than 25 per cent of the connected heat loads of the laboratory facilities are in use at any given time. Where this premise is valid for a given building, it can substantially reduce the requirements of the refrigeration plant. Theoretically, each room should still receive the air quantity required to satisfy the room's connected laboratory load plus all other loads. Here, too, diversity of usage must be considered, and in many instances it will be found that the total room connected load either will not be required at any given time or will be used for short periods not exceeding two hours. It will usually be found that the total air requirements for laboratories can be kept at no more than 20 to 50 air changes per hour without impairing comfort and process function.

Location of laboratories in interior spaces, which are less affected by outdoor conditions, will help to reduce the air-conditioning requirements and also minimize the outdoor variable which could affect process results. Most laboratories can operate satisfactorily at temperatures which provide maximum human comfort. This in the range from 72-78 F  $\pm 1\frac{1}{2}$  F and relative humidities from 25-50 per cent,  $\pm 5$  per cent. If closer air-

conditioning control is required, system costs and possibly even space requirements will increase.

Generally, the nature of the operations in the laboratory requires 100 per cent exhaust of the air. Laboratory air systems thus need 100 per cent outside air supply.

## Systems Applicable

Most laboratories are designed for dual duct, single duct with zone or individual room reheat, unit ventilator units adapted for use with high outside air quantities or a combination of the above. Choice of system will depend on such factors as degree of control necessary for temperature, humidity and air movement, space available for ductwork and cost.

Zone control may be satisfactory for banks of general laboratories or similar laboratories not requiring special controls, although this limits the degree of flexibility available for future changes in operation. If large quantities of make-up air are available and unit ventilators are used, this may materially reduce the outside air requirements. If the room has a laboratory hood, the operation of the unit ventilator can be set up so that when the hood is in use, the unit ventilator furnishes 100 per cent outside air. (See Figure 1.)

When the hood is not in use, the unit ventilator will furnish minimum room outdoor air and the hood fan will be on low speed. When the room is not in use, the entire ventilation system may be shut off.

For supply air duct systems, the duct sizes should reflect the diversity of laboratory usage as finally arrived at in the analysis of the particular project. Each individual room branch duct, coil or mixing box will be sized to receive the full design air quantity but as the duct picks up branches from other laboratories, the duct may be undersized to reflect the diversity factor if volume control is available at each room. (See Figure 2).

When it is desired to minimize op-



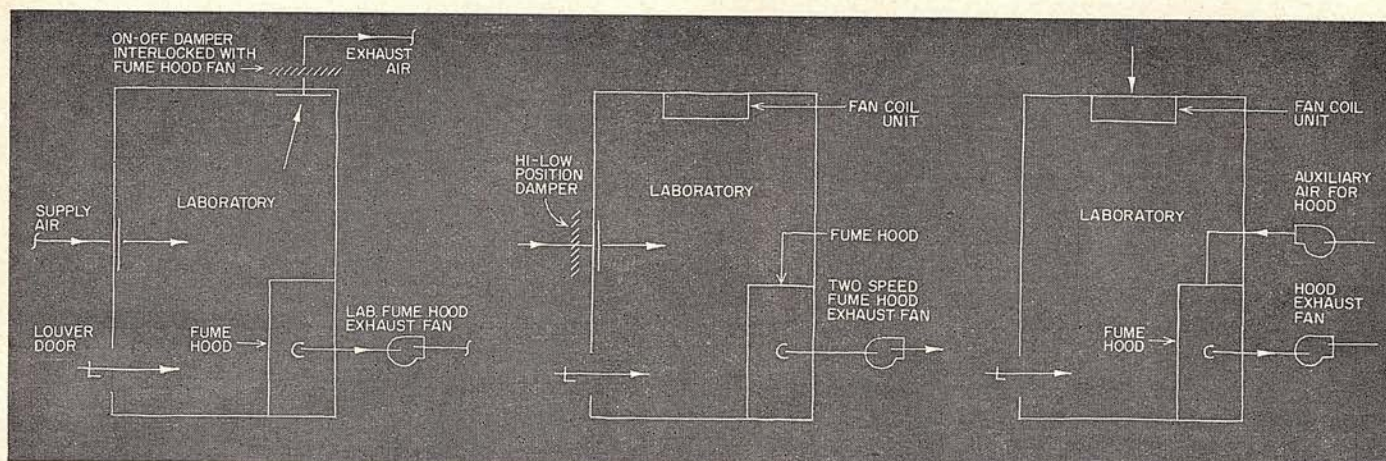


Figure 1: Supply and exhaust air arrangements. Scheme A (left) has central supply and two exhaust systems. Schemes B and C (center and right) use fan coil units

erating costs, and initial funds and space are available, a single multi-purpose or two duct systems are two alternatives (Figure 2). If two duct systems are used, one will satisfy lights, exterior and people load; the other will function only when equipment load is applied.

The space requirements for mechanical equipment rooms and shafts for laboratories may be as much as 25-50 per cent greater than for office buildings or other types of com-

mercial buildings. This is due to hood and laboratory equipment duct and piping needs as well as the requirement for special systems to handle animal laboratories and quarters; insect laboratories, equipment testing, radioactivity, special temperature and special testing laboratories; and other areas having special environmental needs.

Each of these functions may require entirely different temperature and humidity conditions. Special tem-

perature laboratories and animal rooms, for example, may require separate refrigeration compressors because of lower temperature needs. Radiochemical and nuclear laboratories may require special filtering, and supply and exhaust systems.

In contrast some laboratories have comparatively simple areas to air condition, such as basic physics, chemistry, electrical, biology, etc. Even here, special attention must be given to proper air quantity and distribution in order to maintain comfortable occupant conditions. Proper air conditioning will promote better experimental techniques and results.

Administrative areas should be air conditioned in a manner similar to office buildings. The main difference is that the supply air from these areas will probably have to be transferred to laboratory areas in order to make up the air requirements needed.

#### LABORATORY SUPPLY AND EXHAUST AIR SCHEMES

*Scheme A* has a dual exhaust air system and a constant volume supply air system. If the fume hood fan is not operating, then the damper in the exhaust air duct opens to exhaust room air. If the fume hood fan is on, then the damper is closed and all the supply air is exhausted through the fume hood.

A refinement of *Scheme A* uses high-low position dampers behind the supply and exhaust air grilles. When the lab is not in use, the dampers will be in the low position so as to minimize the supply air requirements to the room.

*Scheme B* gets ventilation air from the out doors or from non-laboratory areas such as offices. The fan coil unit recirculates room air for temperature control. When the hood is in operation, its exhaust fan operates at high speed and the air supply damper is in the full open position. When the hood is not in use, the hood exhaust fan operates at a low speed to exhaust the minimum level of supply air plus air entering the room through the louvered door.

An improvement over the foregoing method is shown in *Scheme C*. The fan coil unit brings in 100 per cent outdoor air for ventilation. While this system is frequently used, its filtering efficiency is limited in comparison with a central system. The drawing shows an auxiliary fan for the hood which brings in outdoor air, or air from non-laboratory spaces, to make up 50 per cent of the hood exhaust requirement. The balance of the hood air comes from the fan coil unit and through the louvered door. This technique is applicable to all types of laboratories where it is desirable to reduce loss of conditioned air. An improved variation which cuts refrigeration and fan operation costs utilizes a high-low speed hood exhaust fan, an on-off damper for the auxiliary air duct and a high-low-off position outdoor air damper for the fan coil unit. When the fume hood is in operation, the hood exhaust fan operates at high speed, the auxiliary air damper is open and the fan coil outside damper is in the high position. When the fume hood is not in use, the hood exhaust fan motor operates at low speed, the auxiliary air damper is closed and the fan coil outside air damper is in the low position (assuming sufficient air will be supplied to handle room ventilation requirements).

#### Flexibility

Considerable flexibility for equipment and services is essential in many industrial laboratories; not as much has been provided in the past for teaching facilities. But the picture has been changing for teaching laboratories, especially at colleges and universities. With scientific disciplines changing so rapidly, and class loads for particular courses varying from semester to semester, a fair amount of flexibility will help insure maximum usage and prevent obsolescence.

In industrial laboratories, each scientist has his own method of operation and often prefers to set up his equipment in accordance with his own dictates. His preference for utilities and services may be quite different



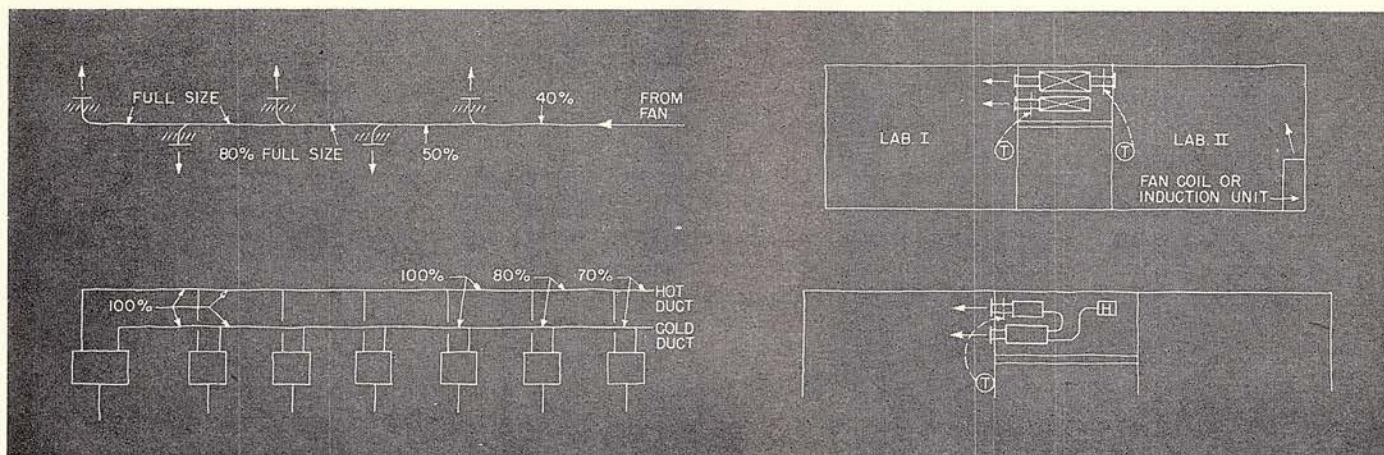


Figure 2: Diversity in load allows ductwork to be reduced from total capacity required when all rooms are used (left). Extra duct handles heat from equipment (right)

from that of other researchers. He may finish or drop an experiment and start work on another one requiring an entirely different approach and a new laboratory set up.

Central service corridors, trenches or ducts which connect to all laboratories, should be furnished. Utilities and services should be piped or wired so that changes can be made quickly and easily and without affecting the operations of other laboratories. Access for maintenance and installation of new services should be provided.

### Lecture Rooms

The larger lecture room may be equipped with special tables for demonstrations of various types of laboratory experiments. These may require that a permanent overhead hood or a portable downdraft hood be furnished to eliminate odors.

Lecture tables or student work spaces, such as those used in small lecture and demonstration rooms and chemistry laboratories, may have downdraft hoods with the ductwork installed under the table or work space. Large hoods may also be provided for use with special experiments.

### Laboratories

Many chemical, biological and similar laboratories produce noxious odors and irritants which make it advisable to keep these rooms under a negative air pressure and to exhaust all air to the outdoors with fans. Organic chemistry laboratories should be especially well ventilated.

Typical chemistry and biology laboratory hood requirements in schools are as follows:

*Analytical Chemistry—*

One lineal ft per two students

*Elementary Organic Chemistry—*

One open front hood per four students.

*Research Work and Preparations—*

One closed front hood per two students.

*Biochemical—*

One lineal ft per student.

Canopy hoods should be furnished over combustion and other types of furnaces such as are found in analytical organic, metallographic and chemical engineering laboratories. Since large amounts of air may have to be exhausted to keep the room temperature within reasonable limits, perforated supply air ceiling plenums or secondary supply air slots at the furnaces may be required.

Organic work performed in the micro-analytical laboratory generally requires a closed front hood. This room, including its associated balance room, should be kept at 75 F maximum.

Biological and biochemical laboratories are handled in a manner similar to those found in hospitals. If special dustproof rooms are required, such as might be found in the study of microbiology, additional filtering of the air entering by means of very high efficiency filters may be necessary. These rooms will also have to be kept under positive air pressure.

*Balance Rooms*

These rooms should be kept under positive air pressure so as to prevent dust and corrosive elements from damaging the balances. Room air velocities should be between 15-20 fpm so as not to disturb the balances. This will often require the use of suitable perforated ceiling outlets.

*Cold Laboratories*

These rooms are generally construc-

ted in the same manner as kitchen refrigerator boxes and are frequently prefabricated. They are used in animal, organic, physical and electrochemical laboratories, to name just a few. A special requirement is that the cold laboratory must be designed to furnish sufficient supply and exhaust ventilation air when it is in use. If large quantities of air are needed, as when the room contains a hood, it may be necessary to precool this air before it enters the cold room to prevent fog formation.

*Constant Temperature Room*

This type of room operates in the temperature range from 60-100 F. This range does not require cold box construction so the room is often lined with only 2 or 3 in. of suitable insulation. The constant temperature room may be found in physical and electrochemical laboratories, neuropsychiatric research facilities and many other types of laboratories. The constant temperature room should have a balanced supply and exhaust air system.

*Chemical Engineering Laboratory*

The most important piece of equipment furnished from the architectural and air-conditioning point of view is the distillation column which is usually more than two stories high. If the column is set in a pit, an exhaust duct should be located in the pit to get rid of high density vapors which may escape from the column. The exhaust fan should be of sparkproof construction with an explosion-proof motor. The exhaust air should be expelled above the roof level at least 100 ft away from the nearest intake. This room should be kept under a negative air pressure.

*Physical and Electrochemical Suite*



In addition to large hoods in the main laboratory, this suite may have an optical room which requires clean, dry air, and balance and dark rooms. More complete facilities, suitable for graduate and research work, may also have cold and constant temperature rooms, a dust free room and even a mass spectrograph room. The optical, balance, dust free and mass spectrograph rooms should be maintained at a positive air pressure.

#### Dark Room

Because of the odors from chemicals, this room should be kept at a negative air pressure with all necessary precautions taken to insure that no light can enter through the duct openings or door louvers.

#### Electronic, Radiation, Electrical and Physics Laboratories

There are many general and specialized facilities falling within the above categories. Although they may have high equipment heat loads, the air will seldom be contaminated with fumes, odors and irritants. Therefore, these laboratories may be satisfactorily operated using a large percentage

of recirculated air. However, because of the use of delicate instruments, primary gages, etc., it is necessary to have a good filtering system.

Some schools want to maintain the accuracy of the air-conditioning system in laboratories within  $\pm \frac{1}{2}$ -1 F tolerance. This may be required in special instances, but the cost penalty is quite high compared to the standard 1-1½ F tolerance, and the closer range should not be specified unless it is really needed.

#### Special Areas

Many laboratories have glass blowing facilities, usually located in a separate room. This room should be under negative air pressure and have about 15 to 20 air changes per hour.

Rooms used for the concentration of solutions and for slow evaporative processes must have minimum air movement and negative room air pressure.

Electrical measurement and instrument calibration rooms should be kept at relative humidities ranging from 20-30 per cent to prevent damage to gages.

#### Laboratory Hoods

Hoods are used to eliminate odors, vapors, irritants, heat and dust and to control the reactions of chemical, physical and bacteriological experiments.

In the simpler laboratories, such as those found in high schools, the hoods may not have any enclosures over the front. However, most laboratory hoods are provided with partial or complete front enclosures.

The air requirement needed for hoods is generally expressed as a function of the air velocity desired across the open area at the face of the hood. The proper air velocity is determined by the type of hood and the nature of the experiment being performed. An average value is 100 fpm with a range as low as 50 fpm for high school open front hoods and as high as 150 fpm for radioisotope and virus laboratory hoods and also downdraft type hoods.

There are several types of laboratory hoods available. The air generally comes in through the front or sides and is discharged through the top by means of a duct connection. Some hoods have flaps or dampers at the sides for adjustment of inlet air quantity and dampers at the exhaust outlet opening.

The hood exhausts may be individually discharged by means of a fan, combined into a common duct system whereby one fan discharges the air from a number of hoods, or emptied into the atmosphere by means of gravity. The latter is seldom used because it is usually unsatisfactory. The common duct system has been used extensively in the past but with the advent of fully air-conditioned buildings, it has created air balancing problems which generally require costly automatic controls to correct the imbalance. It is better design for each hood to have its own ductwork and exhaust fan system. The hood fan should be located at the end of the ductwork to eliminate the possibility of contaminated air leaking from the ducts into occupied spaces.

Hood, ductwork and fan materials should be suitable for the uses employed. Galvanized steel or aluminum may be suitable for some applications but stainless steel, asbestos cement, lead lined copper, high silicon iron, mastic or rubber lined materials, polyvinyl chloride, etc. may be required where certain types of fumes or acids are encountered. Where protective

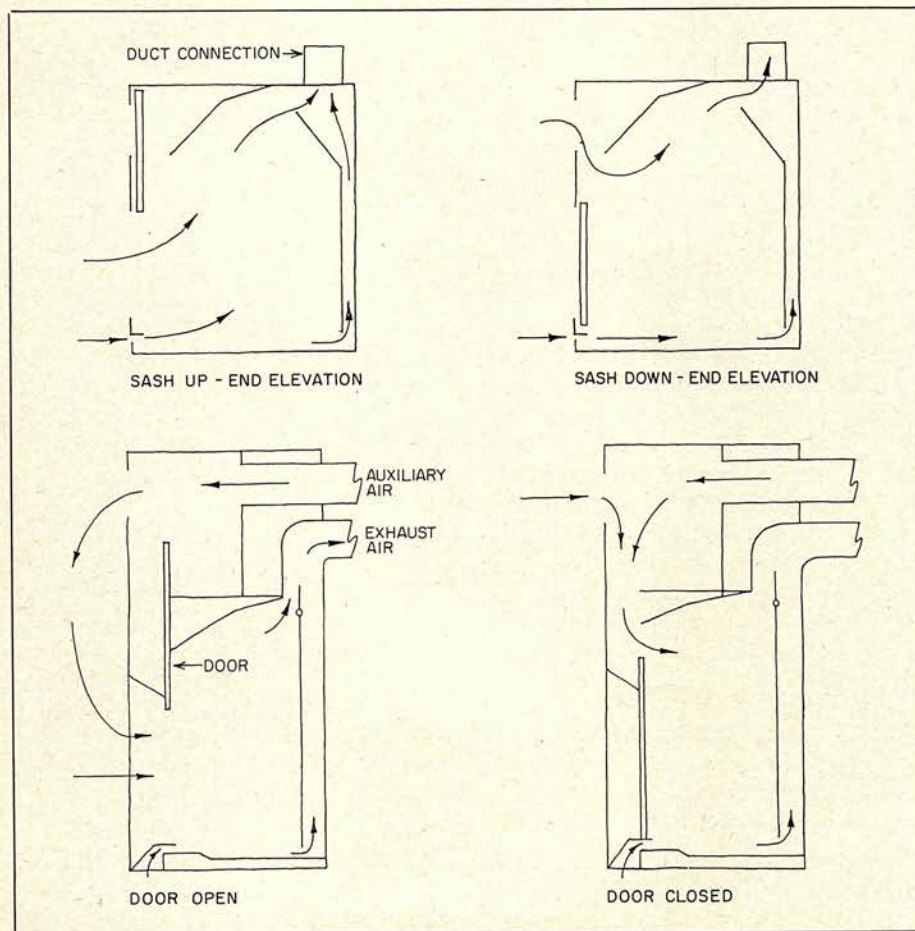


Figure 3: These hood designs help insure room air balance whether hood door is open or closed. Auxiliary air supply from outdoors cuts refrigeration load (bottom)



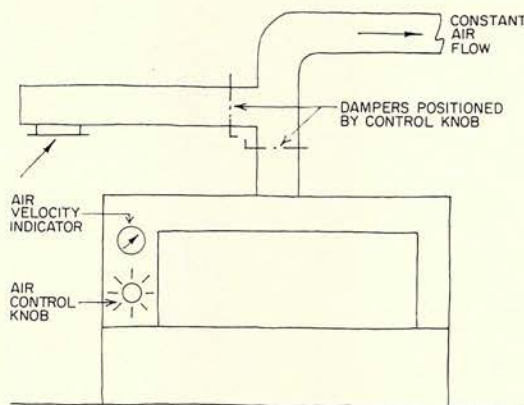
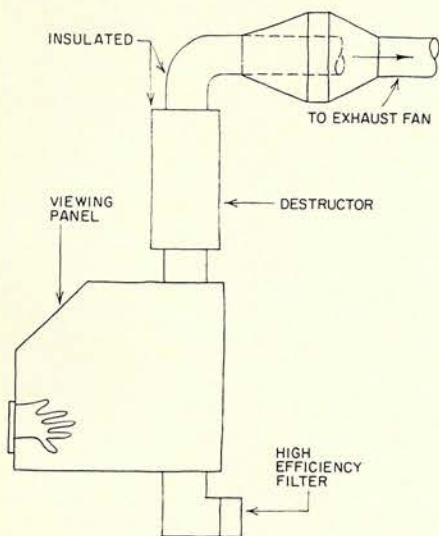


Figure 4 (left): Bacteriological experiments involving hazardous materials may call for a glove box and accompanying high-temperature destructor. Exhaust ductwork must have insulation

Figure 5 (right): Desirable feature for work requiring close control of air velocity is air control knob plus an indicator for air speed

coatings are selected for use instead of basic non-corrosive materials, consideration must be given to the maintenance that will be required. Most often it would be wiser to buy the initially costly material to minimize the maintenance.

The four most commonly used laboratory hoods are discussed below.

1. *The Conventional Hood* is the cheapest and simplest. When the hood door is closed, no air flows through the hood and auxiliary means for exhausting room air must be furnished. Opening the door requires total hood air flow through the face of the hood and auxiliary exhaust means must be shut off to insure the hood getting sufficient air. This involves a damper control arrangement which in a building with many hoods could become complex.

2. *The Modified Hood* is a simple variation intended to overcome the problem created by the conventional hood when the hood is not in operation (see Figure 3). One method is to provide stops on the hood door or an open slot below the door so that it can never completely close. Another method is to provide a slot above the hood door so that when the hood is in operation, the door covers the upper opening. When the hood door is closed, air goes through the upper opening. In either case, exhaust air goes through the hood at all times. In air-conditioned laboratories these hoods use the treated air to satisfy hood air requirements. Since this may increase the cost of operating the air-conditioning system by increasing outside air quantities, a third type of system has evolved.

3. *The Secondary Air Hood* takes

about 50 per cent of its air requirements from the room whether the hood door is open or closed (see Figure 3). This may enable the room to be air conditioned or ventilated with less air. The rest of the air is furnished by an auxiliary air supply system consisting of outside air, tempered and filtered. This requires an additional fan and duct-work system, which may offset the savings in reduced room air quantities. In addition, the hoods are more costly. However, a simple air balance analysis to determine the break-even point based upon hood-hours of operation for a given number of hoods will determine relative economies.

When a conventional hood system is used, a secondary exhaust air system may be required for use when hoods are closed if the excess supply air cannot be transferred to some other area by means of louvers or transfer registers. If the secondary exhaust air system is required, then it must operate such that when the hood is open, the exhaust register closes, and when the hood closes, the exhaust register opens. If a battery of such hoods is exhausted by one fan, then the fan must have volume control in order to prevent too much air from being pulled through those hoods still in operation.

For the modified hood, the hood exhaust fan runs all the time. If the air furnished to the room is in excess of the heating and cooling requirements and the hood has its own exhaust fan, then when the hood is not in operation the fan may operate at reduced capacity, thus allowing the room air quantity to be decreased. If a battery of these hoods is exhausted

by one fan, then the room supply and hood exhaust can have their air volume reduced, when the hood is not in operation, by two-position dampers. The fan requires volume control.

Certain types of laboratory experiments, such as those performed in a bacteriology laboratory, require the use of closed hoods with gloved openings for performance of work procedures (see Figure 4). These hoods require small air quantities (from 15-60 cfm) and the air entering the hoods (usually from the lower back end) may have to pass through very high efficiency filters.

The exhaust air may contain deadly bacteria so it should pass through electric or gas-fired heaters which will heat the air to at least 600 F. The hot air ductwork must be designed and insulated as a low temperature chimney. A high temperature safety cut-out should be provided in the duct to shut the source of heat and actuate visible and audible alarms, if the air temperature near the heater rises beyond the safe limit due to a reduction of air flow.

The fan selection should be checked for an operating temperature of 600 F, with special consideration for an increase in air volume, materials and motor horsepower.

In order to provide the greatest amount of flexibility and control, a hood can be furnished with a calibrated air control dial which will enable the operator to adjust the air quantity through the hood while an experiment is in operation (see Figure 5). This adjustment must be made in coordination with the over-all room air exhaust requirements so as not to upset the air balance.



## C.P.M.—WHAT FACTORS DETERMINE ITS SUCCESS?

A number of case histories are graded as to how well C.P.M. worked (Part 2, Conclusion)

By Francis A. Sando, Project Engineer, Day & Zimmermann, Inc., Engineers, Philadelphia, Pa.

Twenty-two different projects using C.P.M. were analyzed to find the sort of pitfalls to avoid when using C.P.M.

Nine of the projects produced either no significant results or questionable results and were thus discarded from further analysis. One example in this category was that of an architect-engineer who lauded C.P.M. and stated it *always* brought his jobs in on time. At first glance, it seemed true, but a more thorough investigation disclosed that each time the architect could foresee a delay he wrote a letter to his client extending the completion date and revised his arrow diagram accordingly.

From the list of 13 other cases experiencing some degree of success with C.P.M., three were selected for a detailed discussion—each to illustrate a fundamental principle.

For reference, the 13 projects and their results are listed in the chart on page 203. Brief case histories of some projects are as follows:

### Case History 1

C.P.M. was used to plan and control both the design and construction for an Ohio hospital.

The architect stated it was valuable to him in obtaining decisions as he needed them as well as speeding up completion of drawings within his own office.

A resource analysis was made and the number of architects and engineers available was found to be satisfactory to meet the five-month design completion date with one exception. Mechanical draftsmen were needed in the latter stages of the mechanical design. The consulting mechanical engineer decided to work his staff on a partial overtime basis to make up for the shortage.

After the arrow diagram was prepared for the design phase, the progress of the work was evaluated every two weeks. If eight drawings were scheduled for completion during the two-week report period, a report was made on the status of these drawings and any others being worked on to the project manager. New computer runs every two weeks indicated accurately the time gain or loss for the period.

In addition, a meeting of the building committee was held monthly at

which time oral reports were issued on the progress of the job. Any decisions necessary to carry on design work were obtained at this meeting, and both the hospital and the architect knew what was expected to maintain the design pace and prevent delays. C.P.M. is now being applied to the construction phase of the project.

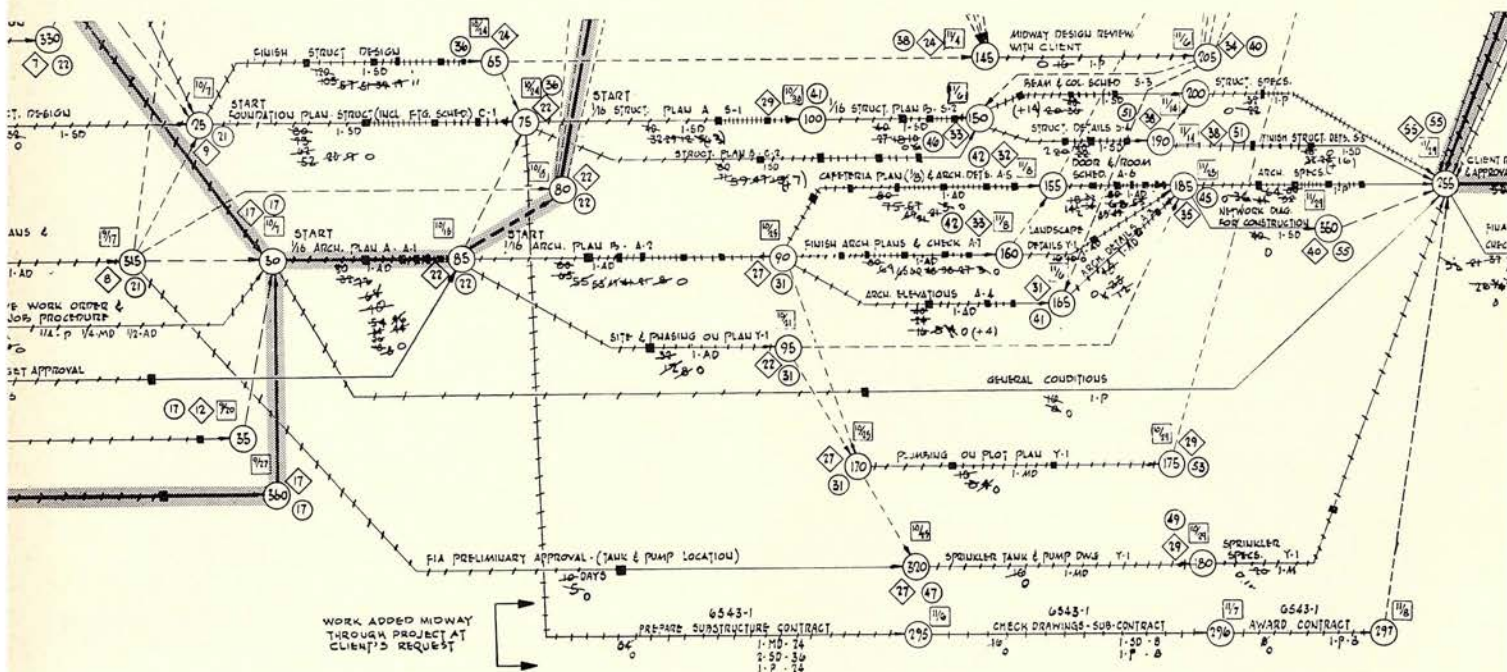
## Case History 2

One of the projects that proved to be most illustrative of C.P.M. efficacy was the \$3 million Beaver Hill six-story apartment building for Fox-Bilt Homes, Jenkintown, Pa., owner-builder.

C.P.M. was applied to the construction phase of the Beaver Hill project and all supervisory personnel were trained in its use. The apartment high-rise building was a Y-shaped building with six duplicate floors.

The implementation of C.P.M. on the Beaver Hill project was successful mainly because of the following reasons:

1. The diagrams were carefully drawn and reflected the thinking of the project superintendent, the project manager and the consulting en-



Portion of a Day & Zimmermann diagram shows a job added during the course of design (see bottom line)



Project identification	Master control diagram	C.P.M. diagram	C.P.M. construction	C.P.M. design	Updating used	Graded efficacy of C.P.M. (A-highest) By owner, architect or engineer; contractors; and author	C.P.M. applied by	Remarks
1. Buil Run steam plant (TVA)	Yes	Detailed	Yes	Yes	Intermittent	C	Owner and Planning Consultant	Difficulties encountered in estab- lishing logic for design work and tying design diagrams in- to construction diagrams
2. Large hospital (\$7 Million)	Yes	Detailed and accurate	Yes	Yes	Bi-weekly	B	Planning Consultant	Produced good results in design phase. Client satisfied with re- sults so far in construction phase
3. \$4½ million Upper Merion Junior High School	No	Detailed and accurate	Yes	No	Bi-weekly	B	Planning Consultant	Late start getting underway, and initial doubts by subcontractors of its value prevented C.P.M. from attaining its full potential
4. \$6½ million Abington High School north campus addition	No	Mostly accurate and general	Yes	No	Bi-weekly	B	Planning Consultant	C.P.M. was effective but needs more detail in diagram. Proj- ect proceeding on time mainly because of drive and capabili- ties of school business manager
5. \$10 million Hershey Chocolate Co. manufac- turing facility	No	Accurate and general	Yes	No	Intermittent	B	Consulting Engineer	No regular updating used, but project proceeding on schedule produced by C.P.M.
6. \$3 million Beaver Hill apartment project	Yes	Detailed and accurate	Yes	No	Bi-weekly	A	Consulting Engineer	Project two months ahead of orig- inal C.P.M. schedule—C.P.M. used extensively by all per- sonnel
7. Addition to existing manufacturing plant	No	Detailed and accurate	No	Yes	Weekly	A—	Consulting Engineer	Project design finished on time —contract for construction awarded one month early
8. \$1½ million McMichael Grade School board of education— Philadelphia	No	General and accurate	Yes	No	Intermittent	C	Contractor and Planning Consultant	No regular updating and proj- ect slipped. Strikes and severe winter weather could not be overcome by C.P.M.
9. \$1 million Leidy Grade School board of educa- tion— Philadelphia	No	Detailed and accurate	Yes	No	Intermittent	B+	Contractor and Planning Consultant	Good diagram—project finished on schedule—C.P.M. effective in spite of no regular updat- ing. Excellent C.P.M. imple- mentation by S. Levy Co., Gen- eral Contractors
10. \$1 million grade school	No	Detailed and accurate	Yes	No	Intermittent	C	Planning Consultant	Good diagram—project slipped two months because of lack of updating—C.P.M. effective in latter stages of construction when updating was resumed
11. \$9 million Philadelphia apartment building	No	General and inaccurate	Yes	No	None	C—	Contractor- Owner and Planning Consultant	Poor diagram—no regular updat- ing, but C.P.M. helped in ma- terial purchasing and pointing out need for elevators
12. Atantic Refining Com- pany truck terminal and motel	No	General and accurate	Yes	No	Intermittent	B	Contractor and Planning Consultant	Good diagram—no regular up- dating—C.P.M. used in discus- sions between contractor and owner. Project completed on revised schedule after delay in obtaining building permit was justified by contractor
13. \$2 million United Aircraft office of laboratory	Yes	Detailed and accurate	Yes	No	Weekly	A	Consulting Architect- Engineer	C.P.M. rigorously used to control job. Very effective in control- ling time, manpower and costs. Difficult project finished one month ahead of schedule



gineer responsible for C.P.M. use. 2. The system was absorbed into construction management routine and carefully updated with meticulous regularity. The planning engineer met with the project superintendent and assistant superintendents every other week to evaluate progress of the preceding two weeks. The information was then fed into the computer print-out ready for a planning meeting the following Monday.

4. Regular planning meetings were held to discuss where performance was poor during the preceding two weeks and how improvements could be made.

#### *Case History 3*

C.P.M. is being used extensively at Day & Zimmermann on several projects, from the proposal stage through finished detailed diagram. C.P.M. proved to be very valuable when used for the design work of a plant expansion in the South. The project consisted of adding 70,000 sq ft to an existing building while keeping most plant operations in progress.

The design was planned by a C.P.M. diagram (shown completely in previous article and partially on page 203). Superimposed on the diagram were completion dates of each arrow with surplus time indicated by a plus sign. Where the job took more time than planned, a minus sign has been used. Time was crossed out under each arrow as each weekly updating reduced the amount of work remaining. Codes were worked out to provide a weekly cost control report of each major engineering area for the project manager's use.

During the course of this design, a sudden urgent need for structural engineers arose within Day & Zimmermann. From the diagram it was obvious that structural design had considerable float (difference between earliest possible completion time and latest allowable time), and thus two structural engineers were diverted from the plant project to another Day & Zimmermann project for a short period of time.

Changes in project scope were easily added to the diagram and the effects of such changes can be seen. One such change occurred midway through the project when it was decided to take bids on foundation and floor slabs for the east end addition. The objective of the change was to finish the foundation construction work before encountering severe win-

ter weather, thus speeding up the entire project by two months. From the C.P.M. design diagram, it was determined the change could take place without additional engineering manpower and without interference with the over-all design schedule.

Before any real thinking had been done, 10,000 sq ft were believed to be the maximum east end area that could be completed in the remaining days of the late fall season. It was decided to work out a C.P.M. construction analysis considering the east foundation work as a separate project, and the diagram determined that 30,000 sq ft could be put on the east end before December 20th. The diagram proved accurate and the contractor completed the 30,000 sq ft on schedule, along with an underground fire main and required electrical groundings.

The plant design was completed on schedule and the project was under a construction contract one month ahead of schedule.

#### **Pitfalls to Avoid**

1. *Diagrams that are too general.* Detailed arrow diagrams used for design or construction should be just exactly that—detailed. Attempts to generalize by lumping too much work into one arrow produces an unworkable job schedule. For example, an arrow designated "brickwork second floor" could be too general if window frames are required in the exterior wall. To start window frames after the entire second floor brickwork is complete is not the way an exterior wall is constructed, and therefore, the diagram does not reflect actual building practice.

2. *Lack of construction know-how in the diagram.* The logic of an arrow diagram should be prepared under the direction of the project manager. His logic should be used since he is the one man directing the project and capable of making the arrow diagram stick. Planning engineers and consultants can aid in the preparation of the diagram but should not dictate the sequence of activities.

When the project manager is unsure of proper procedure relating to certain construction operations, other specialists and key engineers should be called in for consultation. C.P.M. is only as good as the logic that goes into the diagram, and every effort should be made to have the most experienced engineers and construction superintendents actually plan all

of the construction operations. 3. *C.P.M. consulting firms that lack engineering qualifications.* C.P.M. management consulting firms are offering their services to owners, architects and contractors. Such service is valuable in helping an architect or construction firm with the techniques of arrow diagramming or obtaining computer runs. Although some of these consultants are thoroughly trained in the computer aspects of C.P.M., they may lack depth in engineering and construction experience. Such firms should not attempt to develop the detailed logic for a project. 4. *Lack of updating and computer orientation.* Projects under C.P.M. control must be updated regularly. Small diagrams can be hand calculated; large diagrams should use a digital computer. Attempts to hand calculate a large diagram usually fail before the project is finished.

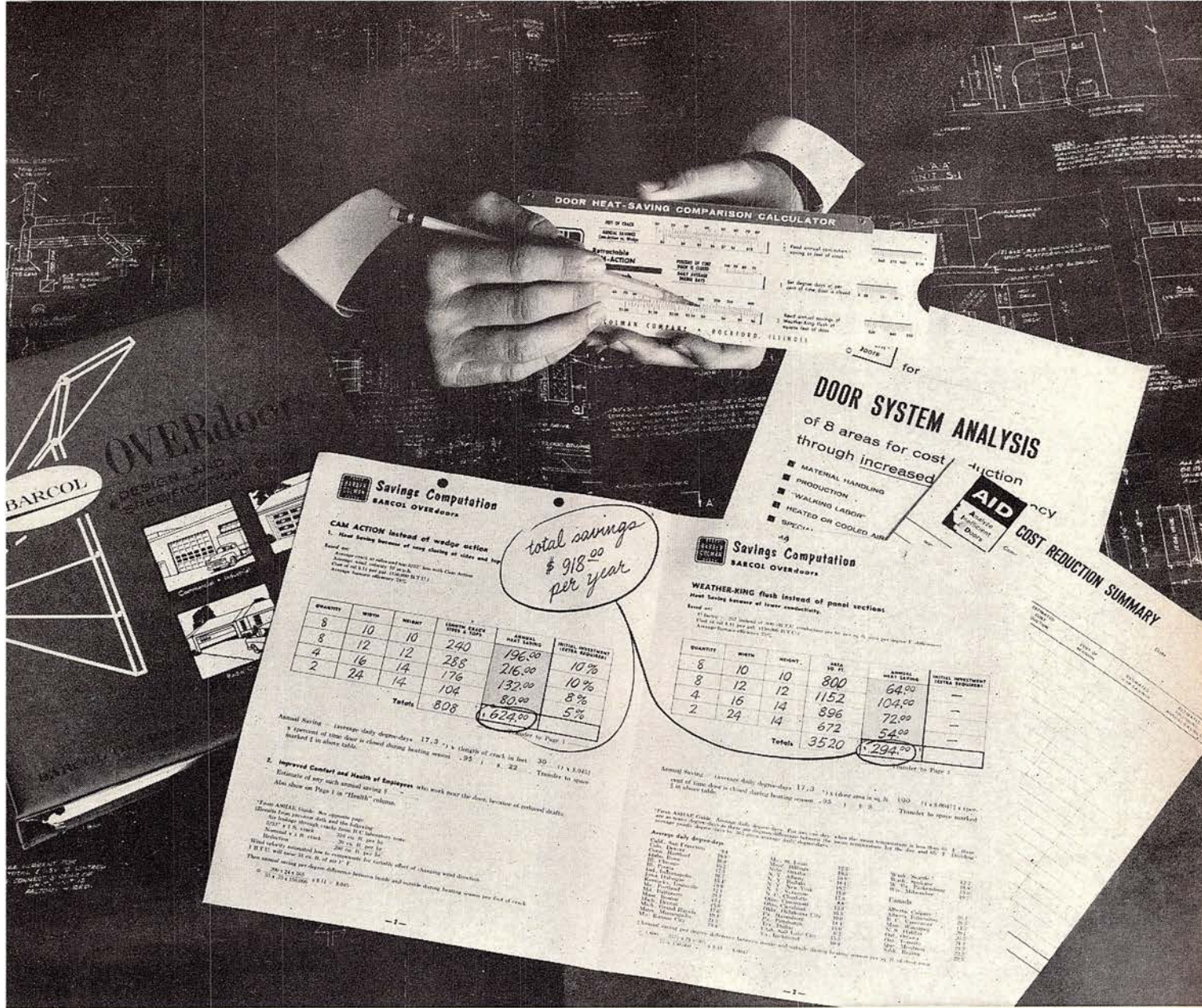
Diagrams drawn on equidistant "time modules" where the length of the arrow is proportional to the magnitude of arrow's duration, usually fall apart rapidly with the first major schedule change. (Such diagrams are made in lieu of conventional diagrams with computer runs.)

Computer rental for C.P.M. is not expensive. A 2,000 arrow diagram can be updated for as little as \$120 a run and can be done in one hour. Why waste valuable time and engineering manpower to accomplish something a high-speed moron (a computer) can do faster and far more accurately? 5. *Innovations.* Innovations or short cuts to avoid the time and expense of the rigorous discipline of C.P.M. are frequently fruitless. Generalized diagrams "for guidance," intermittent updating, arrow diagramming short cuts—all in an effort to save C.P.M. costs—sooner or later end up in the wastebasket. C.P.M. costs money to use correctly, but the results are well worth it.

#### **Summary**

Critical Path is not a panacea for curing the ills of disorganized design or construction firms, because the problem might be beyond the reach of good project management. It *will* help a good architect or engineer do his job more efficiently and effectively than ever before. It *will* help a project manager organize his work properly and thus will head off many potentially serious problems before they can occur and are allowed to develop.





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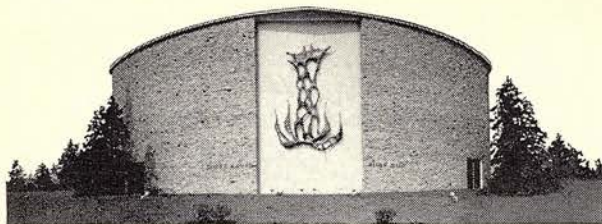
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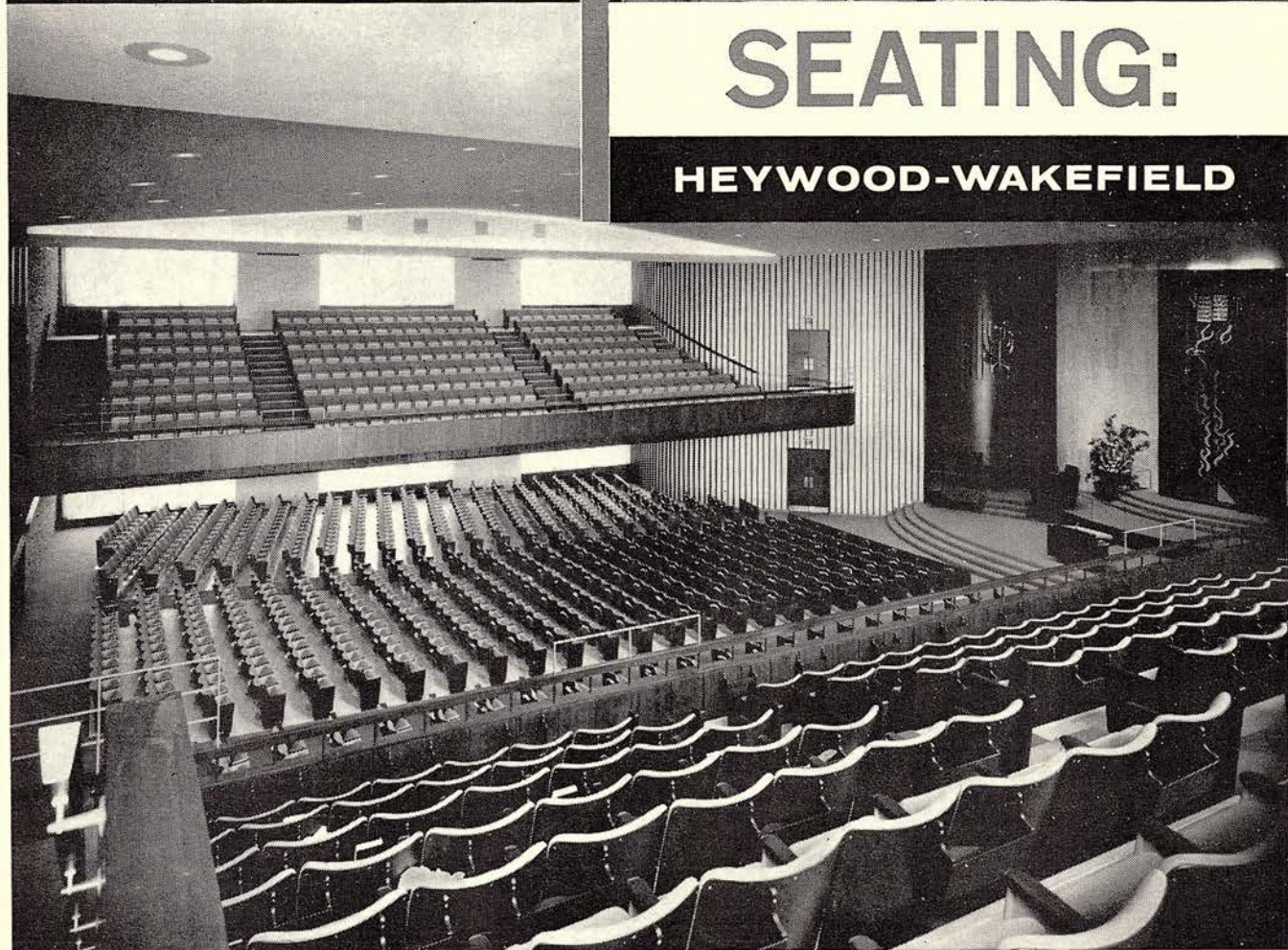
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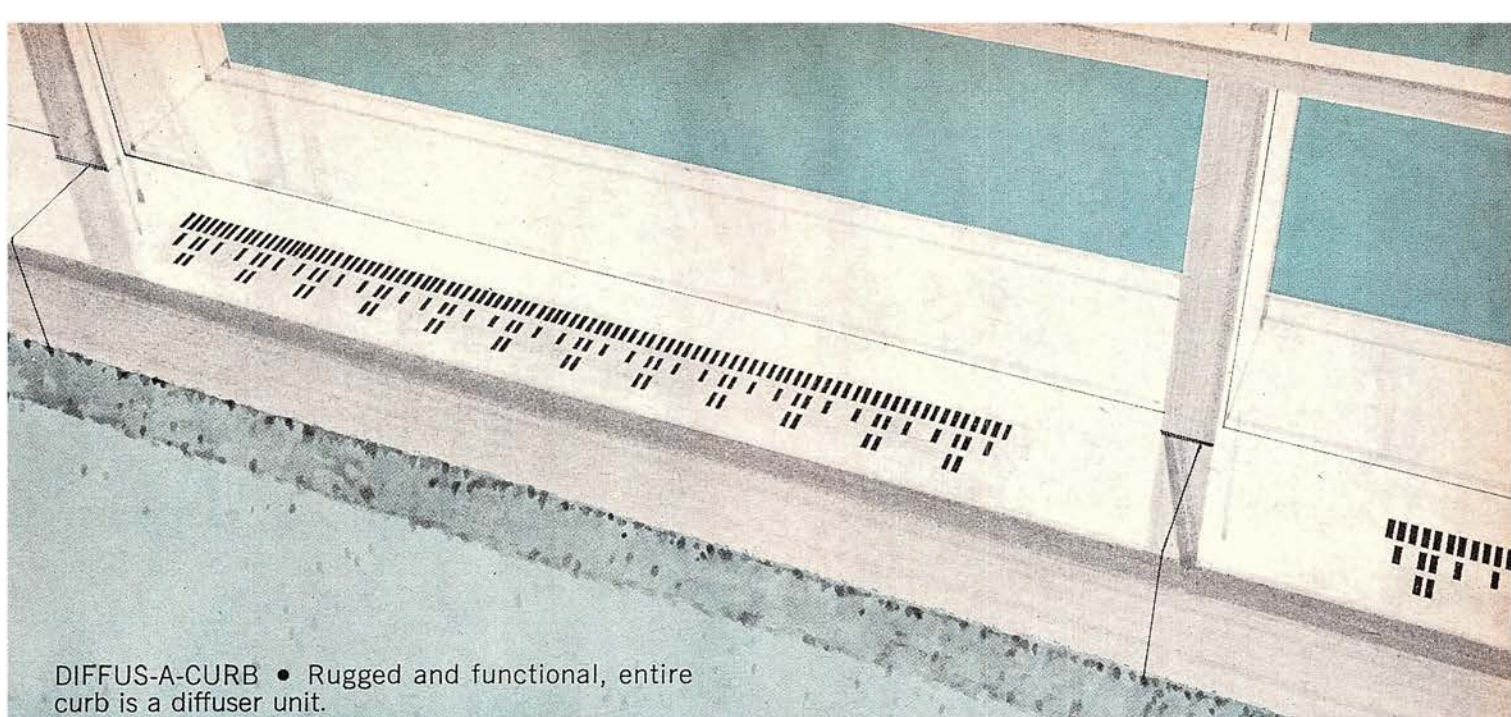
*Architect:*  
**DANIEL SCHWARTZMANN**  
New York, N. Y.



Menominee, Michigan

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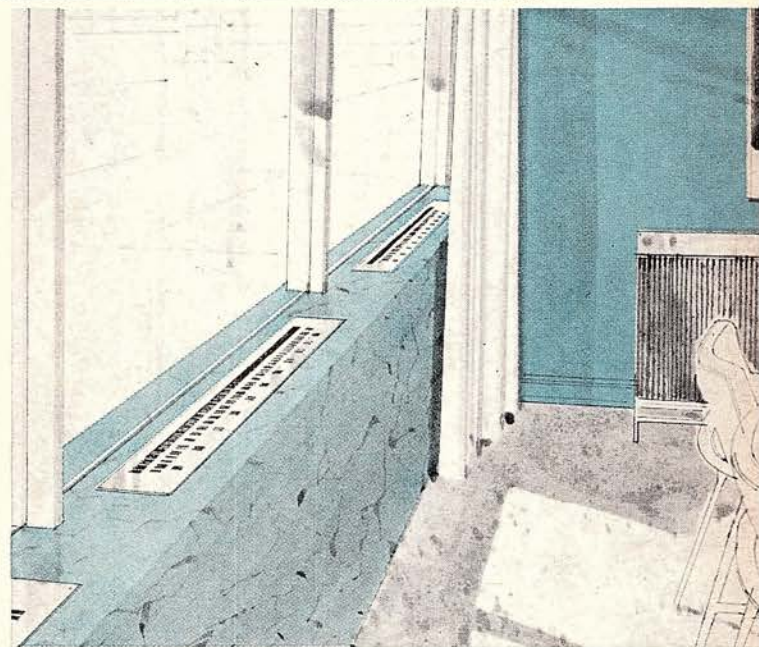




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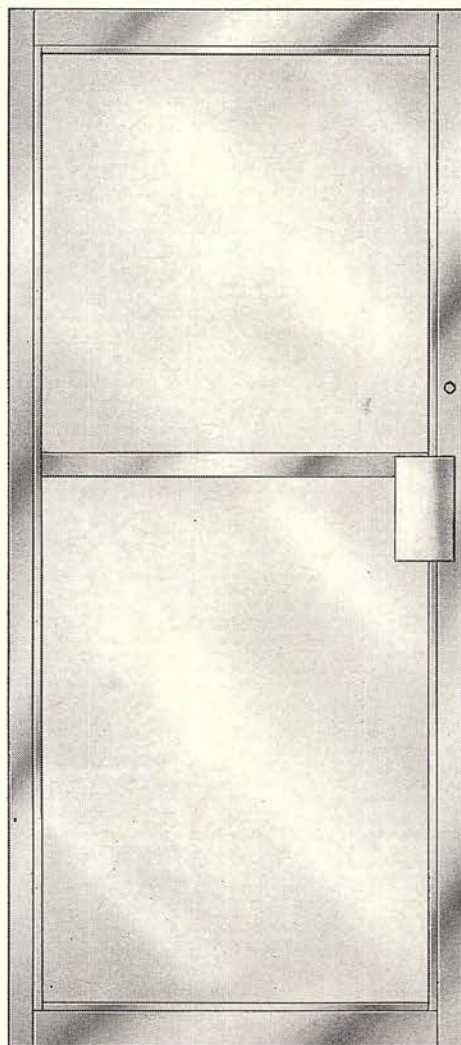
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## PREFABRICATED FLASHING FOR PARAPET WALLS

By Harlan Edwards, P.E.\*

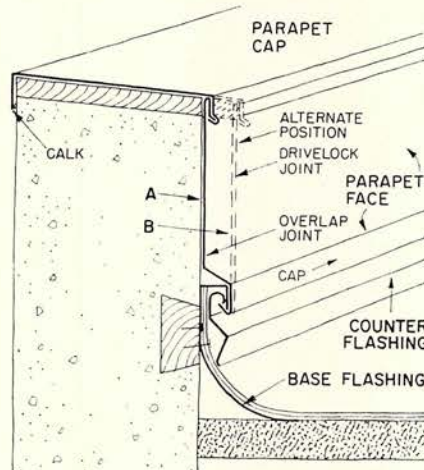
Leaky parapet walls, like taxes, seems to be a problem that has stuck with us. But, something can be done to prevent rain penetration through parapets. Shown here is a new approach in which a prefabricated system of metal units wraps up the parapet wall so that it can expand and contract independently, yet still remain watertight. The prefabricated sections are hooked together in a continuous hinge starting at the top of the solidly-nailed base flashing.

Parapet walls have suffered from a host of leakage problems: (1) breaks in the roof over the cant area have occurred; (2) roofing over base flashing has ruptured just outside the metal line caused by thermal expansion of the flashing; (3) water has penetrated counterflashing where it is inserted into the reglet; (4) wind-driven rain has penetrated masonry joints in parapets.

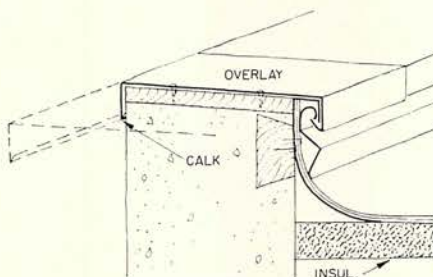
Breaks in the roofing at the cant are frequently a source of trouble because it seems practically impossible to lay the plies so they will remain snug in the angles. Also, in a new building having a wood interior frame and rigid masonry walls, wood shrinkage and building movement cause the deck and cant to settle perhaps an inch in the first year; hence, the roofing nailed to both deck and wall quickly loses the cant strip support and is readily broken when stepped upon.

To avoid these problems, the new system replaces the wood cant with a curving metal base flashing over which the roofing continues upward on a 4-in. radius from the deck to a wall nailing point 5 in. above. When the deck gradually settles, the only change is the flattening of the curve.

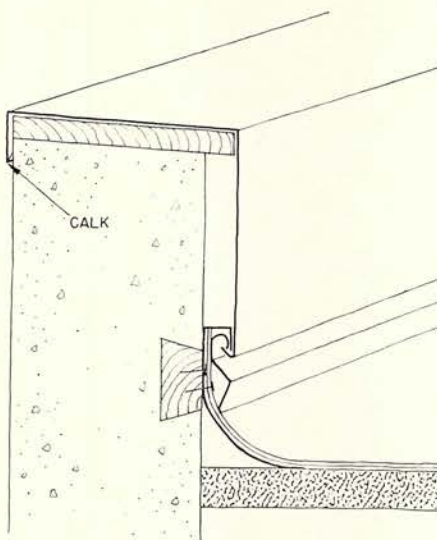
In order to prevent corrosion of the metal base flashing due to condensation of vapor from the building be-



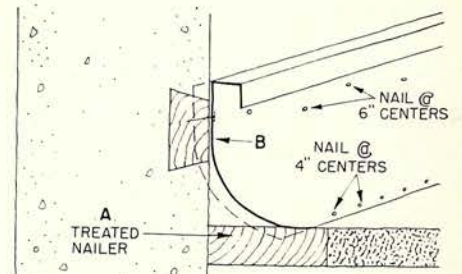
Base flashing is installed first, fastened to wood nailer in wall. Dry sheet is laid on top, then roofing turnup is set in plastic and nailed to the wood. Parapet facing is hooked to base flashing, parapet cap to facing. Counterflashing is rotated or slipped in place.



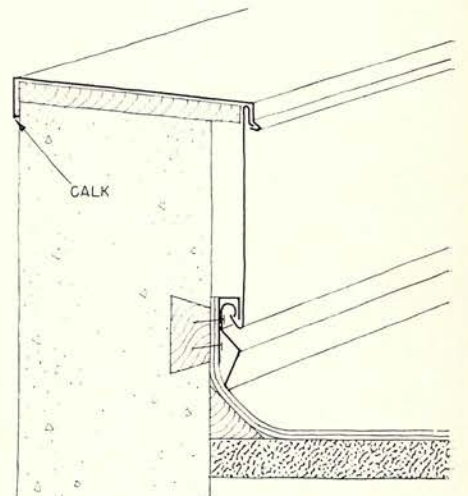
Facing is omitted for low parapet walls



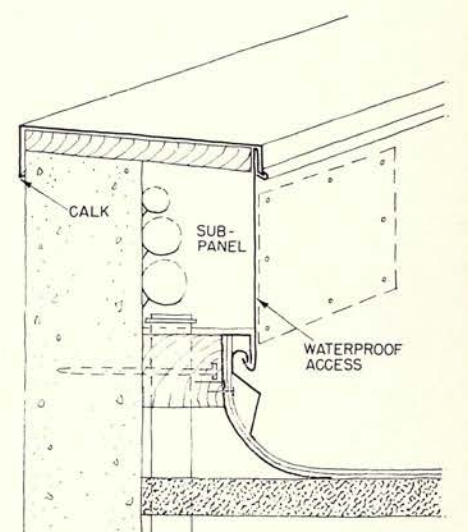
Parapet can and facing can be one piece



If a fixed anchorage to the deck is desired for base flashing, provide a 5½-in. treated nailer (A) next to the parapet.



If roofing and cant are good on existing building, omit base flashing.



Set facing out from wall for utilities

\* The flashing system described herein has been developed and patented by the author and trademarked as *Holdtite*.



low, the base flashing is protected on both sides with a rubber-based coating.

To prevent thermal expansion of the base flashing from rupturing the roof, a dry sheet is provided over the metal, neither mopped nor spotted.

When, as in usual practice, counterflashing is attached by insertion of

its bent top portion into a reglet or a raked-out "raggle" of masonry joint, wedges used to secure the flashing press the metal downward, creating, in effect, a funnel which will admit water into the wall after the caulking material has dried and shrunk.

Another problem is that counterflashing is often permanently bent or

loosened by servicing operations on the roofing turnup back of it. It is then easily flexed and fluttered by winds that drive water up behind it over the usually-loose roofing. (The new system has the top-nailed portion of the roofing turnup bedded against the parapet with a non-hardening roofing plastic.)

Counterflashing in the prefab system has a sharply-angling round top and a reverse bend at the center which work to keep out wind-driven rain. Spring pressure results from the outward flexing of the downturned face of the base flashing as the round top of the counterflashing rotates against it. And wind pressure only increases the snugness of the counterflashing bearing on the roofing.

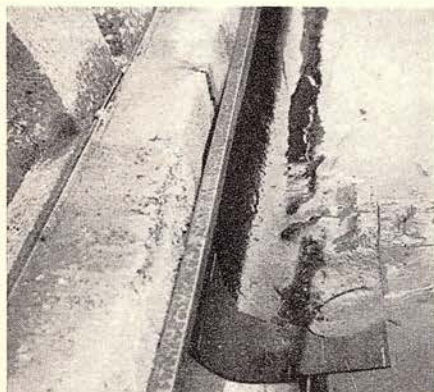
Another feature of the prefabricated parapet flashing system is that the parapet facing can be set out from the wall a distance of 1 in. or more, producing a watertight space between the metal and parapet for the installation of electrical conduits.

The prefab system is adaptable to any parapet design. The contour of the facing can be varied; the base flashing can be varied in size or omitted, as can the protective fascia and part of the cap. In the latter case the metal is returned into a sash reglet-sized slot cast into the top of the wall, sealed with a durable sealant, and protected by a lead or rubber overlay insert-type cover as a guard against possible sealant failure.

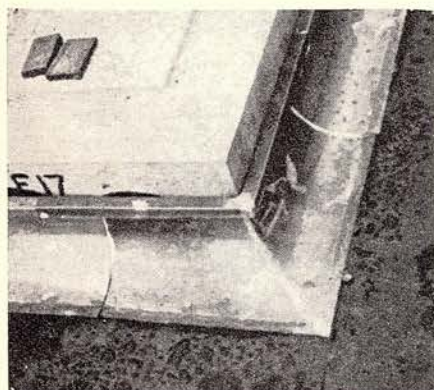
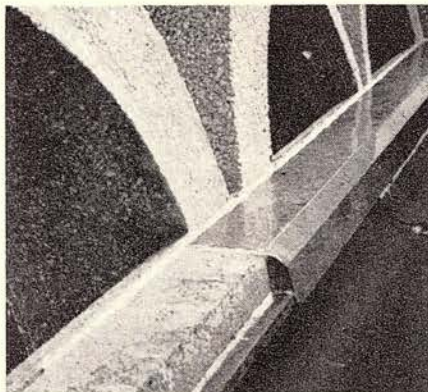
Joints are made as follows: (1) parapet facings are overlapped 3 in. or as desired; (2) parapet cap sections are overlapped and held in place by an overlay strap which is bedded in caulking and fastened with screws turned into the wood sub-cap between 10-ft parapet cap sections.

If the architect wants to avoid prominent joints, then butt joints are employed. In this case, the parapet cap section is provided with a butt strap on the bottom side which goes across the joint. The overlay strap and the butt strap then make, in effect, a tongue-and-groove joint, with the overlay strap being embedded in caulking, and the two straps being pulled together with self-tapping screws.

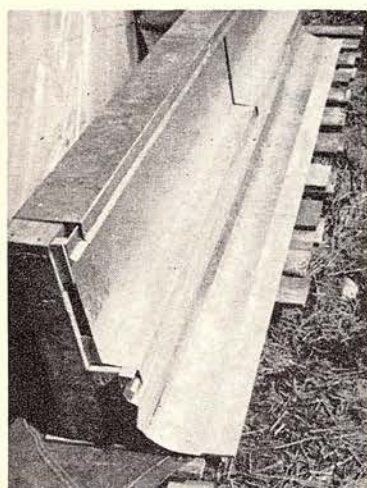
If parapets are 2 to 3 ft or more in height, the facing can be stiffened by crimping it, or by providing a heavier gage of metal, or by stiffening metal braces anchored to the parapet.



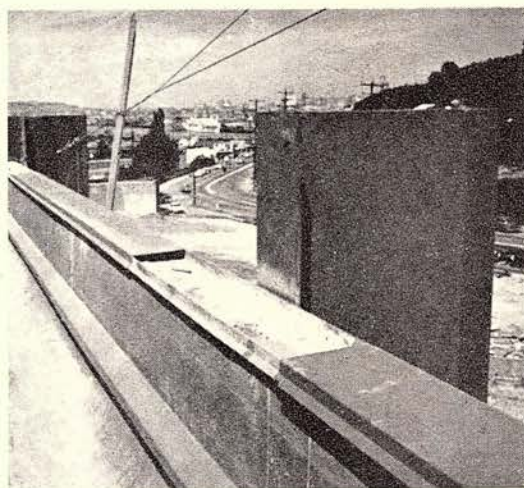
Example of low parapet flashing behind precast, Gothic-shaped arches used on the facade of a Seattle library. With base flashing in place (*left*), dry sheet is laid on top; then roofing is installed. Parapet cap is hooked on base flashing (*right*)



Corner details for building at top. Counterflashing is hooked to base flashing (*right*). Prefabbed corner sections have been caulked to insure against leakage. Flashing here is copper; anodized aluminum and galvanized steel are also used



Mock-up (*left*) was built to demonstrate use of the system for a Bethlehem Steel office building in Seattle. Space behind parapet facing and under parapet cap was filled with mortar to "beef up" the thin precast parapet (cap is off in photo, *right*)



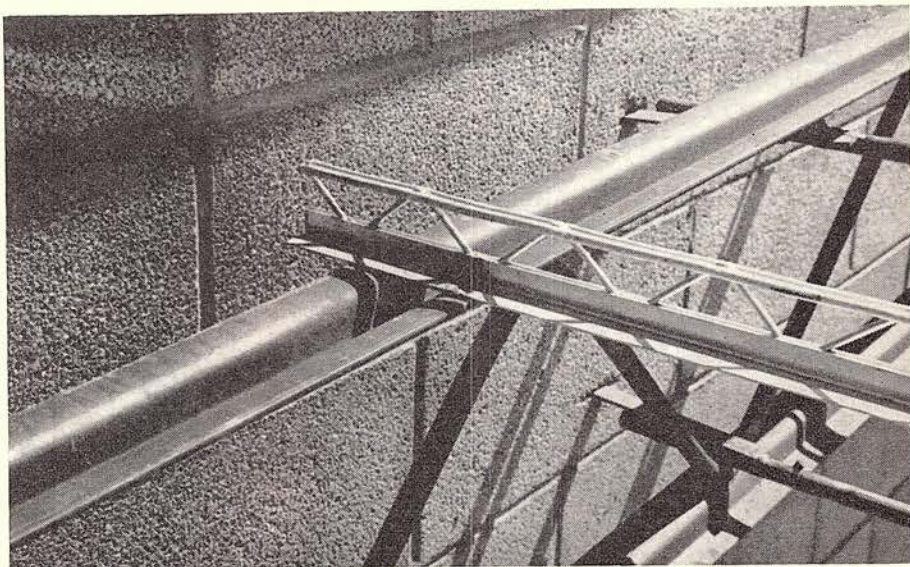


For more information circle selected item numbers on Reader Service Inquiry Card, pages 247-248

## SUBPURLINS FORM PART OF MONOLITHIC ROOF DECK

The open web truss design of *Keydeck* steel subpurlins permits complete embedment of chord and truss members into the deck materials. This results in greater load carrying capacity and minimizes deflection with less weight of steel. Better control of expansion and contraction is also effected. The subpurlins are welded at each intersection with main purlins, and feature a wide flange for stronger T-section and better support for board or slabs. Keystone Steel & Wire Company also manufactures *Keydeck* reinforcing mesh which is unrolled over subpurlins and formboard. *Keystone Steel & Wire Company, Peoria 7, Ill.*

CIRCLE 300 ON INQUIRY CARD



## CLEAR, SPANDREL GLASS IN ONE UNIT

A building glass developed by the Pittsburgh Plate Glass Company combines a ceramic enameled opaque area and a clear vision area in a single sheet of glass. The product, known as *To-A-Line-Spandrelite*, can be fabricated to provide a variety of clear and opaque areas. The new

glass eliminates the need for horizontal mullions, permitting a cleaner vertical look on building facades. It also permits setting one light of glass instead of two. *Pittsburgh Plate Glass Company, 632 Fort Duquesne Blvd., Pittsburgh, Pa., 15222*

CIRCLE 301 ON INQUIRY CARD



## SAFETY GLASS FIVE TIMES STRONGER UNDER IMPACT THAN ORDINARY GLASS

A high-strength tempered safety glass manufactured by a new Pittsburgh Plate Glass Company process, makes possible the flattest and thinnest tempered glass, as well as the best optical properties, available by mass production methods up to now.

*Herculite K* is four to five times stronger under impact than ordinary glass of the same thickness. Under especially heavy impact, it fails by crumbling into small granular-sized particles rather than large, sharp pieces.

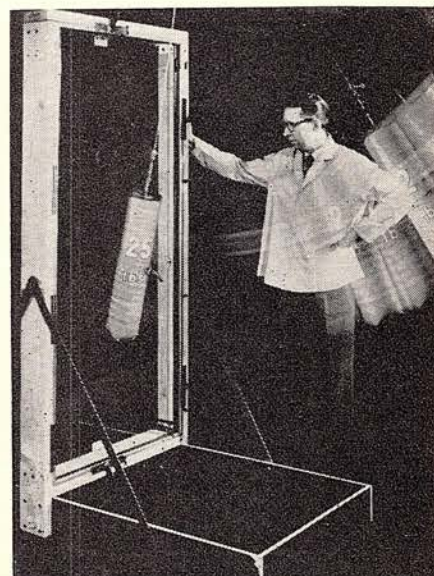
The glass meets revised F.H.A.

requirements and exceeds the safety requirements of all existing specifications and codes governing safety glass.

The extra flatness of *Herculite K* makes it especially suitable for double glazed units. Among the immediate single glazing applications are residential sliding doors, bath enclosures and school windows. *Pittsburgh Plate Glass Company, 632 Fort Duquesne Blvd., Pittsburgh, Pa., 15222*

CIRCLE 302 ON INQUIRY CARD

more products on page 270





# Office Literature

For more information circle selected item numbers on Readers Service Inquiry Card, pages 247-248

## GAS AIR CONDITIONING

A revised and expanded 89-page edition of a "Guide to Gas Air Conditioning" handbook includes technical data sheets on available equipment for residential, commercial and large volume industrial users, and gives manufacturers' descriptions and specifications for basic gas air-conditioning systems. It also points out the operational differences and advantages of each system. *The Peoples Gas Light and Coke Company, 122 S. Michigan Ave., Chicago 3, Ill.*

CIRCLE 400 ON INQUIRY CARD

## WATER BOOSTER SYSTEMS

A complete, detailed study of the various types of water pressure boosting systems commonly employed in multi-story structures today evaluates the several kinds of constant speed and variable speed systems as well as the hydro-pneumatic and roof tank types. *Syncroflo Inc., 5005 Belmont Rd., Downers Grove, Ill.*

CIRCLE 401 ON INQUIRY CARD

## REMOTE CONTROL WIRING

An illustrated, 44-page manual on remote control wiring for office buildings, schools, hospitals, commercial buildings and industrial plants includes sections on lighting controls, applications, circuit diagrams, system planning and advantages. *General Electric's Wiring Device Department, 95 Hathaway St., Providence, R. I.*

CIRCLE 402 ON INQUIRY CARD

## SYSTEM CONVEYS INDUSTRIAL MATERIAL

"Truckveyor System" uses case histories to portray materials handling in freight terminals, warehouses and industrial operations. The *Truckveyor* consists of an endless chain with attachments that pull industrial tow carts or other wheeled vehicles. The chain can be mounted in channels beneath the floor or on overhead tracks. The 50-page book focuses on the engineering considerations in selecting layout, design, components and installation. *Link-Belt Company, Dept. PR, Prudential Plaza, Chicago, Ill.*

CIRCLE 403 ON INQUIRY CARD

## OFFICE PARTITIONS

"Mills Movable Walls" contains 36 pages of detail specifications and photos of Mills' full line of movable partitions. Among the series covered is the newly introduced *Gypsum Wall* series, and both basic design and design variations for all series are shown. *The Mills Co., 965 Wayside Rd., Cleveland 10, Ohio \**

CIRCLE 404 ON INQUIRY CARD

## WEATHER STRIPPING

A revised 32-page catalog presents a wide variety of types of door and window weather stripping equipment, and combinations of suggested applications. The catalog includes 168 full-size detail drawings. *Zero Weather Stripping Co., Inc., 453 East 136th St., New York 54, N. Y.\**

CIRCLE 405 ON INQUIRY CARD

## WATER STORAGE TANK PROTECTION

"A Guide To Successful Water Storage Tank Protection" contains complete details on surface preparation, prime coats, spray application, sealing of difficult-to-spray areas, curing of coatings, immersed coatings, spreading rates, maintenance and touch-up painting, cathodic protection and functional color, as applied to water storage tanks. Nine comprehensive specification charts recommend the best methods for applying various types of coating systems, including alkyd, vinyl, epoxy, zinc-dust phenolic, coal tar epoxy and aluminum barrier coat. *Socony Paint Products Company, Metuchen, N.Y.*

CIRCLE 406 ON INQUIRY CARD

## METAL PROTECTANTS

"Prevent Corrosion with UCARSIL Metal Protectants" gives detailed information on the use of silicone protectants on a variety of metals and their performance under different service conditions. Complete with charts and tables, it describes the properties and features of the protectants, along with data on heat, abrasion and impact resistance. *Union Carbide Corporation, Silicones Division, Dept. 1471, 30-20 Thomas Ave., Long Island City, N. Y., 11101.*

CIRCLE 407 ON INQUIRY CARD

## PLASTIC PIPE STANDARDS

The National Bureau of Standards of the United States Department of Commerce has announced the availability of printed copies of three new standards for pressure rated plastic pipe and fittings. The three standards are: "CS254-63, Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR and Class T)"; "CS255-63, Polyethylene (PE) Plastic Pipe (SDR-PR)"; and "CS256-63, Polyvinyl Chloride (PVC) Plastic Pipe (SDR-PR and Class T)." The Bureau of Standards notes that these standards cover specifications of pipe materials, dimensions and tolerances, and test methods. Also included are pipe classifications, pressure ratings for water (PR), dimensions ratios (SDR), burst pressure and extrusion quality. Methods for marking and for showing compliance with the standards are also given. Copies of the standards are available for 10 cents each from the *Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.*

CIRCLE 408 ON INQUIRY CARD

## TOILET COMPARTMENTS

Mills' 24-page catalog on metal toilet compartments and shower and dressing rooms contain specifications and detail drawings. A color chart for selection of finishes is included. *Mills Metal Compartment Co., 965 Wayside Rd., Cleveland 10, Ohio.\**

CIRCLE 409 ON INQUIRY CARD

## PAINTING AND FINISHING SPECIFICATIONS

Pratt & Lamberts' "Specification Manual" for sewage disposal, water treatment and engineering projects has been prepared as a guide for painting and finishing all internal and external surfaces in these structures. The 34-page manual contains over 30 product descriptions, painting schedules and specification systems. *Pratt & Lambert Architectural Service Department, 3301-38th Ave., Long Island City, New York, 11101\**

CIRCLE 410 ON INQUIRY CARD

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

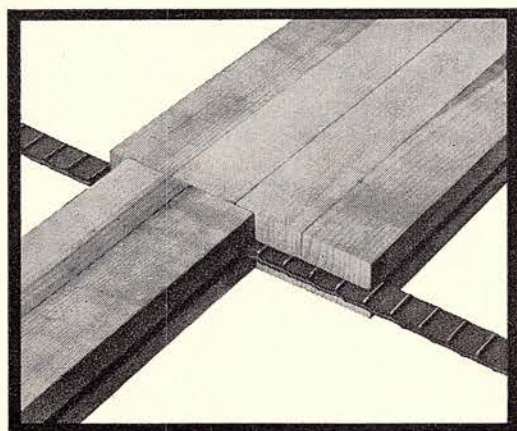
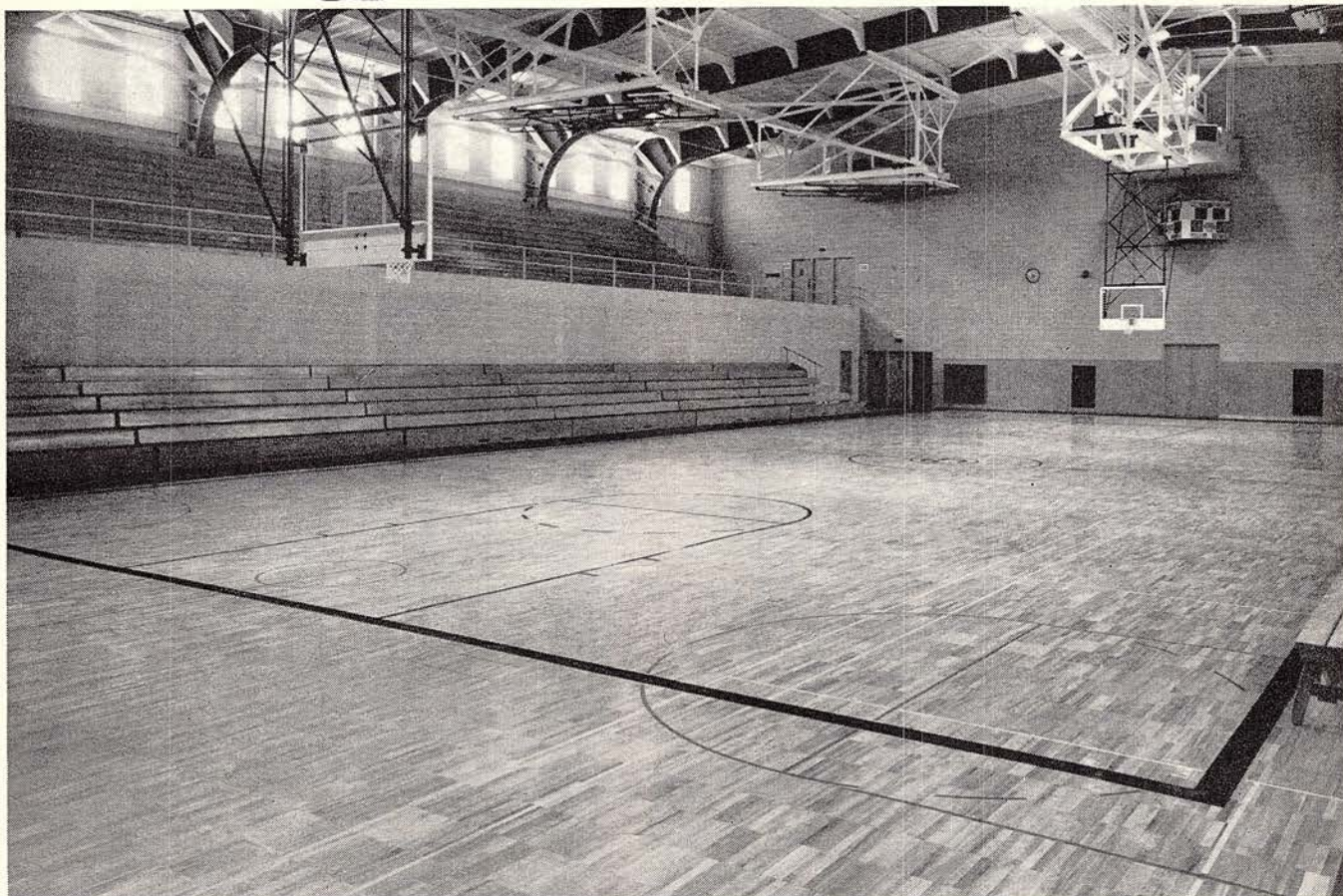
more literature on page 262





# ROBBINS **Ironbound** \*

CONTINUOUS STRIP MAPLE FLOOR



**Ironbound Continuous Strip** Floor consists of individual flooring strips interlocked with steel splines and embedded in mastic. Result: unexcelled uniformity in smoothness and resilience. An underlayment of  $\frac{1}{2}$ " cork gives extra resilience. Treatment with Woodlife preservative optional.

## The floor that guarantees uniform resilience and extra long life

In recreational and industrial buildings and many other areas, Robbins IRONBOUND is the most satisfactory of all floors for these reasons: Precision-milled from edge-grain Northern Hard Maple for maximum durability. Laid in mastic over concrete for uniform resiliency. Installed by expert, franchised floor contractors with guarantee backed by Robbins to assure complete satisfaction. From coast to coast, Robbins IRONBOUND Floors are giving trouble-free service in gymnasiums, auditoriums, industrial and institutional buildings with exacting floor requirements. For detailed data and the name of the nearest authorized installer, write: Robbins Flooring Company, Dept. AR-5-64, White Lake, Wisconsin.

\*REGISTERED TRADEMARK

**ROBBINS**  
flooring company



Dept. AR 5-64, White Lake, Wisconsin

SUBSIDIARY OF E. L. BRUCE CO., MEMPHIS, TENN.

For more data, circle 99 on Inquiry Card



Beautiful 5 million dollar San Francisco high-rise apartment building equipped with MUELLER BRASS CO. *Streamline*<sup>®</sup> plumbing and heating products throughout



Laguna Eichler Apartments developed and built by Eichler Homes • Architects: A. Quincy Jones, Frederick E. Emmons & Associates, A.I.A. • Mechanical Contractor: Currie Heating and Plumbing Co. • Landscape Design: Royston, Hanamoto, Mayes & Beck



**MUELLER BRASS CO.** 1945 LAPEER AVE.  
PORT HURON, MICHIGAN 48061

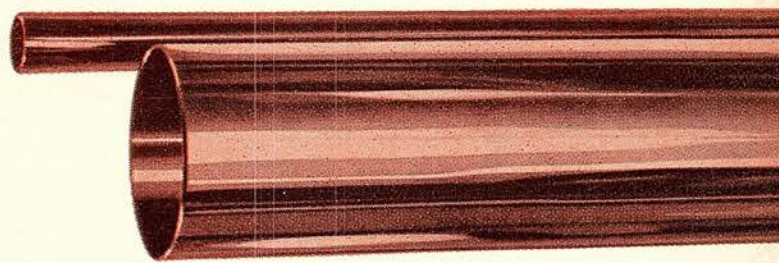
For more data, circle 101 on Inquiry Card



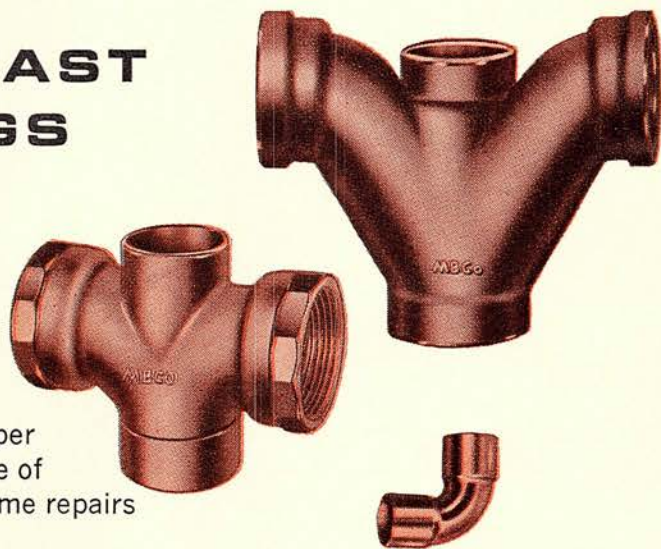
**104,120** FEET OF *Streamline*<sup>®</sup>  
TYPE L COPPER TUBE



**19,000** FEET OF *Streamline*<sup>®</sup>  
**DWV\*** TUBE  
(DRAINAGE, WASTE AND VENT)



**1,000'S** OF  
*Streamline*<sup>®</sup> CAST  
AND WROT FITTINGS



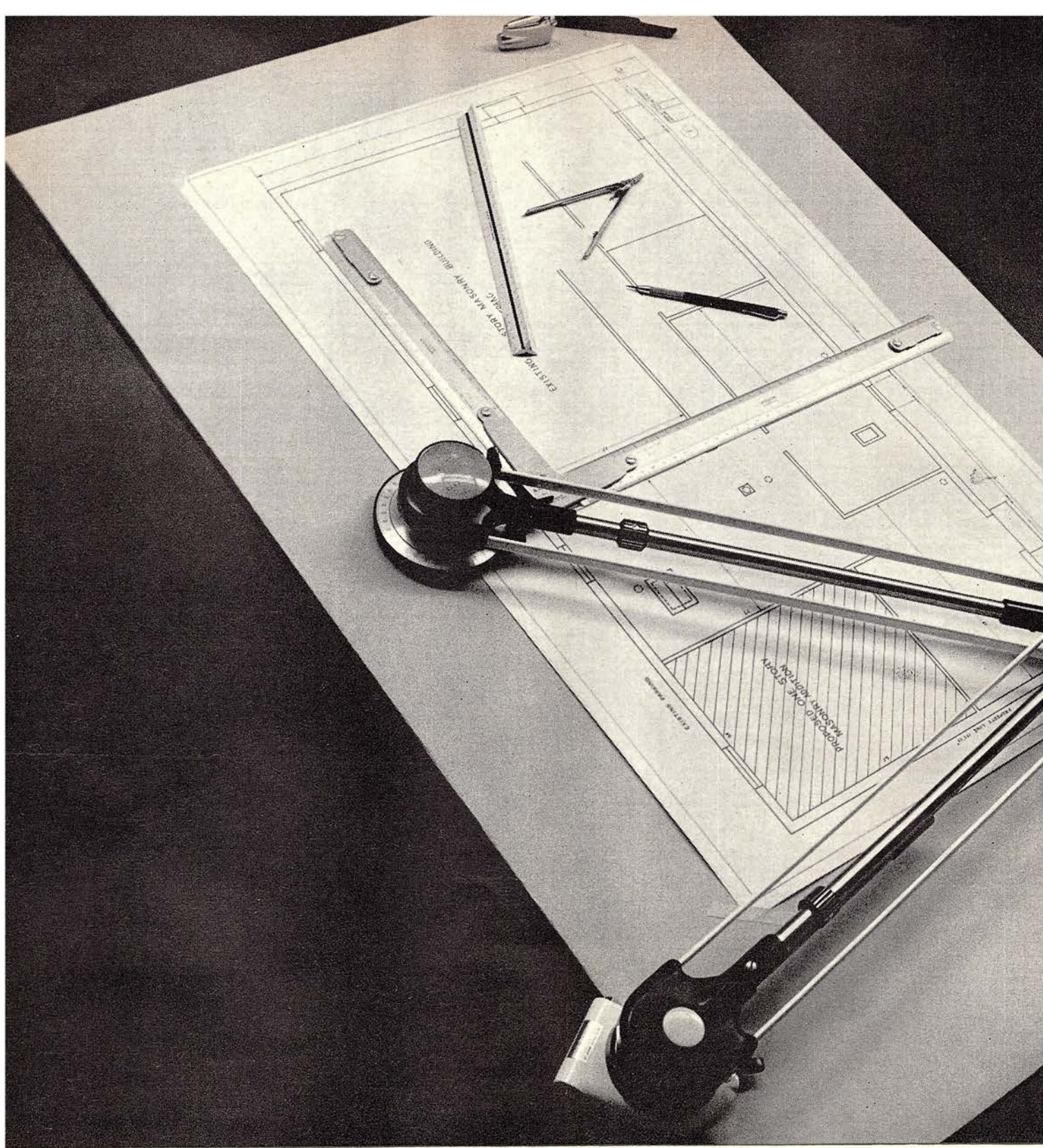
Everything about the new and exciting Laguna Eichler apartment project in San Francisco is crisp and modern . . . including the all-copper radiant heating installation, and the supply and drainage plumbing systems. Streamline copper tube and fittings, manufactured by the Mueller Brass Co., were used exclusively for all above-ground installations. Copper fits perfectly into this scheme of gracious living because of its dependability and long service life without troublesome repairs caused by rusting, leaking or clogging.

Streamline copper tube and fittings offer many other advantages, too. They are easy to handle, require fewer connections because of the convenient 20 foot lengths of tube, and a compact copper system actually adds available space because no furring out to accommodate bulky fittings and cumbersome pipe is needed.

Compare materials and you'll find that copper offers more on every count . . . for high-rise apartments or single story structures, Streamline copper tube and fittings are best for fabricating modern plumbing and heating systems.

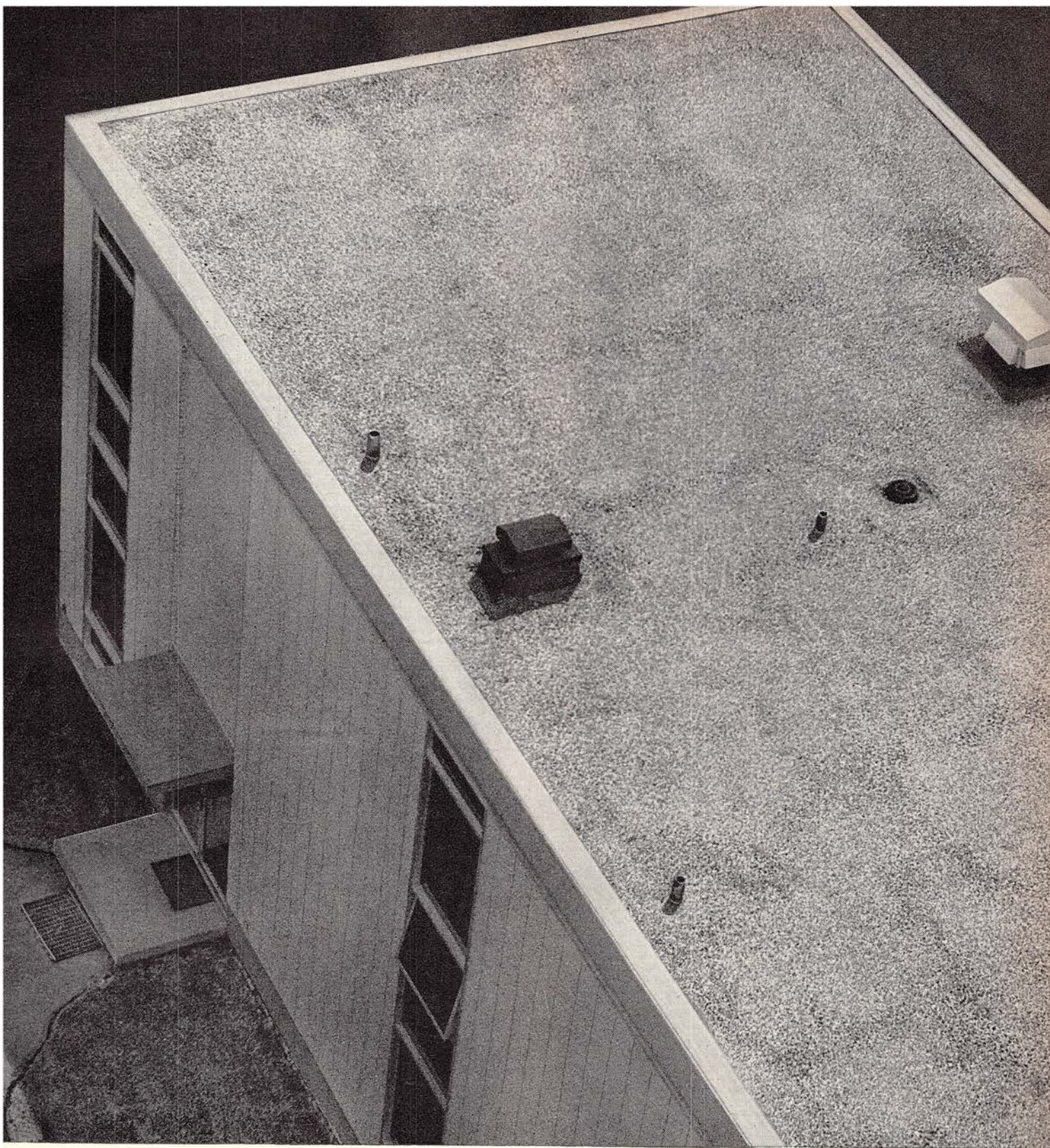
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**Remember Styrofoam.**





## OK. Now forget it.

Once a roof is insulated with Styrofoam® RM brand roof insulation, you won't have to worry about that insulation again. Forget it.

But be sure to remember Styrofoam RM next time you specify roof insulation. Remember that it's economical. Styrofoam RM costs no more than fiberboard insulations. Remember that its closed-cell struc-

ture won't absorb water. No more roof blistering and cracking caused by water-soaked insulation. Remember its low "k" factor. Remember that roofers find it light in weight, easy to handle, fast and easy to install. And most important, remember that with Styrofoam RM roof insulation, heating and cooling costs remain constant for the life of the roof. And clients remain

satisfied for at least that long.

Any questions? We'd be happy to send you all the data and specifications you need. Or see Sweet's Architectural File 8a/Dow. The Dow Chemical Company, Plastics Sales Department 1313N5, Midland, Michigan.

*Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes...look for this trademark on all Styrofoam brand insulation board.*



For more data, circle 102 on Inquiry Card





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## On the Calendar

### May

1-3 Annual Convention, Missouri Association of Registered Architects; theme, "Community Responsibility"—Kentwood Arms Hotel, Springfield, Mo.

14-15 16th National Engineering Conference, American Institute of Steel Construction—Sheraton-Fontenelle Hotel, Omaha

26-28 First National Convention of the Consulting Engineers Council—Denver

May 31-June 3 International Conference of Office Administration Executives, sponsored by the National Office Management Association—Statler Hotel, New York City

### June

8-11 Systems Engineering Exposition and Conference—New York Coliseum, New York City

8-19 First World Congress of Craftsmen, sponsored by the American Craftsmen's Council—Columbia University, New York City

13-18 Annual Meeting, American Society for Testing Materials—Purdue University, Lafayette, Ind.

14-18 96th Annual Convention, American Institute of Architects; theme, "The City—Visible and Invisible"—Chase-Park Plaza Hotel, St. Louis

21-25 57th Annual Meeting, Air Pollution Control Association—Shamrock Hilton Hotel, Houston

21-26 American Society for Testing and Materials Annual Meeting and 16th Materials Testing Exhibit—Conrad Hilton Hotel, Chicago

21-27 1964 International Design Conference, "Design '64: Directions and Dilemmas"—Aspen, Colo.

28ff 1964 Annual Meeting, American Society of Landscape Architects; through July 1—Hotel Baker, Dallas

29ff Summer Session program on "Structural Models", Department of Civil Engineering, Massachusetts Institute of Technology; through July 3—for admissions apply to Rm. 7-103, M.I.T., Cambridge, Mass.

### July

1-4 Annual Meeting, National Society of Professional Engineers—Grove Park Inn, Asheville, N.C.

For more data, circle 103 on Inquiry Card



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lighting history here's an  
industrial fixture—that gives  
50-100 FC with only ONE 1500 M.A. lamp:



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system for equally maintained foot candles.

Get the complete story on this latest GUTH invention—  
write for our engineering report #7 on the new UNO system.

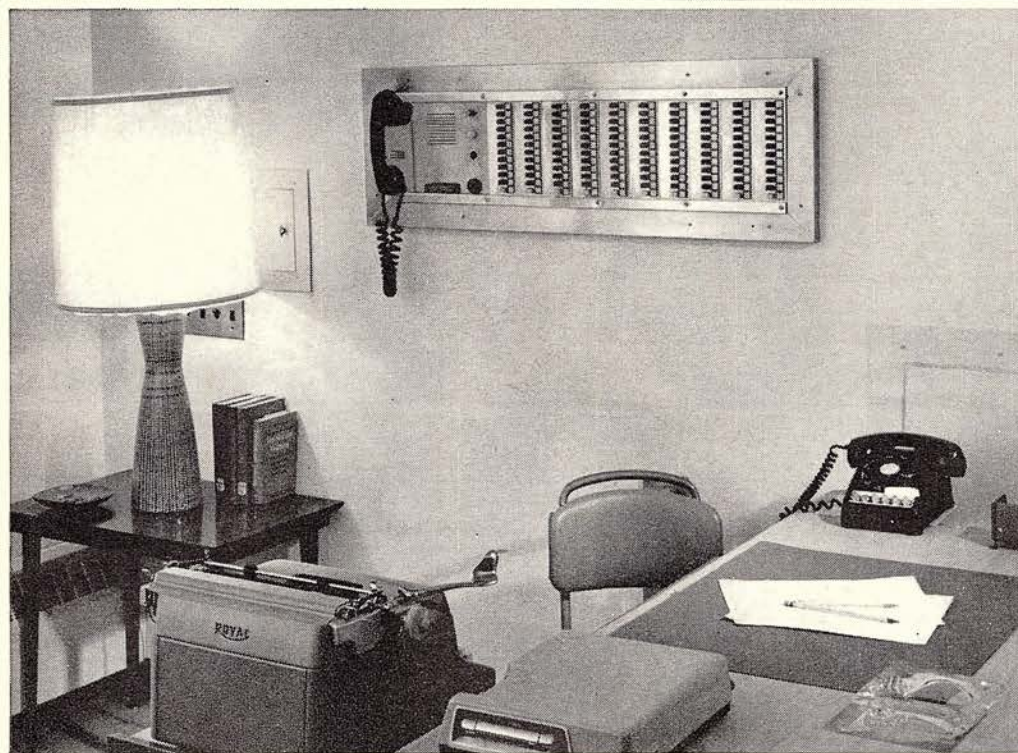
THE EDWIN F. GUTH CO. | BOX 7079 | ST. LOUIS 77, MO.



For more data, circle 104 on Inquiry Card



Up to five microphones can be used at once from any of three zones in the school Cafeteria-All Purpose Room. Five-way microphone connection is ideal for panel discussions or roving microphone use.



Control Station in each central office is connected to 102 room stations in building. Phone handset assures privacy of caller. Office can carry on conversations with each room or page all rooms simultaneously.



All it takes is a small closet to house the sound system equipment for the Cafeteria-All Purpose Room... Microphones and cable, amplifier, controls, and record player that provides background music during meals and social functions.

Wall-recessed room station blends perfectly with modern room decor. Light and chime announce incoming call. Privacy assured by talk button which must be depressed to complete the connection.







## STUDENTS GET THE MESSAGE FAST

*at the New Paltz*

*State University College*

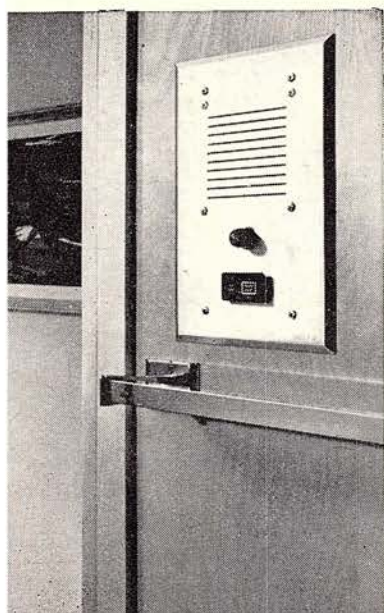
**Executone intercom systems in four new buildings make 350 double rooms instantly available to central offices for messages, paging, emergency alarms and instructions.**

Up-to-the-minute control and convenience in communications is an outstanding feature of the multimillion dollar building expansion at the State University College, New Paltz, N. Y. Exacting communication and sound requirements were met by two Executone systems: the dormitory intercom, and a flexible sound system for the combination Cafeteria-All Purpose Room.

Office personnel and students are saved considerable time and trouble by the Executone dormitory intercom system. No jam-up, no costly confusion at the central office. Messages are relayed immediately—simply by speaking over the system. Less chance of messages getting lost... for “message reminder” light in room stays on until the call is answered. Students may originate calls to the office at any time. The system can also be used to alert students and give instructions during fire, air raid alerts and other emergencies.

In the Cafeteria-All Purpose Room the sound system serves as a facility for background music as well as public address. Zone-type installation permits the use of five microphones at the same time from any or all of three separate areas in the room. This is ideal for panel discussions where several microphones are needed at once, and for meetings where “roving” microphones are desirable.

Avail yourself of Executone's wide experience in the college and university field when planning your sound and communication system. Have an Executone communications man go over your needs—recommend a system—estimate the cost—without any obligation. For full details write to Executone, Inc., Dept. Q-7, Austell Place, Long Island City 1, N. Y. In Canada, 331 Bartlett Avenue, Toronto.

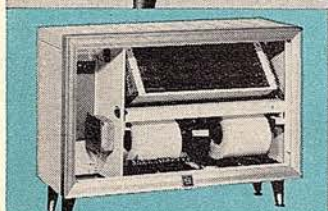


# *Executone*

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# NEW SCHEMENAUER "Series 70" CABINET UNIT HEATERS...

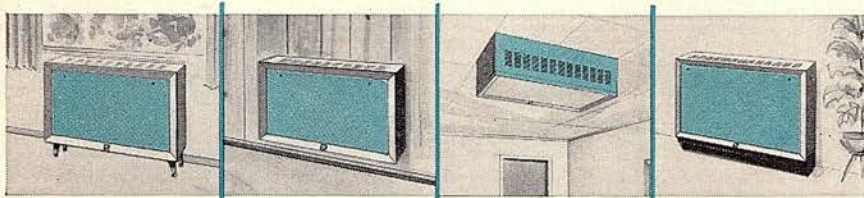


Single access panel, opened by special key lock, offers complete access to unit interior and end compartment.

Beautifully styled  
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EIGHT BASIC SIZES FOR USE WITH HOT WATER OR STEAM HEATING SYSTEMS

Model Number	*37	*50	*75	*100	**125	**150	**175	**200
Motor H.P.	1/20	1/20	1/6	1/6	1/4	1/4	1/4	1/3
CFM (Std.) Min.	261	328	457	658	843	965	1080	1260
(Air) Max.	385	510	770	1025	1280	1540	1795	2055
MBH (Hot Water) Min.	10.6	12.6	21.7	24.4	30.8	33.6	45.8	54.2
Max.	39.2	49.0	55.0	70.3	84.0	100.0	112.0	132.0
EDR (Steam) Min.	70	96	151	165	198	241	275	303
Max.	133	186	246	333	401	448	562	618

\*Models with integral shaft motors and direct driven fans.

\*\*These models have belt driven fan assemblies.

## SCHEMENAUER MANUFACTURING COMPANY

"the most thoughtfully engineered heating products made!"  
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CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

For more data, circle 106 on Inquiry Card

## Office Notes

### Offices Opened

John Franklin Hyer, Architect, has announced the opening of his office at 1600 Sherman Street, Denver

Robert Wanslow, Architect, has opened an office at 2815 South "Q", Fort Smith, Ark.

Edward J. Feheley, Jr., Architect, has established an office for the practice of architecture at 42 Chase Manhattan Bank Building, Rio Piedras, Puerto Rico.

### New Firms, Firm Changes

Caudill, Rowlett & Scott, Houston architectural planning and engineering firm, have announced a new associate partner category. Associate partners named were architects James B. Gattton, Franklin D. Lawyer, William W. Harper, and Robert Walters and engineer Joe B. Thomas.

Engineers Incorporated, 20 Mt. Pleasant Avenue Ave., Newark 4, N.J., appointed Marcel Thompson, A.I.A., as project manager.

Fred S. Dubin Associates, Consulting Engineers, 7 E. 47th St., New York 17, have elected Fred S. Dubin, partner, to the position of Vice President of "Project Unicorn, Ltd." The primary purpose of this group is to provide technical services to development programs throughout the world.

Faulkner, Kingsbury and Stenhouse, Architects, 1710 H St., N.W., Washington 6, D.C., have announced the memberships of Louis Nolte as associate and Avery Coonley Faulkner as junior partner.

Fulmer Bowers, Architects, 341 Nassau St., Princeton, N.J., have appointed Alice Heggan as director of client services.

Gibbs & Hill, Inc., Consulting Engineers, Designers, Constructors, 393 Seventh Ave., New York 1, N.Y., announced the organization of Gibbs & Hill Espanola, S.A. with headquarters in Madrid. Managing director is Boris Lochak and manager is Robert Safier. Jose Maria Rovira Burgada, attorney, is secretary. Other directors include D. B. Sloan, president of Gibbs & Hill, Inc. and B. G. Johnson, vice president of the same firm.

continued on page 232

For more data, circle 107 on Inquiry Card

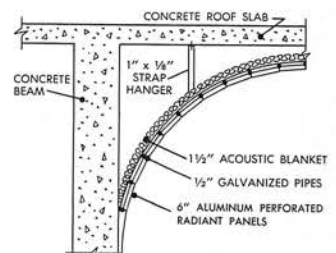




Architects: Shepley, Bulfinch, Richardson & Abbott, Boston, Mass.; Engineers: Richard D. Kimball Co., Boston, Mass.; Gen. Contractor: John A. Volpe Construction Co., Malden, Mass.; Radiant Ceiling Dist.: Pitcher & Co., Cambridge, Mass.

## AN INLAND RADIANT CEILING WAS THE ONLY ANSWER

**Heating and Cooling** this attractive dormitory reception room at Northeastern University, Boston, presented a dual problem: (1) How to heat and cool an area with seven vaults comprising the ceiling — and with outside glass walls measuring approximately 24 feet from floor to ceiling; (2) How to install mechanical equipment without breaking the contour of the vaults. ■ A Burgess-Manning/Inland Radiant-Acoustic Ceiling fulfilled the architect's requirements while providing year 'round comfort. The ceiling heats like the sun, cools without drafts, helps to control noise levels. It takes less space, eliminates much conventional equipment and permits wide design flexibility. For more details, see Sweet's, section 11e/In; or write for Catalog 250.



**Inland Steel Products Company** *Engineered Products Division*

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ATLANTA, BALTIMORE, CHICAGO, CLEVELAND, DALLAS, DETROIT, FREMONT (CALIF.), HOUSTON, KANSAS CITY (KANS.), LOS ANGELES, NEW ORLEANS, NEW YORK, ST. LOUIS, ST. PAUL, SAN FRANCISCO





All installations shown are in the  
Lawrence Central High School, Indianapolis, Indiana.  
Architects: Lennox, Matthews, Simmons and Ford, Inc.

Food lab showing  
demonstration area.

## High activity classrooms like these need the St. Charles touch.

Show us the space, and we'll create the ultimate in efficient and attractive classrooms. You'll get storage furniture that's a happy blend of colorful-beauty and rugged durability. And you get that special St. Charles touch!

The St. Charles secret is three-fold: experienced pre-planning, custom-design and time-tested construction. We plan to your curriculum, number of students and anticipated future loads. We are not committed to standard designs, so we can make full use of all available space. We build in steel—expertly fabricated and finished.

If you're an architect, or an educator with an interest in new construction or remodeling, send for our free School Storage Furniture Catalog—it's an excellent source of information and ideas.

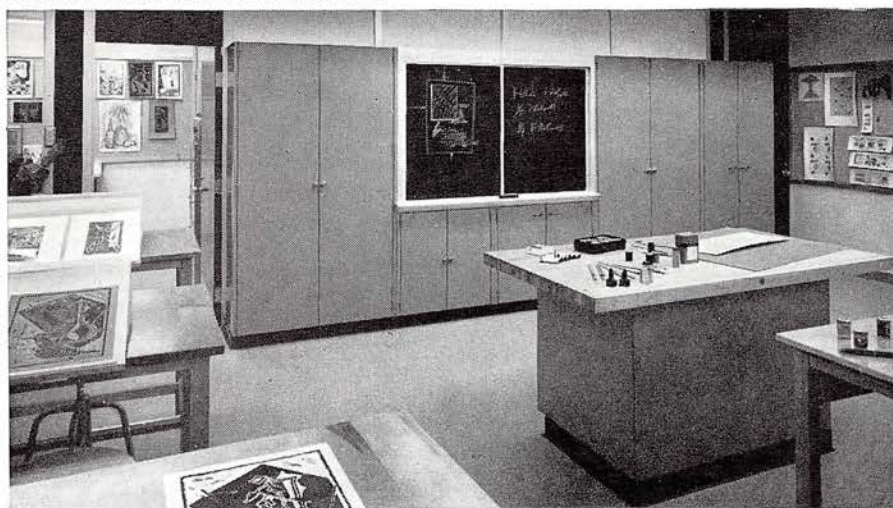


*St. Charles*

**CUSTOM SCHOOL STORAGE FURNITURE**

St. Charles Manufacturing Co., ARS-5, St. Charles, Illinois

Instruction area of the Arts and Crafts room.



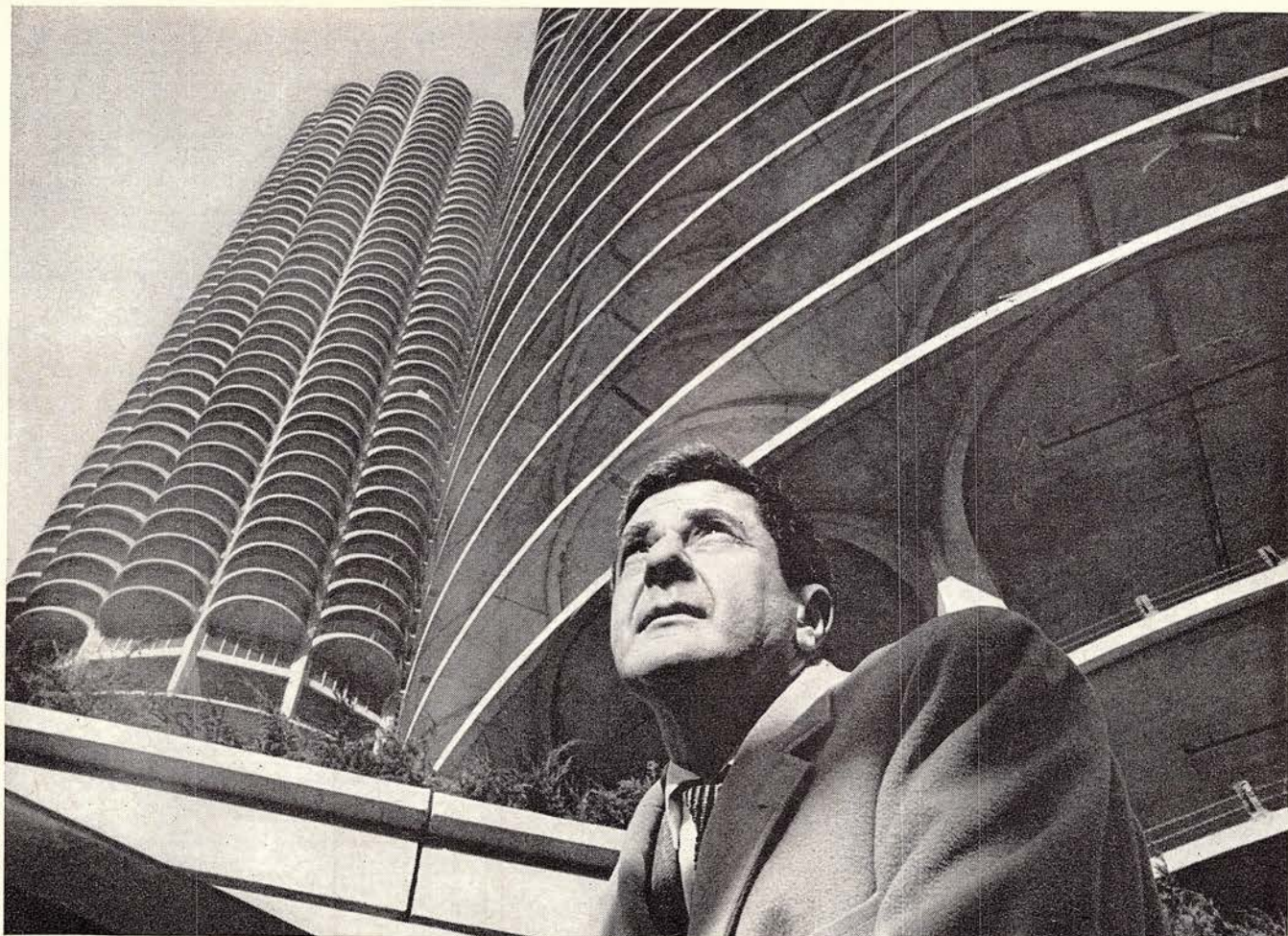
Tote-tray storage in the clothing lab.



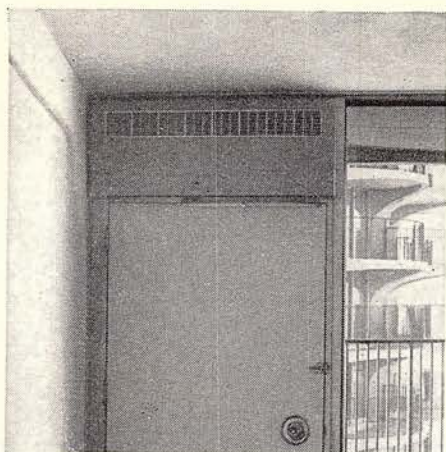
For more data, circle 110 on Inquiry Card

For more data, circle 111 on Inquiry Card ➔





## How Bertrand Goldberg used General Electric Zoneline Air Conditioning to design Marina City "for the varying needs of the individual tenant."



Again demonstrating its flexibility, a Zoneline unit has been installed above a door in a typical Marina City apartment.

Bertrand Goldberg explains a step forward in apartment design: "Today we are designing as flexibly as possible for the varying needs of the individual tenant. In the past we've frequently forgotten that each tenant has needs and preferences which are different from his neighbor's."

This new approach to apartment design is exemplified in Mr. Goldberg's Marina City, a 60-story project in Chicago housing 896 families, recreation and shopping facilities and a 700-boat marina.

"At Marina City individual Zoneline air conditioning units for each room allow not only each tenant—but each room occupant—to enjoy exactly the temperature and air environment that he desires. The push of a button gives each room occupant his choice of hot or cold air, automatic or manually controlled and either

re-circulated or filtered outdoor air."

Goldberg is also enthusiastic about Zoneline because it can be used so unobtrusively that "it doesn't compromise the integrity of the architectural design."

In addition to Zoneline room air conditioning, Marina City features 117 three-ton and 117 five-ton G-E central air conditioning units. Using both room and central air conditioning in the same building is just one more example of how Zoneline's flexibility and custom design can make it an integral part of any architectural design. For details, write Air Conditioning Department, General Electric, Appliance Park, Louisville 1, Kentucky.

**GENERAL  ELECTRIC**

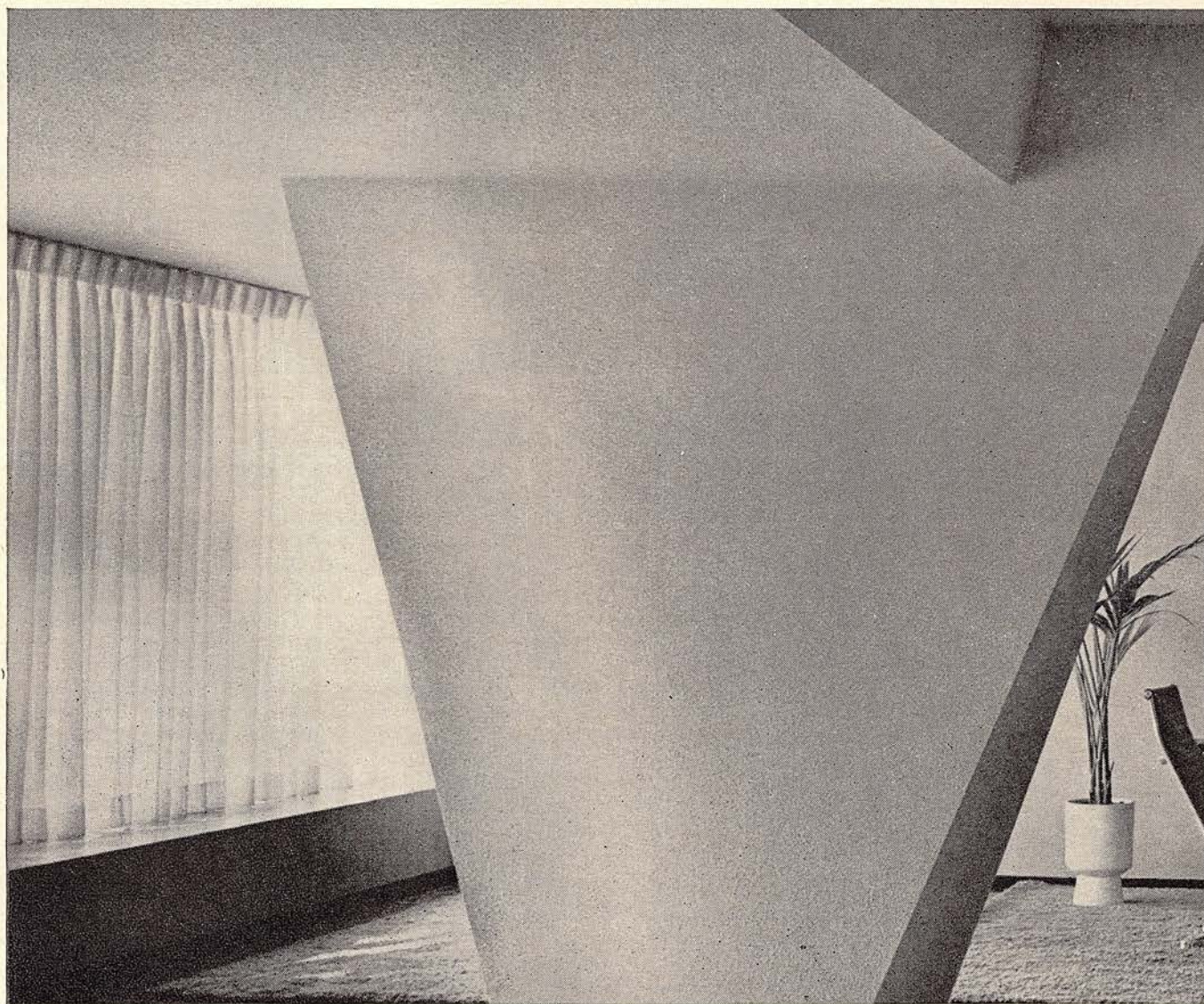
For more data, circle 112 on Inquiry Card



# When something new happens in building...

it's usually designed for monolithic reinforced concrete

■ A split-level design with bedrooms and living room separated distinguishes the 14-story Horizon House Apartments. This departure in apartment design provides for its tenants an atmosphere of single-family home living. The first of several similar luxury apartments to be constructed along the west side of the Hudson River, Horizon House is completely monolithic in its construction, with integral frame, walls, and ceilings. The architect's extensive use of concrete creates an effect of massive strength and simple beauty, inside and out. Today, for every type of building, monolithic reinforced concrete permits architects to design with greater feeling for individual expression—to break away from stereotype and building designs of the past. On YOUR next project, investigate the superiority of this versatile structural material.

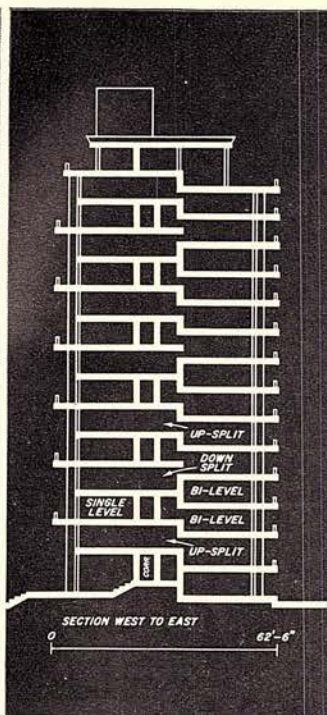
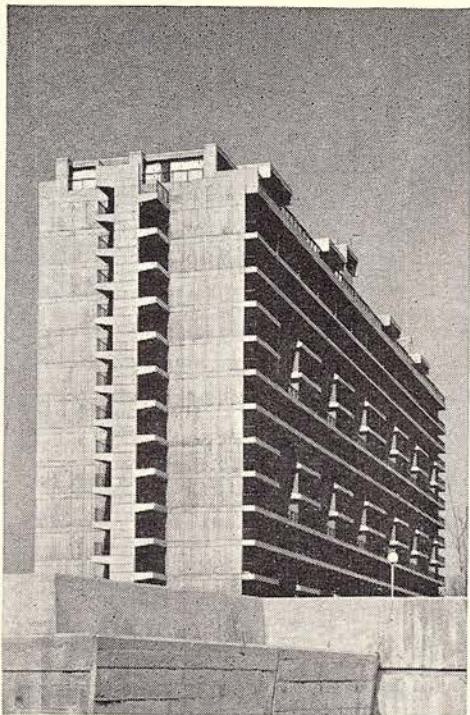


CONCRETE REINFORCING STEEL INSTITUTE

6-63

228 North La Salle Street • Chicago, Illinois 60601





In the Horizon House, all apartments run the width of the building with living areas overlooking the Hudson River. The transverse section drawing shows the unique split-level design of the individual apartments.

8-Inch solid concrete walls provide maximum acoustical benefits between individual apartments. The monolithic design of the building also permitted the architects to take unusual liberties in interior design.



Horizon House, Fort Lee, New Jersey Owner and Builder: Tishman Realty & Construction Co., Inc. Architect: Kelly & Gruzen Structural Engineer: Farkas & Barron Photographer: George S. Zimbel





Model 36-DY

# Sculptured in tenzaloy aluminum

MORE than a useful fountain, this new Haws twin bubbler unit, cast in Tenzaloy Aluminum, adds sculptured *outdoor emphasis* to architectural design. Model 36-DY echoes modern lines with bold form and imparts a quiet richness of color with its muted bronze, hard anodized finish. The surface resists scuffs, scratches and corrosion, the tough body wards off dents and nicks. Clients will appreciate Model 36-DY's vandal-proof features: Simple, push-button valves, locked-on bubblers, and under-plate to safeguard trim. For architectural beauty that lasts to the client's satisfaction, specify 36-DY.

Write today for complete specifications:



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Greenleaf-Telesca is the designation of the new association between John W. Greenleaf Jr. and B. A. McAdams, formerly known as Greenleaf Engineers and the firm of Francis E. Telesca, Architect, A.I.A. Offices are at 1393 S.W. First St., Miami 35, Fla.

Allan O. Bedford has joined Interior Space Design, Inc. in the office located at 485 Lexington Ave., New York, N.Y.

Karl Kaufman and Samuel F. Zambito have been named associates of Leo Kornblath Associates, architectural, planning and interiors firm located at 850 Third Ave., New York 22, N.Y.

Morris Ketchum Jr. and Associates, Architects, 227 E. 44th St., New York 17, N.Y., have announced that John P. Jansson, A.I.A., is now an operating partner of the firm.

Charles James Koulbanis Associates, Architects, 510 Madison Ave., New York, N.Y., have announced that Charles Avery Brandreth, has joined the firm as a partner.

Manfred Stryck has joined Levin, Pierce and Wolf, Consulting Engineers, 19480 Livernois, Detroit, as chief structural engineer.

John C. Goodall, a partner of The Perkins & Will Partnership, Architects, has retired from the firm. He will be a consultant with the firm and plans to conduct fiscal and administrative consultation with other architectural and engineering firms.

Ross W. Singleton, A.I.A., and Donald W. Reidenbaugh, A.I.A., have announced the organization of a firm under the name of Donald W. Reidenbaugh Associates, A.I.A., with offices at 243 North Duke St., Lancaster, Pa. Ross W. Singleton continues as an associate in the firm.

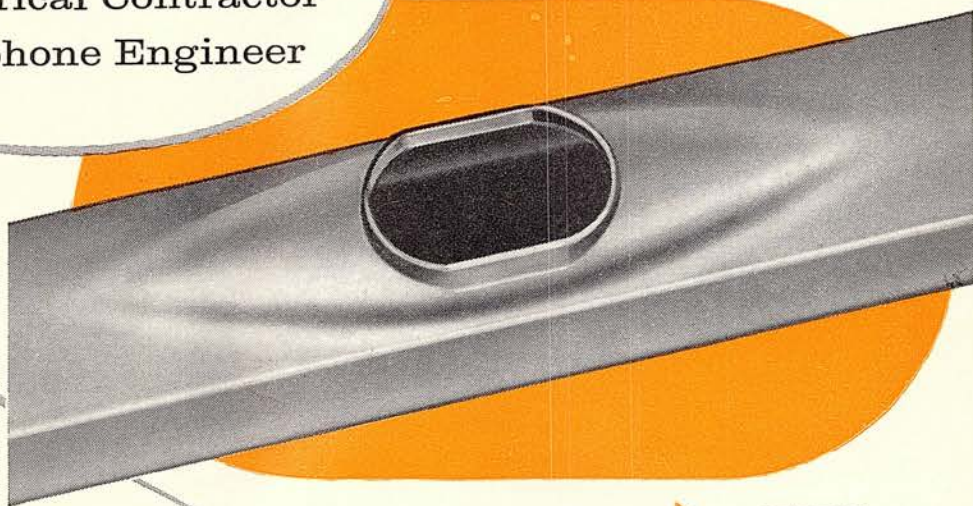
Sert, Jackson and Gourley, Architects, 4 Brattle St., Cambridge, Mass., have become Sert, Jackson and Associates. Ronald R. Gourley will continue a consulting practice in Cambridge.

Shepley Bulfinch Richardson & Abbott, Architects, 1 Court St., Boston 8, Mass., have announced the appointment of Daniel J. Coolidge as an associate of the firm.

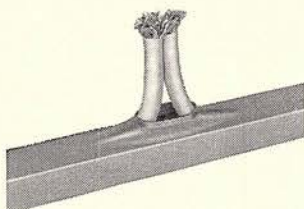
continued on page 236



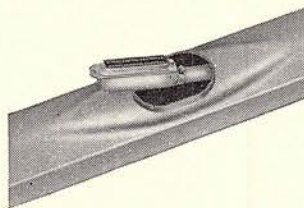
- X** Owner
- X** Architect
- X** Consulting Engineer
- X** Electrical Contractor
- X** Telephone Engineer



**BECAUSE THE INSERT IS SHAPED LIKE THIS**    
**INSTEAD OF THIS**   **...SQUARE D's NEW-DESIGN**  
**UNDERFLOOR DUCT HAS TREMENDOUS**  
**ADVANTAGES FOR EVERYBODY!**



• Notice how two 100-pair cables can be looped in Square D's exclusive ellipsoid insert—previously a physical impossibility. Naturally—additional insert heights are available.



• See how easy it is to slip the Amphenol connector into the ellipsoid insert and leave the cable undisturbed and ready for immediate reactivation.

• At first glance it may seem to be a simple, minor design change—but don't underestimate the significance of this new and exclusive ellipsoid insert. Here's what it does—

Makes it much easier to "fish" and pull cables...cuts installation time and cost drastically. Especially important in industrial installations because heavy, stiff power wires can be pulled without difficulty.

Permits looping two 100-pair telephone cables in one insert—see top photo at left.

Makes it possible, when telephones are moved from one location to another, to store Amphenol connectors in the underfloor duct, leaving the cable undisturbed and ready for immediate reactivation—see bottom photo at left.

This new ellipsoid insert is only one of several reasons why Square D underfloor duct offers more in convenience, efficiency and economy. Ask your Square D Field Engineer or contact your nearest distributor for the complete story. Or write Square D Company, Department SA, Mercer Road, Lexington, Kentucky.



**SQUARE D COMPANY**

*wherever electricity is distributed and controlled*

For more data, circle 114 on Inquiry Card



# *Introducing the all-*



## *So quiet you have to get*

*Trane research puts new materials  
and ideas to work in a new  
fan design...sets a new standard  
for quiet fan-coil operation!*

Only the air-conditioned comfort tells you it's on.

For at low speed you can't hear it.

And at high speed there's just a whisper of sound.

At either speed, the new Quiet-Zone UniTrane provides exceptionally quiet air conditioning for office, apartment, motel, hotel and hospital room air conditioning applications.

Why? Because a new design...made possible with the use of new materials...has been developed exclusively for the fan-coil UniTrane.

For example, the new sculptured fan housing features an exclusive molded design that increases efficiency while eliminating noise. Rugged, fiber-reinforced material makes the design possible.

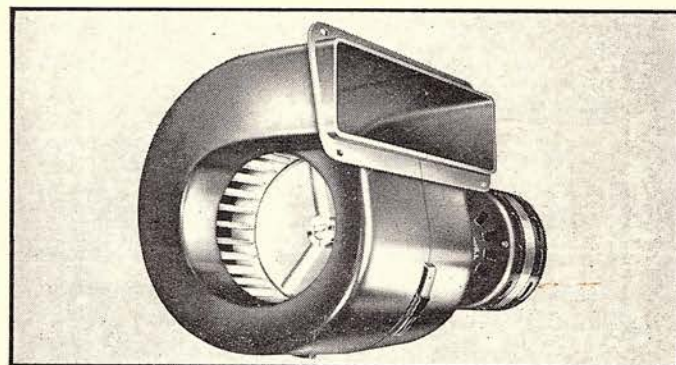
Air flow into the fan is exceptionally smooth. And two major sources of noise are eliminated...turbulence at

the fan air inlet and buffeting between outlet and coil.

Within the unique snail-shaped fan housing (see illustration below), air is permitted to expand in two dimensions instead of the one dimension common to conventional fan housing designs. Air moves smoothly, greatly minimizing noise-creating turbulence.

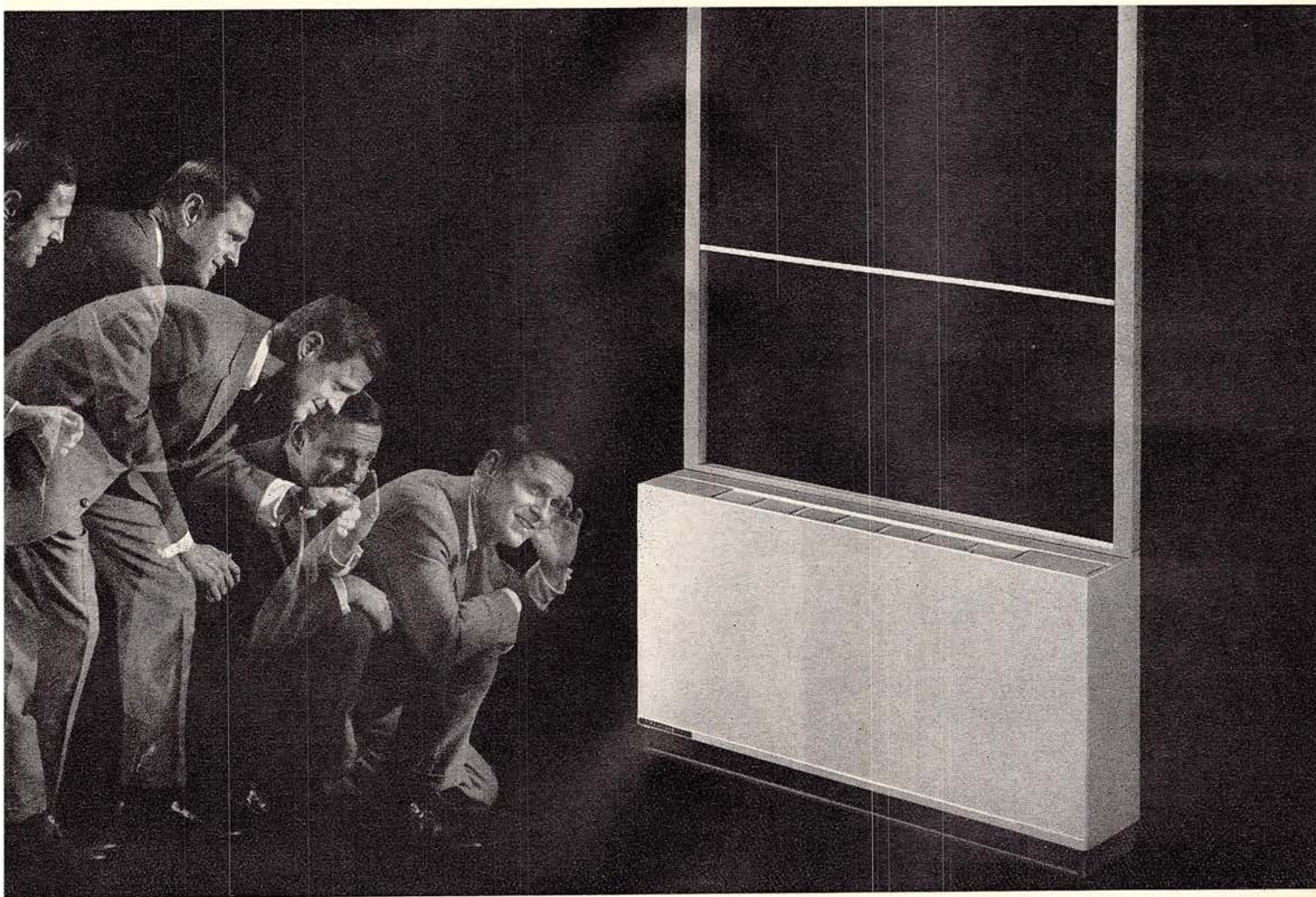
And, the wider discharge opening offers unusually even air distribution at low velocity across the coil, assuring high unit efficiency and contributing further to low sound level.

A new aerodynamically designed fan wheel works to eliminate noise, too. Made from a new high-strength





# *new fan-coil UniTrane*



## *this close to hear it*

glass-fiber material, it all but eliminates high frequency sounds . . . the sounds most irritating to the ear!

That's the inside story on the new Quiet-Zone UniTrane. With over 300 arrangements available, selection flexibility is every bit as exciting.

In many applications, smaller, lower-cost units can be used to meet requirements . . . because new UniTrane is capable of delivering more capacity per cfm. And in other cases you can cut piping, insulation and pump costs in half . . . selection flexibility makes it possible!

**8 basic models.** Vertical units: free standing or wall mounted, cabinet or concealed . . . plus recessed. Horizontal units: concealed or cabinet.

**4 basic heating-cooling coils.** Standard capacity; high capacity; internal face and bypass for excellent humidity control and economical unit control; and high water temperature rise coils which allow system cost savings up to 5% of the total mechanical contract.

**4 auxiliary coils.** For steam and hot water, high capacity hot water, and electric operation.

There's a beautiful side to the new UniTrane, too. Design engineers have styled the line in a new unobtrusive sheer-look that complements the beauty of any decor. That's why we say . . .

**You've never seen, never heard** a fan-coil room unit like this before. See it . . . try to hear it. This beauty is the quiet solution to your air conditioning needs. Contact your nearby Trane Sales Office. The Trane Company, La Crosse, Wisconsin.

# **TRANE**

FOR ANY AIR CONDITION

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

The Trane Company, La Crosse, Wis. • Scranton Mfg. Plant, Scranton, Pa. • Clarksville Mfg. Plant, Clarksville, Tenn. • Salt Lake Mfg. Plant, Salt Lake City, Utah • Lexington Mfg. Plant, Lexington, Ky. • Trane Company of Canada, Limited, Toronto • Trane Limited, Dunfermline, Scotland • 116 U.S. and 20 Canadian Offices.

"TRANE UNITRANE RATINGS ARE CERTIFIED UNDER THE INDUSTRY ROOM FAN-COIL AIR-CONDITIONER CERTIFICATION PROGRAM, ADMINISTERED BY THE AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)."



For more data, circle 115 on Inquiry Card





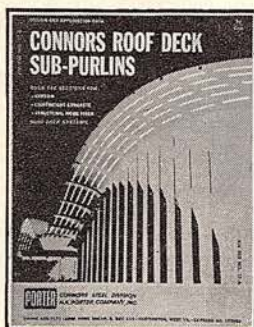
# BULB TEE ROOF DECKS

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Connors bulb tees are specially designed sections for roof deck applications. Rolled from A-440 steel, they provide an economical savings in weight and design versatility. Application data, properties and architectural specifications are contained in a descriptive brochure. Add this useful data to your AIA File . . . send the coupon to P. O. Box 118, Huntington, West Virginia.



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Connors Bulb Tee Sections for Roof Decks

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

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## Office Notes

*continued from page 232*

Smith Smith Haines Lundberg & Waehler have announced that James J. Buckridge has retired as comptroller and is now retained as consultant to the firm. Anthony J. Flaherty has taken over the duties of comptroller. Gregory E. Brooks, Lee Tagers and William North were named associates with the firm.

Spence and Smith, Architects, is the designation of a new partnership between James A. Spence, A.I.A., and A. Calvin Smith, A.I.A. The firm is located at 1241 North Michigan Ave., Saginaw, Mich.

John T. Roberts and Ricardo Scofidio have become associates in the firm of Richard G. Stein, Architect, A.I.A., 441 Madison Ave., New York 22, N.Y.

Sverdrup & Parcel and Associates, Inc., Engineers-Architect, 915 Olive St., St. Louis, Mo., have named changes in the firm's organization. Brice R. Smith was elected president, D. C. Wolfe was elected executive vice president, and Eugene J. Peltier was elected to the position of senior vice president and was made a member of the Board of Directors. Brice R. Smith Jr. was elected treasurer. Warren F. Knapp has taken the new post of comptroller and James J. Clancy Jr. became chief accountant.

William Hamilton Roehl, A.I.A., became an associate partner with Whittlesey & Conklin, Architects and City Planners, and Whittlesey Conklin & Echeverria, Planning Consultants on Foreign Projects, 31 Union Square W., New York 3, N.Y.

## New Addresses

*New Addresses* \_\_\_\_\_

Ulrich Franzen & Associates, Architects, 41 E. 57th St., New York, N.Y.

Genovese and Maddalene, Architects, 91 North Maple Ave., Ridgewood, N.J.

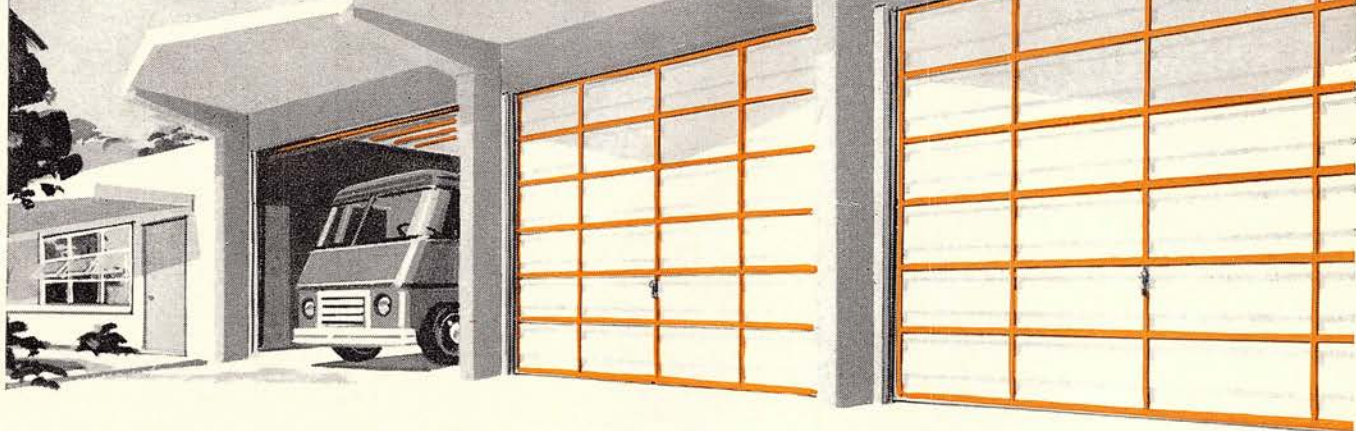
Morris Lapidus Associates, Architects, 1688 Meridian Ave., Miami Beach, Fla.

Chatterjee and Polk, Architects, Engineers, Town Planners, Penthouse B, 145 E. 52nd St., New York, N.Y.



## RōWay **ALUMALUX**

**industrial-commercial  
garage doors to fit in  
with any plan  
you create!**



**Specify **ALUMALUX** ... the aluminum-fiberglass door ...  
for beauty, easy operation and low maintenance cost**

**LIGHTWEIGHT** — Easy to operate, weighs only one-third as much as wood or steel doors.

**ATTRACTIVE** — Corinthian White panels and gold anodized aluminum frame blends and beautifies any style of architecture, any color.

**TRANSLUCENT** — Lightens and brightens interior of building with soft, natural daylight, yet seals out weather, keeps out intruders.

**MODERN MATERIALS** — Widely used and accepted construction materials include fiberglass panels framed by sturdy aluminum sections for long wear, long life.

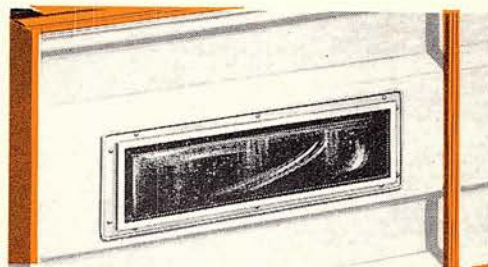
**CONSTRUCTION** — Panels are a permanent type fiberglass, square-ribbed for strength and rigidity. Box section aluminum frames are of extruded, tempered aluminum, gold anodized for lasting finish.

**HARDWARE** — Full size hardware used throughout. Heavy gauge steel, galvanized to resist rust and corrosion. Automotive type, automatic latch, key operated with "lock-out" chrome plated handle.

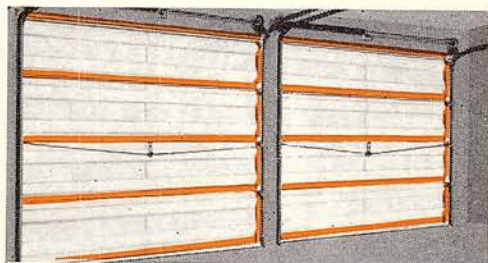
**OPERATION** — Easy to operate, the AlumaLux door weighs only one-third that of a wooden or steel door. Electric or chain hoist operation optional.

**MAINTENANCE** — Weatherproof and shrinkproof. No painting or glazing required. Easily cleaned with garden hose. Non-rusting aluminum and permanent-type fiberglass always looks new.

**BEAUTY** — The attractive appearance of the AlumaLux door adds quiet beauty to any building. Blends equally well with every style architecture, any color. The complete harmony of sparkling gold aluminum frame members set off by the Corinthian White panels provides an attractive appearance that never requires a change.



See-thru panels available if required for clear vision.



Soft, natural daylight illuminates interior of garage with complete privacy.

**SIZES** — Commercial: any size up to 24' wide by 18' high. Residential: any size up to 20' wide by 7' high. All doors 1 3/4" thick.

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**RōWay**  
OVERHEAD  
DOORS

*there's a RōWay for every Doorway!*

**ROWE MANUFACTURING COMPANY**

Dept. AR54, Galesburg, Illinois



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A photograph of a window set into a light-colored brick wall. The window has a dark, possibly black or dark grey, frame. The glass is dark and reflects the surrounding environment. The text is centered on the glass.

## **The demise of the heavyset sash**

Felled by slim, strong, satin-finished  
**FREEDOM WINDOWS** of Stainless Steel



**There was a day** when the window frame was a thing of quiet elegance. Take a drive through colonial New England and you'll know when that day was.

But somewhere along the line windows began to take on bulk. They lost their slim precision. Apartments, hotels, schools, and houses (ranch, split-level, modern, and Georgian) all sported excess beef in the portals. Take a drive through Modern Suburbia anywhere and you'll see what we mean.

**The new FREEDOM WINDOW of Stainless Steel** goes back to first principles. Slimness. Unobtrusive elegance. Perfect proportion. And combines these with the strength; resistance to weather, heat, and corrosion; long-range thrift; and permanence of solid stainless steel.

There are 17 things FREEDOM WINDOWS won't do. They won't stick, rust, etch, crack, chip, peel, flake, twist, rot, discolor, warp, swell, shrink, scratch, bleed, rack, or pit. *Not ever.* Oh, their neutral satin surfaces may occasionally get dirty. If the rain doesn't clean them, soap and water will.

Slim FREEDOM WINDOWS of Stainless Steel (single-hung, double-hung, and sliding) are available from Republic's MAN FROM MANUFACTURING (and only from Republic's MAN FROM MANUFACTURING). He's at the other end of both your telephone and the coupon.

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THE MAN FROM  
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**MANUFACTURING DIVISION**  
**Republic Steel Corporation • Dept. AR-7405**  
**Youngstown, Ohio 44505**

Please send me complete details on FREEDOM WINDOWS of Stainless Steel.

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19 Fire Retardant Design Numbers  
and 7 Tile Companies

Armstrong • Celotex • National Gypsum •  
Wood Conversion • Johns-Mansville •  
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Bestwall "Firestop 120."

but... in addition to its unexcelled fire retardant qualities, the Donn D-L can be purchased for only pennies more per square foot over ordinary grid systems. Install any tile now — fire rated at any later date. The Donn D-L's 2 simple parts mean fast and economical installation plus the guarantee that its exclusive lay-on cross tee will eliminate tilted and exposed surface edges.

**DONN** PRODUCTS, INC.  
700 BASSETT ROAD  
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Write for Donn Ceiling Catalog  
No. 39 for complete architectural  
specifications.



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## CALIFORNIA BANK PRESERVES OLD BENEATH NEW



Historical awareness has been asked to join with practical objectives in the design for the Bank of California's new \$12.5 million head office. The program for this 20-story addition was outlined by the bank's president, Charles de Bretteville: "As a bank with roots in earliest San Francisco and California, we felt a keen need to preserve our historic building which was one of the first to be built after the 1906 earthquake, evidence of the confidence and insurmountable spirit of our predecessors. We hope our example will encourage others to recognize and preserve landmarks and monuments of the past and to build with a sensitivity to one's neighbors on an elegant, yet gracious scale."

The architects, Anshen and Allen, have designed a 30-foot cantilever on the east side of the tower to project over the roof garden of the older building, with the stated aim of "tying in" the old with the new. This section also contributes to the unusual 82 per cent ratio of net to gross rentable space. The top two floors of the new tower will also have landscaped terraces. The gray granite facing of the tower core was chosen to blend with the existing facing of the original structure. The horizontal banding of the main tower floors will be of precast concrete panels.

Cahill Construction Company has been awarded the contract. The 280-by 824-square-foot addition is scheduled for completion in summer 1966.

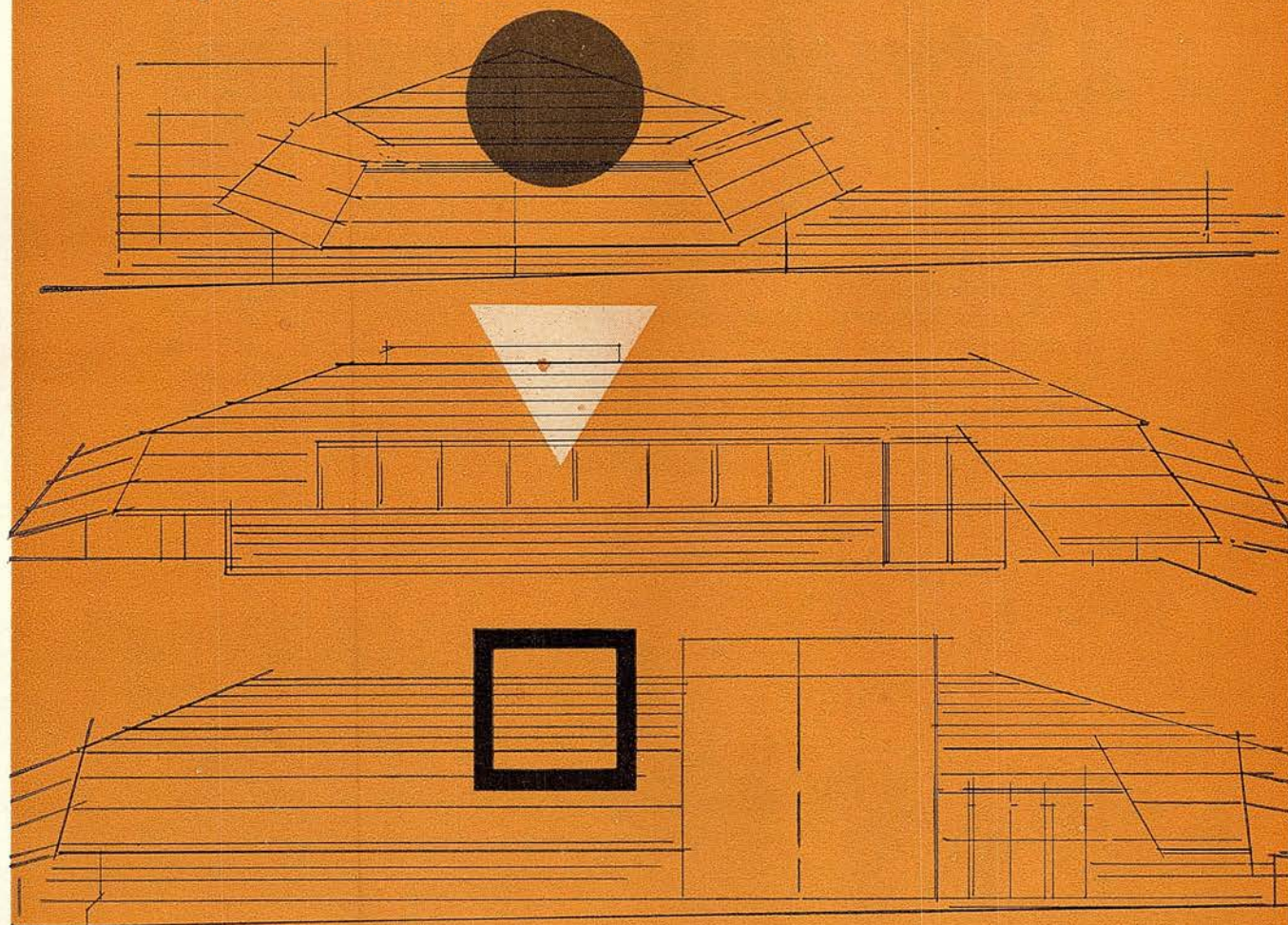




**FOLLANSBEE STEEL CORPORATION**

Follansbee, West Virginia

As Frank Lloyd Wright once remarked, "Because of its inherent adaptability . . . Follansbee Terne permits the visible roof area to become a significant part of structural design." The recently completed Fasbender Clinic at Hastings, Minnesota—one of his last major projects—dramatically confirms this statement. Here COLOR ● and FORM ▼ unite in a singular felicity of expression, underlined by the FUNCTIONAL □ integrity of the material itself.



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

For more data, circle 120 on Inquiry Card



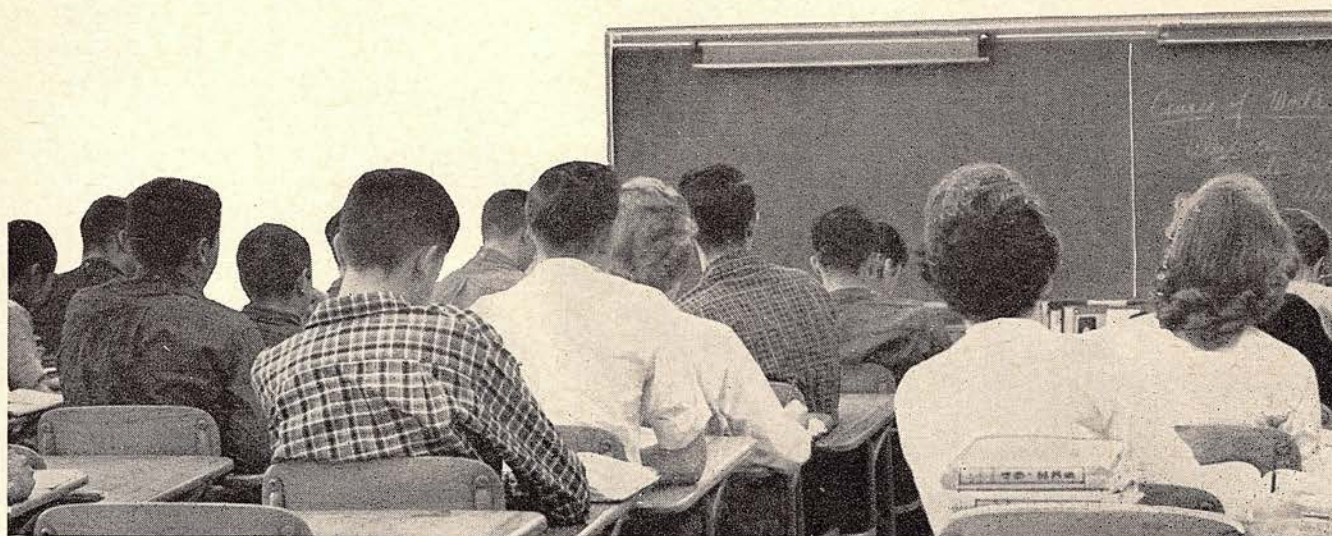
# ***YORK Air Conditioning gives these schools a better climate for learning!***

More and more modern school buildings are being equipped with year-round air conditioning systems to give students a better climate for learning—and to make the school buildings available for summer classes or other community activities.

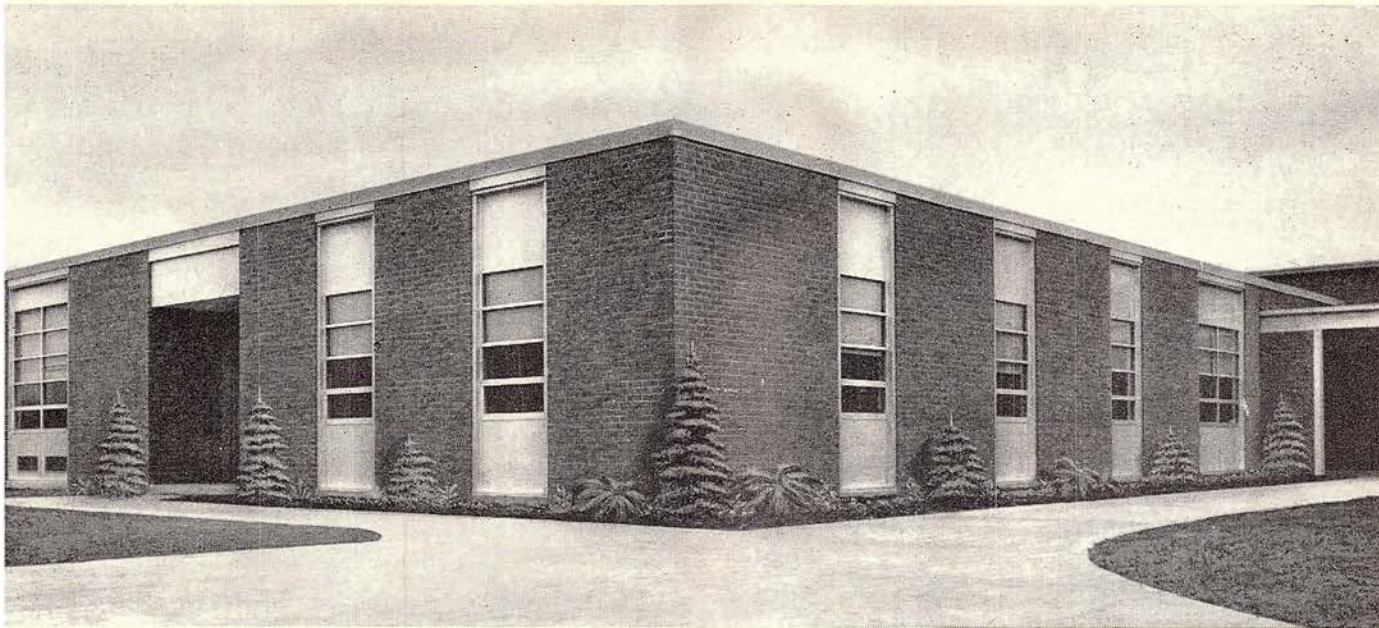
York air conditioning systems can be engineered for any type of school building—economically. York Heat Pump systems, for example, offer low-cost heat-

ing and cooling—with no fuel storage problem, no wasted space for boilers.

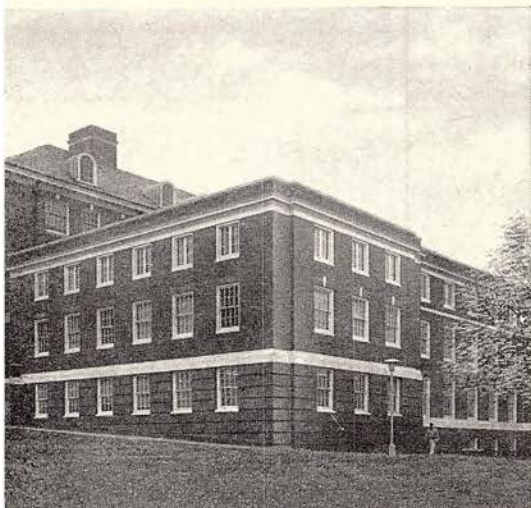
When you plan air conditioning for any school, new or existing, get specification data on York equipment from your York Representative. Or write York Corporation, York, Pennsylvania. In Canada, National Shipley Company, Ltd., 326 Rexdale Boulevard, Rexdale, Ontario.



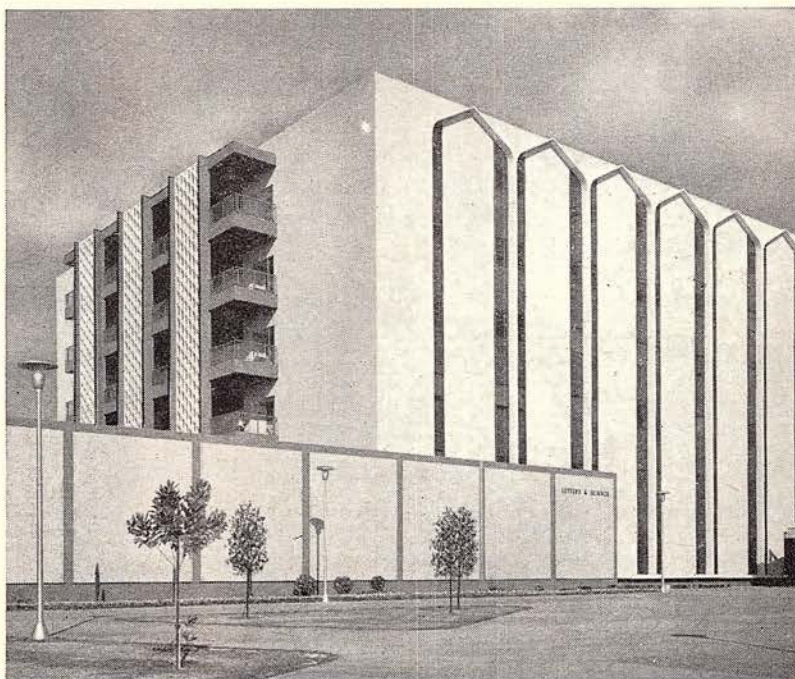




**Pleasant Valley Elementary School**, Rockingham County, Virginia. A York Heat Pump uses only electricity and air to provide both heating and cooling for this modern school. Architect, Davis & McClintock, A.I.A., Harrisonburg, Virginia. Engineer, Sowers, Rodes and Whitecarver, Roanoke, Virginia. General Contractor, J. H. Fralin and Son, Roanoke, Virginia. Air Conditioning Contractor, Riddleberger Bros. Inc., Harrisonburg, Virginia.



**Johns Hopkins University**, Baltimore, Maryland. A centrally located York absorption system provides chilled water for cooling several buildings. Engineer, Egli and Gompf, Inc. Mechanical Contractor, Green Contracting Company.



**Orange State College**, Letters and Science Building, Fullerton, California. York equipment in nearby central refrigeration plant provides chilled water for air conditioning. Architect and Engineer, Office of Architecture and Construction, State of California. General Contractor, Kemp Bros. and George K. Thompson (joint venture), Los Angeles. Mechanical Contractor, Climate Conditioning Company, a Division of Paul Hardeman, Inc., Stanton, California. Boiler and refrigeration equipment work by Scott Co. of California, Los Angeles.



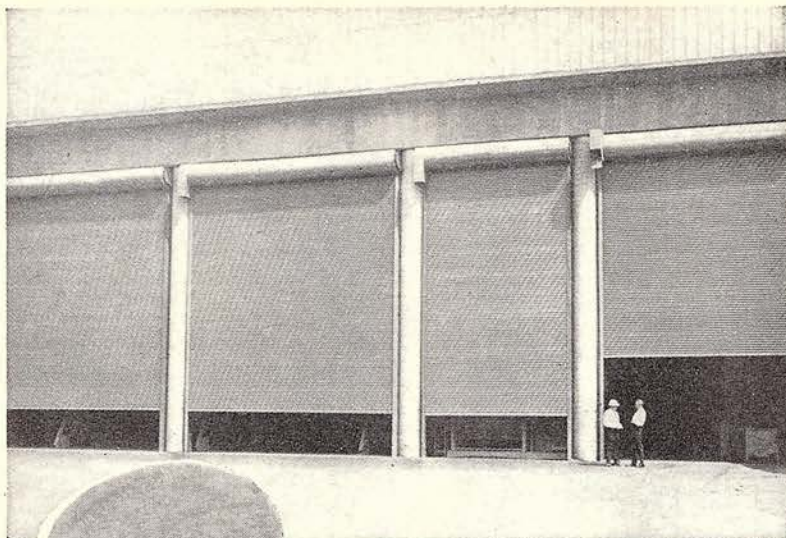
**YORK** CORPORATION  
Subsidiary of Borg-Warner Corp.  
YORK, PENNSYLVANIA

THE QUALITY NAME IN AIR CONDITIONING AND REFRIGERATION



For more data, circle 121 on Inquiry Card





## Pin points another source of efficiency



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

The call today for operating efficiency in every detail of a building's design is another reason Kinnear Rolling Doors are more universally specified than ever.

The all-metal, heavily galvanized steel, interlocking slat\* curtain of Kinnear Steel Rolling Doors is the proven, most efficient way to solve your door requirements. The smooth, easy, upward coiling action saves labor, as well as floor and wall space. They provide the most durable closure against weather, fire and intruders. Also, they are ideal for motorized operation with convenient remote control. Added to these benefits is "Registered" life extension service, to insure against a Kinnear Door ever becoming obsolete. Specify "KINNEAR" on your buildings — and write or call for details.

*\*Also fabricated in aluminum and other metals.*

### The KINNEAR Manufacturing Co. and Subsidiaries

**FACTORIES:** { 1860-80 Fields Avenue, Columbus 16, Ohio  
1742 Yosemite Avenue, San Francisco 24, Calif.  
3683 Dundas Street West, Toronto, Ont., Canada  
*Offices and Representatives in All Principal Cities*

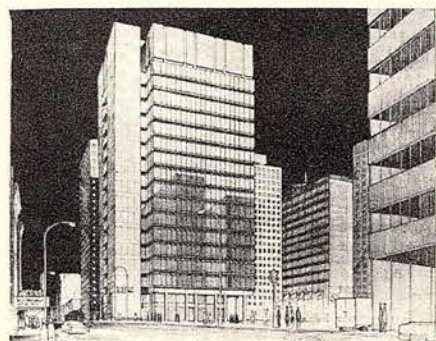
For more data, circle 122 on Inquiry Card



### WASHINGTON VISTA FOR OFFICE TOWER

Directly across the Potomac from the nation's Capitol, Virginia's tallest office building is nearing completion. Designed by Vosbeck-Ward and Associates, the building will afford its tenants, who are expected to do research and development work for the U.S. Government, a panoramic view of Washington.

The \$5.5 million office tower rises 177 feet above four underground levels of parking. The two lobbies and the first floor exterior columns will be finished in Grecian marble. Continuous precast concrete vertical white sun fins and column covers located on a 4-foot module enclose the upper walls.



### IBM BUILDS IN PENN CENTER

Considerations of both company objectives and of the role it will play as the first proprietary building in Philadelphia's Penn Center were major factors in the design of the IBM building by Vincent G. Kling.

Since an unusual flexibility and openness for office floors was desired for this 21-story tower, the elevator service core has been offset on the south side, leaving the center of every office floor unobstructed. The other sides, faced with floor-to-ceiling glass, open on to the pedestrian esplanade. The service core, by contrast, is limestone-faced.

For more data, circle 123 on Inquiry Card





## New ideas in ageless structural clay tile by Natco

Use Natco ceramic glazed Vitritile to dramatize a concourse. Form a lobby wall. Create a mosaic design or mural. Vitritile means radiant color, or the subtle dignity of soft shades. With the new Decorata pattern there's a geometric emphasis. Natcoustile has sound-absorbing

perforations. ■ Select from over forty standard, accent or vivid colors—each with a hard-burned, glazed finish. Fire-proof. Chemical resistant. Impervious to moisture. Vitritile requires a minimum of maintenance. ■ Natsol Solar Screen Tile complements a design

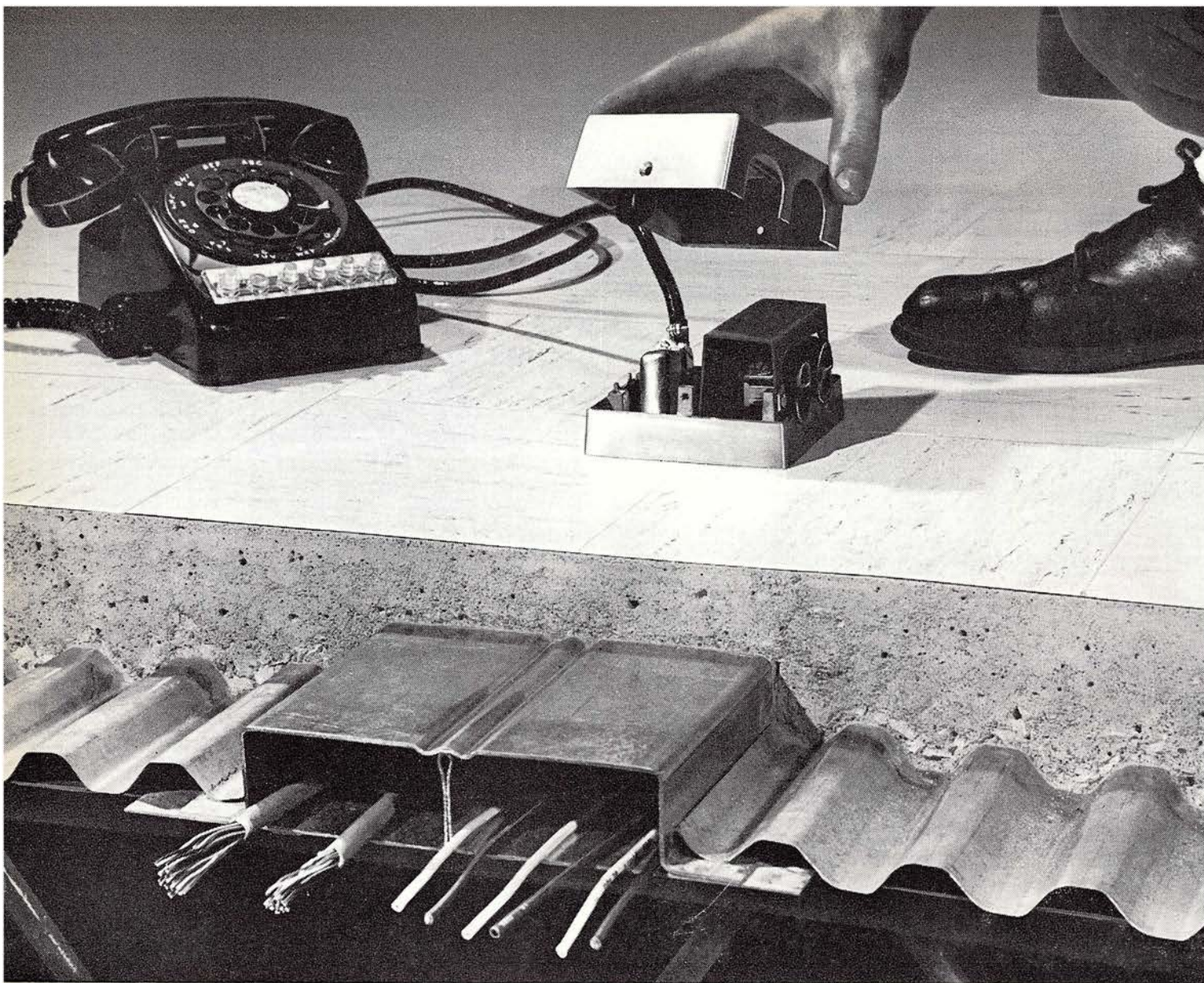
while protecting against direct sunlight. Use as an interior divider, too. Available in glazed or unglazed finishes. ■ Write for catalog S-64.

Vitritile comes in three nominal face sizes: 8" x 16", 5 1/3" x 12" and 5 1/3" x 8".

**GENERAL OFFICES:** 327 Fifth Avenue Pittsburgh 22, Pa. **BRANCH SALE OFFICES:** Boston • Chicago • Detroit • Houston • New York • Philadelphia • Pittsburgh • Birmingham, Ala. • Brazil Ind. • Sayreville, N.J. **IN CANADA:** Natco Clay Products Ltd., Toronto, Ont.

**Natco** corporation





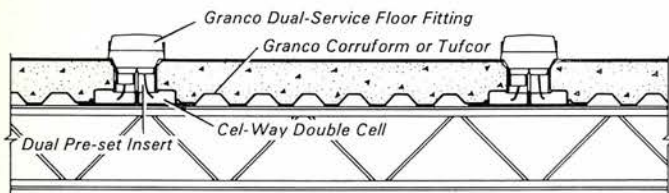
## ***Granco's new Cel-Way floor system uses one fitting for power and telephone***

Now for the first time, you can fully electrify thin, structural slabs over steel joists! Granco's new Cel-Way system gives you cellular-floor electrical capacity in a compact slab. Large-capacity single, wide or double cells, blended with a Granco permanent steel form (shown above with *double cells* and Corruform®), provide the form for wet concrete and raceways for telephone and power...all within a single thin slab!

For high-capacity systems—using double cells—optional new dual-service floor fitting and matching dual pre-set insert offer additional benefits and economy. The new, satin-finish fitting encloses *both* telephone and power outlets in *one* fixture...to cut in half the number of fittings

needed. To meet modern telephone requirements, each fitting can conceal two amphenol jacks. Floor cleaning and maintenance is easy. Servicing communication needs of present and future tenants is simplified.

With Cel-Way you can design complete in-floor electrification for any building in a new, economical way. For floors requiring long spans and greater load-carrying capacity, combine Cel-Way with Granco Tufcor®, Cofar®, or Cofar Composite. For more information about Cel-Way, see our catalogs in Sweet's, or send for Cel-Way catalog 99-363. Write Granco Steel Products Company, 6506 N. Broadway, St. Louis, Missouri 63147. A subsidiary of Granite City Steel Company.



District Offices: Atlanta • Chicago • Cincinnati • Dallas • Detroit • Houston • Kansas City • Los Angeles • Minneapolis • New York  
St. Louis • San Francisco • Tampa • District Representatives: Greenville, S.C. • Little Rock, Ark. • Washington, D.C.

For more data, circle 124 on Inquiry Card

# **CEL-WAY**

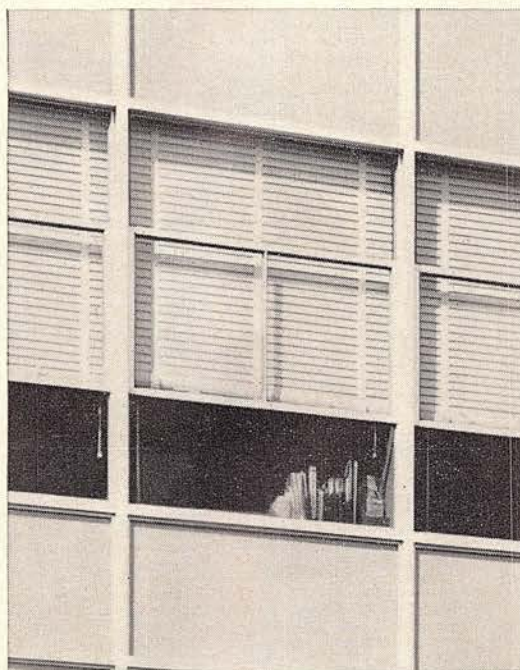
IN-FLOOR ELECTRIFICATION SYSTEM

# **GRANCO**





# You can keep <sup>\$</sup>131<sup>61</sup> from going out the window



with solar control  
by "Flexalum" Aluminum Blinds

\$131.61 for *every* 18 sq. ft. window in your building, that is. By reducing your cost of air conditioning.

Flexalum Aluminum Blinds control the heat of the sun in modern buildings with massive glass areas, so they lower the air conditioning capacity required. Lower it by a ton for each 136 sq. ft. of glass.

In dollars and cents this means a savings in original air conditioning of \$118.80 for every 18 sq. ft. window

\* All figures for typical West exposure, New York City.

plus \$12.81 every year in operating savings and financing costs (7 times the cost of the blinds).\*

Want proof? Send for your copy of the pioneer study: "Cost analysis of Solar Controls" by Alfred J. Jaros, Jr. of Jaros, Baum and Bolles, Consulting Engineers, New York. This article, from the July 1963 issue of *Buildings Magazine*, explains the most efficient way to handle the large glass areas in today's modern buildings.

*Flexalum*

Bridgeport Brass Company  
30 Grand Street, Bridgeport 2, Conn.

Please send me a copy of the Jaros study on solar control.

MR. \_\_\_\_\_

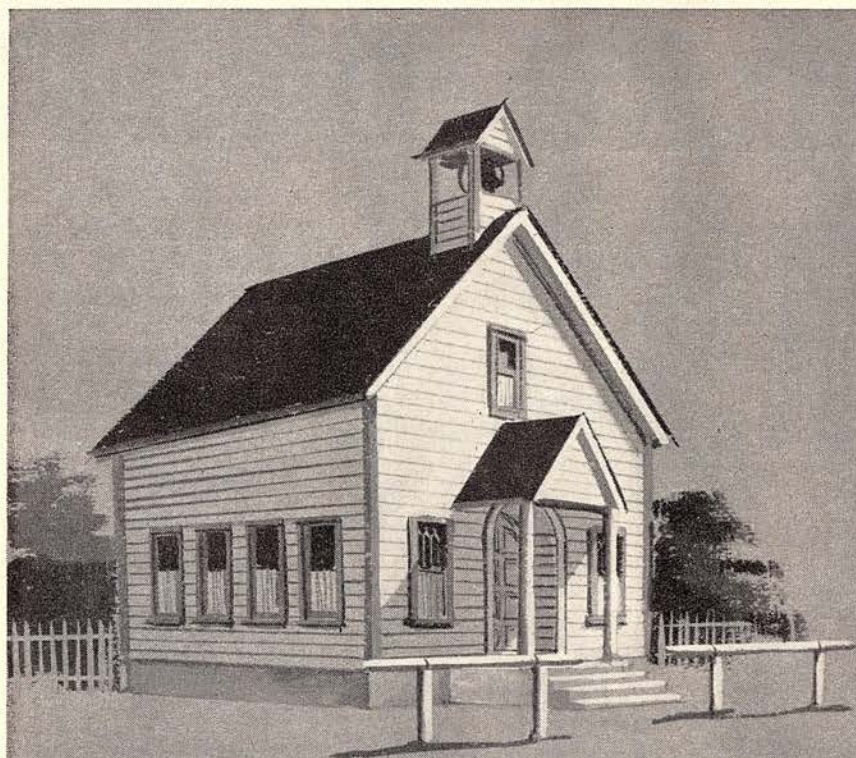
TITLE \_\_\_\_\_

FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

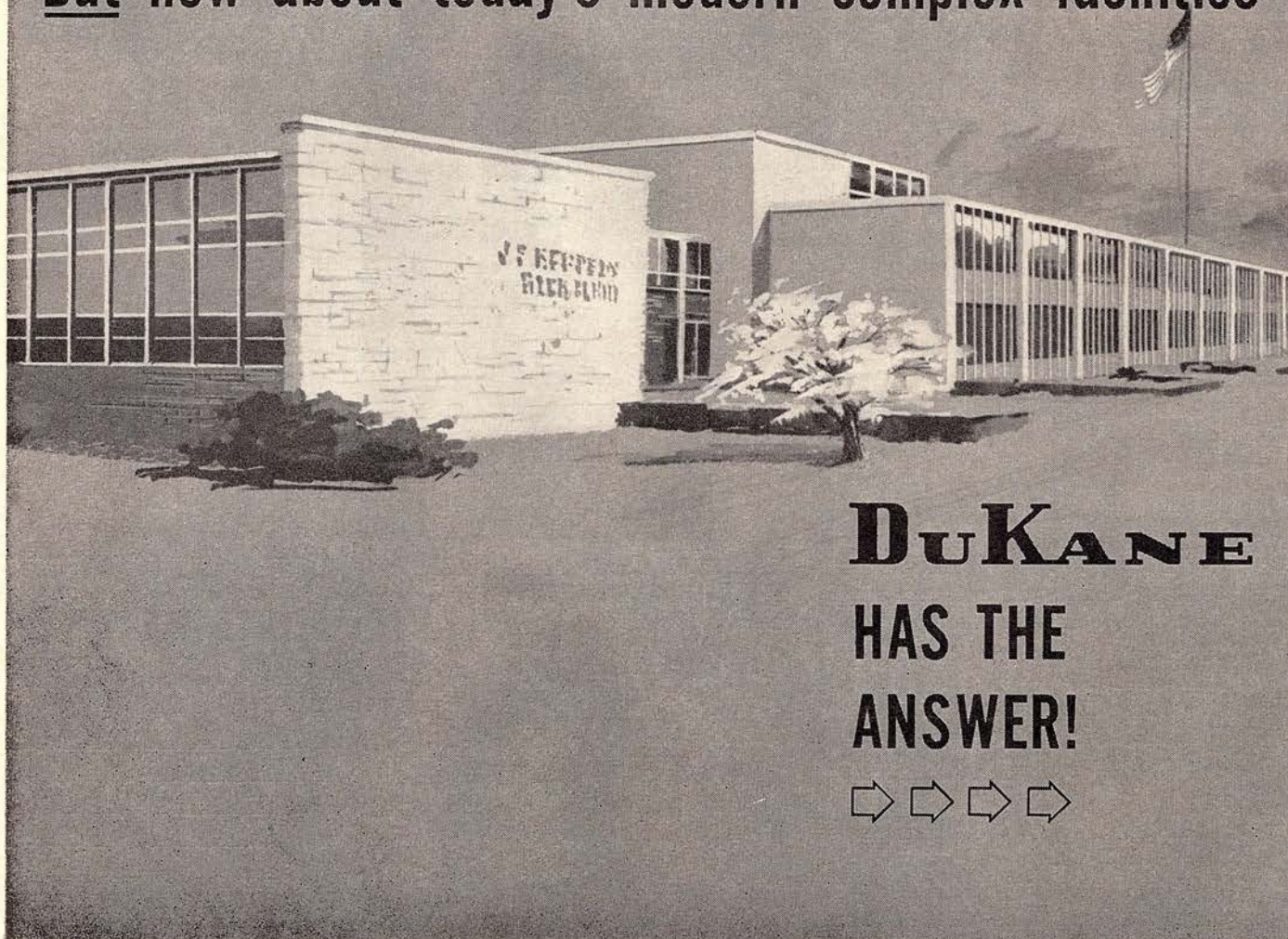
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



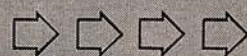


Communications  
... a simple  
problem for a  
**ONE ROOM  
SCHOOL  
HOUSE**

But how about today's modern complex facilities



**DUKANE**  
HAS THE  
ANSWER!

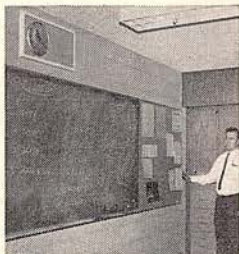




Today, every DuKane School Communications System is a round-the-clock administrative *workhorse*. Apply its flexibility features for total school communications without a staff increase. A few of the many functions are illustrated on this page. Your local DuKane Franchised Distributor, a factory-trained, qualified, and equipped communications expert will assist you in planning, supervise installation and maintain lifetime system service to your complete satisfaction—no obligation. Call him or clip coupon below for full details.

### TWO-WAY COMMUNICATIONS

Tie together every classroom or area of your school's physical plant. Eliminate needless steps in locating key staff personnel or students... contact between console and an area or vice versa is instantaneous. If desired, all areas can be contacted simultaneously.



### UNATTENDED CLASSROOM MONITORS

Eliminate shifting of personnel to watch a classroom when an instructor is called away. Automatically monitor specific classrooms from the central control console. If disturbance arises, give instructions via two-way communications.



### TIME & SIGNAL COORDINATION

Coordinate all time and signal functions automatically. Class period opening and closing signals sound without manual attendance. Time and signal functions are all preset—easily changed, if desired.



### FIRE & EVACUATION ALERTING

All classrooms and areas in your school can be alerted simultaneously in event of a fire or emergency. Voice directions can be made from the central console to assure complete safety and security for all students and staff personnel. Emergency groups can be instantly directed to troubled area.



### EDUCATIONAL PROGRAMMING

Teaching staffs can increase flexibility. AM/FM programming and/or professional records and tapes can be distributed as supplemental instructional material to any and/or all classrooms. Programming is prescheduled with school office and distributed on a desired time schedule.



### VANDALISM PROTECTION

Each DuKane School Communications System provides a twenty-four hour "watch" on school property. Every area can be monitored by the school watchman or remotely, by police department officials.



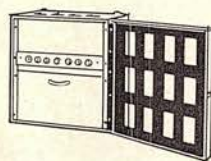
### FIRE DETECTION

Round-the-clock fire detection devices maintain school security. Special thermostat controls alert master school communications system console or remote fire station master in event of fire.

### OTHER ADMINISTRATIVE COMMUNICATIONS TOOLS



PRIVATE  
AUTOMATIC TELEPHONE  
SYSTEMS



AUDITORIUM/GYMNASIUM  
COMMUNICATIONS  
SYSTEMS



COMPANION  
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COMMUNICATIONS SYSTEMS DIVISION  
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CALL YOUR LOCAL DUKANE FRANCHISED DISTRIBUTOR... OR CLIP THIS COUPON... ATTACH TO YOUR LETTERHEAD... AND MAIL TO US FOR FULL DETAILS—NO OBLIGATION. BE SURE... TO INVESTIGATE OUR LEASE PURCHASE PLANS.

- ☐ SCHOOL COMMUNICATIONS SYSTEMS BULLETIN
- ☐ PRIVATE AUTOMATIC TELEPHONE SYSTEMS BULLETIN

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

SCHOOL \_\_\_\_\_

ADDRESS \_\_\_\_\_

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

For more data, circle 127 on Inquiry Card



# If you've tried other vapor seals and they failed... isn't it time to switch to the very best?\*

As a conscientious architect or contractor you have undoubtedly specified and used various types of vapor seals, many, many times. If you have never had a vapor seal failure or complaint, read no farther—you're already using **PREMOULDED MEMBRANE Vapor Seal**. If, however, you have found that the vapor seal you used did not stop the ravages of excessive moisture, then we believe this message will be of interest to you. It's an academic fact that 80% of the moisture that enters a structure originates in the site. It makes little difference where the structure is placed... somewhere below the site water exists and vapor will infiltrate the structure. Dampness, condensation, insulation failures, cracked plaster, dank smells, blistering and peeling paint, fungal or bacterial attack on construction and furnishings and masonry efflorescence soon follow.

## YOU KNOW THE PROBLEM...

While the building industry has recognized the need to install a vapor seal between the structure and the site there has been a promiscuous use of permeable materials as vapor barriers. The only sure way to permanently eliminate moisture migration into the structure is to install true inviolate, impermeable vapor seal during the original construction. The following chart graphically illustrates that saturated felts, building and duplex papers, and plastic films are highly permeable and should not be considered as effective vapor seals.

MATERIAL	WATER-VAPOR TRANSMISSION*
Duplex Paper (coated both sides with reflector material, reinforced)	.347
Polyethylene Film (.006 in. thick)	.17
55-pound roll roofing	.081
PREMOULDED MEMBRANE Vapor Seal	.0048

\*grains/per square foot/per hour as measured in accordance with ASTM Designation E96-53T, Procedure A.

## WE HAVE THE ANSWER...

In addition to an almost nil water-vapor transmission rating, **PREMOULDED MEMBRANE** with **PLASMATIC Core** offers many other important and exclusive qualities. It is durable, flexible, and strong...will not rupture or tear under normal installation, traffic, and handling. Monolithic when installed to expand and contract in direct ratio with the concrete without breaking bond. Available in 4'x 8' sheets and rolls 4' wide to 50' long. It is lightweight, easy to handle and install.



**PREMOULDED MEMBRANE Vapor Seal** with **PLASMATIC Core** provides a practical, permanent method of waterproofing both vertical and horizontal surfaces in all types of construction; including slab-on-grade, basement and crawl space. For complete information request Catalog No. 753.

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FOR BETTER  
CONCRETE  
CONSTRUCTION

**W. R. MEADOWS, INC.**

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## Technical Books

### Fitness of Shells

**SHELL ARCHITECTURE.** By Jurgen Joedicke. Reinhold Publishing Corp., 43 Park Ave., New York 22, N. Y., 304 pp., illus. \$22.50.

This handsome pictorial documentary of shell structures conveys as no previous book has, the pervasiveness of shell construction's influence on modern architecture and the wide variety of structural shapes possible. All basic types of executed shell-roofed buildings are covered.

The book's consistently excellent photographs manage to capture equally well the spooky "physiognomy" of a mining foundry's smoke stacks, or the elegance of Nervi's Sports Palace. Author Jurgen Joedicke does not iterate verbally what the reader can perceive visually.

The text, supplemented by uncluttered drawings, discusses shell behavior and geometry in non-mathematical language. Up to now shells have been dealt with mostly in a highly technical manner or from a limited viewpoint.

In contrast, in this book, lucid chapters on statics and geometry precede each of the three main divisions of shell types. The three sections are: singly curved shells (e.g., cylinders and barrels); shells doubly curved in the same direction (e.g., hemispheres); and shells doubly curved in opposite directions (e.g., hyperbolic paraboloids). These explanatory chapters will help the architect to comprehend the inherent strengths and weaknesses, design of edge zones, and formwork necessary for the various types of shells. Mr. Joedicke considers the economics of shells as well. For instance, formwork costs for doubly curved shells may come to half of the total cost for the structure. The book discusses new, more economical ways of forming; it also shows what has been done with precast elements in shell construction.

The examples the author has selected are all of architectural interest. He conscientiously calls attention to exemplary architectural details and evaluates how well the structural design contributes to carrying out the architect's program.

*continued on page 258*

For more data, circle 128 on Inquiry Card



# FOR QUIET ROOM AIR CONDITIONING LOOK TO BOHN

EXAMPLE

**HOLIDAY INN**  
EFFINGHAM, ILL.



## Bohn-Aire FAN-COIL UNITS

Extra slim! Extra compact! For concealed mounting (as above) or for exposed mounting in attractive beige enameled cabinets. In capacities from 200 to 1200 C.F.M.

"Whisper-quiet" and personalized control of room comfort are outstanding features of BOHN-AIRE Room Conditioners. Mr. George Wenthe, one of the owners of the Effingham (Ill.) Holiday Inn Motel, says: "We had Bohn-Aire Room Conditioners installed in every guest room of our new motel. Bohn-Aire units are whisper-quiet and completely efficient."

# BOHN

**ALUMINUM & BRASS COMPANY**

Danville Division • Danville, Illinois

A DIVISION OF UNIVERSAL  AMERICAN CORPORATION

For more data, circle 129 on Inquiry Card



**Before your plans are frozen** talk things over with a structural steel fabricator. That talk may save your client time and money. Translating your architectural plans into detailed shop drawings, into exact-specification patterns and into precisely-fitting steel sections, is his business. But to your project he can also bring the kind of first-hand knowledge and experience you can put to good use. He knows costs thoroughly, knows the adaptability of steel in every conceivable situation—in highrise apartments, office buildings, shopping centers, schools, hospitals—knows how modern steels can be used to speed





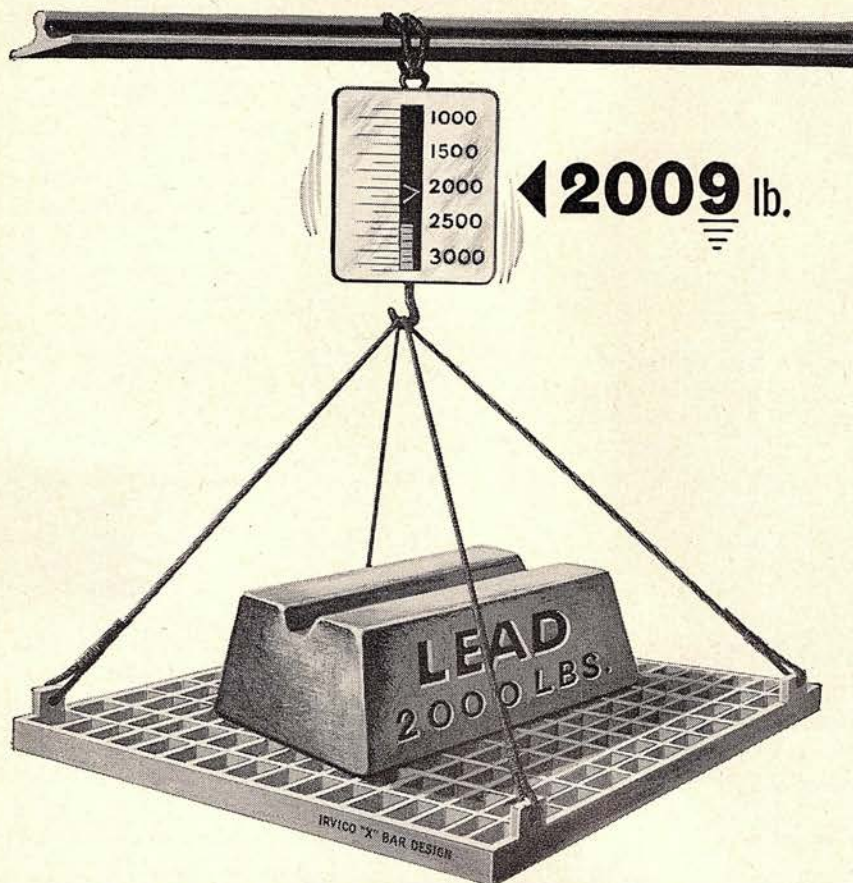
erection. To you, the architect or engineer, the steel fabricator can bring up-to-the-minute steel information, helpful suggestions, practical ideas. Working regularly with regional engineers of the American Institute of Steel Construction, your steel fabricator can answer your every question—often offer surprising, new, construction methods. Use him! That steel fabricator and his highly skilled staff, are the technologists who help turn creative dreams into reality. Talk to him early in the game. You'll find it pays.

Inland Steel Company, 30 West Monroe St., Chicago 3, Ill.



For more data, circle 130 on Inquiry Card





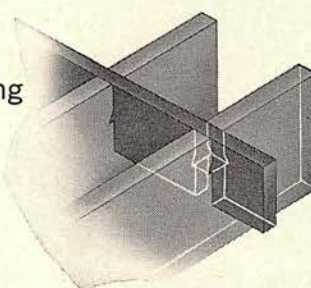
## ALUMINUM GRATING

is strong, lightweight,  
non-sparking, corrosion resistant...

**IRVICO ALUMINUM GRATING** is ideal for industrial flooring, stair treads, walkways and marine catwalks. It can be used for decorative and architectural purposes, anodized in non-fading colors.

It is available in 21 different types, plain or serrated, in a wide variety of standard sizes. Our free brochure on aluminum grating includes illustrations of the types, tables of safe loads, standard panel sizes, weights and illustrates uses of the grating.

With Irvico grating, you get superior workmanship, perfect fit, and dependable service. Be sure that your grating will be engineered and fabricated to meet your exact requirements. **SPECIFY IRVICO.**



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X-BAR DESIGN**  
features positive  
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**ORIGINATORS OF THE GRATING INDUSTRY**  
Offices and Plants at

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For more data, circle 116 on Inquiry Card

## Technical Books

continued from page 254

### On Steel Behavior

**STRUCTURAL STEEL DESIGN.** Edited by Lambert Tall, Lynn S. Beedle and Theodore V. Galambos. The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. 829 pp., illus. \$12.00.

This book on the fundamental behavior of steel structures germinated from notes originally prepared for a weekly seminar on steel design conducted in 1962 by staff members of the Fritz Engineering Laboratory, Lehigh University. The 19 co-authors have been associated with the formulation of design recommendations and with much of the experimental and theoretical investigations on allowable stress and plastic design conducted at Fritz Laboratory. This research forms the basis for the book.

### Noise Isolation

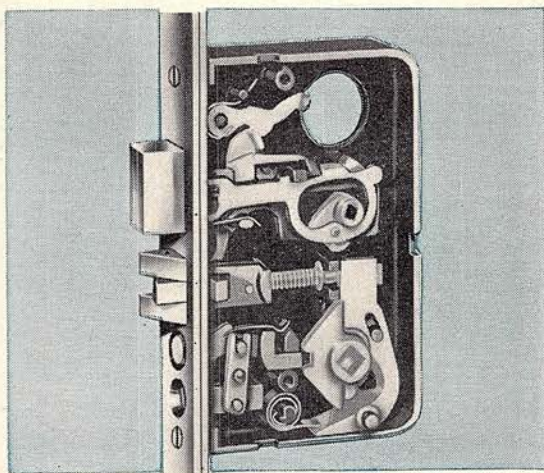
**SOLUTION TO NOISE CONTROL PROBLEMS IN THE CONSTRUCTION OF HOUSES, APARTMENTS, MOTELS AND HOTELS.** Owens-Corning Fiberglas Corp., Box 901, Toledo 1, Ohio. 59 pp., illus. \$1.00.

Lack of acoustical privacy in residential-type buildings has been accentuated lately in both the technical and popular press. As construction assemblies have become increasingly lighter the problem of noise transmission through walls and floors has been aggravated. The main purpose of this manual is to show the relative efficacy of a wide variety of walls and floors in stopping noise. It also examines the other building elements whose noise deterring or noise producing characteristics bear on acoustical privacy such as doors, windows, plumbing, mechanical equipment, etc.

The first section of the book contains a series of graphs evaluating the relative ability of the principal types of wall constructions in various stages of acoustical treatment to reduce airborne noise. The following section consists of graphs which allow a comparison of the effectiveness of major types of floor-ceiling constructions in stopping structure-borne and impact noise.



# 39 JEWEL LOCK

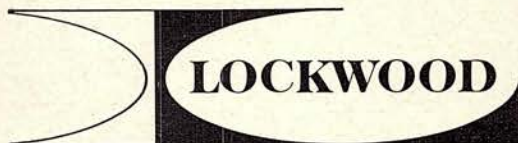
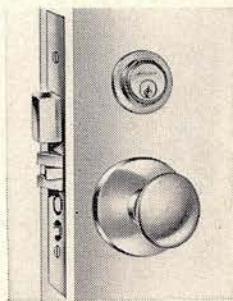


**Clocks and Locks?** They have something in common. Take this Lockwood mortise lock for example—it's built like a clock. Every one of its 39 working parts is a real jewel. All the important ones are extruded of brass or bronze for corrosion resistant, dependable operation.

Just as with every high quality timepiece, these parts are carefully *hand assembled* by master craftsmen who know their product and are proud of it.

Any one of the dozens of trim designs which are available with this lock will enhance any door.

But, it is the lock itself that makes it tick and keeps it ticking —  
"til the end of time."



LOCKWOOD HARDWARE MFG. CO.  
FITCHBURG, MASSACHUSETTS

For more data, circle 132 on Inquiry Card



# THOUGHTS FROM A FOURTH GRADER ABOUT

“Teacher says a comfortable classroom makes it easier to learn. She says that’s why we have a Modine unit ventilator. It always knows just what temperature is best for us.”

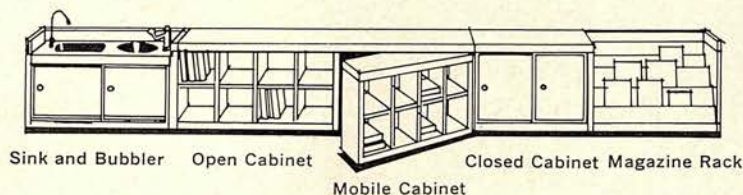
“It sure looks nice. Pretty colors and smooth, shiny edges. I can’t spell Valedictorian but teacher says it means highest honors.”



Modine Valedictorian unit ventilators are constantly alert, instantly responsive to students’ comfort needs. A unique “weather control center” dictates the total heating, cooling, ventilating and dehumidifying function of the Valedictorian.

Valedictorian units have vinyl-clad front panels in a wide variety of solid colors and wood grains. Panels are edged with sparkling chrome. Modine also offers a complete line of custom-designed storage cabinets and other matching accessories.

A full line  
of attractive,  
functional accessories.



Sink and Bubbler

Open Cabinet

Mobile Cabinet

Closed Cabinet Magazine Rack

WRITE TODAY FOR  
SCHOOL-VENT  
BULLETIN 1264



# MODINE Valedictorian UNIT VENTILATORS

“Teacher musn’t know how strong our Valedictorian is. She always scolds when I climb on it. But I never seem to hurt it any.”

“Oh, oh, here she comes. Everybody sure gets quiet when teacher comes in the room. She says we should be like the Valedictorian . . . it’s *always* quiet.”



Valedictorian beauty is virtually student-proof. Heavily-reinforced, sturdy-steel construction! Durable, baked enamel finishes! Chip-resistant chrome! Scuff-resistant vinyl! Maintenance is further simplified by slide-out filters, pushbutton lubrication.

Quiet and vibrationless! Two-speed motor and low-speed centrifugal blower fans meet the most rigid acoustical requirements. And Modine design prevents small objects, such as paper clips, from falling into the fans, causing fan damage, or being hurled into the room.



## Modine

MANUFACTURING COMPANY

1510 DeKoven Avenue, Racine, Wisconsin

The Valedictorian is more sensitive to classroom comfort than the student body!

For more data, circle 133 on Inquiry Card



## Office Literature

continued from page 212

### BUILT-UP ROOFING

Besides specifications for Philip Carey's bonded Built-up roofs, a 20-page "Specification Manual" outlines methods of attachment and other construction data. *The Philip Carey Manufacturing Company, 320 S. Wayne Ave., Cincinnati 15, Ohio\**  
CIRCLE 411 ON INQUIRY CARD

### CONCRETE FORMING

"Concrete Forming Equipment" features 34 different forming 34 different applications using the standard *Steel-Ply* line and accessories, including the new *Slab Shore System*. *Symons Mfg. Company, 200 East Touhy Ave., Des Plaines, Ill.\**  
CIRCLE 412 ON INQUIRY CARD

### LIQUID SET-RETARDING ADMIXTURE FOR CONCRETE

*Retardwel*, a liquid set-retarding admixture for concrete, is described in a new 12-page brochure. Technical data deals with the effects of the admixture when added to concrete, such as rates of setting and hardening, compressive strength, and water reduction during high concreting temperatures. *Johns-Manville, Concrete Specialties Department, Box CPOD-11, 22 East 40th St., New York 16, N. Y.*  
CIRCLE 413 ON INQUIRY CARD

### BASIC MATERIALS

"Selecting One Best Material" offers general descriptions of vulcanized fibre, *Anilite* resin impregnated fibre, *Phenolite* laminated plastic, *Filamite* glass filament wound tubing, and extruded thermoplastics (nylon, *Delrin* and *Penton*); various applications for each, and the grades, forms and sizes in which they are available. This 16-page catalog contains a comprehensive chart of the electrical, mechanical, physical, chemical and fabrication properties of these materials. Also included are charts of military specifications—NEMA, Federal and Association, MIL-P, Aeronautical Material, Federal L-L-31, and ASTM D709 ratings. *National Vulcanized Fibre Company, 1064 Beech St., Wilmington, Del.*  
CIRCLE 414 ON INQUIRY CARD

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

more and more  
great American architects  
are using

# MARMET

**here are a few of the reasons:**

**Close liaison . . .** between the architect's job captain, designers, the general contractor and MARMET's engineering staff, plant expeditors and field service men . . . from the moment of bid award to final execution.

**Single source capability.** As an engineering fabricator of all types of curtain wall, individual window units, entrance frames and doors . . . MARMET is able to render complete services and products for every fenestration need.

**Laboratory checks on quality control.** Full size sections are pulled from assembly lines for exhaustive testing in MARMET test laboratories. Components must exceed NAAMM standards for wind deflection, air or water infiltration before shipment.

More and more . . . experienced architects find that specifying MARMET is a long step toward successful execution of all fenestration components.



Photo by Baltazar Korab

A new way of living and learning is rising on Michigan State's Lansing campus. High rise student dormitories are arranged in unusual groupings with access to low level classrooms through connecting wings containing faculty offices. Each grouping of buildings provides facilities for a thousand students. One of the newest building groups is the East Campus section shown in the architect's model above. A number of buildings in this newest campus section will be completed with gleaming aluminum fenestration from MARMET.

# MARMET

corporation

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3a  
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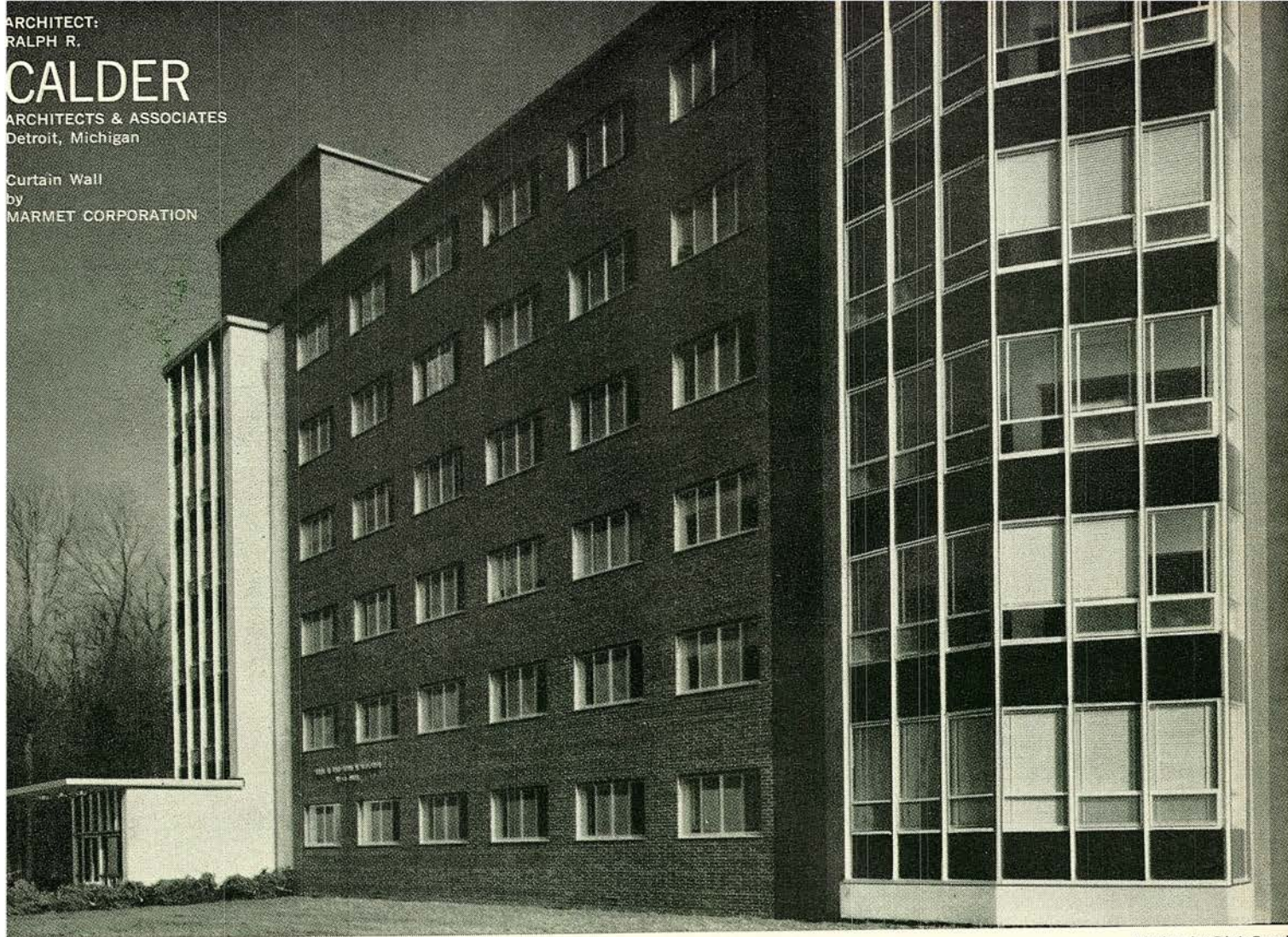
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Detroit, Michigan

Curtain Wall  
by  
MARMET CORPORATION

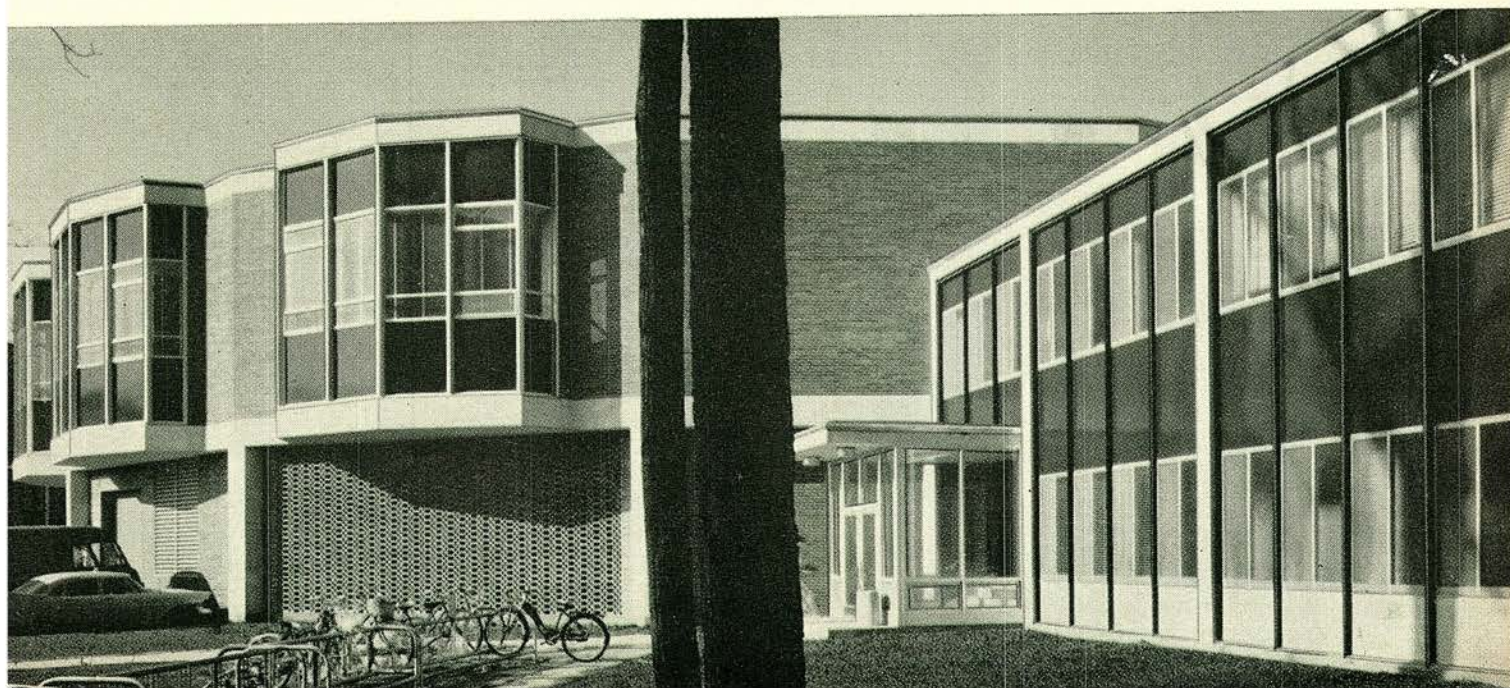


*Photos by Dick Reed*

## MARMET goes to Michigan State

McDonnell Hall above . . . a typical high rise student dorm, illustrates the interesting contrast the architect has achieved with curtain wall against the sweep of masonry. The 5212 series rises resplendently from ground to roof at the point where the curving "dorm" building makes a gentle bend.

Dining rooms connecting to McDonnell Hall (below) have smartly shaped MARMET bays which match the 5212 series curtain wall on the high rise section. The contemporary entrances are MARMET 1000 series entrances with MARMET aluminum doors fabricated to the architect's specifications for extra wide style design . . . especially suited to the hurried goings and comings of student swarms.





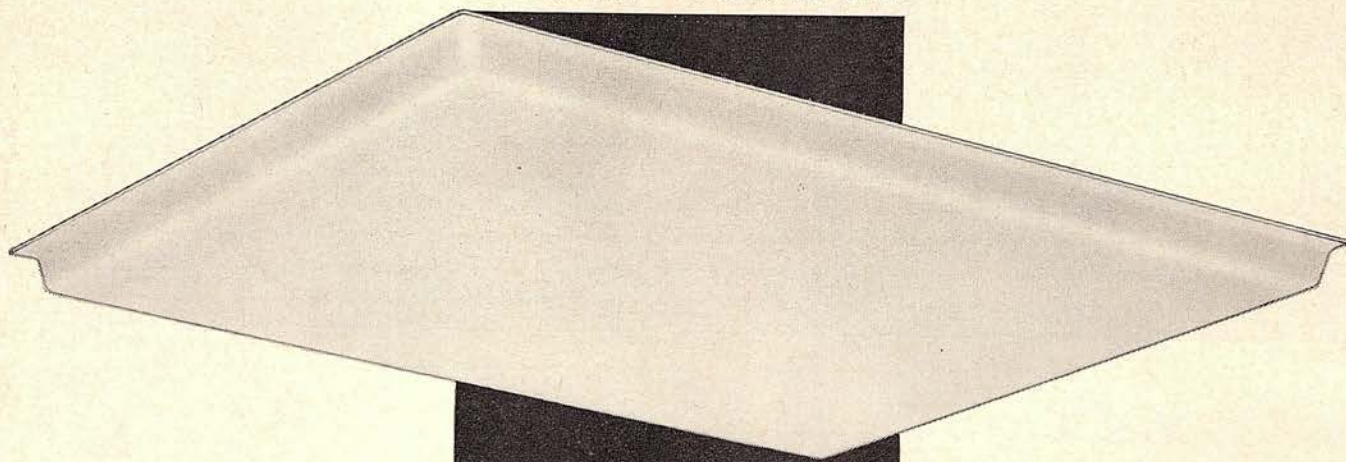
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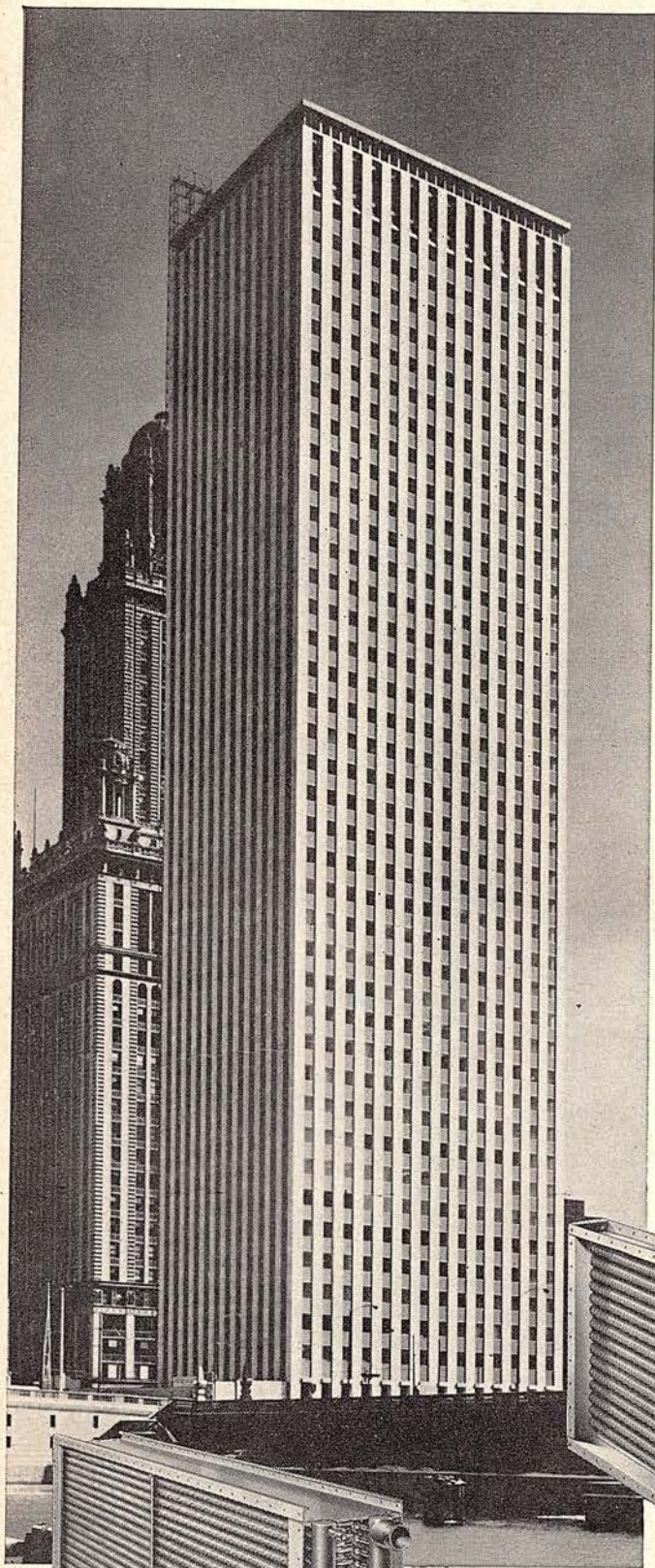
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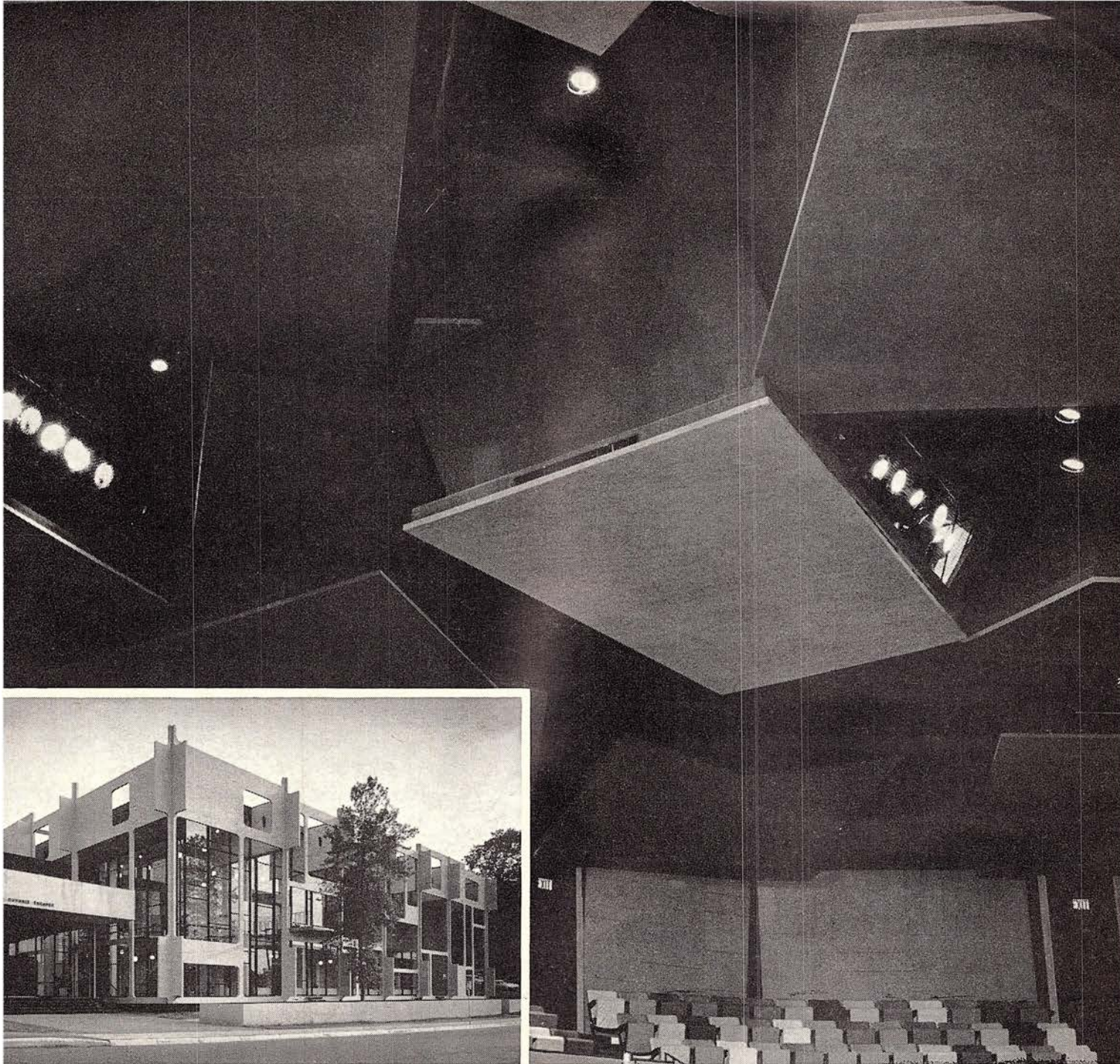
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ENGINEERING OFFICES IN PRINCIPAL CITIES

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*Tyrone Guthrie Theatre, Minneapolis • Architect: Ralph Rapson, A.I.A., Minneapolis  
Lathing and Plastering Contractor: Peterson & Hede Co., Hopkins, Minn.*

## **The Gold Bond difference: Panels created with Gold Bond plaster control sound at Tyrone Guthrie Theatre**

The natural voices of the actors can be heard clearly, without electrical amplification, in any one of the 1,437 seats at the new Tyrone Guthrie Theatre, Minneapolis. A precise system of ceiling panels reinforces the voices of actors and directs sound evenly throughout the auditorium. Sloping partitions, extending the three-floor height of the theatre, further aid sound control. Both wall and ceiling assemblies were constructed with Gold Bond plaster to achieve the desired acoustical qualities.

The formation of true plane surfaces, in an intricate ceiling panel system, would have been more difficult with any other assembly. Joints were eliminated. For information on this and other Gold Bond acoustical plaster systems and materials, call your Gold Bond® Representative, or write to Department AR-54, National Gypsum Company, Buffalo, New York 14225.

**Gold Bond materials and methods make the difference in modern building**





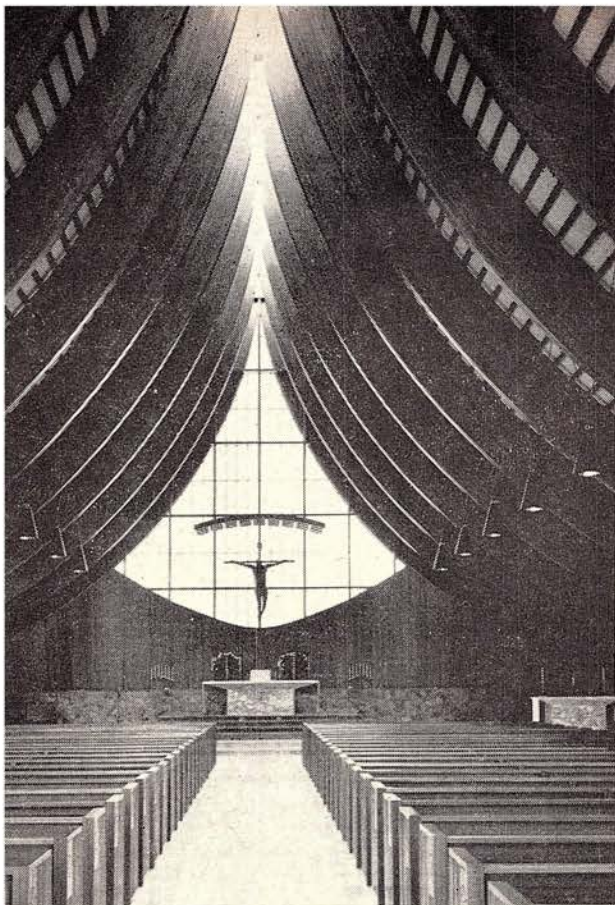
The Gold Bond difference in churches is Tectum



**"Acoustics are excellent  
in this inverted arch."**

Walter J. Rozycki, A.I.A.  
Detroit



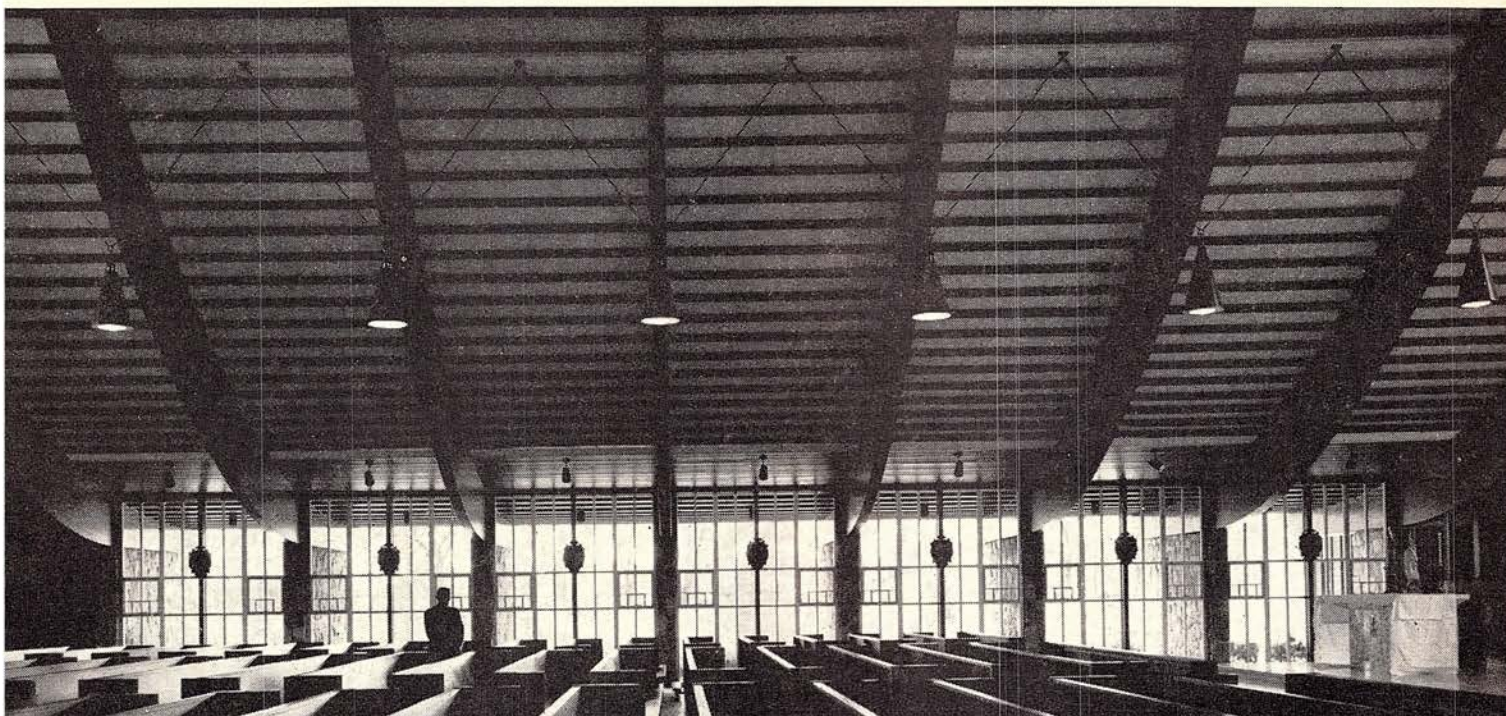
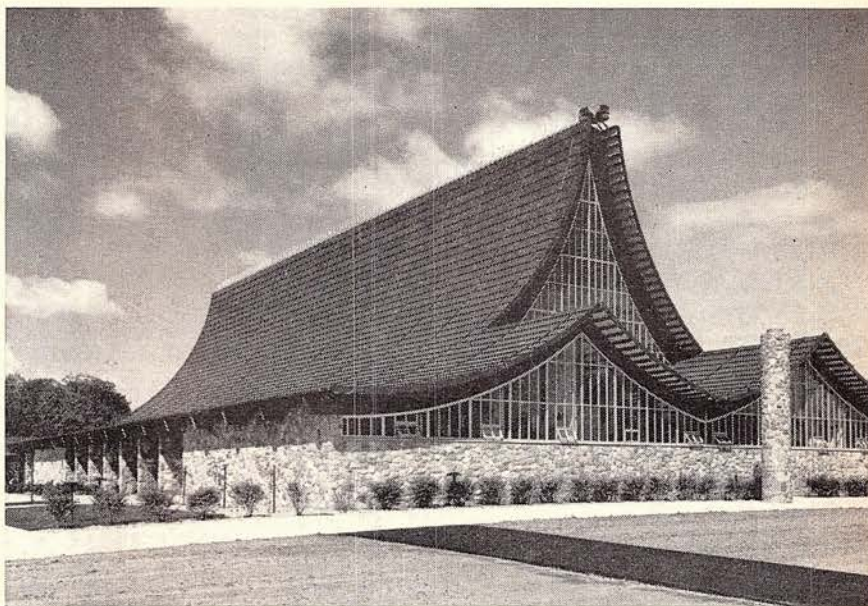


Roof deck, 24,000 sq ft. Tectum 3" thick, anchored horizontally on 3" x 4" wood sub-purlins. Laminated wood beams. Simplicity of erection reported. No scaffolding required for installation of Tectum. An excellent use of a versatile building material.

**Building:** Shrine Chapel of Our Lady of Orchard Lake

**Architect:** Walter J. Rozycki, A.I.A., Detroit, Michigan

**Contractor:** Matthew Lalewicz, Inc., Centerline, Michigan



The graceful lines of this inverted arch or quadrant are subtly repeated throughout the interior of Our Lady of Orchard Lake Shrine Chapel, Orchard Lake, Michigan. The textured Tectum roof deck contributed esthetically and acoustically, and substantially reduced the time taken to cover the building. The acoustics are perfectly balanced between the hard glass surfaces, the inverted shape of the roof framing and sound-absorbing Tectum. The church is noted for its Schola Cantorum choir. Architect Walter J. Rozycki reported completely satisfactory acoustical control. • Tectum roof deck and form plank materials are in

great demand for large area enclosures posing acoustical or sound absorption problems. The attractively textured surface of Gold Bond Tectum is factory finished—saves painting. When the deck is erected the ceiling is finished. Structural sheathing, insulation and acoustical control are installed with one labor cost. For more specifics, contact your Gold Bond Tectum representative or write National Gypsum Company, Buffalo 25, New York, Dept. AR564.





## Product Reports

continued from page 211

### FIRE EXTINGUISHER CABINET

Extinguisher cabinet with a revolving door has been designed to accommodate 10-lb ABC, soda and acid, pressurized and foam extinguishers. The *Rotogard* cabinet has semi-cylinder pivot mounting which provides fastest possible access. Fingertip pressure opens the revolving door on which the extinguisher is hung to prevent tipping or falling from cabinet. *Rotogard* has a three hole steel bracket which permits it to be adjusted on the job to fit 4- or 7-in. rough openings. *W. D. Allen Mfg. Co., 650 South 25th Ave., Bellwood, Ill.*

CIRCLE 303 ON INQUIRY CARD

### TRANSLUCENT GARAGE DOOR

The new aluminum-fiber glass *Alumalux* sectional overhead garage door features Corinthian white fiber glass panels framed by gold anodized aluminum sections box extruded. The non-rusting aluminum and permanent-type plastic is weather proof and shrink proof. The light-weight door weighs only one-third that of wood or steel doors and is easy to operate. The translucent panels brighten the interior of the garage. Clear vision insert panels are available for commercial or industrial applications, at additional cost. Full-size hardware is made of heavy gage galvanized steel. Doors are available with either extension or torsion spring counterbalance. *Rowe Mfg. Co., Galesburg, Ill.*

CIRCLE 304 ON INQUIRY CARD

### NEW PLASTIC REGLET

Now made of inert polyvinyl chloride plastic, *Superior Type A* cushion lock reglet is used in concrete construction, and provides a leakproof joint for counterflashing as well as for metal window frames. It will not stain, rust or corrode; comes prefilled with butyl rubber sealer ready for use. *Superior Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.*

CIRCLE 305 ON INQUIRY CARD

### MULTIPLE TUBING CABLE SUPPLIES PNEUMATIC CONTROLS

When the air supply for pneumatic controls of a chemical process must be located remotely from the operating area, an air header of *Okoflex* tubing can be run down the center of each bundle of instrument tubing. *Okoflex* is of unique multiple construction that makes it possible to locate the air supply wherever convenient. At a recent refinery installation, more than 20,000 feet of cabled instrument tubing was installed and connected in only two days, slashing about 60 per cent off conventional installation time for single tubing. Strong, lightweight, flexible, corrosion-resistant *Okoflex* tubing is of multiple construction, in which separate small pneumatic tubes are spiraled together into a cable having an air header as the center tube. Each bundle used at the refinery has nine 1/4-in. aluminum tubes spiraled around a center 1/2-in. aluminum tube carrying air to operate the pneumatic control system. *The Okonite Co., Passaic, N. Y.*

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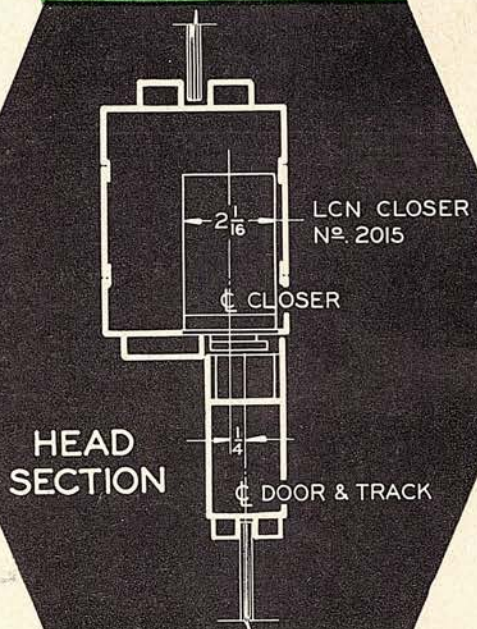
more products on page 274

## Construction Details

for LCN overhead concealed door closer  
installation shown on opposite page

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- 2 Mechanism entirely concealed in head frame and top of door; arm shows when door opens, is hidden when door is closed.
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- 4 Hold-open available at 85, 90, 100 or 110 degrees setting
- 5 Closers are made for heavy duty and long life



Send for comprehensive folder  
and see Sweet's 1964, sec. 19e/Lc. p. 6

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Modern Door Control by

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Closers concealed in head frame

Indianapolis Motor Speedway Motel  
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Daggett, Naegle & Associates, Inc.  
Architects

**LCN CLOSERS, PRINCETON, ILLINOIS**

Construction Details on  
Opposite Page

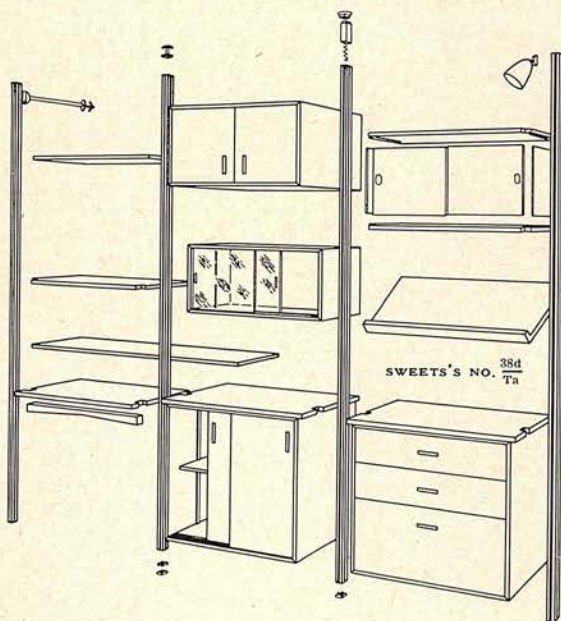






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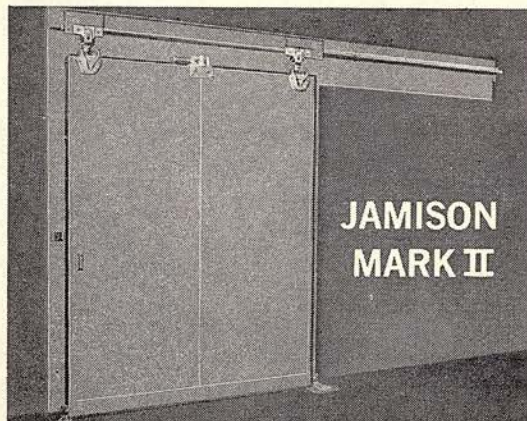
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MARK II**

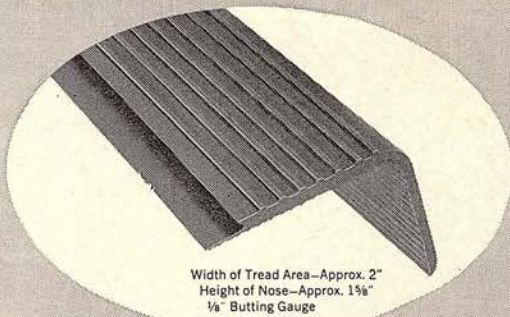
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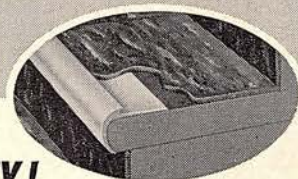
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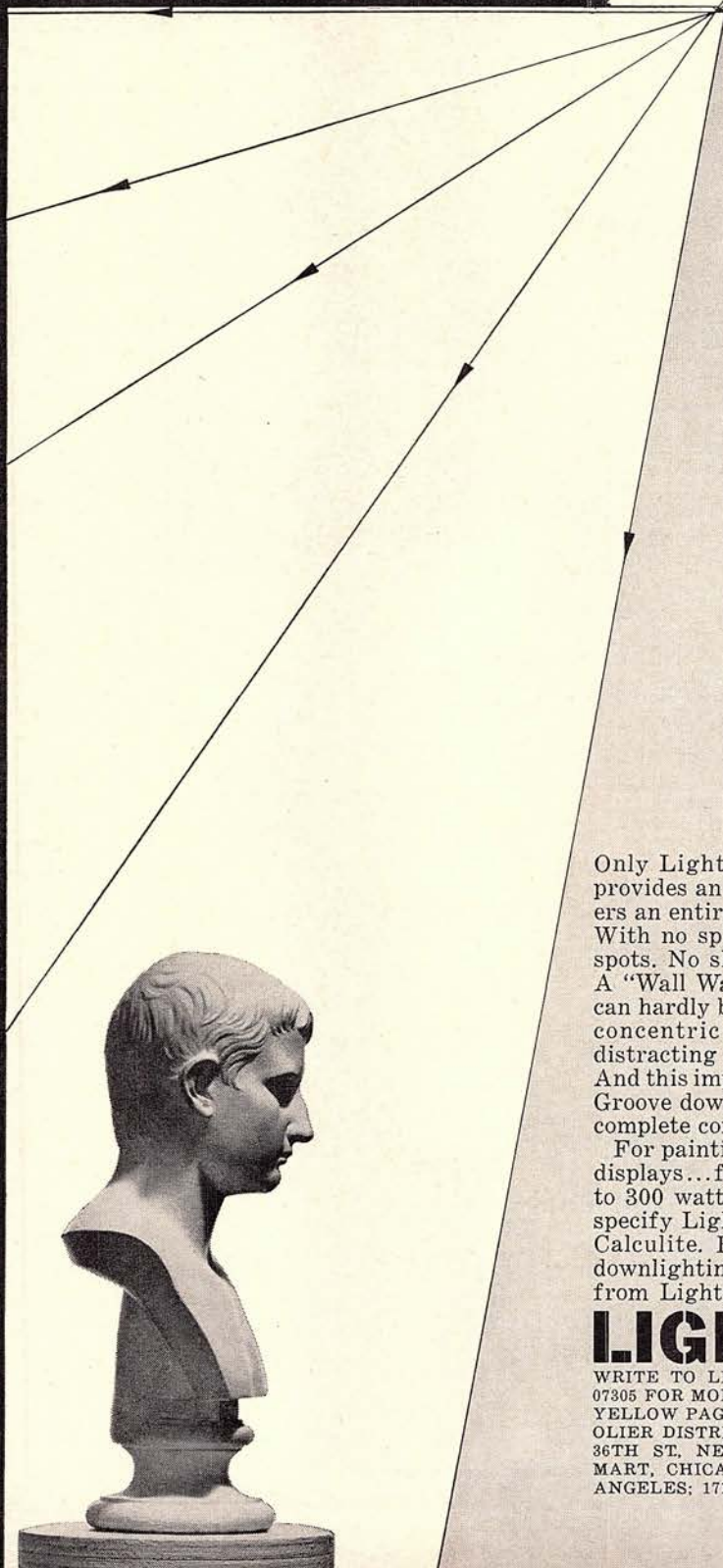


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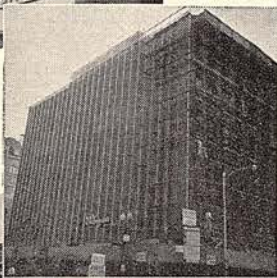
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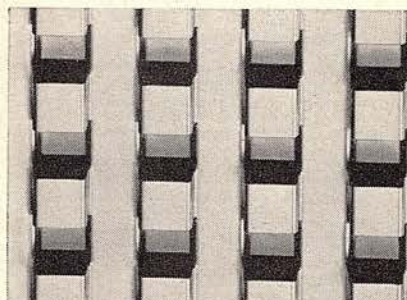


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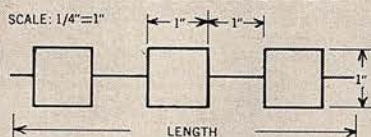
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## Product Reports

continued from page 270

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CIRCLE 307 ON INQUIRY CARD

### TOWER CRANES FROM DENMARK

The F. B. Kroll Company of Denmark, manufacturers of hammerhead tower cranes, has announced the opening of a U. S. subsidiary which will handle U. S. sales and services and will maintain a parts depot as well as mechanics to aid dealers in servicing equipment in operation. The *Kroll* line consists of four models with maximum working loads of from 1,330 lbs to 11,000 lbs. Outstanding features are convertibility into climbing, stationary or mobile power cranes. *Kroll Cranes, Inc.*, 10 East 40th St., New York, N. Y., 10016

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CIRCLE 309 ON INQUIRY CARD

more products on page 282

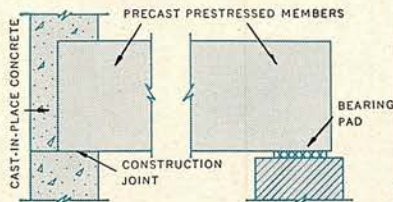
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# THERE ARE SIMPLE PRESTRESSED CONCRETE CONNECTIONS FOR EVERY STRUCTURAL APPLICATION

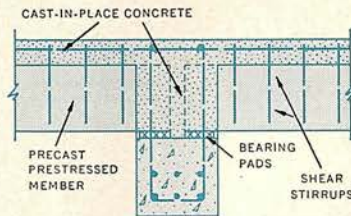
There are many different ways to connect prestressed concrete members. And they're accomplished with common operations like welding, bolting, or cast-in-place concrete requiring only normal construction skills. This wide choice of field-proven connections permits broad flexibility in design. Designers are able to rely on economical standardized connections ranging from simply supported to fully fixed—or develop new solutions. Connections are just one aspect of prestressed concrete's versatility.

*These are examples of basic concepts ready for completion by the designer.*



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Flexible bearing pads allow for even load distribution, provide for joint rotation and are inexpensive insurance against adverse stress conditions occurring in the bearing area. If moment transfer into the wall is not needed flexible pads can be placed at points of contact where the beam enters the wall. However, with proper reinforcing into the cast-in-place section, continuity can be provided.

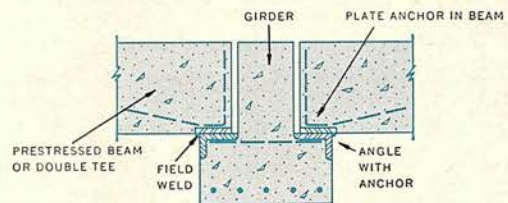


## CAST-IN-PLACE

This connection has the appearance and behavior of monolithic concrete. At an interior connection, the top bars may be long enough to extend over the full negative moment area, or the bars may be lap spliced. Close length tolerances of the beams are not required.

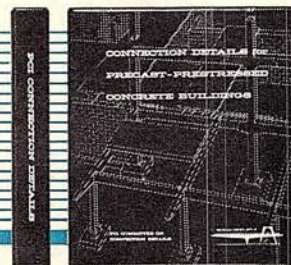
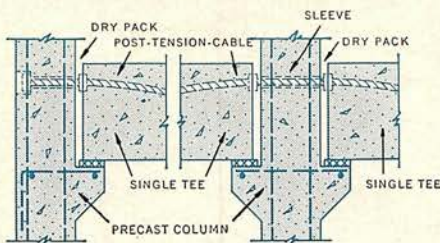
## WELDED

This type of all weather connection can be quickly erected. It is useful where moment carry-over to adjacent spans and stress reversals are to be avoided. If heavy dead loads are to be placed on the beam, make tack welds during erection and provide full fillet welds after all dead loads are in place, thus reducing stresses in the welds. Consideration may be given to a welded connection at the top of the beam, with a flexible bearing pad where the beam bears on the girder, resulting in partial restraint. Prestressed beams tend to shorten slightly over a period of time, and if frame is inflexible one end of each beam should be left free to slide.



## POST-TENSIONED

Post-tensioned connections are good for the resistance of high moments. All post-tensioning anchorages and devices should be installed in accordance with manufacturer's recommendations. The conduits containing the tendons should be grouted except where deterioration is prevented by other means. A small chamfer at the outer edge of the concrete haunches will reduce spalling. Also, bearing pads will help prevent cracking of haunch corners.



Connection Details for Precast-Prestressed Concrete Buildings, just published, is the result of more than two years study by the PCI Connection Details Committee. Purpose of this publication is to assist designers in selection of appropriate connection details. Detailed schematic drawings show all established types of connections grouped in four main sections: column base, beam-to-column, beam-to-girder and bearing wall. Illustrated and described are welded, cast-in-place, dowelled, bolted and post-tensioned connections. Price: \$4.50

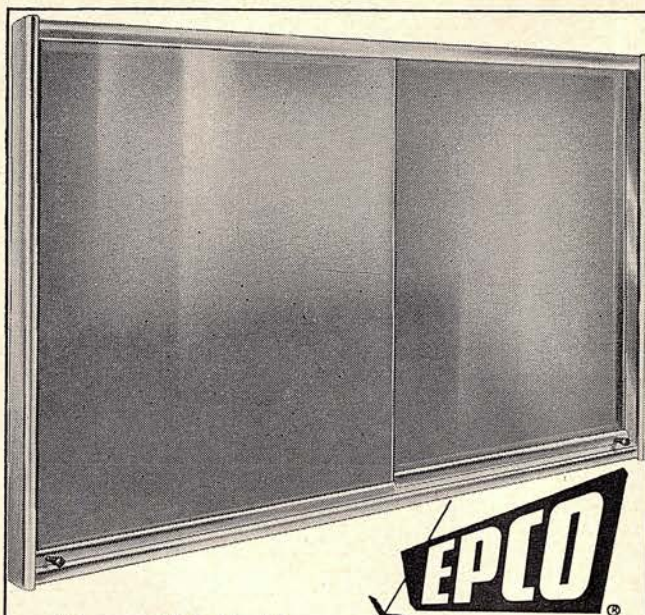
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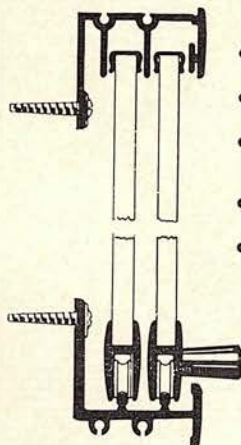


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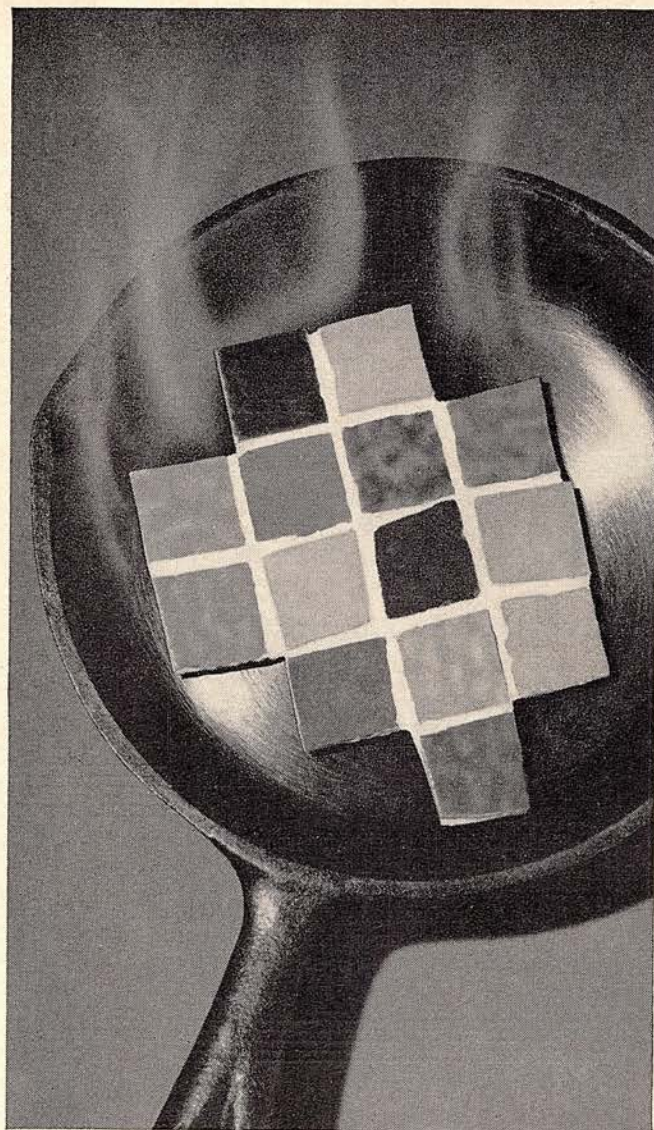
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The Tile Council of America



For more data, circle 147 on Inquiry Card

For more data, circle 148 on Inquiry Card



# PPG Speedhide® Paints make Travelodge motels more attractive coast to coast...



**You'll see PPG SPEEDHIDE Paints** all across the nation at Travelodge motels like this one in Atlanta.

**Here's why:** PPG SPEEDHIDE Paints offer a complete line of attractive colors and quality finishes, with extremely high hiding characteristics, superior color retention and remarkable durability.

**These are among the numerous reasons** so many leading architects are now specifying SPEEDHIDE Quality Paints.

**They cover faster and better**—in almost any color you can imagine—than any other finishes you can name.

(Note: For complete SPEEDHIDE specifications, see Sweet's, Section 15 Pi.)

**FREE**—illustrated brochure explaining the modern Pittsburgh COLOR DYNAMICS® Painting System. COLOR DYNAMICS is scientifically based on known psychological reactions to the energy in color. For an interesting Color Dynamics folder, just mail the coupon, or contact your local PPG representative.



Pittsburgh Plate Glass Company,  
Paint Div., Dept. AR-54, Pittsburgh 22, Pa.

- ☐ Please send booklet with full information on new Pittsburgh SPEEDHIDE line.
- ☐ Please send me your free folder on COLOR DYNAMICS.
- ☐ Please have your Architectural Representative contact me.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

ZONE \_\_\_\_\_

STATE \_\_\_\_\_



**PITTSBURGH PAINTS**

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS  
PITTSBURGH PLATE GLASS COMPANY  
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

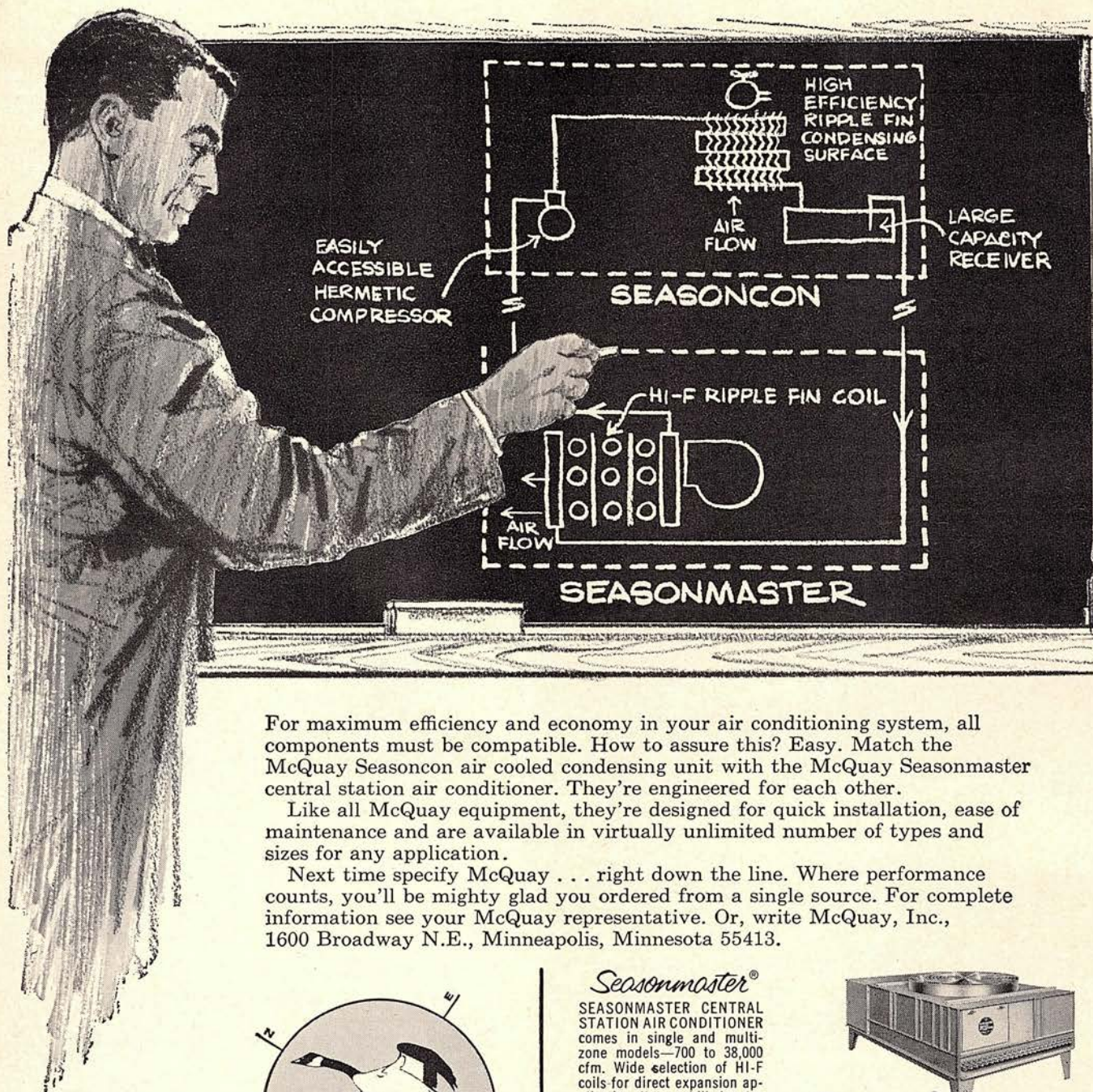
For more data, circle 149 on Inquiry Card



LOOK TO THE LEADER....

# McQuay

for a completely compatible air conditioning system



For maximum efficiency and economy in your air conditioning system, all components must be compatible. How to assure this? Easy. Match the McQuay Seasoncon air cooled condensing unit with the McQuay Seasonmaster central station air conditioner. They're engineered for each other.

Like all McQuay equipment, they're designed for quick installation, ease of maintenance and are available in virtually unlimited number of types and sizes for any application.

Next time specify McQuay . . . right down the line. Where performance counts, you'll be mighty glad you ordered from a single source. For complete information see your McQuay representative. Or, write McQuay, Inc., 1600 Broadway N.E., Minneapolis, Minnesota 55413.



## McQuay INC.

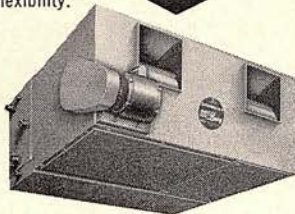
MEANS QUALITY

AIR CONDITIONING • HEATING • VENTILATING • REFRIGERATION

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

### Seasonmaster®

SEASONMASTER CENTRAL STATION AIR CONDITIONER comes in single and multi-zone models—700 to 38,000 cfm. Wide selection of HI-F coils for direct expansion application. Hot or chilled water and steam coils available. A complete line of accessories are available for maximum flexibility.



### Seasoncon®

SEASONCON AIR COOLED CONDENSING UNIT is available in 8 models—20 to 50 nominal horsepower. The Seasoncon comes completely factory engineered and assembled—ready for installation. Its rugged weatherproof aluminum housing, low silhouette and completely waterless operation combine to make this the perfect running mate for the Seasonmaster.

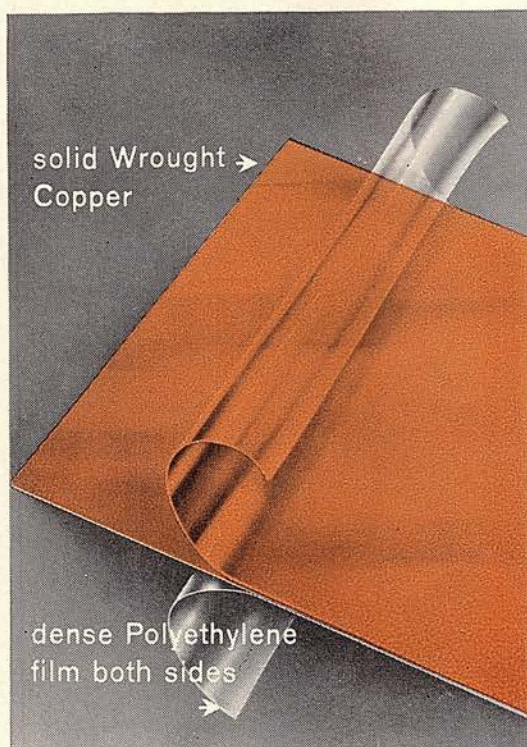
For more data, circle 150 on Inquiry Card

For more data, circle 151 on Inquiry Card ➤



# NOW!

you can afford to specify  
time-proven, rolled copper  
for all concealed flashing  
applications



new REVERE  
DRYSEAL FLASHING—  
no paper to rot . . .  
no asphalt to stain . . .  
a superior product at  
a competitive price

Revere Dryseal Flashing is made from 2 or 3 oz. solid, rolled (wrought) copper, having the same inherent characteristics and physical properties of standard sheet copper that has been used so successfully for centuries in quality building construction.

This solid copper sheet is laminated on both sides with a film of dense polyethylene. Result: a low-cost flashing material that provides a moisture, vapor and water barrier, unaffected by temperature extremes, that is non-staining, alkali and acid-resistant.

one look at a sample will convince!

Send today for a free sample of the new Revere Dryseal Copper Flashing, with illustrated, technical bulletin. Write: "Dept. D" at address below.



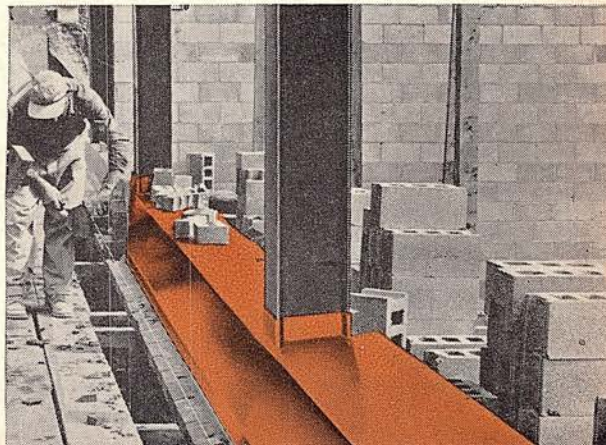
**REVERE**  
COPPER AND BRASS INCORPORATED

*Founded by Paul Revere in 1801*

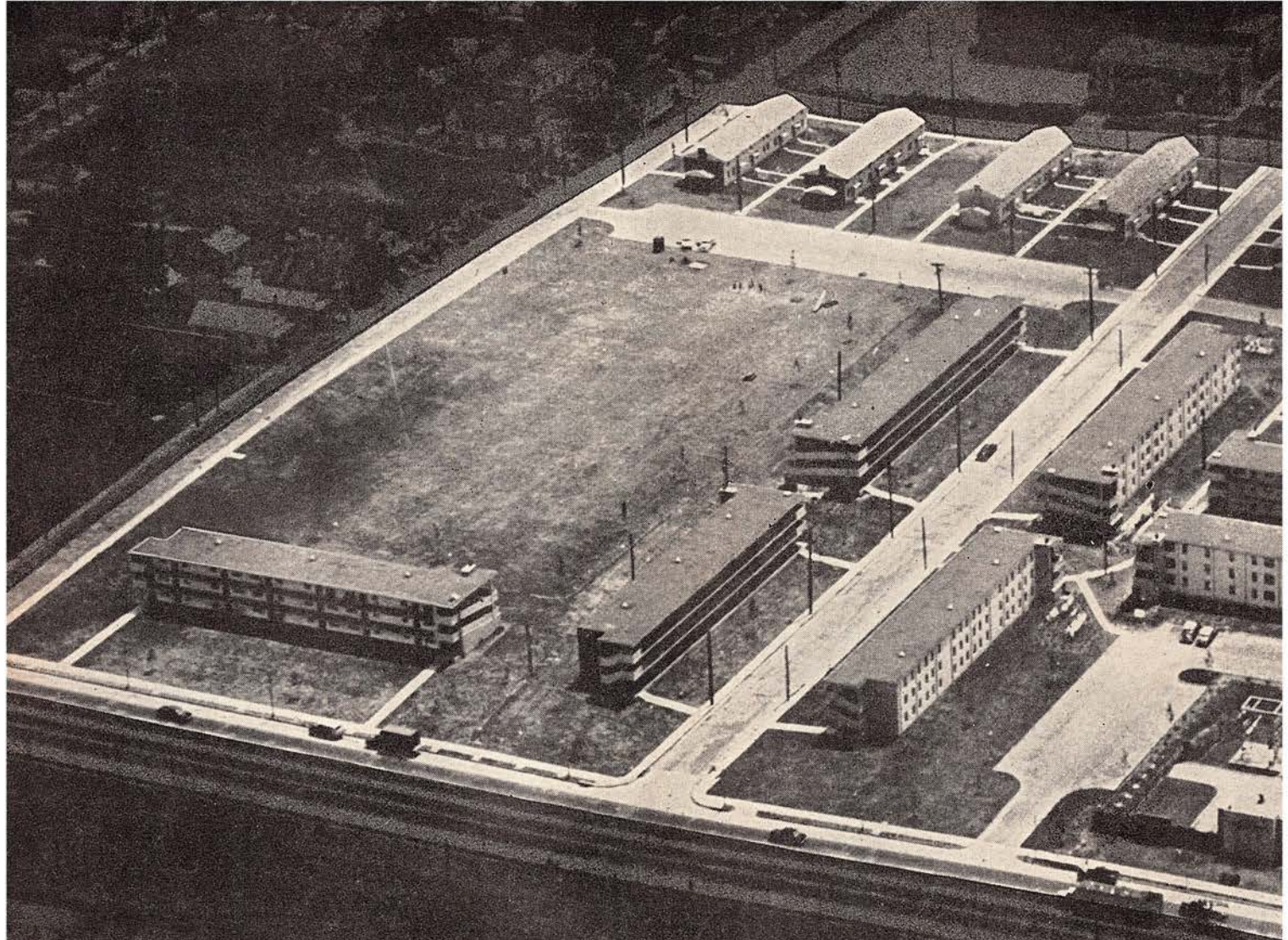
230 Park Ave., New York 17, N.Y.

Offices in Principal Cities. • Distributors Everywhere.

For more data, circle 151 on Inquiry Card







There are 27 buildings in the public housing project, Joseph A. Fowler Homes, Memphis, Tennessee. One is an administration building; the rest residential buildings containing 320 apartments. Walls are of brick veneer concrete block with Keywall in alternate courses,

used to control thermal movement and to serve as a brick tie. Interior walls are of rock lath plaster utilizing Keycorner and Keystrip as reinforcement.

**ARCHITECT:**  
Charles S. Peete & Associates, Memphis

**GENERAL CONTRACTOR:**  
McDonough Construction Co.  
of Atlanta, Georgia

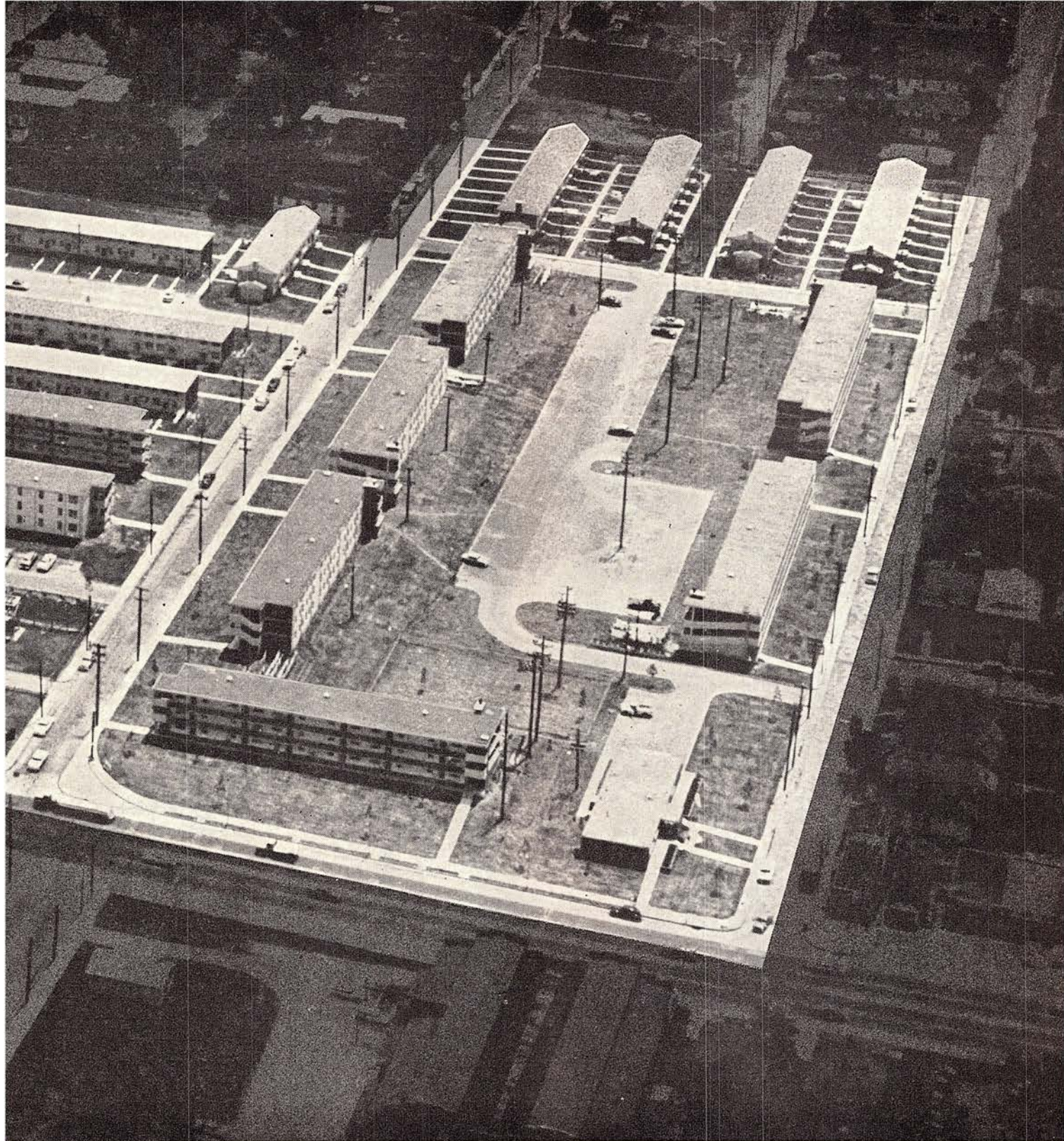
**MASONRY CONTRACTOR:**  
Memphis Masonry Company, Memphis

**PLASTERING CONTRACTOR:**  
F. M. Gravier Plastering Co., Atlanta

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

KEYSTONE STEEL & WIRE COMPANY • Peoria, Illinois





**mortar  
and  
Keywall  
what else?)**

It's a coincidence you should ask about the advantages of Keywall. You can see from the tight pattern that it gives you more mortar locks with block (and/or brick). Which in turn controls shrinkage and thermal movement better, resulting in greater crack resistance. And because Keywall comes in rolls, masons lay Keywall in place more easily and quickly. You might think that you would have to pay more for a masonry reinforcement with such advantages. Not so.



**MORE LOCKS TO THE BLOCK** with Keywall . . . because of the tight-woven pattern, it is impossible for any one strand of Keywall to be subject to the strain of more than two square inches of a block's thermal movement or shrinkage. By dividing the strain into such small segments, Keywall provides greater crack resistance.



## Product Reports

continued from page 274

### DOUBLE GLAZING WARRANTY

*Thermopane* warranty has recently been extended from five to 10 years, according to Libbey-Owens-Ford. The warranty applies to double-glazed units made with Bondermetic seal and a GlasSeal edge. *Libbey-Owens-Ford Glass Co., Toledo, Ohio, 43624.*

CIRCLE 310 ON INQUIRY CARD

### FOUNTAIN PEN FOR ARTISTS, DRAFTSMEN

A new india ink pen which offers artists and draftsmen a wide variety of working tools is called the *Pen-graphic*. The pen is designed to accept 18 Higgins nibs in four different categories: technical, writing, drawing, brush and music. It will also accept nibs of numerous other manufacturers. Nibs can be changed without emptying pen. *Higgins Ink Co., 271 9th St., Brooklyn, N. Y.*

CIRCLE 311 ON INQUIRY CARD

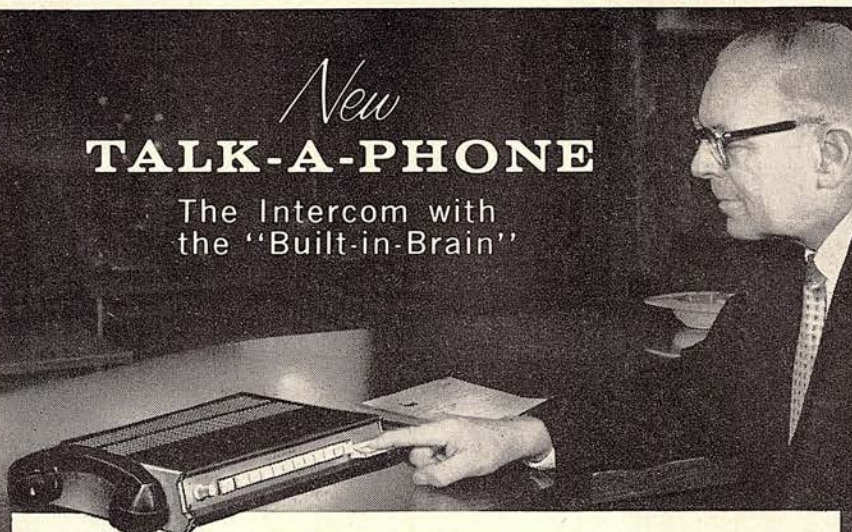
### SOUND BARRIER WALLBOARD

A new gypsum wallboard system for high sound reduction, the *Tri-Core* system, consists of three gypsum board composite walls with two air spaces between the walls to trap noise. A sound transmission loss rating as high as 57 db is achieved when filling one of the air spaces with *Fiberglas* insulation. Composite walls are made of 1-in. gypsum coreboard panels with 1/2-in. wallboards laminated to each exposed side. In spite of the number of components used to reduce sound, *Tri-Core* is only 6 in. thick. It is for non-load bearing construction where height requirements are not more than 8 ft. *National Gypsum Co., Buffalo 2, N. Y.*

CIRCLE 312 ON INQUIRY CARD

## New TALK-A-PHONE

The Intercom with  
the "Built-in-Brain"

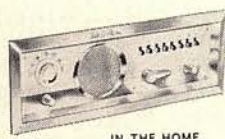


### FOR OFFICE AND INDUSTRY

Distinctively styled, with more dependability and higher efficiency than any Intercom ever developed . . . yet sensibly priced. Meets every Intercom need of office and industry. Proportioned like a book to lie flat on the desk . . . only 3 inches high. Combines the look and feel of fine grained leather with the strength and rigidity of steel. Beautifully finished in charcoal gray with brushed chrome side panels.

- **Chief and Chief Redi-Power Universal Systems**, with normal and reserve high volume. Up to 20 watts when and as you need it.
- **Deluxe Systems**. Low-cost intercommunication for use anywhere.
- **Hi-Power Deluxe Systems**. Provide exceptional volume, economically.
- **12-Station Selective Wireless System**, featuring 6 separate 2-way conversations and Selective Paging with reply.
- **2-Station Wireless Systems**. Available in 6 separate channels.

**TALK-A-PHONE . . . "Has Everything. Does Everything."** The accepted standard of quality and dependability in Intercommunication for over a third-of-a-century.



**IN APARTMENT HOUSES . . .** Provides instant and direct 2-way conversation between any Apartment and Vestibule in buildings of any size. Whispers, shouts and normal voice are heard clearly under any conditions. Greater performance with these exclusive Talk-A-Phone features:

- Ample volume without "boom" • Automatic privacy
- Individual volume selection for each apartment • Built-in buzzer • Naturalness of tone • Simplicity of operation.

**IN THE HOME . . .** everyone in the family will enjoy the comfort, convenience and peace of mind this Talk-A-Phone Home Intercom-Radio System provides. From any room you can • Listen-in on baby, children or sick room • Answer outside doors without opening doors to strangers • Talk to anyone—upstairs and downstairs, inside and out • Enjoy radio in every room with the simple flick-of-a-switch. Distinctively styled. Beautifully finished. Easily installed.

Send for Free Catalogs . . . Dept- AR-5  
**TALK-A-PHONE CO., 5013 N. Kedzie Ave., Chicago 25, Illinois**

### EPOXY COATING FOR CONCRETE

Deterioration of concrete, steel and other structural materials under attack by weather, chemicals and other corrosive agents now can be prevented by *Colma* protective coating, a new dual-purpose coating which protects and also decorates. Coating is a two-component epoxy system of paint-like consistency composed of solid, high-molecular-weight epoxy resins and selected inorganic pigments. It provides a glossy, durable, chemically resistant coating. Colors are red, green, gray, white, aqua and clear. Additional colors are available on special order. *Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.*

CIRCLE 313 ON INQUIRY CARD

### SELF SEAL PIPE INSULATION

*Self Seal Lap Pipe Insulation*, a two-piece 7 1/4-lb density *Fiberglas* material incorporating a pre-applied adhesive lap for fast, fool-proof application, is designed for insulating refrigerated, chilled water, cold water and dual temperature lines at a temperature range of minus 120 F to plus 450 F.

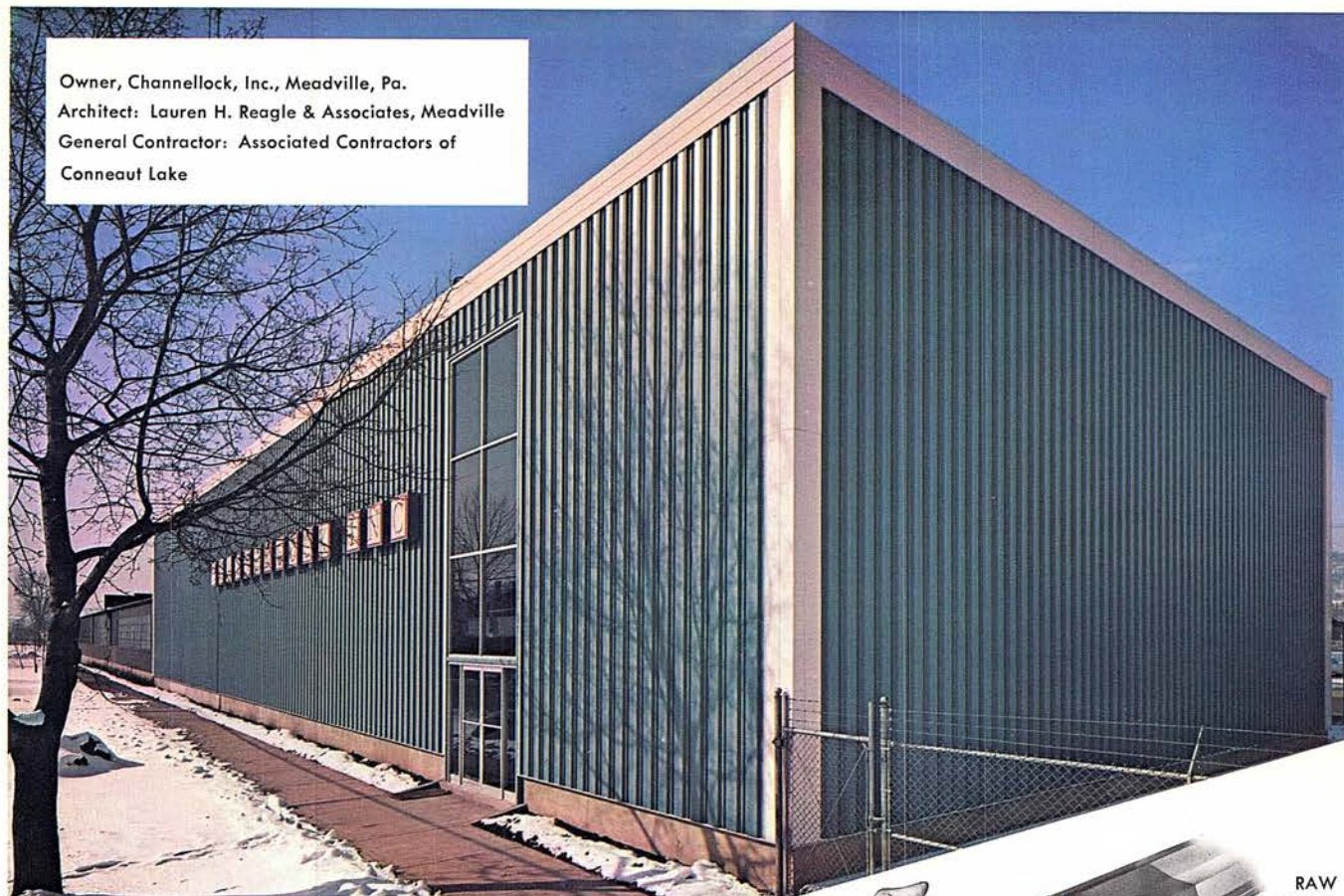
The positive vapor seal is achieved by a 1 1/2-in. extension of the jacket that overlaps the longitudinal joint and is secured by a special non-creeping adhesive. Circumferential joints are sealed by 3-in.-wide pre-applied adhesive butt tape. *Owens-Corning Fiberglas Corp., 717 Fifth Ave., New York, N. Y., 10022.*

CIRCLE 314 ON INQUIRY CARD  
more products on page 294

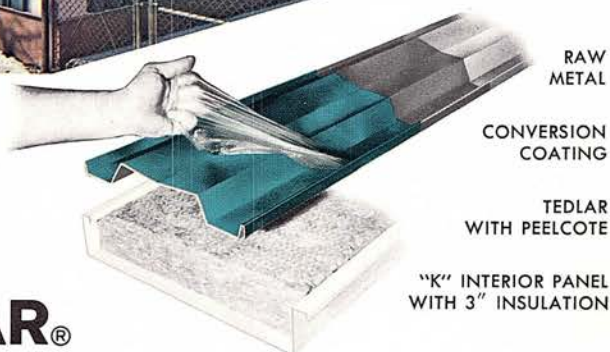
For more data, circle 153 on Inquiry Card



Owner, Channellock, Inc., Meadville, Pa.  
 Architect: Lauren H. Reagle & Associates, Meadville  
 General Contractor: Associated Contractors of  
 Conneaut Lake



## NOW: SMITH INSULATED METAL WALL PANELS WITH LONG-LIFE TEDLAR®



Yes! Now you can have the excellence, durability and architectural good looks of Smith insulated metal walls with the lasting beauty and protection of a Tedlar color surface.

Tedlar\* by Du Pont, bonded to a Smith panel contour of your choice, is a new exterior finish of fluoride film. By a special bonding process, Tedlar becomes a part of the metal it protects. It's tough; it resists staining, ordinary airborne chemicals and even harsh cleaning agents. It won't blister, peel or crack.

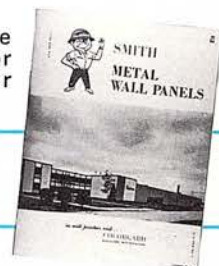
And, as with all Smith panel finishes, Tedlar is protected during forming, shipment, storage and erection by Peelcote®, a strippable clear plastic coating.

\*Tedlar is a DuPont trademark

The Channellock building walls pictured are Smith K-Panel: Shadowall® exterior panels for pleasing architectural lines, with 3" of glass fiber insulation encased in a metal back-up panel. It provides a smooth interior wall with a durable baked-on enamel finish in a choice of color.

On top of all this, you buy Smith Metal Walls in a single package, including engineering, structural drawings, manufacture, shipment and storage in Smith trailers and quality erection by Smith specialized crews. Many Smith Walls "repeats" with nationally known companies attest the economy and dependability of a contract with the nation's foremost wall specialist.

See Sweet's file 3b/Sm, or write for Bulletin 64W for details.



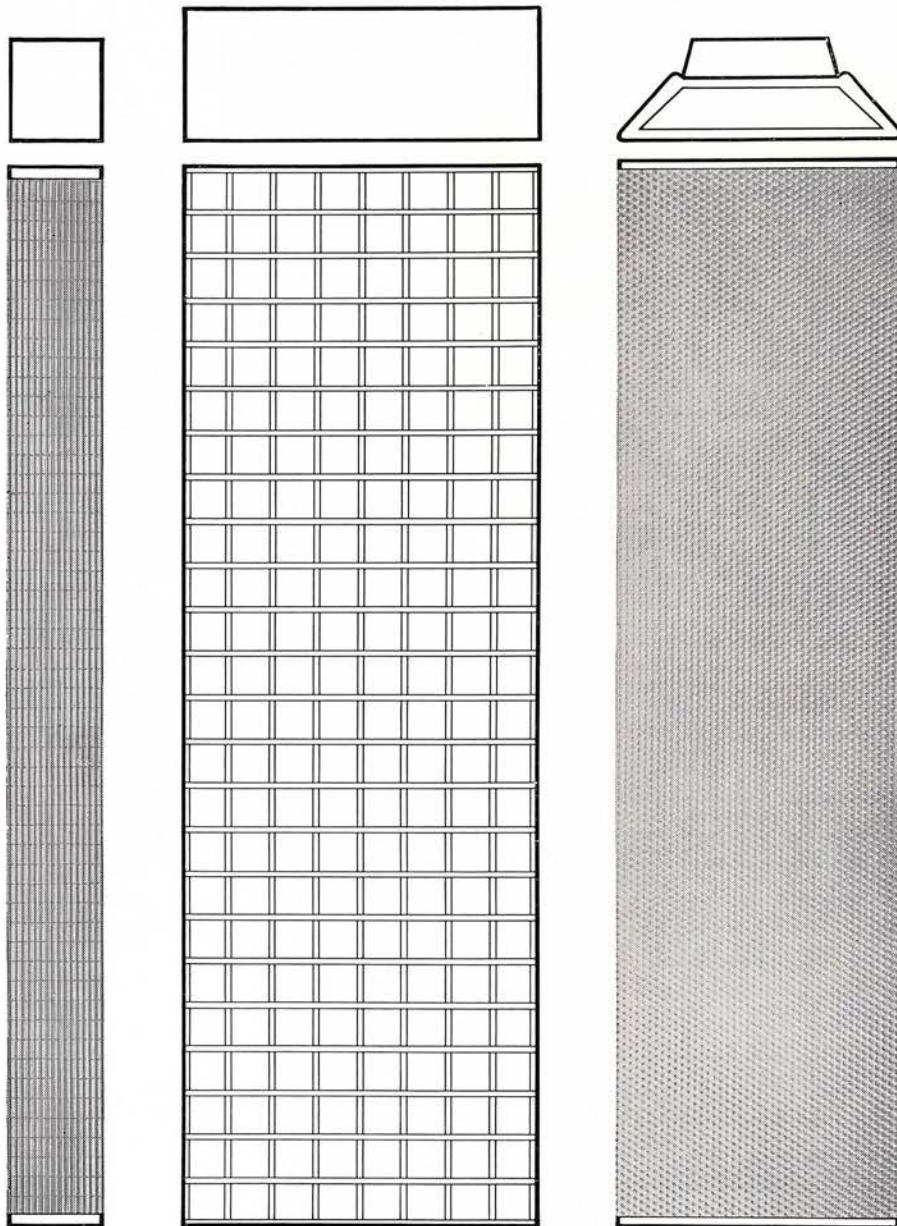
**"Smitty builds walls for Keeps"**

**ELWIN G. SMITH & CO., INC.** Pittsburgh, Pa. 15202 / Detroit • Chicago  
 Cincinnati • Cleveland • New York • Atlanta • Toledo • Philadelphia





# Functional, Cost-Conscious School Lighting Designed by Litecontrol



The Styline Corridor Light — designed for today's buildings

The Medalist — designed especially for gymnasiums

The Jamaica — 3 lenses available including Holophane

The three new Litecontrol fixtures — the Styline, the Medalist, and the Jamaica — will give your school installations the functional, well-lighted look of the future • Designed especially for school applications—corridors, gymnasiums or classrooms—the three fluorescent fixtures are cost-conscious, yet add the aesthetic values you strive to obtain in schools. • Write for complete details on any one, or all three, of the new Litecontrol fixtures.



**LITECONTROL**  
**LIGHTING**

LITECONTROL CORPORATION,

36 Pleasant Street, Watertown 72, Massachusetts

For more data, circle 155 on Inquiry Card



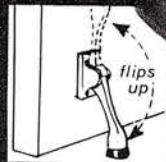


- *it's economical*
- *it's aluminum*
- *built for long wear*
- *shoe replaceable*

**NEW**

## GJ444A\*

lever-type  
door holder



\*"A" for aluminum, standard finish. Also available in sprayed brass or bronze.

*the latest addition to the GJ quality-built line of door holders*

### OTHER GJ LEVER-TYPE DOOR HOLDERS



GJ 4, GJ 5  
GJ 6 1/2  
"Hercules"  
The finest  
holder  
available.



GJ 44,  
GJ 45  
"Excel"  
For  
moderate  
cost  
con-  
struction.



GJ 444,  
GJ 555  
"Security"  
For low  
budget  
installa-  
tions.

*write for complete details*

**G L Y N N**  
**JOHNSON**  
corporation  
4422 n. ravenwood ave.  
chicago, illinois 60640

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For more data, circle 158 on Inquiry Card ➔





## WESTERN WOOD PRODUCTS MADE IN U.S.A.

FROM THE MEMBERS OF  
WEST COAST LUMBERMEN'S ASSOCIATION

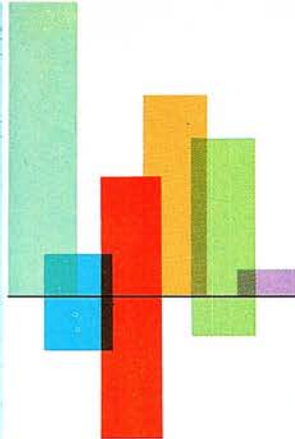
**FREE!** Write us for your personal copy of "Bright New World of West Coast Hemlock," containing span information and application ideas.

P. O. Box 2845, Portland, Oregon 97205

DOUGLAS FIR ■ WEST COAST HEMLOCK ■ WESTERN RED CEDAR ■ SITKA SPRUCE ■ WHITE FIR



# MODERN DESIGN Uses WESTERN WOOD PRODUCTS



For

## NOVELTY SHOPS

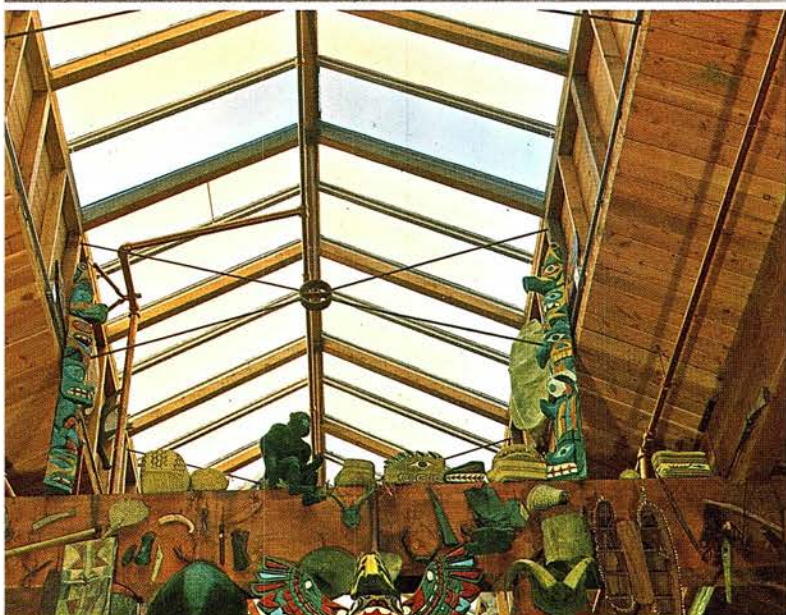
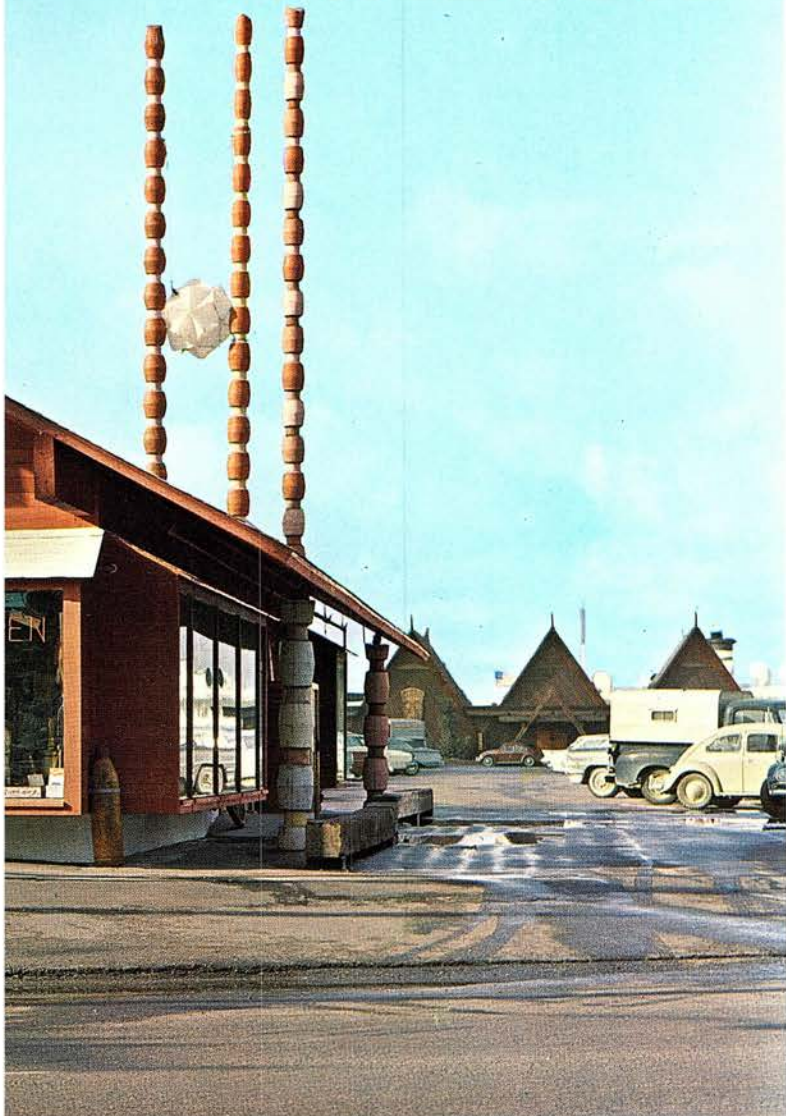
"Ye Olde Curiosity Shop," world-famous shop for art objects, gifts and novelties indigenous to the Pacific Northwest and Alaska, is located on the colorful Seattle waterfront. It is visited annually by thousands of tourists and native residents alike.

The nature of the business demanded that it be of native material, and that it be at home in its locale. The architect solved both of these problems by finishing the structure in beautiful and durable Douglas Fir. The wall framing is 4"x6" spaced 24" o.c. The siding is 2"x6" tongue and groove fir decking which results in single wall construction. Extended roof lines and eaves rest on massive timbers of the same species.

Another requirement was for ample floor space to display wares as diverse as bead work and totem poles. The structure permits sky-lighting the entire length of the ridge with delicately tinted glass supplying illumination for the handsome interior finish of Douglas Fir.

The entire building is an excellent example of how the standard sizes and grades of Western Lumber may be used to create an attractive, appropriate and economical construction for any specific purpose. Your convenient, local retail lumber dealer is your source of Western Lumber information and supply.

ARCHITECT: PAUL THIRY, F.A.I.A.



The standard sizes and grades used in this attractive building were:



Douglas Fir 2"x4", 2"x6" Framing, 2"x10" Joists and Planks, 6"x12" Beams, 4"x4", 4"x6" Posts and 1"x4" Battens.



Douglas Fir 2"x6" tongue and groove applied horizontally for siding.



Douglas Fir 4"x6" double tongue and groove for roof deck mezzanine floor.



Douglas Fir stepping and trim.



# The Exciting Aluminum **AGITAIR**<sup>®</sup> SERIES

Combining Creative Design  
with  
Excellent Air Handling

## See **AGITAIR** At The FAIR

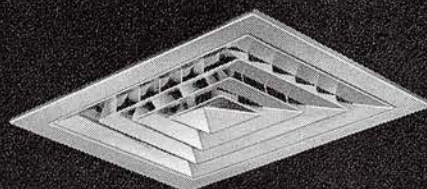
Administration Building  
The Ship Bounty (Metro Goldwyn Mayer)  
Chrysler Pavilion  
General Cigar Exhibit  
Malaysian Pavilion  
New York City Exhibit  
Post Office — at Worlds Fair  
Radio Corp. of America  
Scott Paper Co.  
Sierra Leone  
Swiss Exhibits Inc.  
Transportation & Travel Pavilion  
Vatican City  
The Arena  
Entrance Bldg (PD)

This series of aluminum AGITAIR Air Diffusers, Grilles and Registers presents a choice of designs to match any decorative scheme. Practical engineered features of these items assure warranted air handling performance to meet the most common or unusual application requirements.

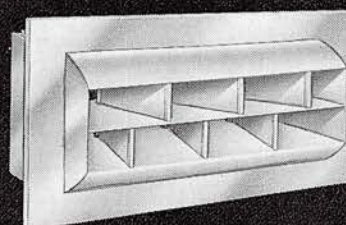
Your local Air Devices Inc. representative will be pleased to recommend the correct type and size best suited for each application. If you prefer, write for catalog.

## AIR DEVICES INC.

185 Madison Avenue  
New York, New York



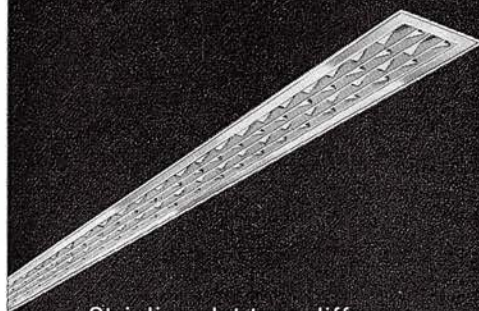
"RC" square and rectangular diffusers



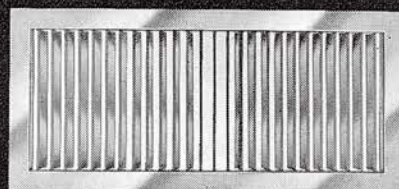
Roto-Jet cylinder type diffusers



Decoraire continuous grilles



Stripline slot-type diffusers



Registers and Grilles

For more data, circle 159 on Inquiry Card

For more data, circle 213 on Inquiry Card ➔



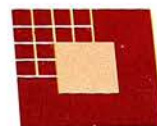


## EXTRUDED QUARRY TILE RESISTS EVERYTHING

Only *extruded* quarry tile offers so much resistance to wear, weather, abrasion, stains, acids, impact and dents. Only Summitville offers a complete Quarry Tile line...colors, textures, glazes and murals. Ask your ceramic tile contractor for the full story.

QUARRY TILE BY  
*Summitville*

Member: Tile Council of America, Inc.



**TILES, INC.**  
Summitville, Ohio



UNRETOUCHED PHOTO OF SUMMITVILLE TILE INSTALLATION



# FULLSPACE



## NEW SPACE SAVING STORAGE SYSTEM

*EXTRA Shelf Storage and/or Floor Space*

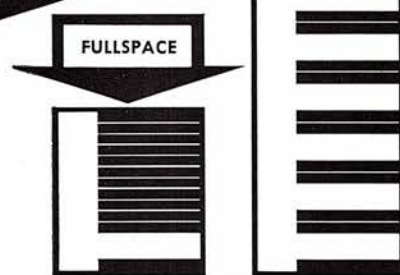
FULLSPACE is a patented arrangement of economical carriage-mounted units of rail-riding prefabricated wood shelving that save up to almost 50% of any floor space reserved or used for vertical storage. Fully loaded FULLSPACE sections are easily moved, left or right, by hand. A real space-saver and cost-cutter. Write or call for specifications and free descriptive literature.



FULLSPACE is manufactured by:

Dept. AR-4 LUNDIA, SWAIN and MYERS, Inc. / P. O. Box 309 / Decatur, Illinois.

For more data, circle 160 on Inquiry Card



Compare! FULLSPACE floor plan vs. typical shelving arrangement. Same amount of storage with both but with FULLSPACE, one aisle does the job of six and saves almost half the amount of floor space.

We could  
tell you how great  
our new  
drawing pencil is  
but you won't  
believe us  
until you try it.

So try it.

VENUS Pen & Pencil Corporation  
50 W. 44 St., New York 36, N. Y.

Gentlemen: I'll try it.

Send me the new Venus Drawing Pencil Sampler Kit free so I can make my own drawing board test.

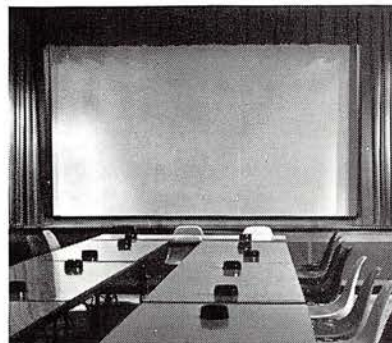
Name \_\_\_\_\_

School Name \_\_\_\_\_

Address \_\_\_\_\_

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

AR-5



Rodman Public Library Alliance, O. enjoys the BIG DIFFERENCE in Projection with a...

### DA-LITE® ELECTROL® SCREEN

The new Rodman Public Library in Alliance, Ohio was designed by the architectural firm of Berge-mann & Associates to perform all the wider functions of a fully modern library.

In the beautiful Library auditorium which seats 100, audio-visual techniques are used for every kind of meeting from Boy Scouts, to school instructions, to local business men's groups.

A new 9' x 12' Electrol projection screen is installed on the ceiling. Electrically controlled from the projection booth, the screen is out of sight when not in use, lowers automatically at the touch of a

button and stops in opened position.

Superb reproduction of projected pictures on Da-Lite's unique White Magic II® Chemi-Cote® glass beaded surface assures effective visual presentations.

Da-Lite screens are available in a wide selection of sizes to fit every need. An Electrol screen can be recessed in ceiling or installed on wall or ceiling. Choose a Da-Lite screen—you get the big difference in quality—and the difference costs you nothing.

Write for specifications, prices and name of your nearest franchised Audio-Visual dealer.



perfection in  
projection since  
1909

## DA-LITE®

SCREEN CO., INC.  
WARSAW, INDIANA

For more data, circle 86 on Inquiry Card

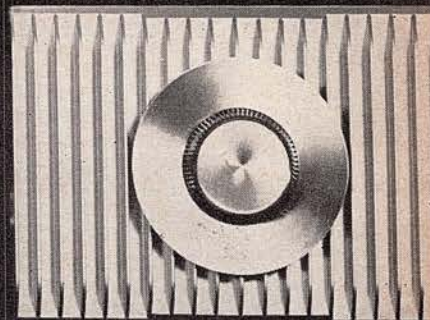




**Once you lifted the chimney  
and trimmed the wick,**

***NOW...***

**You can specify HUNT  
ELECTRONIC dimming  
controls and trim  
the cost of relamping!**



With Hunt Dimming Controls you not only get all the romance, mood and effect of the old Kerosene Lamp (minus the wick trimming), but you achieve the efficiency and flexibility necessary in modern lighting together with Economy... Economy in Relamping because incandescent bulb life is actually extended over 1,000% when burned at 75% of maximum rated wattage\*... Economy in Operation because Hunt Controls consume only the amount of power burned by the lamp or lamps... and Economy in Installation because all Hunt Dimming Controls are designed around the Hunt developed Silicon Symmetrical Switch (SSS) resulting in a small, compact unit for manual controls of from 600 to 1800 watt capacities. In Hunt remote manual controls of 1800 to 2500 watt capacities and in larger remote motorized systems controlling up to 20KW, the units are housed in 4" x 8" x 12" NEMA 1 enclosures, surface mounted to save valuable floor space.

No matter what your lighting requirement you will find a Hunt Dimming Control or System in either an Incandescent or Fluorescent model to do the job.

For more complete information and specificational data on the fully guaranteed line of Hunt Electronic Dimming Controls and Systems, contact your local Electrical Distributor or the Hunt Representative in your area listed on the back cover of our Sweet's Catalogue... or write the people who bring you the Brightest Ideas in Dimming:



\*General Electric's characteristics calculator for large and miniature filament lamps.

**HUNT ELECTRONICS  
COMPANY**

**2617 ANDJON DRIVE / DALLAS, TEXAS 75220  
FL 2-8421 / AREA CODE 214**



## Product Reports

continued from page 282

### KING SIZE PLANTERS

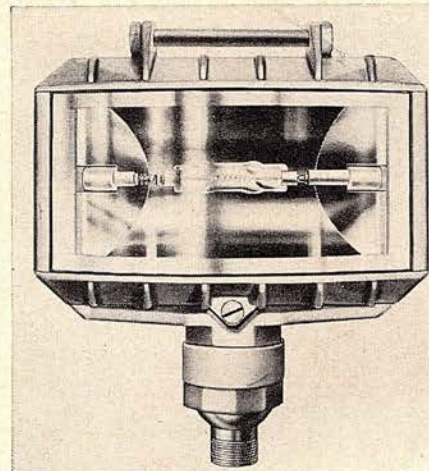
Decorative hemispherical planters of satin-finished aluminum are offered in three sizes: 16, 20 and 24 inches in diameter. Each size has an oil-finished black walnut base with aluminum feet. *McDonald Products Corp., 261 Duk-It Building, Buffalo, N.Y.*

CIRCLE 315 ON INQUIRY CARD

### QUARTZ IODINE FLOODLIGHT

A new quartz iodine floodlight can be tilted in any position because the *INA-2A/200w* and *INA-2A/400w* floodlights are mounted on ball joints which allow tilting a maximum of 45 degrees in both directions as well as forward and back movements.

The *INA-2A* floodlight provides top beam efficiencies with a special reflector system that redirects normally spilled light. The narrow angle can be preset between 5 degrees up to 22 de-



grees and the wide angle is 105 degrees. The 5- by 8-in. unit has a housing of aluminum alloy with fins designed for good heat dissipation. *Infranor of North America, Inc., 742 Worthington Ridge, Berlin, Conn.*

CIRCLE 316 ON INQUIRY CARD

**1964's BIG NEWS FOR  
THE CONSTRUCTION INDUSTRY!**

## GRP **NORTHWALL**\* BY GILSTOP

### Introducing THE NORTHWALL PROTECTIVE WATER-REPELLENT FINISHING SYSTEM

Remarkable new preservative finishes  
**GUARANTEED** to protect exterior  
above-grade concrete and masonry  
surfaces against water damage.  
Available **CLEAR** and in **COLORS**.

The **NORTHWALL SYSTEM** comes as a long-sought-after solution to costly damage by moisture, smog, salt spray, freezing, thawing, efflorescence, alkalinity, blistering and peeling. The key formulations in the **NORTHWALL SYSTEM** are **NORTHWALL CLEAR** (water-repellent preservative finish), **NORTHWALL IN COLOR** (decorative preservative finish), **NORTHWALL FILLER-COAT** (for porous and other unpainted masonry surfaces) and **NORTHWALL BLOCKFILL** (reconditioner for painted surfaces such as wall board). The **NORTHWALL SYSTEM** provides completely effective water repellency through 4 major factors: 1—The guidance of technical experts to help overcome wall-coating problems. 2—Strict quality control of unique improved formulations plus continuous laboratory testing. 3—Delivery in sealed containers. 4—Careful on-site inspections before and after application. The strong written guarantee is fully described in our literature. Products of the **NORTHWALL SYSTEM** meet the most demanding Federal and other specifications.

Send for our catalog or see it in Sweet's **S**  
#9/GIL-AIA #25-b-3.9. Write or call for complete details.

**THE GILSTOP DIVISION**  
**GILLESPIE-ROGERS-PYATT CO., INC.**

Producers of protective coatings for nearly a century and a half  
6200 Annapolis Rd., Hyattsville, Md. 20784  
Phone (301)-773-6800

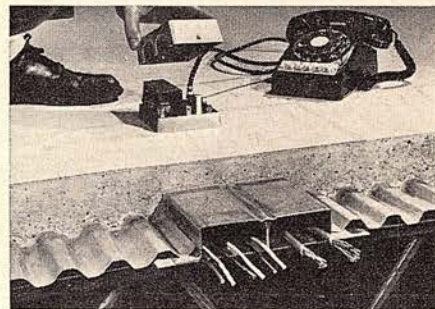
Executive Offices: 40 Wall St., N.Y., N.Y. 10005

\*Trademark of Gillespie-Rogers-Pyatt Co., Inc.  
© By Gillespie-Rogers-Pyatt Co., Inc., March 1964

### NEW FLOOR SYSTEM USES ONE FITTING FOR POWER AND TELEPHONE

A new cellular steel floor system introduced by Granco Steel Products Company puts power and telephone outlets in one floor fixture and fully electrifies thin, structural slabs used with steel joist construction.

Designed to provide cellular floor electrical capacity in a compact slab, the new floor system is being marketed nationally under the trade name of *Cel-Way*.



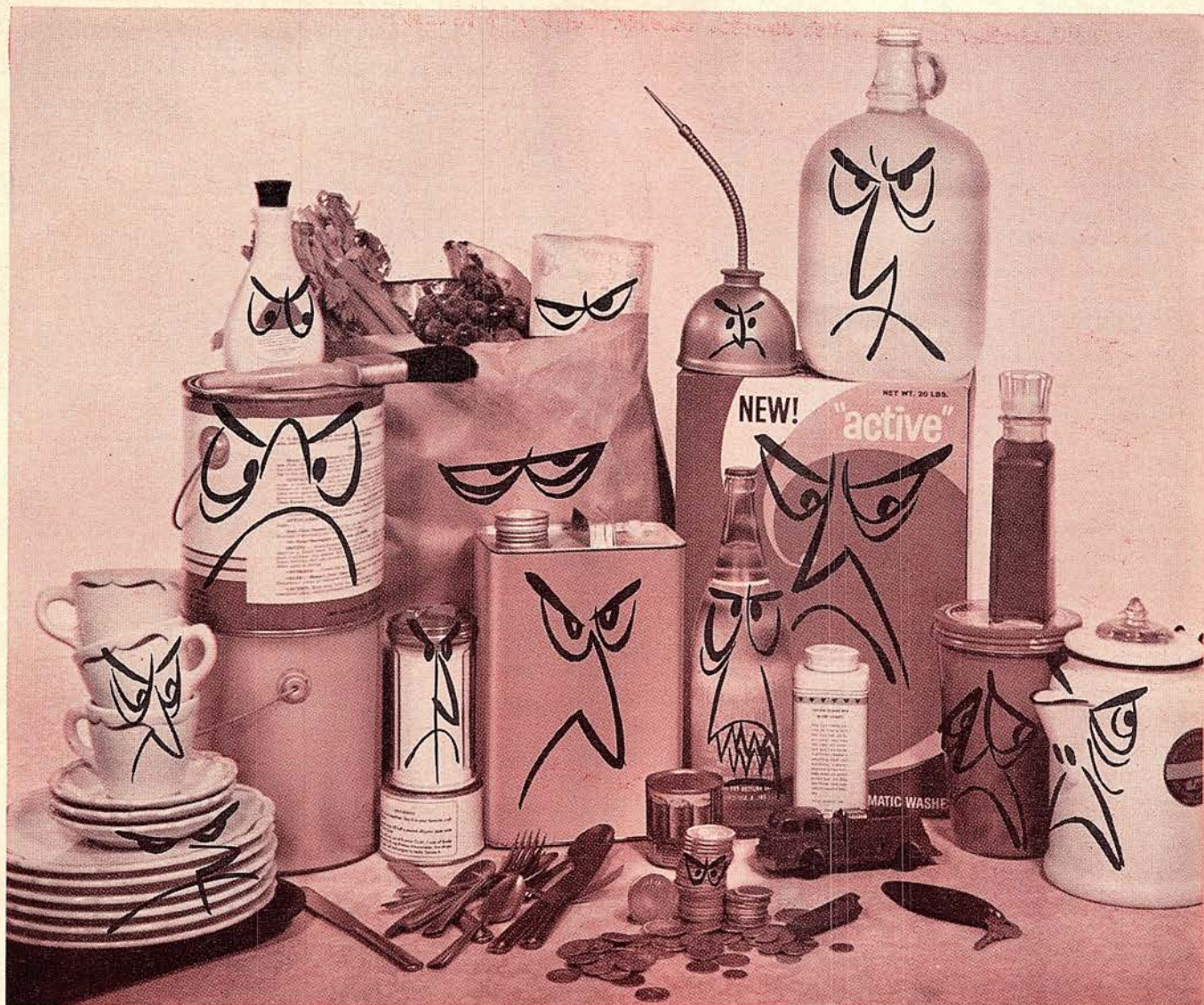
The *Cel-Way* system combines large galvanized steel cells with one of Granco's permanent steel forms for poured concrete floor slabs. The network of underfloor cells carries telephone cables and electrical wiring throughout the building and can be spaced to serve desks and office equipment regardless of location.

Units are available in three types—single, wide and double. *Granco Steel Products Co., 6506 N. Broadway, St. Louis, Mo., 63147*

CIRCLE 317 ON INQUIRY CARD  
more products on page 298

For more data, circle 162 on Inquiry Card





**STOP THE MONSTERS**  
with new "twice-the-wear"

**Textolite 1000**  
LAMINATED PLASTIC

**...now you can wage war  
on abrasive wear to  
commercial counter tops,  
tables and work surfaces**

The greatest advancement in laminated plastic in 25 years, G-E **Textolite 1000**

offers amazing twice-the-wear benefits over today's conventional high-pressure laminates. Here's a laminate that fights back against the wear of counter top "monsters" . . . a laminate with remarkable ability to withstand constant abrasion. Perfect surfacing for such high-wear commercial applications as checkout and coin exchange counters, restaurant and store fixtures, institutional furniture . . . and many others. A General Electric exclusive, it stands alone in the field for wearability because of a new, super-tough surface. (The extra wear is not

achieved by merely an extra thickness of melamine.) **Textolite 1000**, to put it plainly, exceeds double the wear resistance required by NEMA standards for high-pressure, melamine Class 1 laminates. Colors have more vitality . . . woodgrain designs are more sharply defined. It's easily machined with standard shop equipment. Cost? Reasonable! Initially, only pennies per square foot more than conventional laminates—but it really costs less in the long run because it lasts over twice as long. Send now for pattern and color samples, and more information.

**GENERAL  ELECTRIC**

General Electric Company, Coshocton, Ohio, Dept. AR-54

Please send more information and color samples for Textolite® 1000 laminate

Name \_\_\_\_\_ Title \_\_\_\_\_

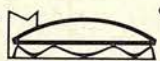
Firm \_\_\_\_\_

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

For more data, circle 163 on Inquiry Card

AN INTERIOR SURFACING ADVANCEMENT  
DEVELOPED BY GENERAL ELECTRIC

VISIT GENERAL ELECTRIC PROGRESSLAND  
A Walt Disney PRESENTATION  
AT THE NEW YORK WORLD'S FAIR





Secretary of the Treasury Douglas Dillon discusses prospects for 1964 with the chairman of the United States Industrial Payroll Savings Committee—Frank R. Milliken, President of Kennecott Copper Corporation.



## The leaders of America's business community invite you to join in a major fiscal undertaking

*"The volunteer efforts of such distinguished business leaders as yourselves on behalf of the Payroll Savings Plan are a notable instance of the active and productive concern of American business generally for the fiscal soundness and economic well-being of this nation."*

With these words the Secretary of the Treasury greeted leaders of 27 basic industries and opened the 1964 planning of the U. S. Industrial Payroll Savings Committee, a group formed of key businessmen and industrialists who assist the Treasury Department in its debt management program by promoting U. S. Savings Bonds.

The Committee's prospects for 1964 are bright. Thousands of companies will be urged to promote the Payroll Savings Plan enthusiastically within their organizations. *Your support is needed.* Will you join your fellow businessmen to help millions of American employees help themselves by saving regularly? Your own organization—with your backing—can make a splendid showing!

For full information, contact the chairman of your field of activity —today.

## THE 1964 INDUSTRIAL PAYROLL SAVINGS COMMITTEE OF THE TREASURY DEPARTMENT

**Honorary Chairman:**  
Honorable Douglas Dillon  
Secretary of the Treasury

**Chairman:**  
Frank R. Milliken, Pres.  
Kennecott Copper Corporation  
(Copper)

**Members:**  
Crowdus Baker, Pres.  
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James T. Griffin, Vice Pres.  
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Burroughs Corporation  
(Office Equipment)

Raymond C. Firestone, Pres.  
Firestone Tire & Rubber Company  
(Rubber)

Alexander H. Galloway, Pres.  
R. J. Reynolds Tobacco Company  
(Tobacco)

Harold S. Geneen, Pres.  
International Telephone &  
Telegraph Corporation  
(At Large)

John F. Gordon, Pres.  
General Motors Corporation  
(Automotive)

Crawford H. Greenewalt, Chm. of the Bd.  
E. I. du Pont de Nemours & Co., Inc.  
(Chemicals)

John L. Gushman, Pres.  
Anchor Hocking Glass Corporation  
(Glass)

Reed O. Hunt, Pres.  
Crown Zellerbach Corporation  
(Paper)

Thomas V. Jones, Pres. and Chm.  
Northrop Corporation  
(Aerospace-Aircraft)

Clarence A. Kelley, Pres.  
Dixie Ohio Express, Inc.  
(Trucking)

Lawrence Litchfield, Jr., Chm. of the Bd.  
Aluminum Company of America  
(Aluminum)

Joseph A. Martino, Chm. and Pres.  
National Lead Company  
(Lead)

Charles F. Myers, Jr., Pres.  
Burlington Industries, Inc.  
(Textiles)

William J. Quinn, Chm. and Pres.  
Chicago, Milwaukee, St. Paul and  
Pacific Railroad Company  
(Railroads)

M. J. Rathbone, Chm. of the Bd.  
Standard Oil Company (New Jersey)  
(Petroleum)

H. I. Romnes, Vice-Chm. of the Bd.  
American Telephone and  
Telegraph Company  
(Electrical Equipment)

W. Cordes Snyder, Jr., Chm. of the Bd.  
Blaw-Knox Company  
(Machinery Manufacturing)

C. E. Woolman, Pres.  
Delta Air Lines, Inc.  
(Air Transportation)

Leslie B. Worthington, Pres.  
United States Steel Corporation  
(Steel)

Charles J. Zimmerman, Pres.  
Connecticut Mutual Life  
Insurance Company  
(Insurance)



in your plant...promote the **PAYROLL SAVINGS PLAN for U.S. SAVINGS BONDS**



*The U. S. Government does not pay for this advertisement. The Treasury Department thanks, for their patriotism, The Advertising Council and this magazine.*





Ageless...because it's stainless



Architects: Curtis & Davis, New Orleans, La. General Contractor: George A. Fuller Co., Pittsburgh, Pa. Stainless Exterior: Limbach Company, Pittsburgh, Pa. Rigidized Stainless: Rigidized Metals Corp., Buffalo, N.Y.

What happened to curtain wall costs on this building when the architect designed it with Stainless Steel? They were lower than competitive materials.

The dramatic, diamond-shaped facade of Pittsburgh's IBM Building represents a radical departure in building design. Its structural steel framework is on the outside, and called for sheathing with extraordinary properties. It had to have high strength, good dimensional stability in varying temperatures, lasting corrosion-resistance in an industrial atmosphere—and harmonize with other buildings in the Gateway Center. And, naturally, cost was a factor.

Competitive bids in other materials were obtained to meet design requirements. The result: Stainless steel proved to be significantly lower in cost. Its high strength, coupled with depth of shape, permitted the use of lighter gauge sheet.

Stainless steel is economical over the years, too. It's solid—maintains its lustrous, corrosion-resistant finish for life with a minimum of care.

Why not utilize the economy, strength, permanent beauty and design flexibility of nickel stainless steel in your own plans? For further information send for Inco's suggested guide specifications and lists of manufacturers for curtain wall, windows, entrances and flashing.

The International Nickel Company, Inc. 67 Wall Street  New York 5, New York

For more data, circle 164 on Inquiry Card



## Product Reports

continued from page 294

### INCINERATOR WITH CYCLONE SEPARATOR

Claimed to be the first vertical high temperature cyclone separator applied to incinerators, *Cyclovane* Fly Ash Control is designed to improve the efficiency of an incinerator under adverse conditions of firing and charging, and virtually eliminates fly

ash discharge. *Cyclovane* is a feature of the *Model 57 Disposall* incinerator which has a nominal rated capacity of 100 lbs of waste per hour in continuous service.

The approximate weight of *Model 57* is 2,500 lbs. It measures 4 ft 11 in. high, 2 ft 3 in. wide and 6 ft 5 in. deep, and its charging chamber volume is 12.5 cu ft. *Joseph Goder Incinerators*, 4241 North Honore St., Chicago, Ill., 60613

CIRCLE 318 ON INQUIRY CARD



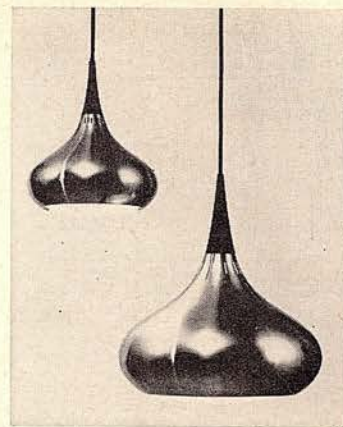
**These outdoor-indoor fabrics don't fade**

**Guaranteed 5 years not to!**

This could be a color ad of our fabric as parabola, fence, chair covers, blinds and canopy. But there are 25 Sunbrella® colors and patterns available, so we'd rather you used your imagination. Woven of 100% Acrilan® acrylic fiber, tests prove Sunbrella astounding. Plus colorfastness, it's mildew and rot proof. Retains its strength. Excellent porosity. Lightweight. Same color underneath as on top. Leave it up safely year 'round. Soft, non-glare finish. Increases efficiency of air-conditioning equipment up to 75%! Write for Sunbrella information and free new design idea booklet. Glen Raven Mills, Inc., Glen Raven, North Carolina. \*Reg. T M of Chemstrand



For more data, circle 165 on Inquiry Card



### LIGHTING FIXTURE

Available at the Danish Design Center are two residential lighting fixtures, *Orient Minor* and *Major*, shown here in aluminum. These fixtures are also available in copper. *Minor* is made in sterling silver too. *Danish Design Center*, 21-21 41st Ave., Long Island City, N.Y.

CIRCLE 319 ON INQUIRY CARD

### GRANITE CHIP COATING

Small granite chips, in a variety of colors, can now be sprayed directly on a modified neoprene matrix. Called *Marble-Lite*, the process uses chips in standard No. 1 and No. 2 sizes. In addition to its decorative value, the new surface is said to be water-proof and fire-resistant.

A similar process, called *Glamo-rock*, is applied by trowel. Both aggregates adhere rigidly to metals, wood, concrete, building block, brick and sheetrock. *E. M. Fitzsimons and Associates, Inc.*, 89 Wolf's Lane, Pelham, N.Y.

CIRCLE 320 ON INQUIRY CARD

### HEAT TRANSFER CEMENT FOR PROCESS SYSTEMS

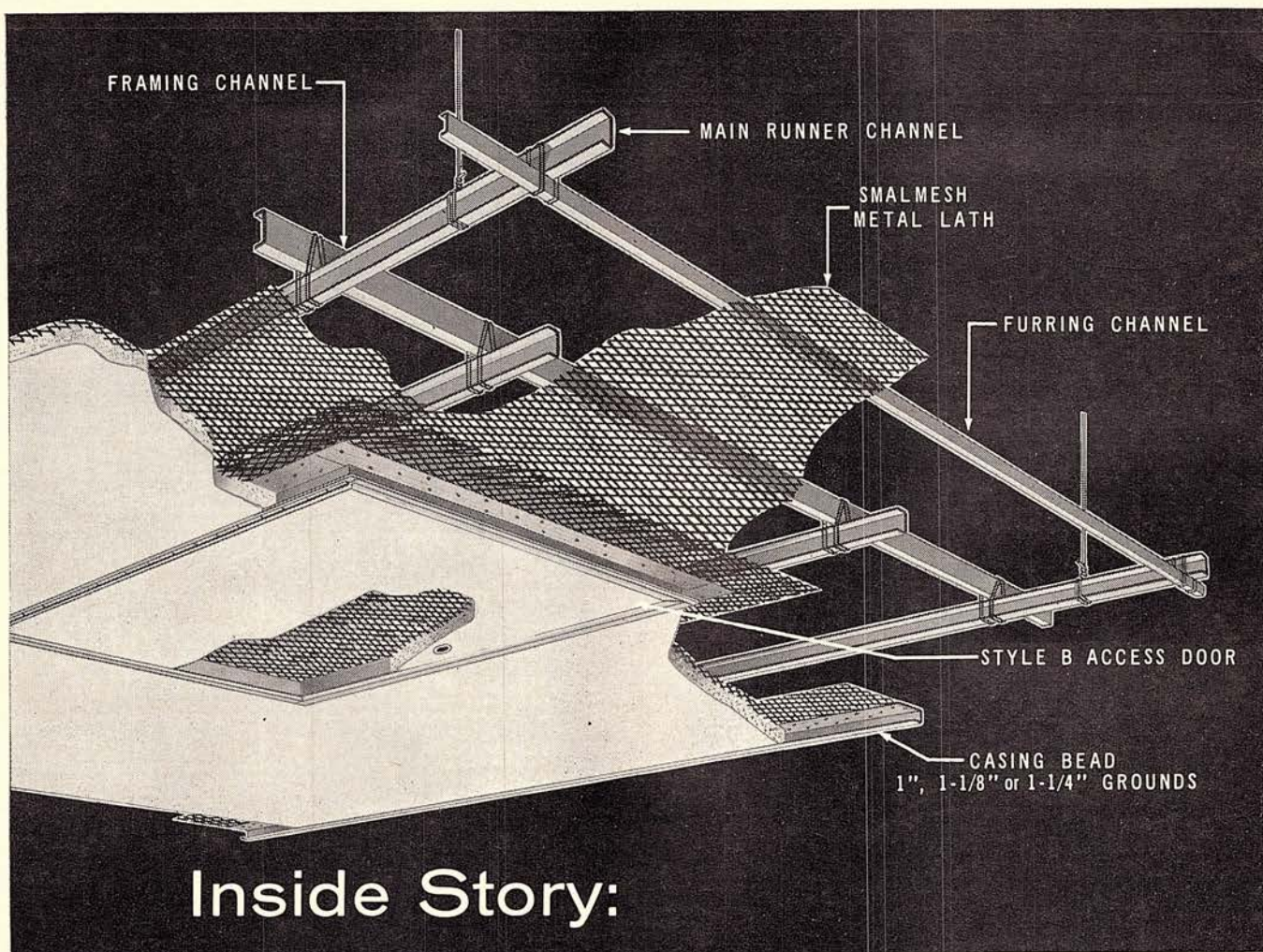
*Zeston* heat transfer cement is designed to increase the efficiency of external heat applications. It is a non-metallic, non-corrosive compound with high heat transfer characteristics which can be used where heat transfer from or to a process line is required.

*Zeston* is supplied in a mastic compound similar to roof cement in consistency and can be applied with a trowel or packet by hand. It dries into a hard and intimately bonded cement providing even temperature distribution, fast heat-up and increased efficiency. *Zeston, Inc.*, 744 State St., Perth Amboy, N. Y.

CIRCLE 321 ON INQUIRY CARD

more products on page 302

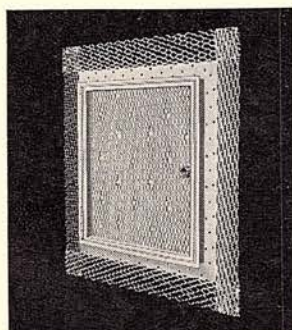




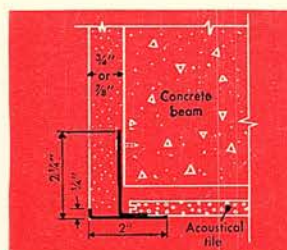
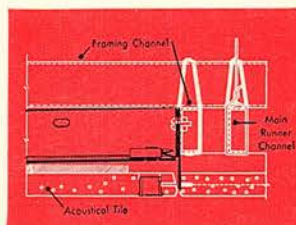
## Inside Story:

*Behind acoustical ceilings that install faster, look better, maintain maximum acoustical capacity*

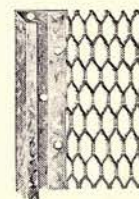
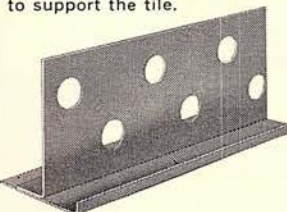
Access to utility systems behind an acoustical plaster ceiling is through virtually concealed Milcor Style B Access Door. It is keyed to surrounding plaster by Milcor No. 66 Expansion Casing Bead, an integral part of the door's outer frame. Casing bead also protects edges of plaster bonded to recessed door panel by Milcor Furlath.



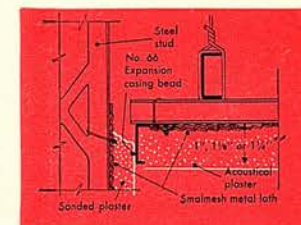
With acoustical tile, a Milcor Style A Steel Access Door is used. The tile attaches to the recessed door panel at a depth flush with the surrounding tile surface.



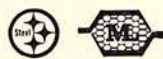
Milcor plaster and acoustical tile terminal forms a neat, clean terminal where a plastered fascia meets an acoustical tile ceiling. Provides automatic grounds and return for the plaster and a shelf to support the tile.



Milcor No. 66 Expansion Casing Bead — with 1", 1 1/8", or 1 1/4" grounds — provides the extra depth you need for proper thickness of acoustical plaster. Avoids structural cracking at unrestrained juncture of wall and ceiling. Provides straight, narrow reveal.



Member of the INLAND Steel Family



# MILCOR®

See Sweet's, sections 12a/In and 16K/In, or write for catalogs 202 and 210.

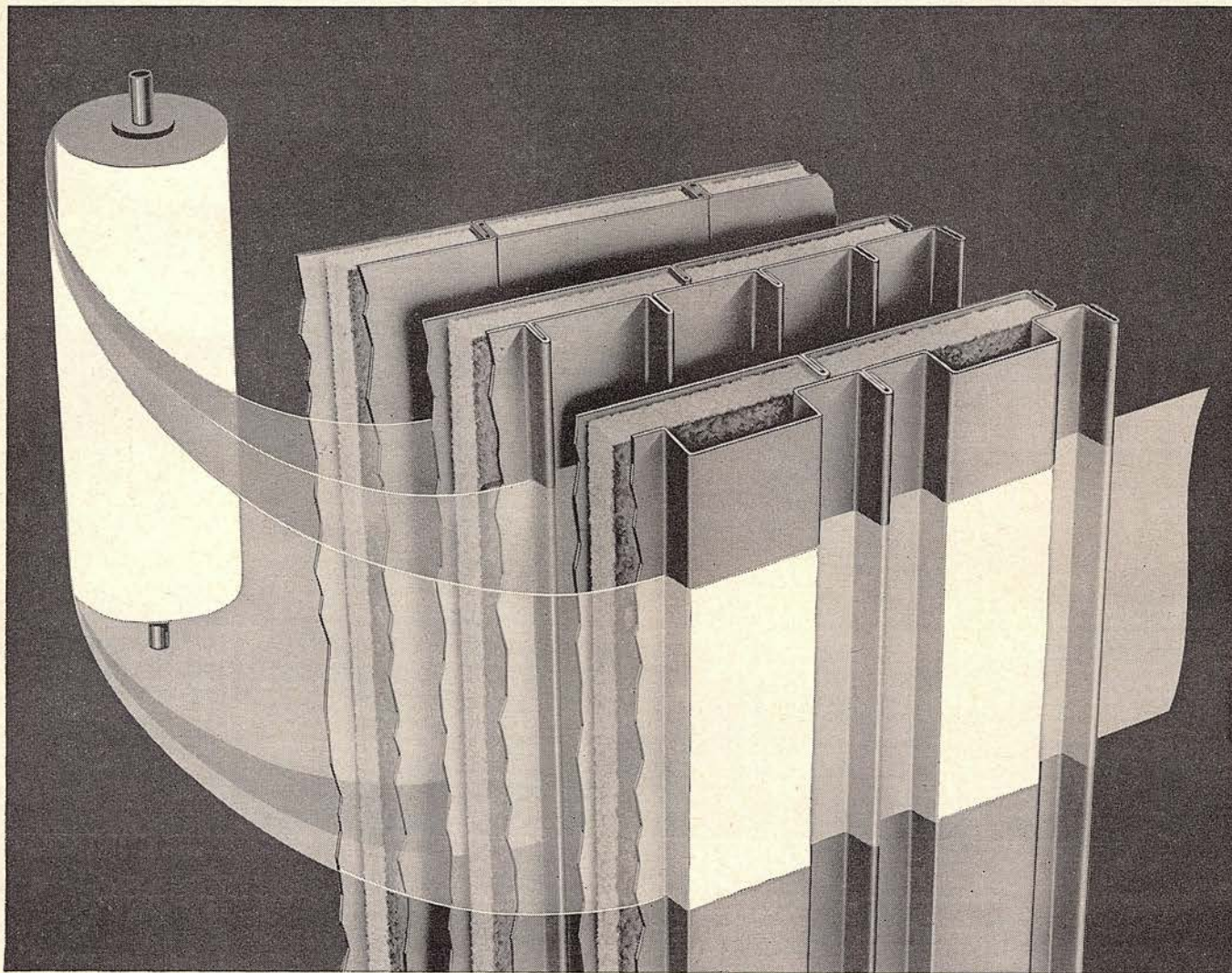
## Inland Steel Products Company

DEPT. E, 4033, WEST BURNHAM STREET, MILWAUKEE, WISCONSIN 53201  
BALTIMORE, CHICAGO, CLEVELAND, KANSAS CITY, LOS ANGELES,  
MILWAUKEE, MINNEAPOLIS, NEW YORK, AND SAN FRANCISCO

ML-72

For more data, circle 166 on Inquiry Card





## **A finish nobody cares for**

Maybe for 25 years. That's TEDLAR\* PVF film, DuPont's protective exterior surface that is bonded to building products for no-care maintenance. It's durable, good looking and weather resistant. It's thoroughly proven and economical over the long haul. And it's now available on all Mahon insulated-metal Curtain Walls having exterior panels of aluminum.

Mahon Fiberglas<sup>\*\*</sup>-insulated Curtain Walls have long offered functional advantages—erection to 60 ft. in height without a horizontal joint, invisible

\*DuPont registered trademark

\*\*TM of Owens-Corning Fiberglas Corporation

vertical joints, easy installation and low cost. And architects find a wide choice—in types, construction, metals, textures and finishes—for maximum design freedom in meeting project criteria.

It is indicative of Mahon's *competence* with metal building products that they are now using TEDLAR as one other means of better serving the construction industry. Find out how this *competence* helps you. Write for literature or better yet, talk it over with a Mahon architectural representative. The R. C. Mahon Company, 6565 E. Eight Mile Road, Detroit, Michigan 48234.

# **MAHON**

For more data, circle 167 on Inquiry Card



steelcraft metal door frame idea

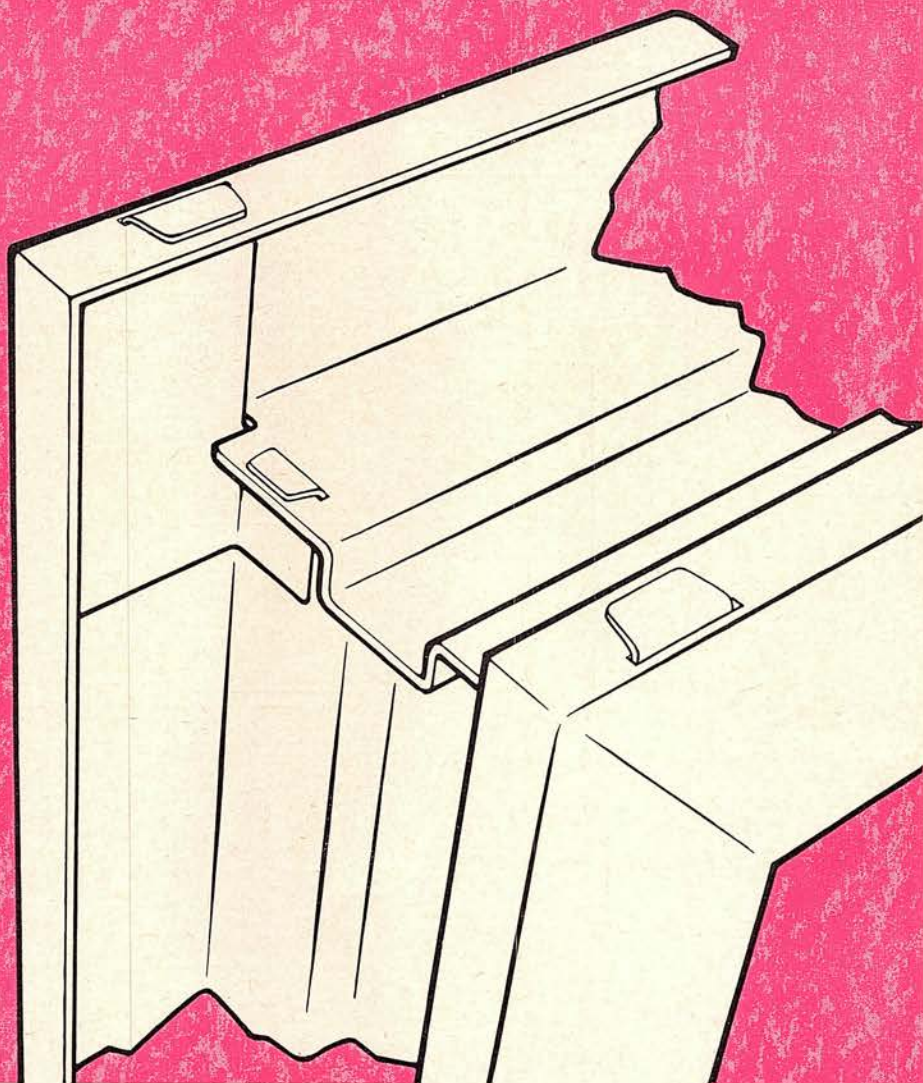
no.

12

in a series

In 99 out of  
100 cases  
**WELDING  
IS A  
WASTE**

Precision-mitered  
corners, double  
interlocking tabs  
give perfect fit,  
great strength  
to our  
"knocked-down"  
frame



## Insist on Steelcraft machine-mitered door frames



Actual slam tests have proven that our "KD" frame will perform all functions of a door frame without the necessity of welding. Many people prefer "KD" frames because they eliminate the ugly grind marks and unsightly corners of welded frames. Reduce your costs . . . get fast delivery . . . maximum versatility . . . and the best in quality . . . get Steelcraft.

This is another of the many advantages gained from the use of Steelcraft metal door and frame products. Write for other items . . . and the name of your technically trained distributor.

The Steelcraft Manufacturing Company, 9017 Blue Ash Road, Cincinnati, Ohio 45242

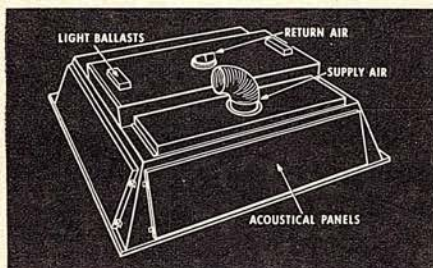
© Steelcraft 1964

For more data, circle 168 on Inquiry Card



## Product Reports

continued from page 298



### INTEGRATED CEILING SYSTEM

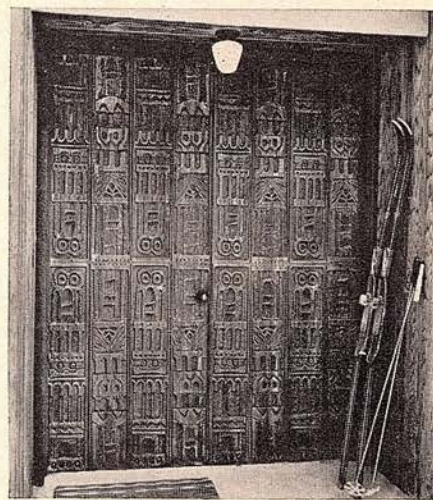
A ceiling coffer module named *Cof-Air-lite* is an integrated ceiling system which controls the amount of air, light and sound absorption. The basic frame can be furnished from 2 ft square to 6 ft square, with a rise from 3 in. up to 12 in. in height. Virtually unlimited flexibility of standard components permits a specifier to choose his own module size and depth, *Multi-Vent* air supply and return system, lighting fixture, acous-

tical material and pattern. Air is supplied through a ducted system and returned through the lighting fixtures or grills. Regular 2, 3, or 4 lamp fluorescent lighting fixtures can be used. Recessed, surface or cove-type incandescent lighting can also be supplied. *The Pyle-National Company, 1334 N. Kostner Ave., Chicago 51, Ill.*

CIRCLE 322 ON INQUIRY CARD

### CARVED WOOD PANELS

*Panelcarve* designates a varied series of wood panels in modular sizes that can be assembled to create carved wood doors, tables, cabinets, paneling and many other decorative products. The panels have a tongue-and-groove edge detail that permits



easy assembly. Most panels are 9 by 36 in. and they are carved from kiln-dried all heart redwood  $1\frac{1}{16}$  in. thick. *Panelcarve, Box 5215, Santa Barbara, Calif.*

CIRCLE 323 ON INQUIRY CARD

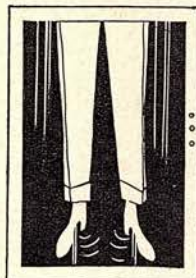
### FOLDING WOOD DOORS

*Louver-Fold* doors are vertical panels installed in doorways or used as room dividers that move along a track from jamb to jamb and may be completely closed or left open in a louvered effect for light and air control. An unobtrusive, sturdy steel, semi-enclosed overhead track with top and bottom pantograph provide the necessary support for operating alignment, regardless of the length of the span. Plywood panels are bonded to form a hollow center of not less than 1 in. in thickness, tapering to  $\frac{1}{4}$  in. on each end. *Haldeman-Homme Manufacturing Company, 2205 E. Hennepin Ave., Minneapolis, Minn.*

CIRCLE 324 ON INQUIRY CARD  
more products on page 306

# What is a dumb Waiter?

... probably the most  
industrious worker  
in multiple-floor  
buildings!



### here's why...

*A dumb waiter lifts vertically loads of every description between floors faster and easier than any other method of transportation — just by pushing a button. It reduces work loads, saves valuable man hours and increases overall efficiency.*

To stand the use and abuse that it must, a dumb waiter must be carefully and soundly engineered. Emphasis should be on safety, sturdiness, heavy duty construction and most important — dependability.

You can protect your clients by specifications that will in-

sure this dependable service. Let Sedgwick study your lifting problem, make recommendations, submit suggested specifications and prepare preliminary sketches of hoistway requirements. This is a free consultation service based on Sedgwick specialized experience since 1893.

See standard specifications and layouts in SWEETS 23a/Se

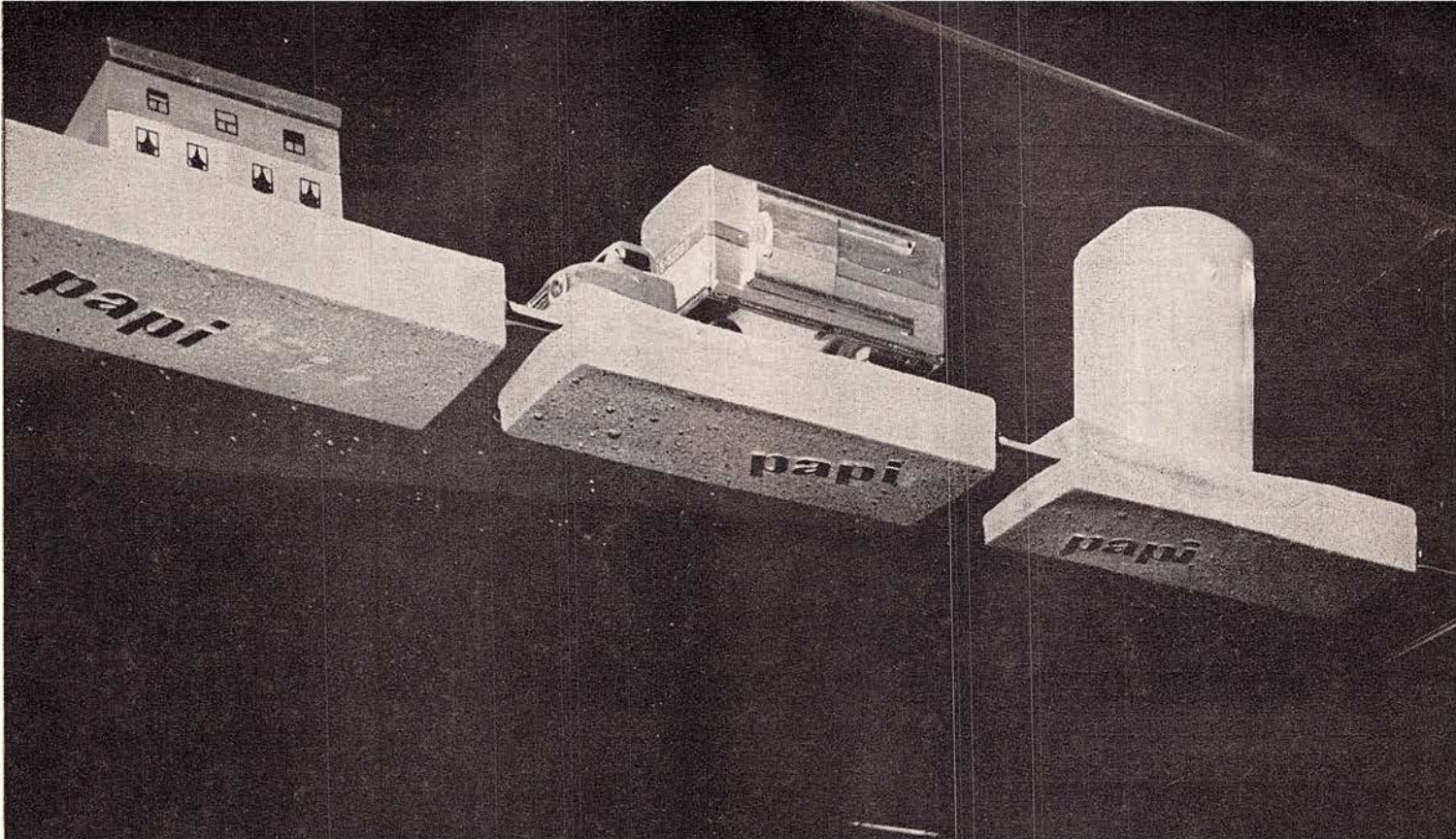


## Sedgwick MACHINE WORKS

84 Eighth Avenue, New York 11, N. Y.

For more data, circle 169 on Inquiry Card





# **papi**® IS ON TOP OF THE PROBLEM

(POLYMETHYLENE POLYPHENYLISOCYANATE)

## **PROBLEM:**

Water. Water can reduce insulation material to ineffectiveness.

## **SOLUTION:**

Specify PAPI-based 1-shot rigid urethane foam as the insulation material to keep on top of the problem.

When more than 5 per cent absorption takes place, insulation effectiveness is reduced. This holds true whether you are insulating reefer trucks, refrigerators, houses, or innumerable other products. The added weight of the water reduces payload for carriers. Moisture induces rusting in enclosed panels and heat and cold insulation factors deteriorate. The uni-cellular structure of PAPI-based foam eliminates the serious problems faced by conventional water absorbing insulation. Write us for recommendations to meet your particular application.

THE **CARWIN** COMPANY  
A DIVISION OF THE UPJOHN COMPANY  
NORTH HAVEN, CONNECTICUT

PAPI® T.M. Reg. U.S. Pat. Off.

WEST — 2113 East Chapman Avenue  
Fullerton, Calif. 92631 (714) 526-4936

MIDWEST — 553 Pennsylvania Avenue  
Glen Ellyn, Illinois 60137 (312) 469-8875

EAST — Stiles Lane, North Haven,  
Connecticut 06473 (203) 288-1671

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## CAN THIS GOOD LOOKING WALL ALSO FOLD?

Indeed it can. The difference between a FAIRHURST FOLDING WALL and an "accordion door" is apparent. Quite evident is the beauty of its near-seamless facade of wood veneer, plastic or fabric. Less obvious is the real reason Fairhurst has been first in Folding Walls for over 35 years—the patented folding mechanism which assures ease of operation and positive closure without motors or exposed hardware. A FAIRHURST FOLDING WALL is always sound-retardant. It won't sag, warp or jam and can be made fire retardant if you wish. Check your SWEET'S FILE or WRITE DIRECTLY FOR COMPLETE INFORMATION.

TECHNOPLY CORPORATION Dept. A

Huntington Hebrew Congregation, Huntington, New York

**Fairhurst**  
DIVISION TECHNOPLY CORPORATION  
Manufacturers of Folding Walls and Architectural Plywood  
182-20 Liberty Avenue, Jamaica 33, New York

For more data, circle 171 on Inquiry Card

## MARBLE: economy material for cost-conscious clients!

MARBLE? they'll say, an *economy* material? Yes, indeed! If they'll take a square look at *all* the facts.

Too many people make the mistake of assuming that anything as beautiful as marble—with its incomparable look of luxury—must simply be too costly. That simply is not true.

Actually, marble offers the best of *both* beauty and economy.

Marble, of course, is permanent and durable, more than good for the life of any building. Its economy begins the minute it's installed. It never needs painting or waxing or buffing. Year after year, its minimum cost of maintenance is like money in the bank.

Even marble's long-lasting look of luxury has a tangible value, increasing pride of ownership and pleasure in use, and helping to sustain property values by creating individual distinction for any structure.

Members of the Marble Institute of America offer skilled and experienced counsel in the proper use of marble; they offer the world's finest marble workmanship in their plants throughout the U.S.; and they offer as well more than 250 foreign and domestic marbles for you and your cost-conscious clients to choose from.

For further information, write:



**MARBLE INSTITUTE OF AMERICA, INC.**  
32 Fifth Avenue, Mt. Vernon, N. Y. 10550

For more data, circle 172 on Inquiry Card



## FOR A "FABULOUS FINISH" Gloss-Flo

Finest Quality,  
School Approved Polyurethane Gym Finishes,  
Floor Lacquers, Varnishes, and Lacquer Sealers  
...Finish Floors Better — Faster — Easier — With  
Longer Lasting Gloss.

Write for Samples, Trial Orders and  
Further Information to:

**Gloss-Flo CORPORATION**  
135 Jackson Street, Brooklyn, N. Y. 11211

For more data, circle 173 on Inquiry Card

For more data, circle 174 on Inquiry Card ➔



## **HOLOPHANE Square Postop®**

*For all Educational  
Outdoor Areas*

### **high, wide & handsome**

**High efficiency... High mountings (20 to 30 ft.)**

**Wide square distribution of light... Wide range of applications.**

**Handsome, modern styling... classic lines.**

Prismascope\* photoelectric control and InBilt ballast are prewired and encased in an aluminum, weather-sealed housing... Prismatic square refractor—molded of Endural\* glass—assures low brightness, and uniform luminosity...

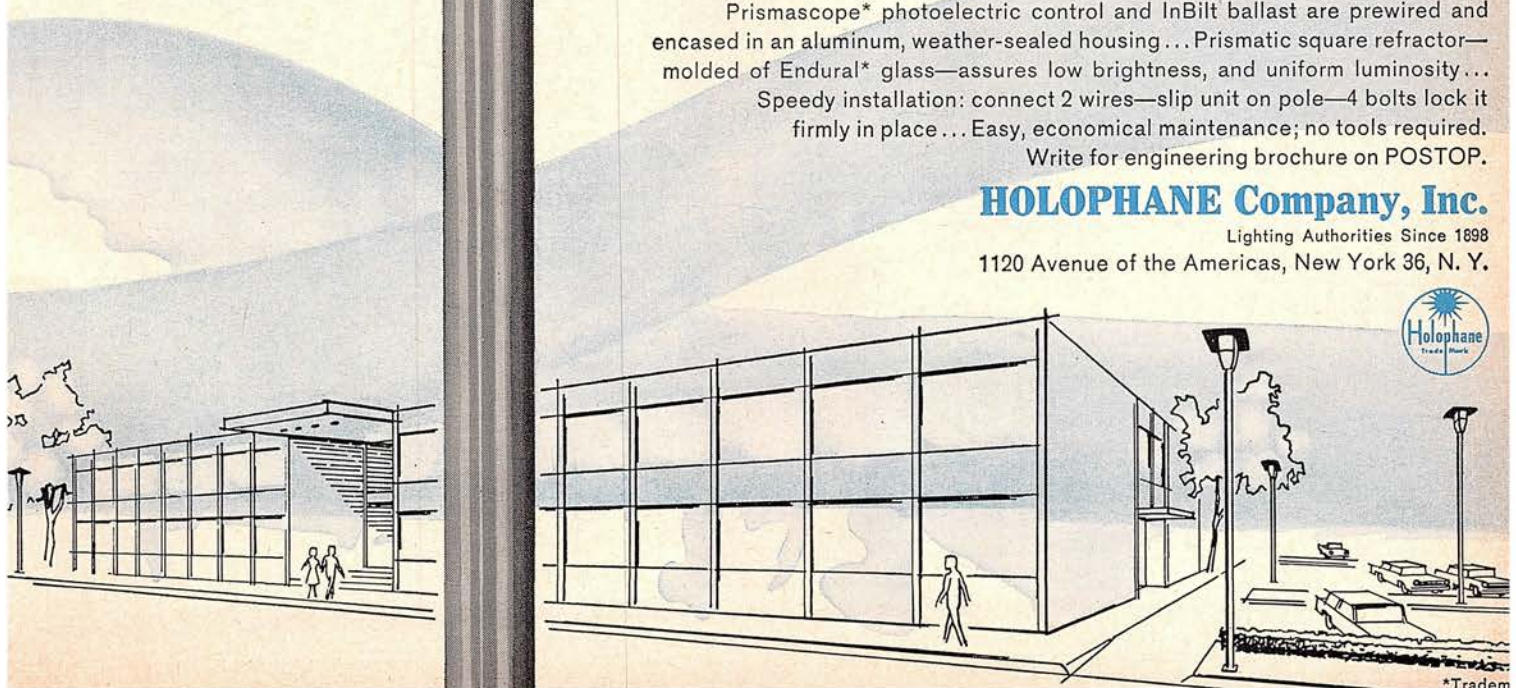
Speedy installation: connect 2 wires—slip unit on pole—4 bolts lock it firmly in place... Easy, economical maintenance; no tools required.

Write for engineering brochure on POSTOP.

**HOLOPHANE Company, Inc.**

Lighting Authorities Since 1898

1120 Avenue of the Americas, New York 36, N. Y.





## Product Reports

continued from page 302

### POCKET-SIZE CALCULATOR

A palm-sized circular calculator with a 30-in.-long scale is only 2¾ in. in diameter, yet it is said to be more precise than a standard slide rule. Front and back dials are synchronized and have nine concentrically arranged scales for functions includ-

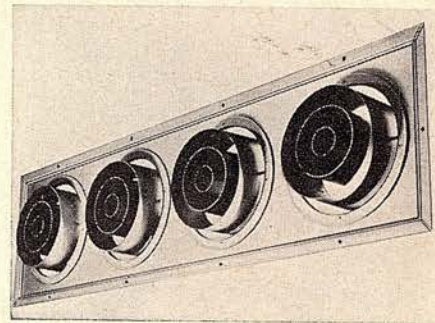
ing reciprocals, logs, square roots, cube roots, natural and log sines, and log tangents. *Scientific Educational Products Corp., 30 E. 42nd St., New York, N. Y., 10017*

CIRCLE 325 ON INQUIRY CARD

### HIGH CAPACITY SIDEWALL DIFFUSER

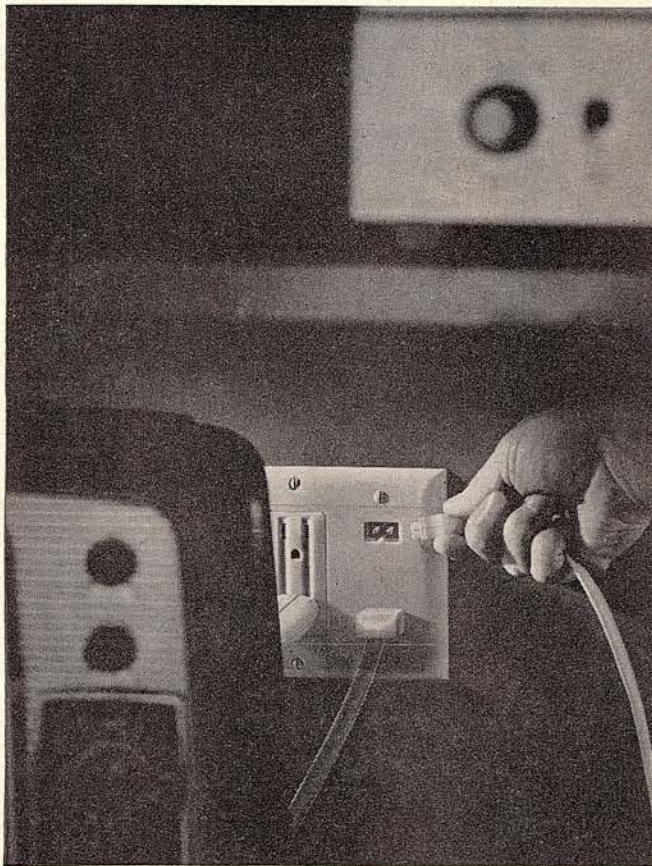
A new *Jet Flo* sidewall diffuser for applications requiring high discharge velocities with low aspirating characteristics and maximum direc-

tional flexibility is designed specifically for auditoriums, arenas, shopping center malls, gymnasiums and theaters.



Units are available with one to four diffuser elements per assembly. The discharge pattern of each diffuser element can be manually adjusted. *Barber-Colman Company, Rockford, Ill.*

CIRCLE 326 ON INQUIRY CARD



### NEW TV-FM ANTENNA RECEPTACLES

Beauty and utility... distinctive Sierra Wall Plates with TV/FM Receptacles recessed for custom appearance. Choice of types and combinations, in one and two gangs... choice of colors: ivory, beige, grey, white and brown. Packaged complete with plug and 8-foot cord set, or with plug only. Ideal for all TV, FM, AM, and rotary antennas. Use one or more in every room.



## SIERRA ELECTRIC CORPORATION

15100 SOUTH FIGUEROA ST. ■ BOX 85, GARDENA, CALIFORNIA

For more data, circle 175 on Inquiry Card

### BRONZE WINDOWS

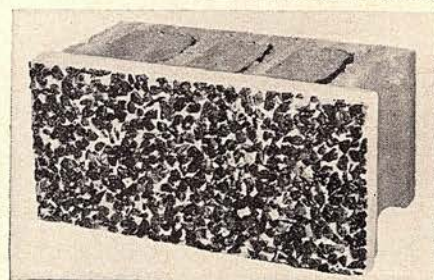
The first windows ever produced of Anaconda's *Everdur* bronze on a productive basis consists of frame and reversible sash. The new windows made by a roll-forming process, are priced approximately 30 per cent lower than those made of bronze extrusions, are competitive with anodic-color aluminum, and are only 15 per cent higher than stainless steel. They are available in natural, reddish old gold color of *Everdur* or in a pre-aged statuary finish. Standard sash and frame size is 3 ft 6 in. by 8 ft 0 in. Custom sizes are also available. *Trio Industries, Inc., 1095 S. Ave., Bridgeport, Conn.*

CIRCLE 327 ON INQUIRY CARD

### EXPOSED AGGREGATE FACINGS FOR MASONRY BLOCK

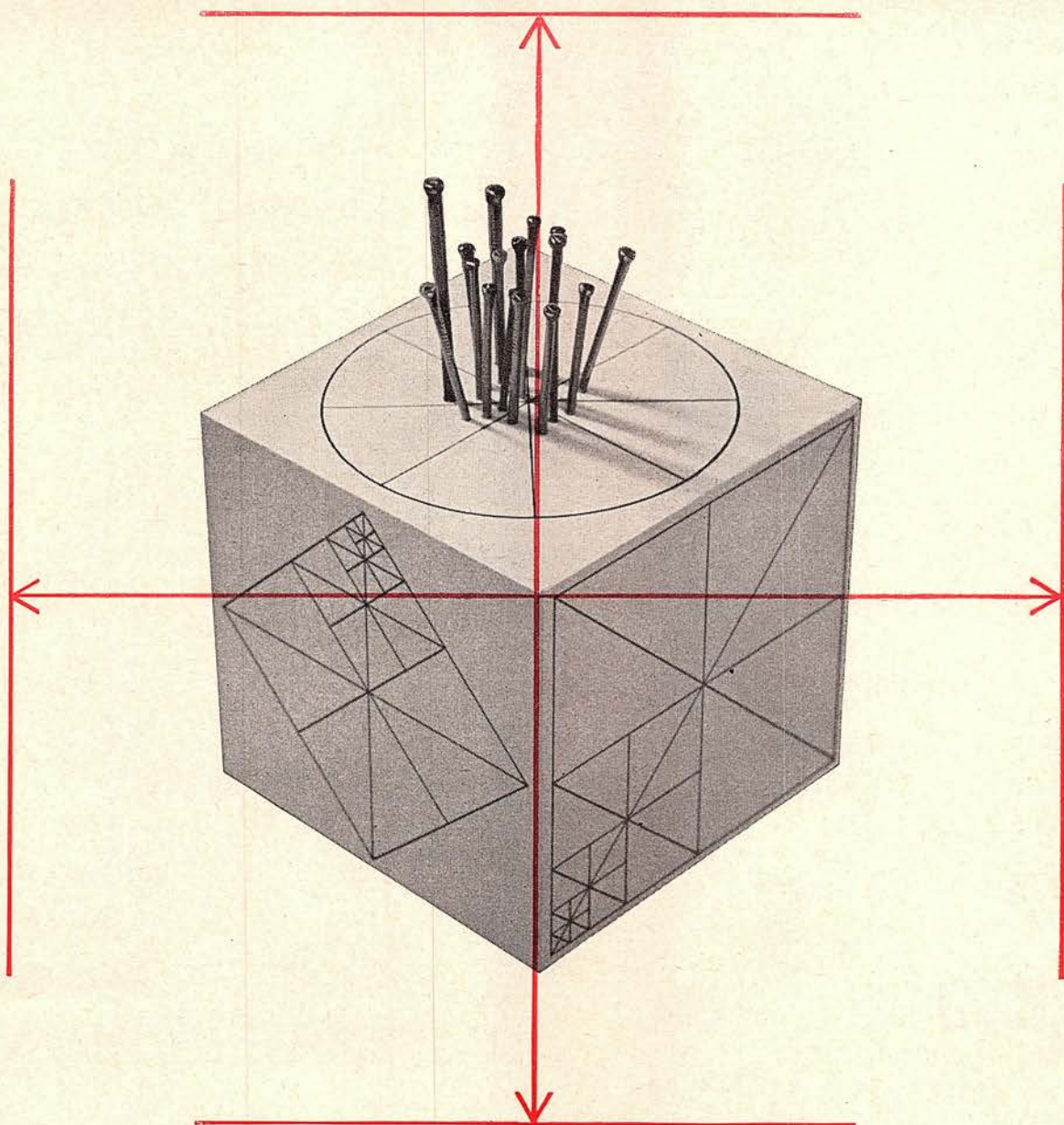
An exposed aggregate block called *Jewel-Tex* features a decorative facing on a structural, modular size concrete block. Properties are: resistance to weathering and water, and non-fading colors. *Preco Chemical Corp., 589 Main St., Westbury, N. Y.*

CIRCLE 328 ON INQUIRY CARD



more products on page 312





## Why accept stock plywood panels? Eggers will make and match custom crafted plywood to your exact design, dimensions and expression

Eggers custom crafted plywood doesn't cost that much more. (In fact, Eggers may even save you money by eliminating the waste of cutting stock panels to size.) But Eggers custom crafted plywood panels give you so much more — look so much better — outwardly demonstrate the care and attention you've given to the entire building. Eggers offers you real design opportunity for interior expression that can't be obtained from stock panels. Discover how Eggers will custom craft just the paneling effect you want. Incidentally, if you insist on stock panels, we make them, too.

### Write for Eggers Custom Craft Plywood Paneling Booklet (a useful reference guide for specifying the effects you want).

This booklet tells and illustrates how you can specify: that doors match panels; that transoms match doors; that panels match panels regardless of height variation of panels (up to 16 feet). How, with Eggers, you may specify the color, grain, texture of the flitch for panels . . . the veneer match (book, slip, random, etc.) . . . the panel face match (running, center or balanced) . . . the panel construction. Why accept stock panels? Eggers will custom craft plywood to your exact design.

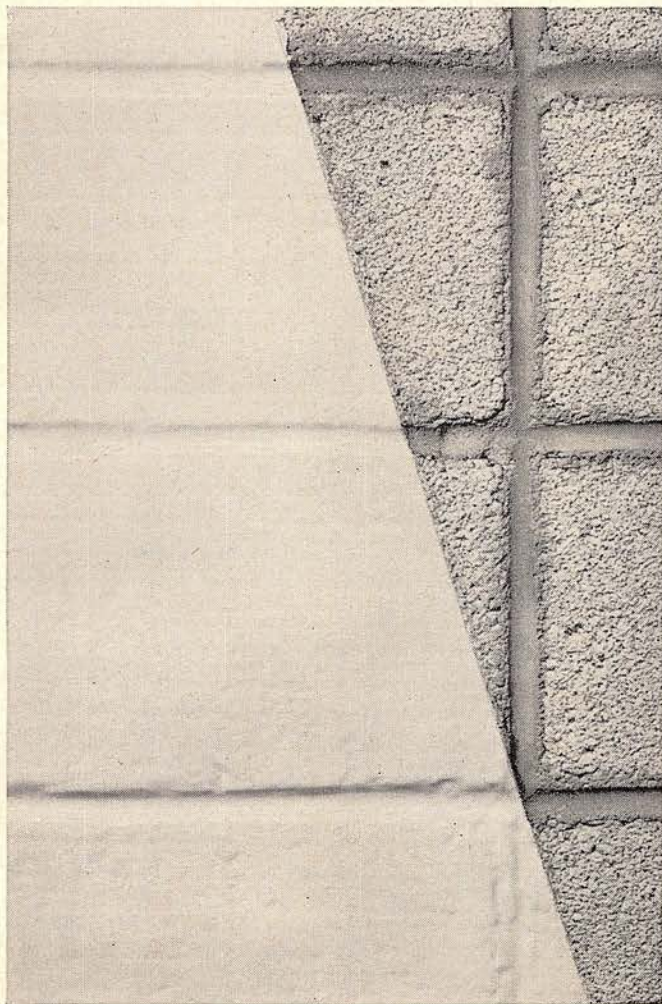


EGGERS PLYWOOD COMPANY OF TWO RIVERS, WISCONSIN / PHONE 414-793-1351

*Manufacturers of Quality Architectural Plywood since 1884*

For more data, circle 176 on Inquiry Card





## O'Brien's New *Mira-Plate*

***The miracle strength epoxy that goes  
on like paint, looks and lasts like ceramic tile!***

Here's superior protection and tile-like beauty—at a fraction of tile's cost. O'Brien's MIRA-PLATE beautifully coats everything paintable—including new or previously painted plaster, brick, concrete, wood, metal. Ideal for heavy traffic areas. Superior to paint. Defies wear, weather, chemicals, fumes, peeling, and cracking. Unique waterproofing properties defy moisture. Brush it, roll it, or spray it on—and MIRA-PLATE may be recoated or retouched at any time. Many popular colors and attractive fleck patterns. Ask your O'Brien dealer, your painting contractor, or simply send the coupon.



To: The O'Brien Corp., Dept. AR-5  
South Bend 21, Indiana

Please send me complete information about MIRA-PLATE, your miracle-strength coating that goes on like paint, looks and lasts like ceramic tile.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

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

The O'Brien Corporation, South Bend 21, Indiana • Baltimore • Oklahoma City • San Francisco • Los Angeles

For more data, circle 177 on Inquiry Card

## Specify Bally all-metal sectional walk-in refrigerators

(with features you can't get in "built-ins"  
and at lower cubic foot cost than "reach-ins")



Bally Walk-Ins can be assembled in any size or shape from prefabricated sections. Easy to increase size by adding sections . . . easy to disassemble to relocate. New design features!

1. 4-inch moisture-proof urethane "foamed-in-place" equals 8½-inch fiberglass 2. Urethane's strength eliminates need of wood structure . . . reduces weight more than half 3. Patented Speed-Lok makes assembly accurate, fast, easy 4. Lightweight door with automatic self-closing hinges . . . improved hand lock (inside safety release) and foot treadle . . . opens and closes easily 5. Self-contained refrigeration systems . . . factory-tested and hermetically sealed . . . eliminate service problems 6. Galvanized or aluminum interior and exterior assure maximum sanitation. Stainless steel available.

Because of mass-production, Bally Walk-Ins cost less than built-ins constructed by building trades. And cubic foot cost is less than half that of reach-ins.

Available everywhere through thousands of dealers and contractors . . . no need to ever accept a substitute.



Write for 12 page brochure  
and sample of urethane wall.

**Bally Case and Cooler, Inc.**  
Bally, Pennsylvania

For more data, circle 178 on Inquiry Card





Marina City, twin 60-story apartment towers in Chicago. Architect, B. L. Goldberg, A. I. A.

## Marina City operating costs well under estimates



After enjoying the advantages of all-electric living for a full year, Marina City residents are finding their utility bills to be at — or below — the original estimates.

The actual billing for 209 of the first 248 apartments occupied was adjusted downward an average of \$4.66 per month, by Commonwealth Edison, the serving utility, while 29 remained at the level estimated. Only 10 of the apartments had an increase in budget billing, averaging \$3.30 monthly.

Total electrical costs for the 248 apartments — including space heating, air conditioning, lighting, cooking, hot water, television and all other appliances averaged \$14.47 per month, or \$173.64 annually.

Marina City apartments are heated and cooled with General Electric baseboard heating and thru-the-wall air conditioners in a climate with an annual average of 6113 degree days.

Marina City, through its modern trend-setting design, has proven that all-electric construction is practical — and economical — even in Chicago's extreme winters.

For more information on General Electric's program for total-electric apartment construction, contact your General Electric major appliance distributor, or write to Construction Market Development Operation, General Electric Company, Appliance Park, 6-230, Louisville, Kentucky.

*Charles R. Swibel is President of the Marina City Management Corporation, now involved in the construction of the total-electric office building adjacent to the twin towers.*



**GENERAL  ELECTRIC**







# **NOW: architectural panels surfaced with Du Pont TEDLAR®**

A finish of TEDLAR® PVF film was specified for these architectural building panels. Typical of the increasing number of building products available with TEDLAR, these "Shadowall"† panels by Elwin G. Smith Co. offer the architect flexibility in design and practical application. They look good, go up fast, cost relatively little and combine inner and outer walls and insulation in each modular unit.

More and more architects are specifying TEDLAR on siding and roofing. This film finish is available on standard building products as well as on building panels and accent panels produced by custom fabricators to the architect's original design.

**Find out more about TEDLAR. Write  
Du Pont Film Dept., Box 501A,  
Wilmington, Delaware 19898.**

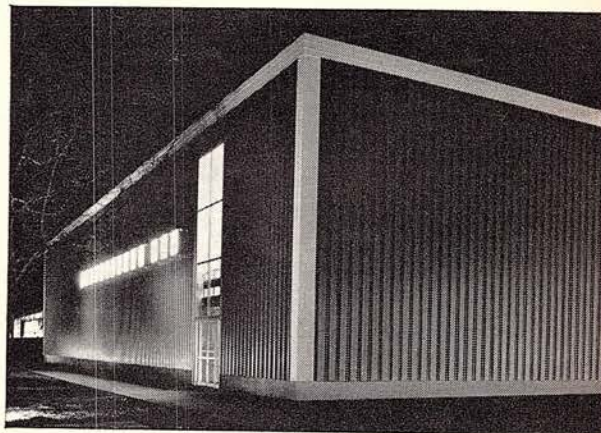
Channellock Inc., Meadville, Pa.  
Architects-Engineers:  
Lauren & Lenn Reagle, Meadville, Pa.  
General Contractor:  
Associated Contractors of Conneaut Lake, Pa.

\*Du Pont registered trademark.

†Elwin G. Smith Co. registered trademark.



BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY





## Product Reports

continued from page 306

### PANELED CEDAR SHAKES

Eight-ft panels of cedar shakes, called *E-Z Ply*, are now available in a three-ply thickness. The first, or outer course, is unstained or gray-primed cedar shakes. The second layer is a cross-bind of plywood veneer and the backing is an undercoursing grade of cedar shingles. All three lay-

ers are bonded together with exterior glues for a strong, rugged panel. *Shakertown Corp., 20310 Chagrin Blvd., Cleveland, Ohio, 44122*

CIRCLE 329 ON INQUIRY CARD

### MOVABLE WALL SYSTEM

United States Plywood Corporation has announced a new partition system called *Designer Wall/6*, a simple, inexpensive movable wall system for office buildings, schools, hospitals and other installations.

The new system consists of only six

basic metal parts as framing members for a wide range of panel materials of stock facing products.

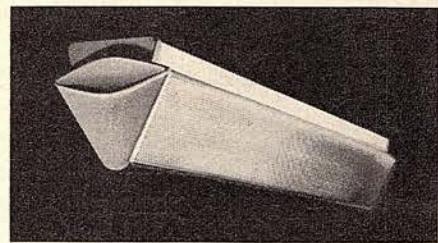
Panels for the new *Designer Wall/6* use a wide range of economical stock facing products. The system also may utilize 1¾-in. *Novoply* panels, incombustible *Weldrok* core materials, even stock doors.

The six basic parts in the new system are: an H-shaped post; a half-post used as a ceiling channel, starter, or railing for a low-rail bank screen; an insert for glass; floor channel; panel support; and painted steel base covers. *United States Plywood Corp., 777 Third Ave., New York, N.Y., 10017*

CIRCLE 330 ON INQUIRY CARD

### CORRIDOR LIGHTING

The new *Series II Vee-Lens* delivers high levels of light for corridor walls, and its upward component of 19 per cent provides proper brightness ratios and relief of ceiling contrast. The manufacturer also says the luminaire controls brightness for glareless, down-the-hall viewing.



Clear polystyrene or acrylic diffusers are available. A 4-ft *Vee-Lens* accommodates one rapid-start 430 MA lamp; an 8-ft model houses two such lamps in tandem. *Lighting Products, Inc., Highland Park, Ill., 60036*

CIRCLE 331 ON INQUIRY CARD

### WALL AND FLOOR SURFACINGS

*Ryno-Wal*, *Ryno-Krete* and *Traffic-Dek* are new surfacing materials for walls and floors. *Ryno-Wal* is a non-cementitious, inorganic, vitreous type surfacing for interior building wall available in a variety of colors.

*Ryno-Krete* is a non-cementitious, inorganic, breathing type surfacing for exterior building surfaces such as concrete, masonry, plywood, etc.

*Traffic-Dek* is an elastomeric system coupled with a durable traffic surface. *R. M. Hollingshead Corp., Advertising Dept., 840 Cooper St., Camden, N. J., 08102*

CIRCLE 332 ON INQUIRY CARD

more products on page 316

## Super Soundguard X24 TOPS ALL FOLDING PARTITIONS with **STC\*44** SOUND RATING

**STC 44**  
Super Sound-guard  
**X24**

**STC 42**  
Super Sound-guard  
**X12**

**STC 40**  
Super Sound-guard  
**X8**

**STC 40**  
Sound-guard  
**X12**

**STC 36**  
Sound-guard  
**X8**

**... and ALL FOLDOORS EXCEED COMPETITIVE PARTITIONS, MODEL FOR MODEL!**

The Super Soundguard X24 outperforms all other single, fabric covered folding partitions with an unprecedented STC rating of 44! Engineered for Total Excellence throughout, the X24 is your most economical solution for those critical sound-control applications . . . such as classrooms, conference areas or music rooms.

And you get the highest STC ratings . . . model for model . . . throughout the entire line of sound retardant FolDoor partitions. The Super Soundguard and Sound-guard Series offer more consistent sound control in the critical range from 350 cps. to 1400 cps. Five models with job-tailored STC ratings give optimum performance and economy for every situation.

FolDoor stands supreme in operating ease and dependability . . . proven in the laboratory and in actual use . . . and backed by FolDoor's exclusive extended warranty program . . . strongest in the industry. Ask your FolDoor Distributor for complete details.

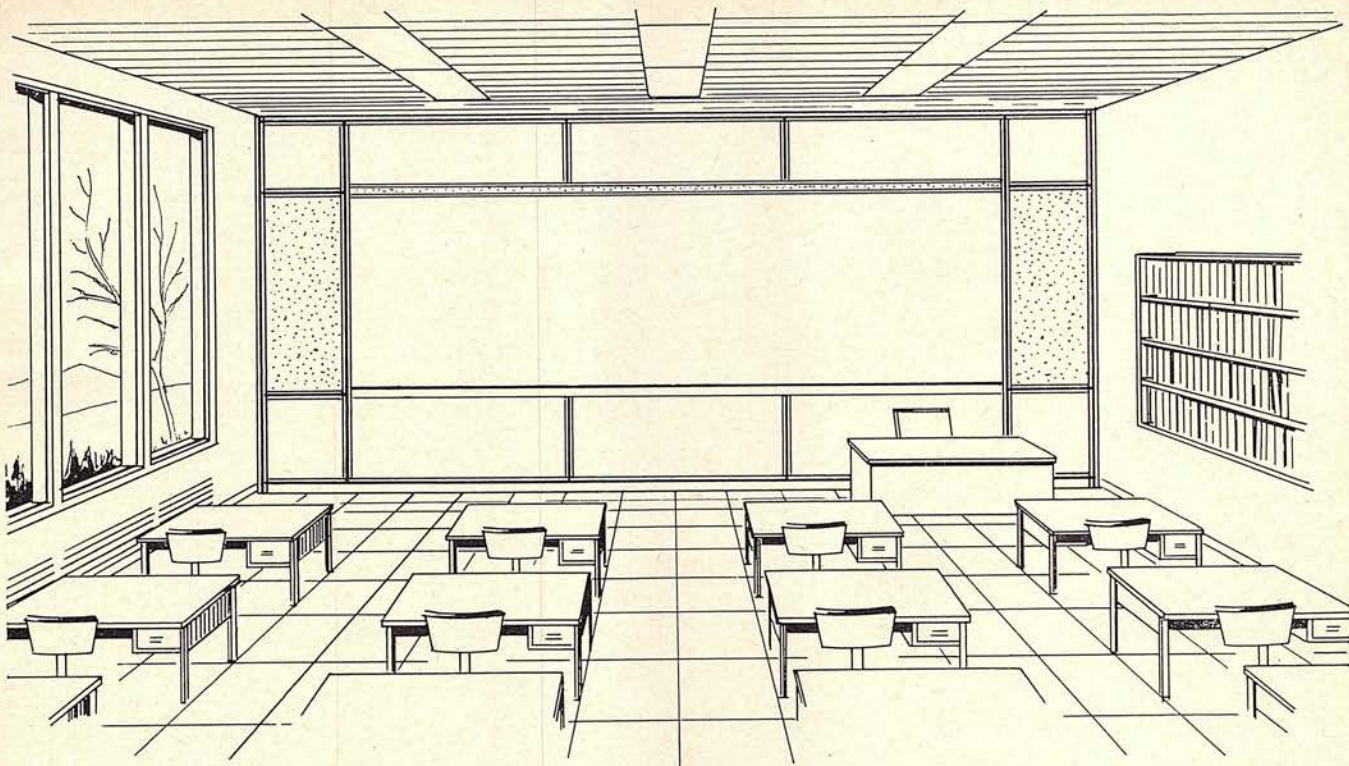
**VISIT AIA BOOTH NO. 109**

A new concept in decorative styrene grillework for space dividers and screens . . . factory fabricated with customized framing.

**HOLCOMB & HOKE MFG. CO., INC.**  
1545 CALHOUN ST. • DEPT. E34 • INDIANAPOLIS, IND. 46207

For more data, circle 180 on Inquiry Card





# College Administrators Appreciate The Flexibility Of Mirawal Classroom Divider

With constant changes in college curricula, it is necessary to be able to subdivide and rearrange classroom space rapidly and at will. Mirawal Demountable Classroom Divider provides this flexibility—both student and instructor are offered adequate facilities. The divider may be moved or removed overnight by school custodians.

Classroom Divider Partition Panels are porcelain-enamel (glass-fused-to-steel) and available in various colors and finishes. Complementing the Mirawal Classroom Divider are Mirawal porcelain-enamel steel chalkboards of the same high quality as previously specified and furnished in all types of educational institutions throughout the country.

Mirawal Classroom Divider shows a sound transmission loss of 35 db.

*See how Mirawal Classroom Divider will fit into your next problem project. Write or call for our brochure.*



**QUALITY PRODUCTS FOR QUALITY BUILDINGS**

## MIRAWAL COMPANY

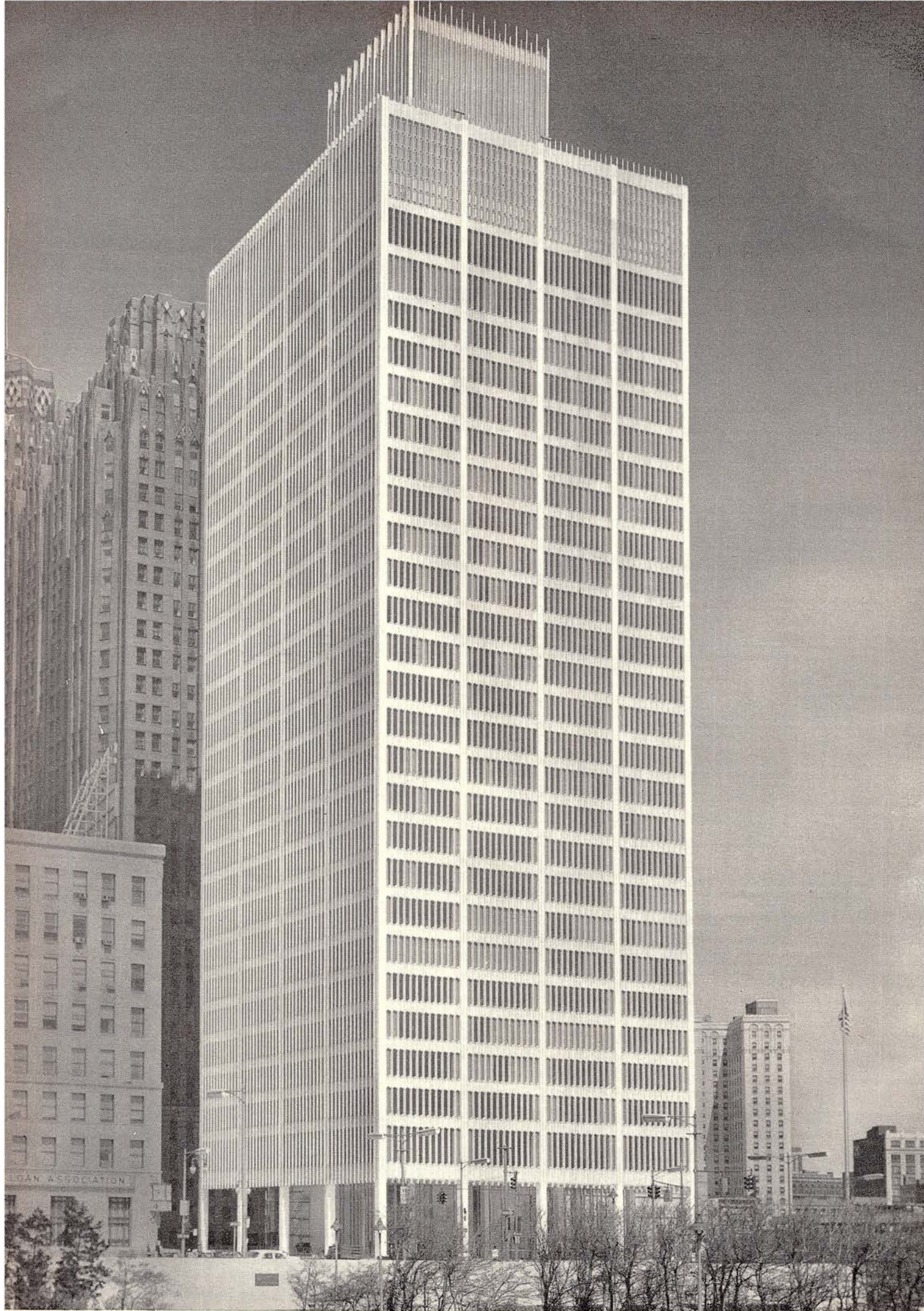
PORT CARBON, PENNSYLVANIA • PHONE: (717) 628-2500

*West of the Rockies, send your inquiry to:*

MIRAWAL PACIFIC, INC.—943 SAN FELIPE ROAD, HOLLISTER, CALIFORNIA

For more data, circle 181 on Inquiry Card







## some feats are impossible without steel

Steel has the most favorable strength-weight-cost combination of any building material. Because of its strength, flexibility of fabrication methods, and wide range of available structural shapes, steel makes possible esthetic and space-saving achievements unattainable with other materials. Steel can be designed as a beam, rigid frame, continuously, compositely, plastically, orthotropically. Steel can be erected in any season, can be handled more roughly than other material. Because there are so many grades of structural steel of varying strength levels, it is never necessary to over-design.

**Only steel columns could bear the load.** The 30-story Michigan Consolidated Gas Company Building in Detroit is the world's tallest all-welded building for a reason: integrated architectural design prohibited use of columns larger than 2 ft., 4 inches square. Reinforced concrete columns that size couldn't carry the required 6½ million pounds. Connections were welded to eliminate bulkiness and achieve smooth right angles between beams and columns. Heavy columns for lower stories are four plates welded into a rectangular box section. Where extra strength was needed a fifth interior plate was added. Lighter upper columns are regular rolled sections. The field-welded wind-resisting system contains the equivalent of 40 miles of 5/16-inch fillet welds. American Bridge Division fabricated and erected 5,700 tons of steel, inspected welds by radiographic and dry powder magnetic particle techniques. Architects: Minoru Yamasaki-Smith, Hinchman & Grylls, Associated Architects & Engineers. Contractor: Bryant & Detwiler Co.

**Steel dome saves Syracuse University \$193,500.** Fabricated and erected by American Bridge, the low-profile dome of the Syracuse University field

house has a rise of only 32 ft. and a diameter of 300 ft. Because there are no interior supports, all of the 80,000-sq.-ft. floor is usable. Seating capacity is over 4,000 with room enough for basketball, track and field meets, or a 70-yd. football practice field. There are over 700 tons of structural steel in the dome and canopy. In a competitive bid with the alternate concrete design, steel saved \$193,500. Architect: King and King. Engineer: Eckerlin and Kleper. Contractor: R. A. Culotti Construction Company.

**High-rise truss walls—now possible with unique design and the "combination of steels."** Through a new building design concept using four different steels of varying strengths, designers trimmed 200 tons of steel (and saved \$300,000) from the skeleton of Pittsburgh's IBM Building, first high-rise building with truss walls. External framework is a diagonal, criss-crossing truss system. Only interior vertical supports are the six columns of the central service core. Outer truss walls direct all wind, wall and most floor loads down to two ground contacts on each side of the building. Using different strength steels (from 33,000 to 100,000 psi) engineers accommodated stress levels much as bridge designers have done in the past. This principle also kept truss members a near-uniform size from top to bottom regardless of stresses, and permitted American Bridge use of time-saving modular fabrication and erection.

Truss walls form the facade, eliminating spandrels and independent curtain wall system. Diagonals were fireproofed with asbestos plaster and sheathed in 22-gauge stainless steel. Architect: Curtis and Davis Associates. Engineer: Worthington, Skilling, Helle & Jackson. Contractor: George A. Fuller Company.

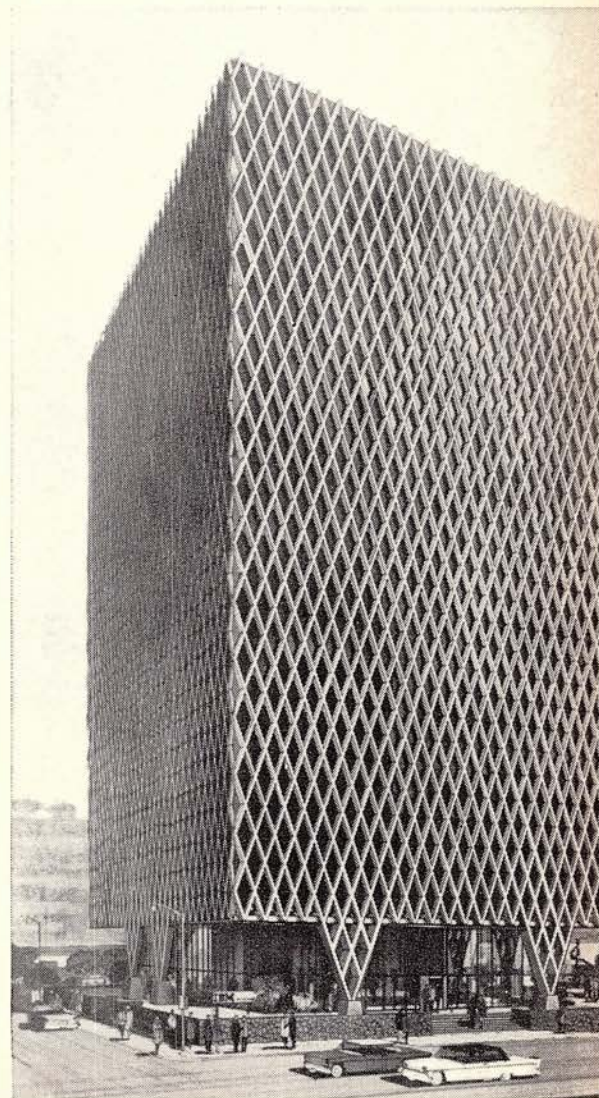
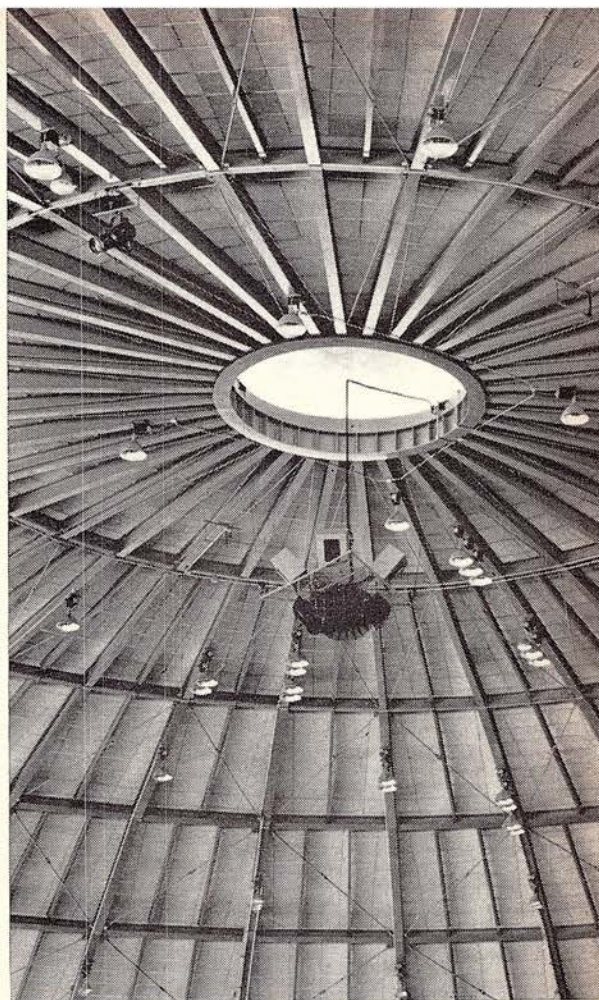
General Offices: 525 William Penn Place, Pittsburgh, Pa. Contracting Offices in: Ambridge • Atlanta • Baltimore • Birmingham • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Elmira • Gary • Harrisburg, Pa. • Houston • Los Angeles • Memphis • Minneapolis • New York • Orange, Texas • Philadelphia • Pittsburgh • Portland, Ore. • Roanoke • St. Louis • San Francisco

**American Bridge  
Division of  
United States Steel**



TRADEMARK

For more data, circle 182 on Inquiry Card





## Product Reports

continued from page 312

### FABRIC FOLDING DOORS

Torjesen, Inc., is now manufacturing a complete line of folding doors and room dividers for commercial and institutional installations.

The new line was made possible when Torjesen purchased assets for the manufacture of architectural doors from the Commercial Products

Division of Clopay Corporation. *Torjesen, Inc., Brooklyn, N. Y.*

CIRCLE 333 ON INQUIRY CARD

### FRAMELESS TROFFERS

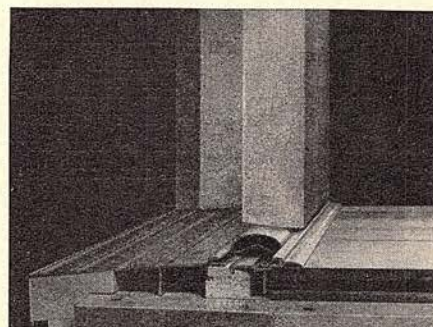
By eliminating the shielding door frame, *Smithcraft Frameless Troffers* provide 11 by 47 in. (or 23 by 47 in.) of recessed lighting free from hardware or the possibility of light leaks. In inverted tee grid systems, the illuminated shielding is surrounded only by the exposed members

of the ceiling itself. In other type ceilings, only a single, narrow band of metal outlines the fixture in the ceiling. Diffusers are self-hinging and access to the interior of the unit is simple and trouble-free. The troffers are available in 1-ft widths for two and three lamps; in 2-ft widths for two, three, four or six lamps. *Smithcraft Corp., Chelsea 50, Mass.*

CIRCLE 334 ON INQUIRY CARD

### DOOR FRAME

An exterior door frame sets directly on rough flooring and adjusts automatically to any finished floor from

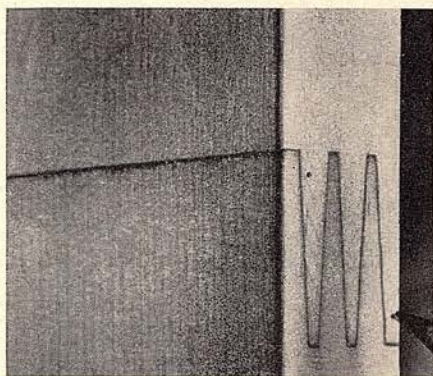


$\frac{3}{8}$  to  $\frac{3}{4}$  in. thick. The *Adjust-A-Sill* door frame consists of two heavy gauge, skid-proof aluminum members separated by a wooden thermal barrier. A large tubular, flexible vinyl seal makes a weathertight fit against the bottom of the door, the manufacturer reports. *Rock Island Millwork Manufacturing Division, Rock Island, Ill.*

CIRCLE 335 ON INQUIRY CARD

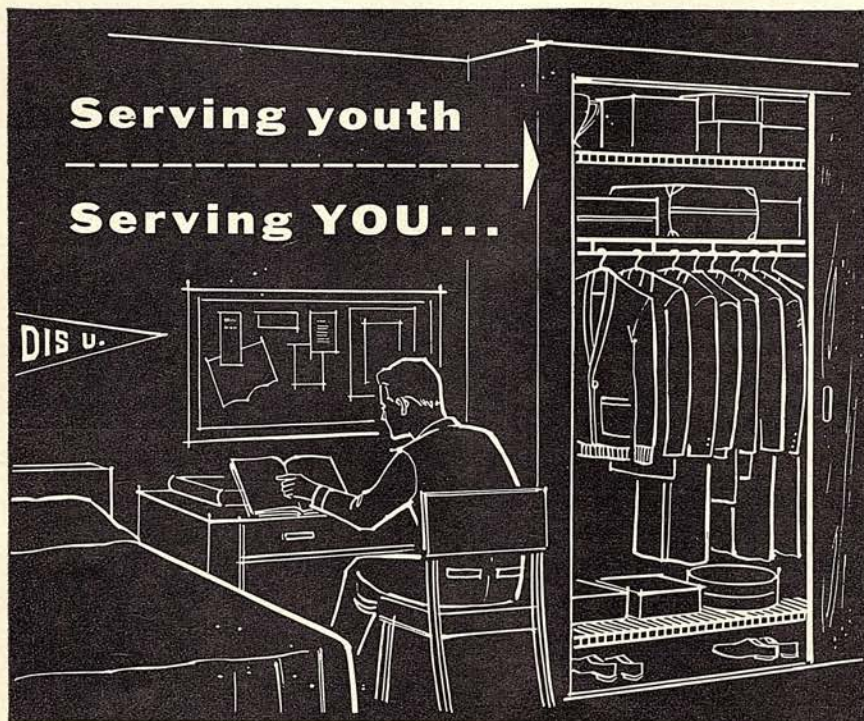
### FINGER JOINT LUMBER

*Weldwood Lokwide Pine* is produced with a unique "three-on-three" finger jointing process, which is said to improve the grade and strength of the lumber. This specially engineered

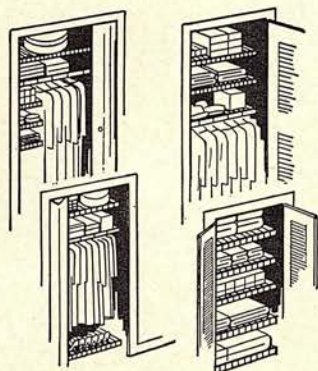


lumber is available in sizes ranging up to 4 ft wide and 24 ft long. *United States Plywood Corp., 777 Third Ave., New York 17, N.Y.*

CIRCLE 336 ON INQUIRY CARD



## PEMCO Steel Rod-Raks



• COST SAVING • LABOR SAVING • SPACE SAVING

Serving youth in his home away from home by giving him storage area for personal belongings in dormitory rooms. A place to store the extras... in an orderly fashion.

Serving you by cutting installation costs, ending maintenance costs and utilizing 100% of closet and wardrobe space.

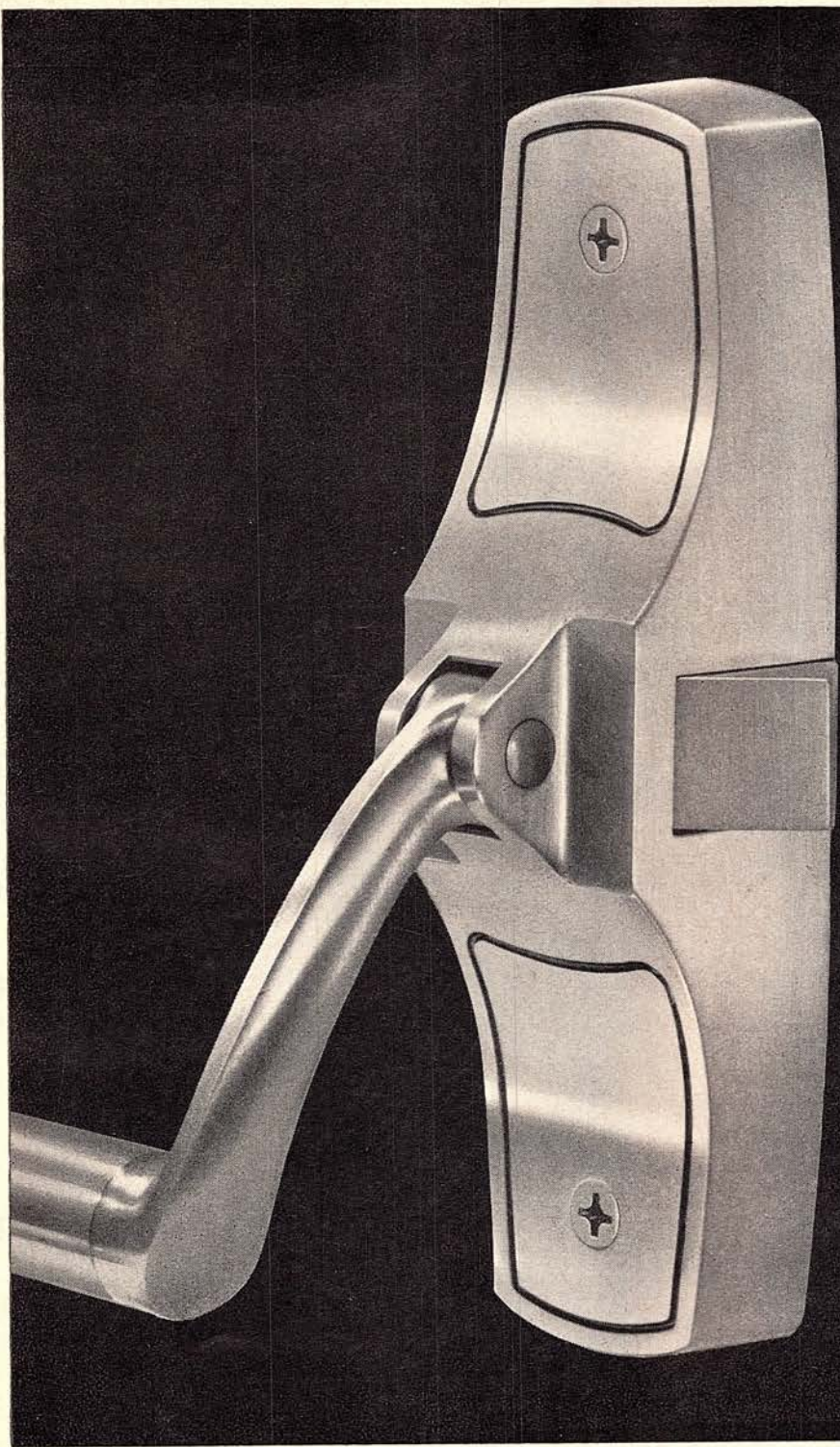
Brighten up dorms with Rod-Raks finished in Color-Fuse T.M. fused on vinyl, satin zinc or high luster Copper Nickel Chrome. For further information phone or write.

**PEMCO-KALAMAZOO**

1810 Ravine Road  
Kalamazoo, Mich.  
Phone 342-0239  
AC 616

For more data, circle 183 on Inquiry Card





Another  
reason for  
including  
Von Duprin  
in your plans!

● As you can see from this 77 model shown here, Von Duprin leadership in exit hardware covers design as well as engineering . . . and "the safe way out" is also the smart way out. Lock and hinge stile cases and other major components are drop-forged bronze, assuring lasting service and dependable operation in any opening. The 77, in bronze, or chro-



mium finish, is also available with six color choices of tough vinyl fabrics—applied permanently to cases and/or crossbars. Write for free, full-color Bulletin 631, showing 77 rim, mortise lock and vertical rod devices that *look best and work best* in any opening.

VON DUPRIN DIVISION, VONNEGUT HARDWARE CO.  
402 W. MARYLAND ST., INDIANAPOLIS 25, INDIANA

## Von Duprin® 77 Exit Devices

For more data, circle 184 on Inquiry Card

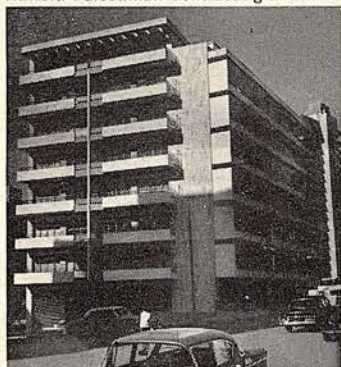




Ministry of Information & Guidance Bldg., Kuwait; Painting Contractor: Kuwaiti Palestinian Contracting and Trading Co., Kuwait.



Private housing development, Kuwait; Painting Contractor: Kuwaiti Palestinian Contracting and Trading Co., Kuwait.



Abdel Hafiz Itani Bldg., Beirut; Architect: Ahmad Tanir.



Mohammad Amin Khodari Bldg., Beirut; Architect: Berg Bedrossian.

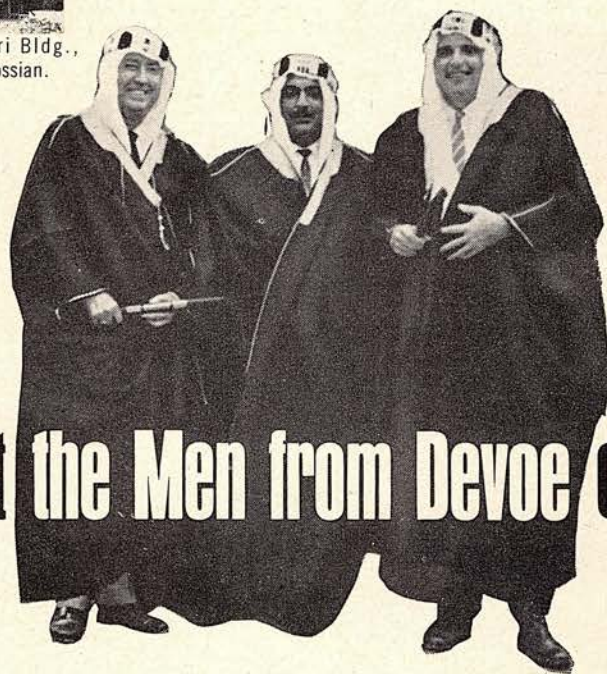


Abdel Hamid Chehab Bldg., Beirut; Architect: Jos. Karam.



Ras Beirut Mosque, Beirut; Architect: Said Hijail.

The Man from Devoe gives service in depth on the spot—wherever it is. Here, two of them—J. L. Hobart, general sales manager (right), and J. L. Lloyd (left), export manager—visit Ratib Al Kurd, local Devoe distributor in Beirut, Lebanon.



## Even in the Middle East the Men from Devoe offer

It's no accident that here in Lebanon and Kuwait—as around the world—so many new buildings colorfully wear Devoe paints.

First of all, the architects and engineers who build here know they need outstanding paint quality to resist the intense heat, the beating sun, the harsh winds and rains. And so they turn to Devoe interior and exterior paints—among them Vinyl Wonder-Tones, Velour Semi-Gloss, Mirrolac Enamels, alkyd Velour Flats.

Then, the Middle Easterners possess a keen insight into color—it's a special genius of theirs.

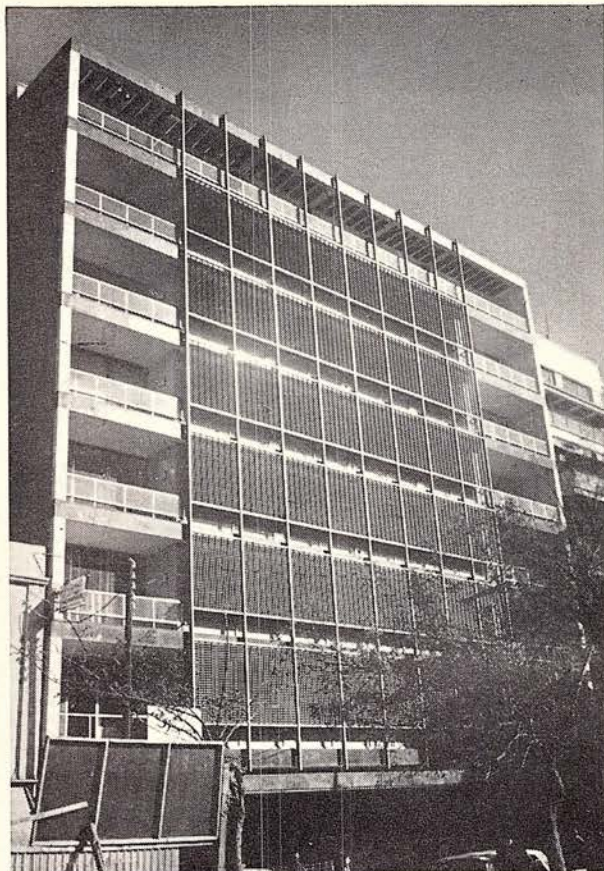




mzeh Malass Bldg., Beirut; Architect: Hogop ichian.



Fouad el Lababidi Bldg., Beirut; Architect: Samir Khairallah.



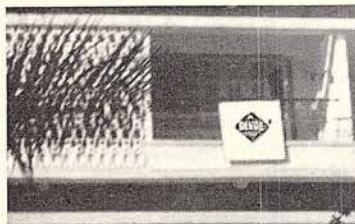
Hassan Hamrad Bldg., Beirut; Architect: Bahij Makkissi.



wait Bldg., Beirut; Painting Contractor: Kuwaiti estinian Contracting and Trading Co., Kuwait.



Soheil Bechara Bldg., Beirut; Architect: Jos. Karam.



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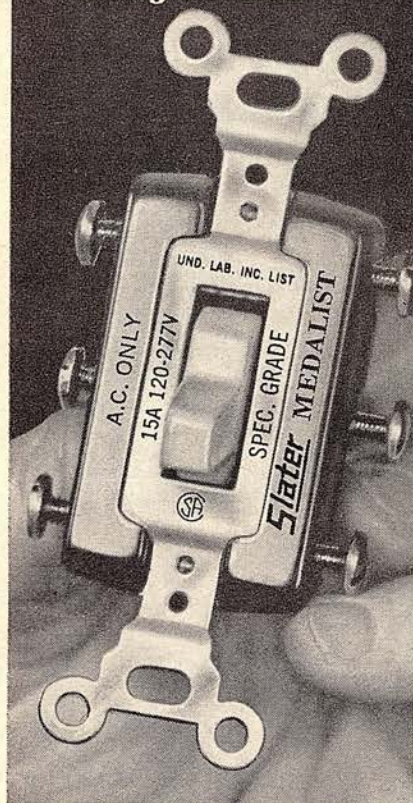
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## CERAMIC TILES DRESS DECORATIVE HOME FOR BACARDI

A gleaming facade of glass, white marble, and blue and white tile defines the new Bacardi Building against the Miami sky.

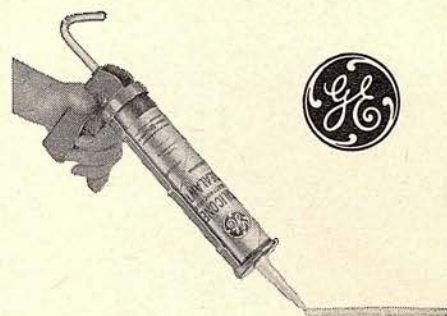
Some may sense a new corporate image—the simple structural boldness that resulted from Bacardi's patronage of Felix Candela and Mies van der Rohe has ceded place to a more decorative fancy. To house their United States sales operation, Bacardi Imports, Inc. called upon the firm of Sacmag International of Puerto Rico, headed by Luis Saenz.

Enrique Gutierrez was in charge of the design of Miami's \$1 million project. The eight-story building occupies less than 20 per cent of the 18,666 square-foot site. The glass-enclosed lobby serves as a display gallery and entrance to the elevator core attached to the rear. The remaining floors are used for Bacardi's clerical and executive offices.

The reinforced concrete building is supported by four main columns. The stress is transferred to a horizontal truss along the top from which the upper seven floors are hung by post-tensioned cables.

The north and south facades are decorated with tile mosaics designed by the Brazilian artist, Francisco Brennand. The patterns are composed of 6-inch-square, hand-painted, ceramic tiles.

Bliss Associates were the engineers. Contractor was Frank J. Rooney, Inc.



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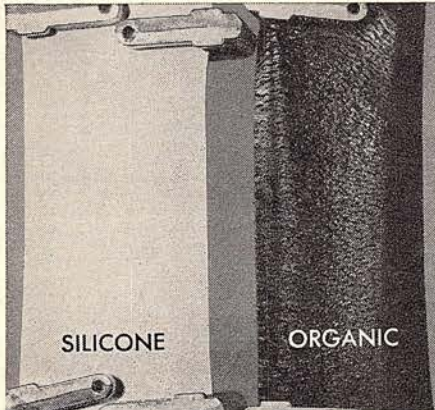
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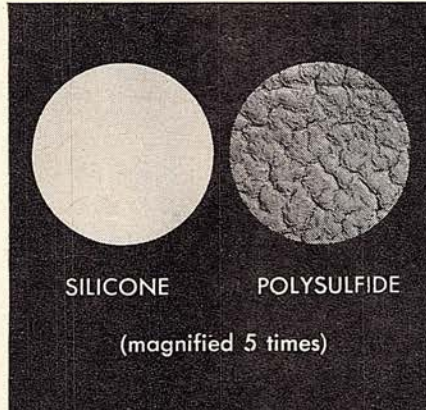


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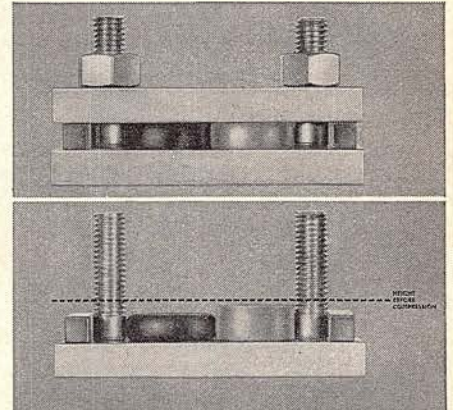
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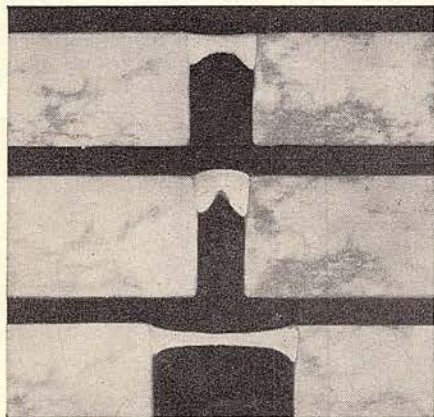
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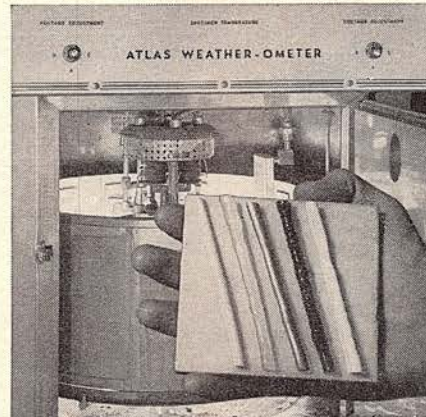
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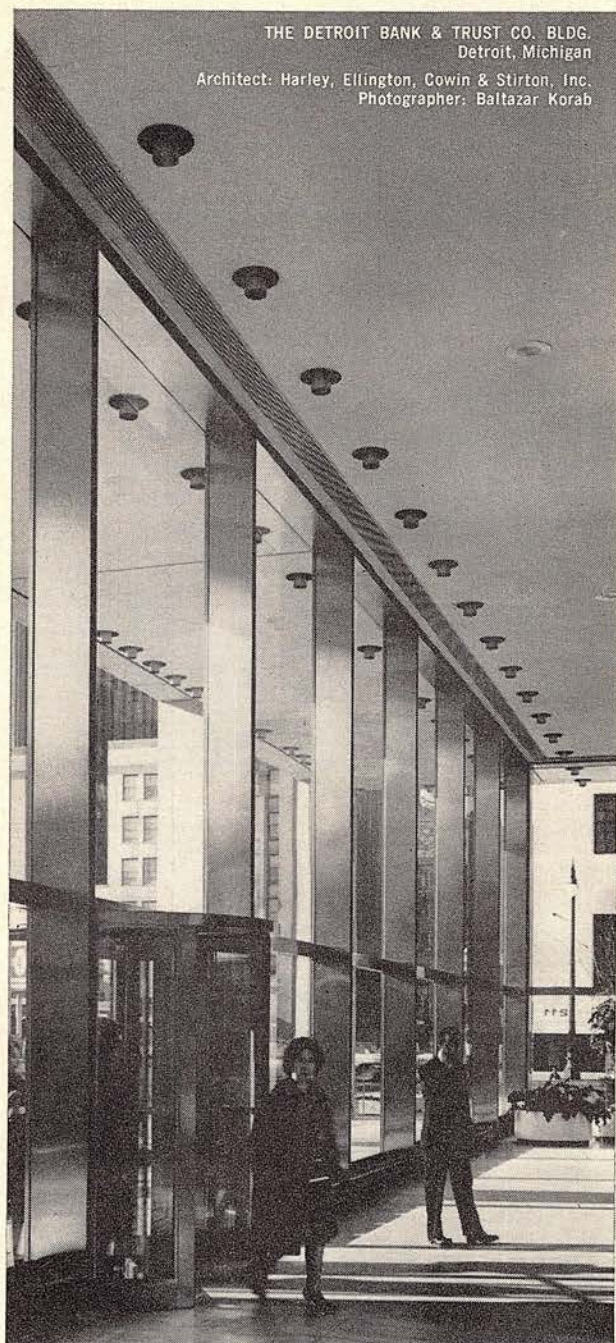
manufacture of the basic gum through formulation and final packaging. No steps are trusted to formulators or satellite plants. This is your assurance of the finest and most consistent quality.

For more information contact your G-E Silicone Construction Sealant Distributor shown on the opposite page. Or write Section BG5105 Silicone Products Department, General Electric Company, Waterford, New York.

**GENERAL  ELECTRIC**

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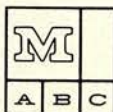




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Detroit, Michigan

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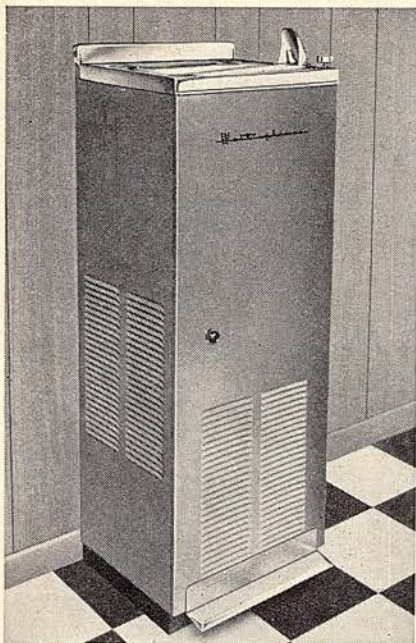
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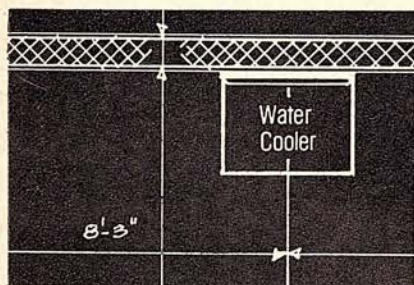
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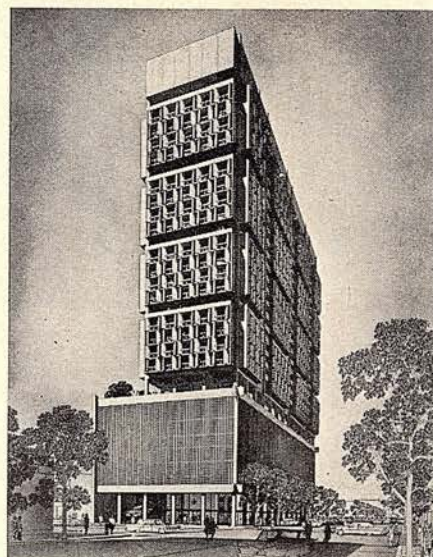
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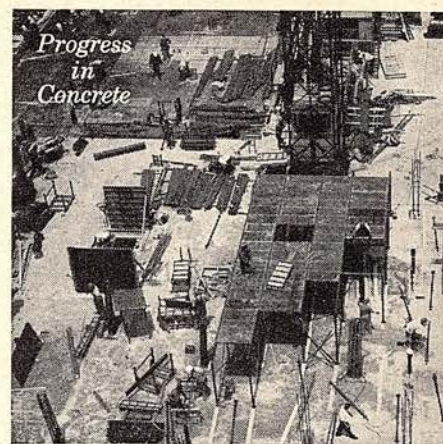
A pattern of brise-soleils characterizes the design of a new 33-story apartment house now under construction in downtown Houston. Architects Charles Goodman Associates have planned the precast concrete floor-to-ceiling louvers to be fixed in place at different angles on alternating floors.

The \$8 million building, owned by the Lumbermens Investment Company of Austin, Tex., covers a site of 26,460 square feet. The 403 apartment units rise above a nine-story base containing parking space for 407 cars.

The 10th floor will house a club, a dining room opening onto a roof terrace, a swimming pool and three duplex apartments with private gardens. The 20 stories of apartments above will contain 20 units per floor.

The structure is exposed reinforced concrete with a flat plate floor system. The parking structure will be sheathed in 52-foot-long, formed steel fins. The entire building will be coated with a black textured material. Once settled, it forms a permanent bond with the concrete as a protective covering against injury.

Irving R. Klein & Associates are associated architects. Contractor is the Lott Construction Company. Engineers are Bovay Engineers, Inc. (mechanical and electrical) and Heinzman & Clifton (structural).



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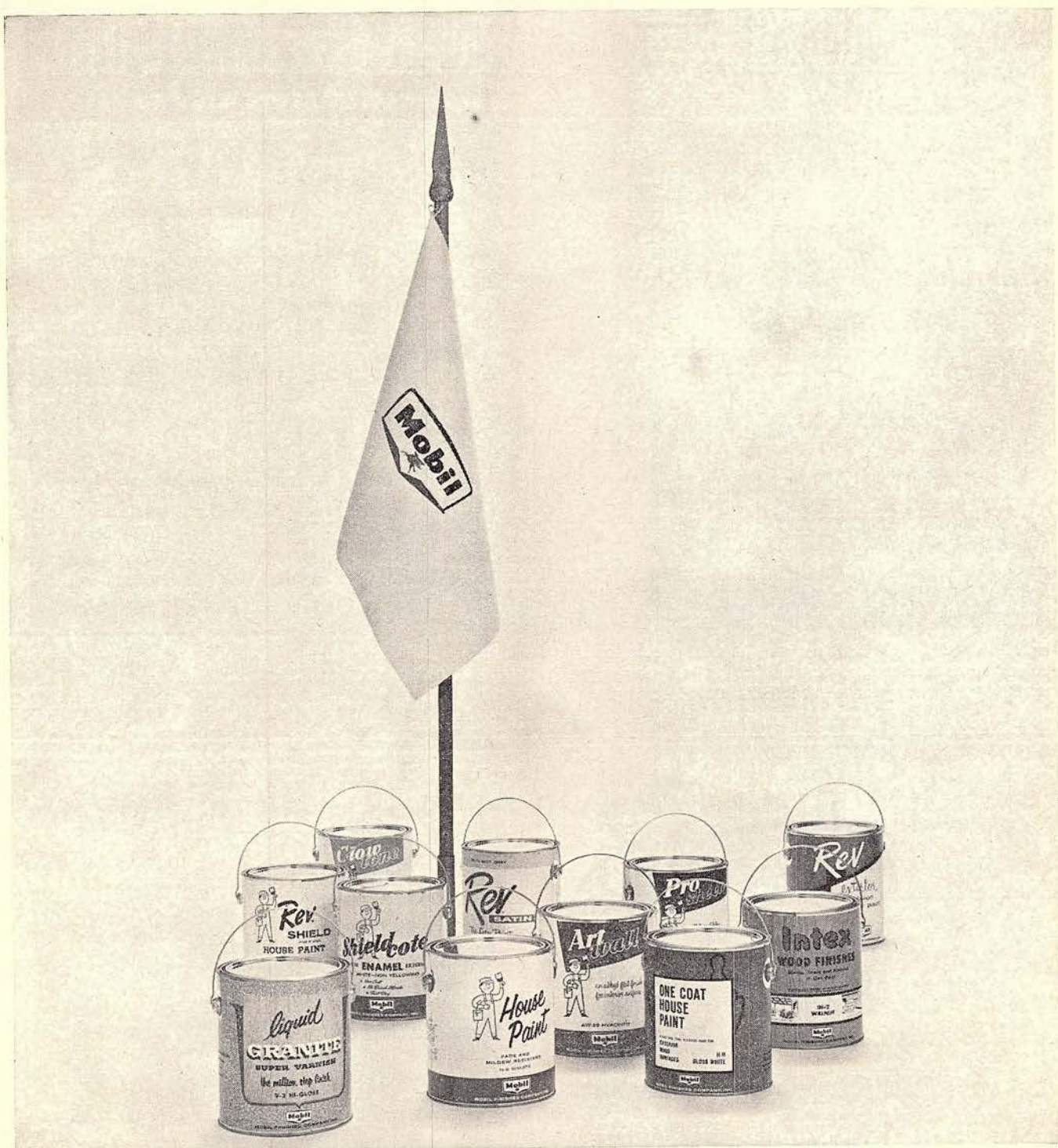
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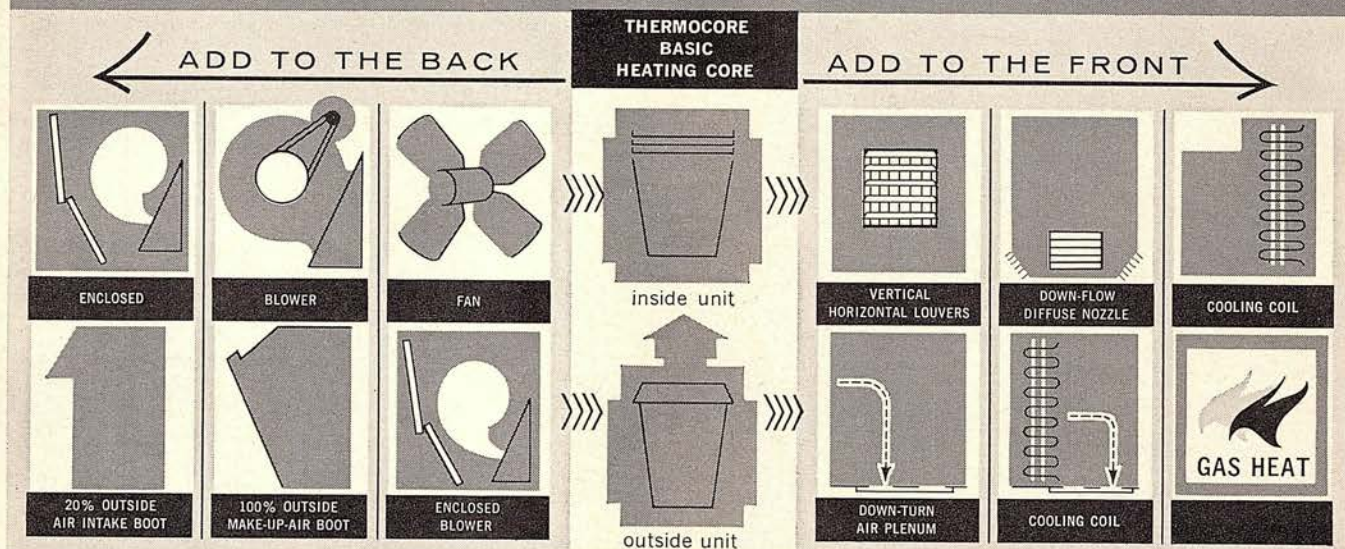
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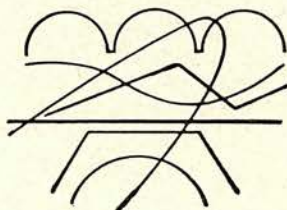
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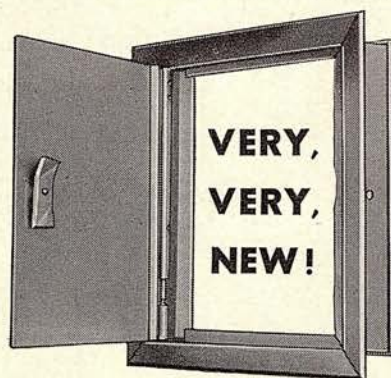
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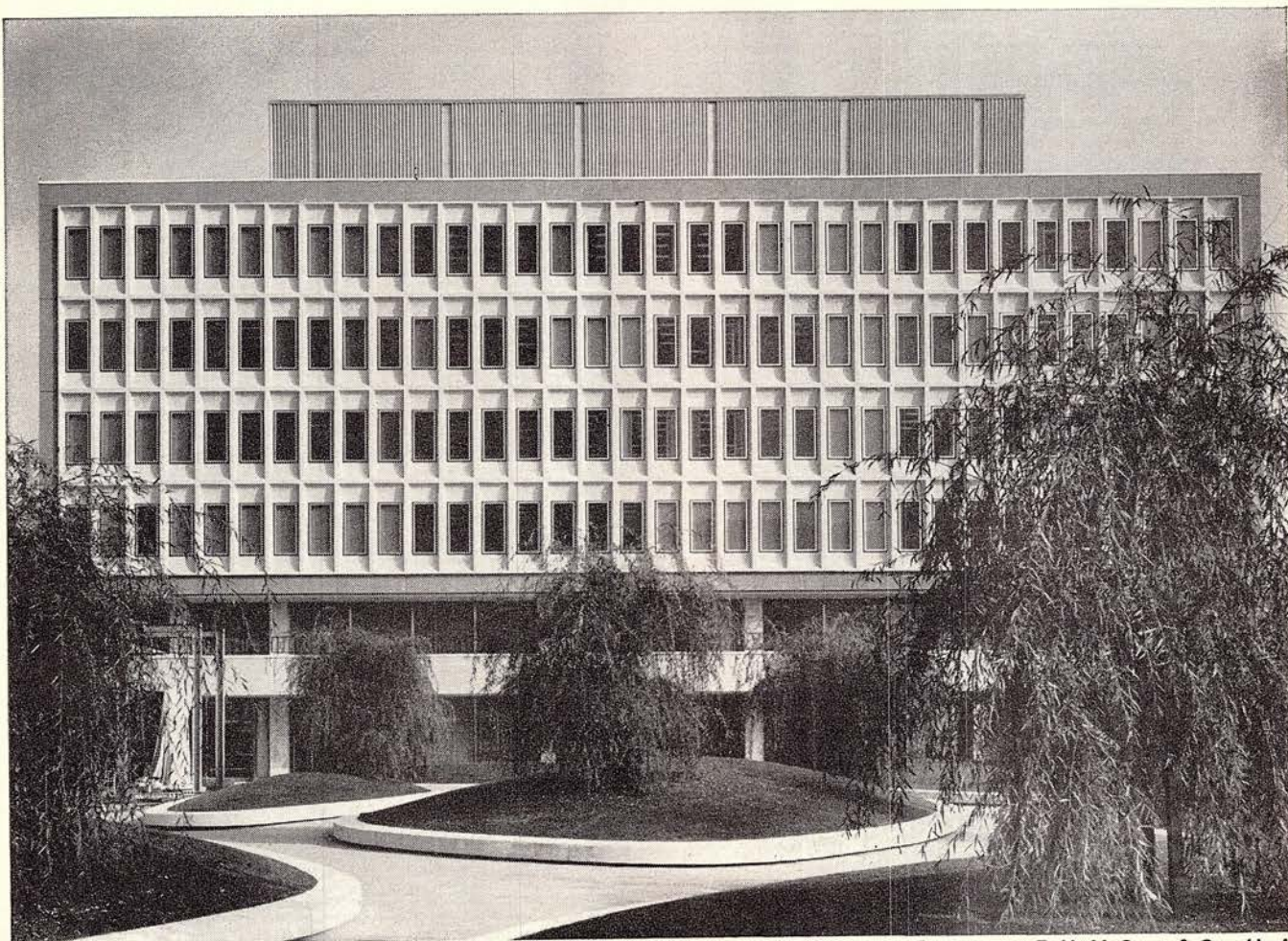
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Research Center, Constitution Plaza, Hartford, Conn. Architect: Charles DuBose, Hartford. Contractor: F. H. McGraw & Co., Hartford. Structural Engineer: A. J. Macchi, Hartford. Concrete Panel Manufacturer: Glazon Corp., Precast Division, Talcottville, Conn.

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## ANIMALS TO ROAM NATIVE SETTINGS IN MODERN ZOO

That modern planning concepts should be instrumental in creating for Los Angeles "the finest zoo in the world" was the basis of two and one-half years of research into zoological procedures by the architects, Charles Luckman Associates. Specialization of functions and a free-flowing sense of space combine in an area designed for instruction, recreation and enjoyment.

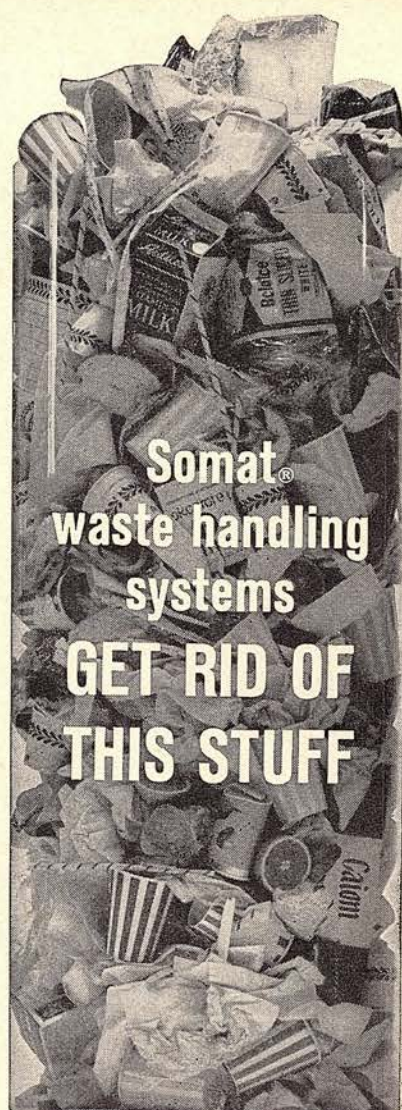
Taking advantage of the hilly terrain of the site, the architects have designed a system of bridges to allow the spectator a "two-level" viewing. The zoo is divided by means of landscaping into five main areas, each exhibiting the characteristic animal life and flora of one of the world's continents.

To preserve natural contours, Luckman states that "nothing will be permitted to detract from full enjoyment of the zoo's attractions." Fences and barriers will be dispensed with in favor of more unobtrusive means of restraint such as moats.

A centrally located restaurant with satellite pavilions will provide a convenient space for outdoor relaxation, educational exhibits and information facilities. The 104-foot-high spires, visible from every part of the zoo, will help visitors orient themselves.

Slated for early completion is a children's zoo where sculptured animals will be scaled to the child's size.

Johnson, Nielsen & Steinbrugge are the structural engineers, and Dudley Budlong & Associates are the mechanical and electrical engineers of the project begun in March. Landscape architect is Robert H. Carter.



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Your clients have waste material they've got to do something about. All sorts of waste—food scraps, paper service, cardboard, packing refuse, government classified documents, proprietary information, etc. SOMAT Waste Handling Systems reduce this (including tough stuff, such as bones) to an inoffensive, odorless, semi-dry pulp—only 1/5th its former volume. Means 80% less haulaway cost (when figured on a per-barrel basis). Waste is reduced as fast as it's collected—fewer containers standing around. Housekeeping is much easier.

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There's a SOMAT System to meet your clients' needs. Small kitchen? Complex of large kitchens? Combine food waste handling with guest accommodation or office refuse? Security document destruction? General plant waste? From 100 pounds of dry waste per hour to tons per hour. For full information check Sweet's Architectural File 27b/So or contact Somat Corporation, Dept. A-45, Box 831, Coatesville, Pa. Tel: 215-384-7000.

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# GRACE

## CONSTRUCTION MATERIALS

# Notes on below-grade waterproofing

Designers and contractors have long recognized the necessity to compensate for both hydrostatic pressure and capillary action on below-grade structures. The variety of techniques and frequency of inquiries concerning products for foundation dampproofing show a marked divergence of opinions, however, as to the most effective methods.

Assuming the proper and adequate use of mechanical waterstops and structural keying, perhaps the next most important contribution to moisture resistance in reinforced concrete construction is water control in the mix itself. Water gain voids at tie rods, structural interfaces and form junctures are a prime cause of water seepage.

Look to low slump, low water/cement ratio mixes for significant improvement in the watertight integrity of below-grade structures (1). While

water reduction through the use of admixtures is certainly not news, its importance in the over-all waterproofing process cannot be overemphasized. Well-placed, water-reduced concrete makes sense in terms of dollars, time and effectiveness in the finished job.

At low temperatures, set accelerators can be completely compatible with low water/cement ratio mix design and are frequently used (2). Set acceleration, however, should be used in conjunction with water reduction—not in place of it:



Barrier coatings (waterproofing "blacks") are naturals for exterior masonry below-grade (3). A wide choice of spray, brush and trowel-on coatings are available. Asbestos-reinforced compounds often permit single-coat application but should be protected during back-filling.

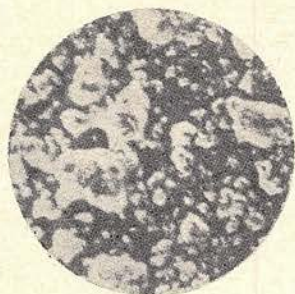
Stearate water repellents are integrally mixed to impart a high degree of water resistance to masonry (4). Our experience has shown this type of dampproofer to be especially effective

under extremely wet conditions and its use requires no additional labor or application cost since it is added to the mix at the batch plant.

Below-grade waterproofing also includes the extremely effective iron oxide (5) coating which is normally applied to the interior wall and/or floor surface. Successive coats of iron oxide grout create a "masonry lining" which is highly resistant to hydrostatic pressure.

Effective below-grade waterproofing is neither prohibitive in cost nor mechanically difficult. WRDA is a recognized and proved water-reducing admixture which permits low water/cement ratios while retaining desirable placeability and strength characteristics. DEHYDRATINE 80 accelerates set for high early strength development and complements the effects of WRDA. In waterproofing "blacks," DEHYDRATINES 4, 6 and 9 offer a choice of spray, brush and trowel consistencies with and without asbestos reinforcement to suit user preference and specification requirements. In addition, Grace offers HYDRATITE integral water repellent for concrete and METALON, the multiple-coat iron oxide compound for interior surfaces.

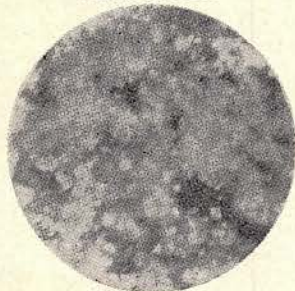
For specifications and application suggestions, write to Grace Construction Materials, 62 Whittemore Ave., Cambridge 40, Mass., or refer to Dewey and Almy and A. C. Horn Products in Sweet's Catalog. Literature available on request (1) WRDA Form CMD-432-22; (2) DEHYDRATINE 80 Form CMD-113; (3) DEHYDRATINE Dampproofing Compounds Form CMD-131; (4) HYDRATITE Form CMD-120; and (5) METALON Form CMD-118.



### Without WRDA

Magnified cement particles in water show how catalyzing action of WRDA speeds hydration, promotes plasticity of mix.

### With WRDA



### GRACE

DEWEY AND ALMY CHEMICAL DIVISION  
W. R. GRACE & CO.

### CONSTRUCTION MATERIALS

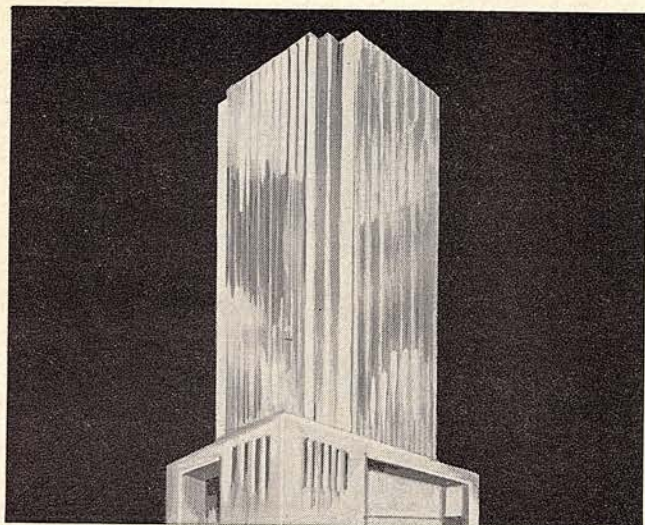
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DAREX CONSTRUCTION CHEMICALS  
ROCK PRODUCTS CHEMICALS

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*plus Beauty*  
**LONGER LASTING**  
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MARACON water-reducing admixtures satisfy the exacting demands for higher strength, greater durability and better on-the-job control imposed on concrete for use in structural designs.

To familiarize yourself with the advantages of using MARACON in concrete mix designs, ask for specific test data. Use the convenient coupon below.

Maracons are lignin chemicals which conform to ASTM Chemical Admixtures Specification (ASTM Designation C494-62-T, issued 1962). They are made by the Marathon Division of American Can Company, a leader in the field of lignin research and a basic manufacturer of a variety of lignin chemicals.

Write for name of nearest MARACON distributor.



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DIVISION OF AMERICAN CAN COMPANY  
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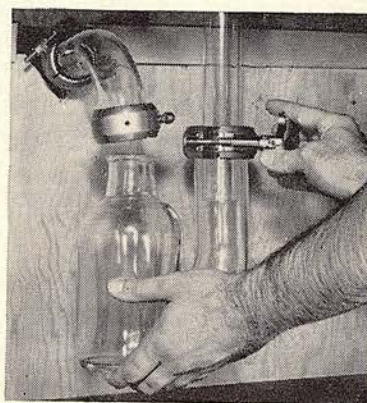
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H-54

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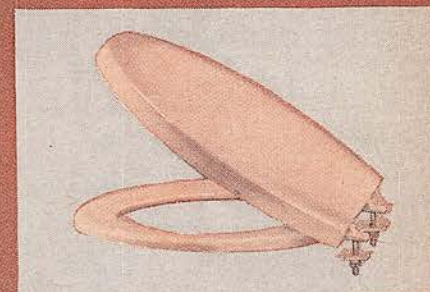
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NEW BENEKE UNIFIED SEAT DESIGN HELPS SELL CRANE CLOSETS!

Perfection of product... compatibility of design... fidelity of color coordination... these are but three reasons why outstanding fixture manufacturers such as *Crane Co.* benefit with *Beneke* closet seats. Illustrations at right reveal the striking beauty of new *Beneke* seat styling and how its exclusive *unified* design complements the configuration of the *Crane* water closet. Why don't you take a tip from the leaders—let *Beneke* prove how superior techniques, and ability to meet exacting specifications, mean a better seat for every requirement.



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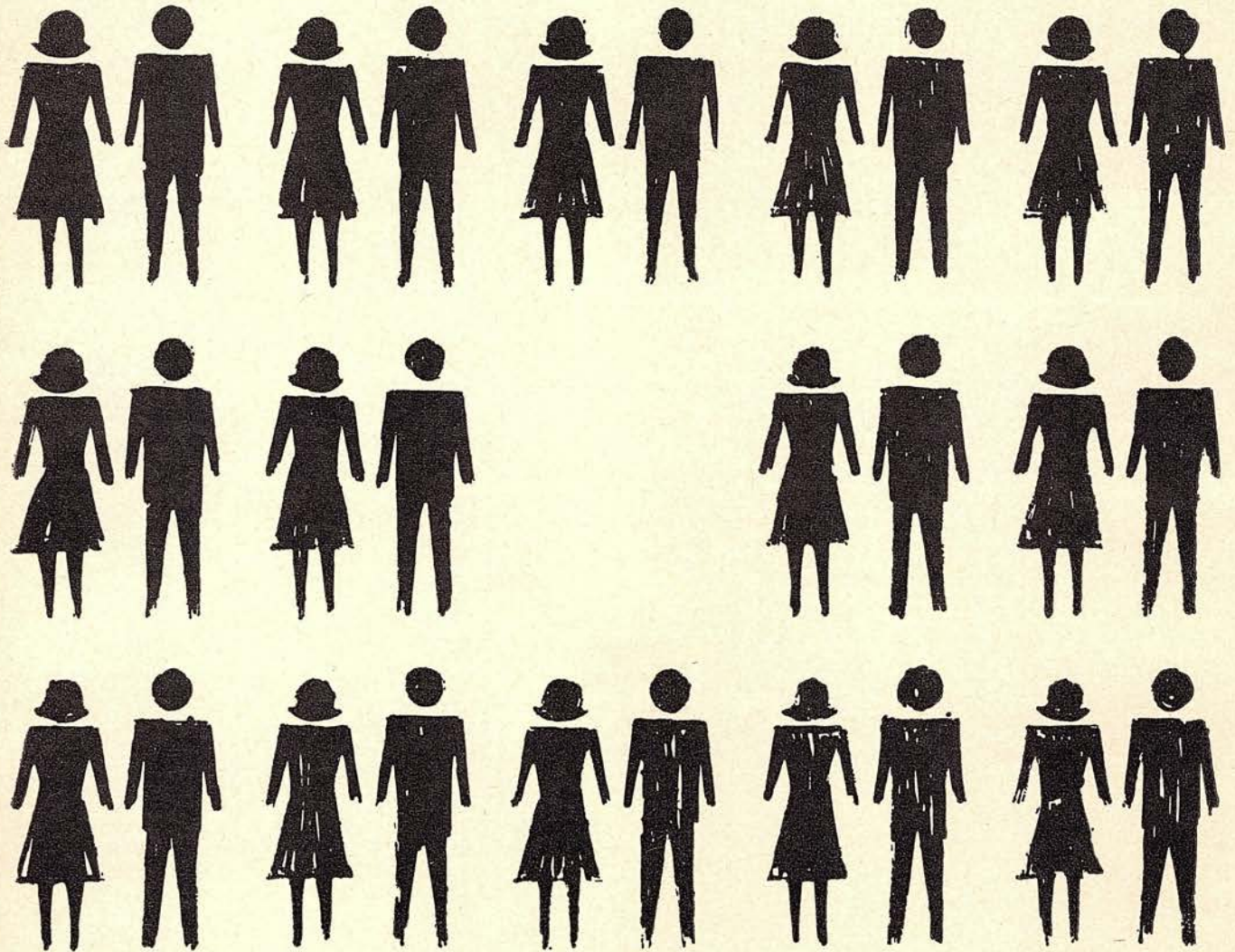
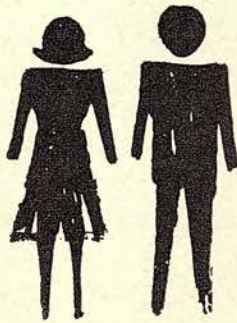
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Don't take chances with a Respiratory Disease—one of the sicknesses of breathing. Chronic RD afflicts at least 1 out of every 15 Americans today. Don't take chances with its most common symptoms—chronic cough and shortness of breath. Your local Christmas Seal organization and the National Tuberculosis Association say: **See Your Doctor!**





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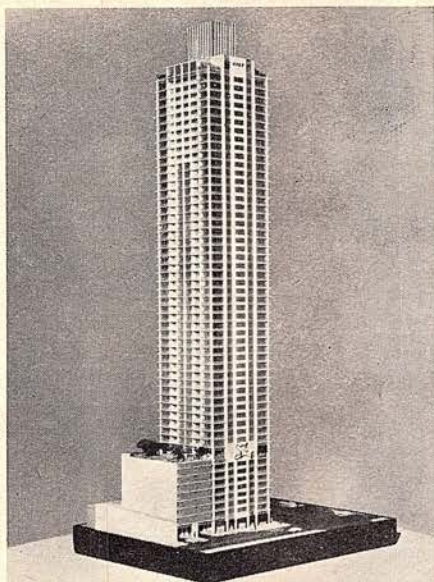
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The resurgence of interest in downtown urban redevelopment poses a great number of problems today, especially in the area of housing. Efforts by Chicago developer Harold L. Perlman are directed toward luring the suburban dweller back to the city by offering him apartments with a luxuriousness and spaciousness which could before only be found in "mansions in the suburbs."

In 1952 the McCormick mansion on Lake Shore Drive was razed to permit construction of a 23-story apartment house. Now a 55-story, \$10 million high-rise dwelling will be added to the site. Called 1000 Lake Shore Plaza, it will be one of the tallest reinforced concrete apartment buildings in the world when completed in 1965.

Rising 590 feet around a central service core, the building will contain 136 apartments of nine different types. They range from 6½-room units to 10½-room penthouse suites. A gas-powered heating and cooling system features dual-zone controls.

High-speed elevators, designed to travel at 1,225 feet per minute, will whisk tenants from the nine-story parking garage, which is topped by a nine-hole putting green, to the 55th-floor recreation deck.

The building was designed by the Chicago Highrise Corporation, with Sidney H. Morris and Associates as consulting architects.

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**EVERYTHING ...**



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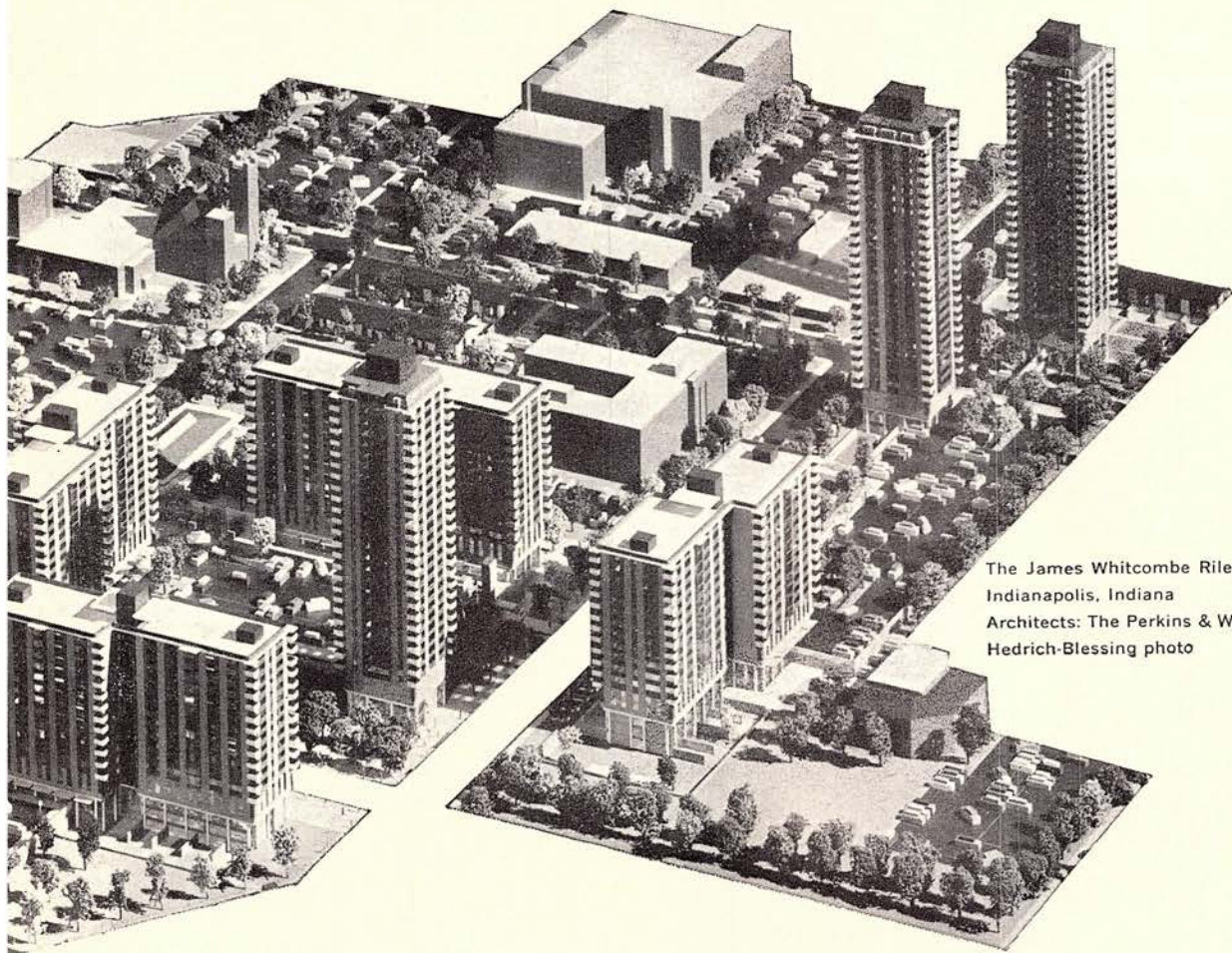
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# IN 28 BASIC BUILDING PRODUCT CATEGORIES . . .



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Architects: The Perkins & Will Partnership  
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They could help save your life. They are used in research—in the laboratories of the universities and hospitals where the unceasing war against cancer is fought. Like all wars, it is expensive to wage. For instance, 1,000 rats cost \$2,500— $\frac{1}{2}$  gram of cobalt 60

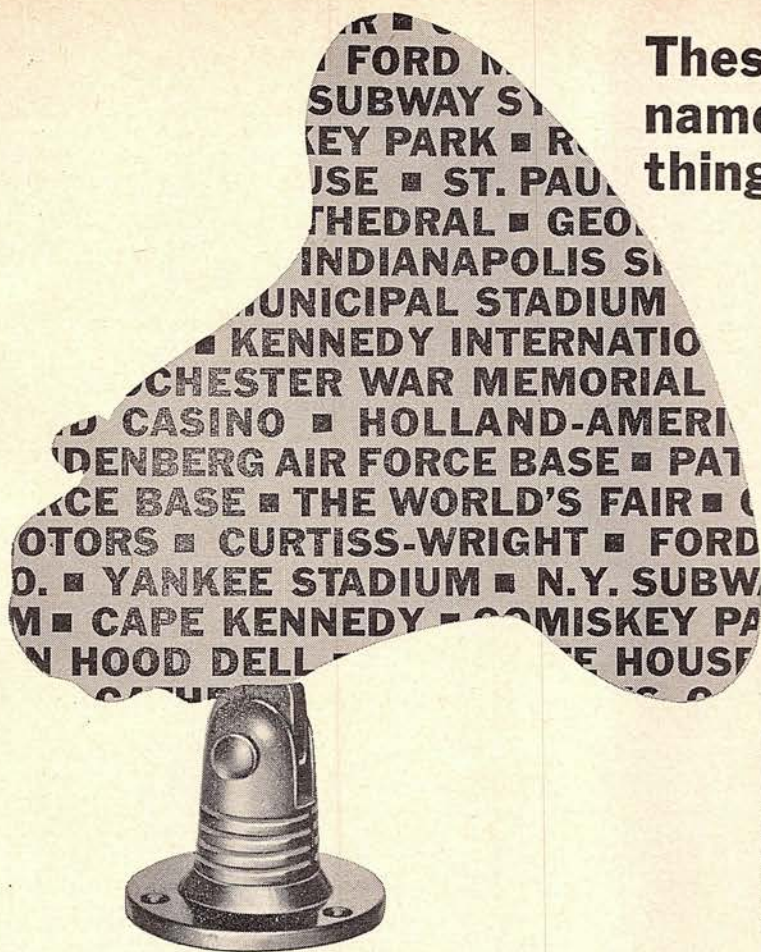


costs \$6,000—one electron microscope, \$35,000.

Last year, the American Cancer Society spent \$12,000,000 on research to help fight this war. To cure more, give more. Every dollar helps save lives. Send your check to "Cancer," c/o Postmaster.

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FREE! 66-page Sound Planning Handbook. Price: \$1.00—but free to architects and engineers. Write: Desk AR-5, LTV/University, Div. Ling-Temco-Vought, Inc., 9500 West Reno, Oklahoma City, Oklahoma.

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A DIVISION OF LING-TEMCO-VOUGHT, INC.

U-44

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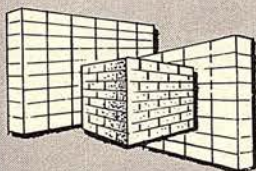
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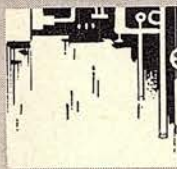
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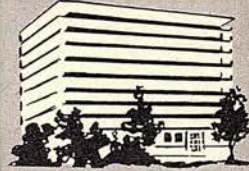
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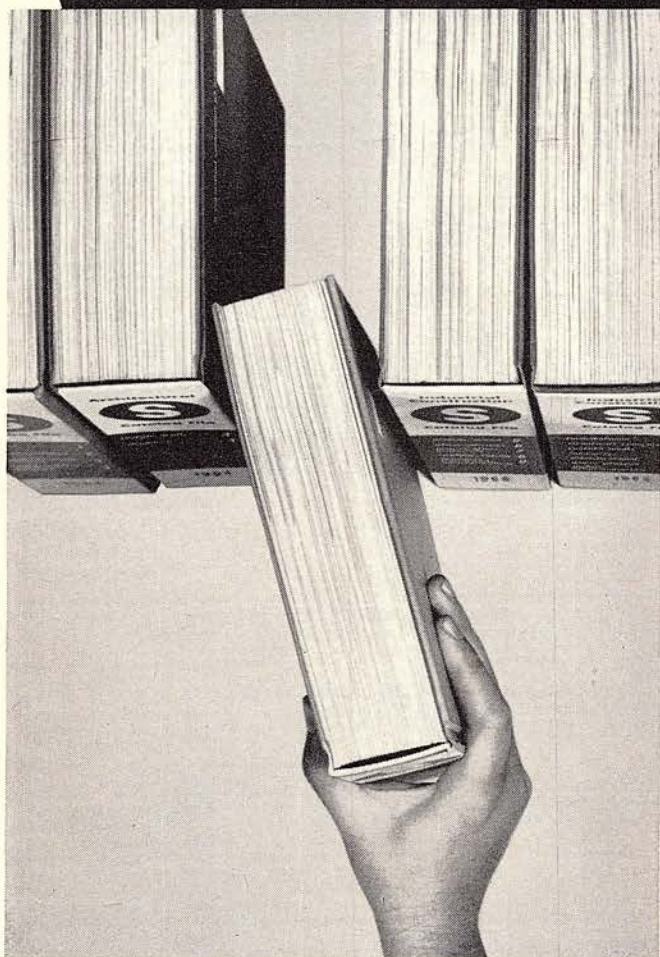
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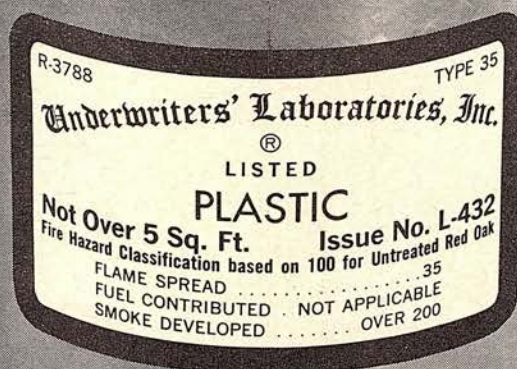
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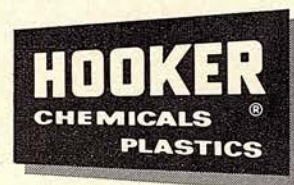
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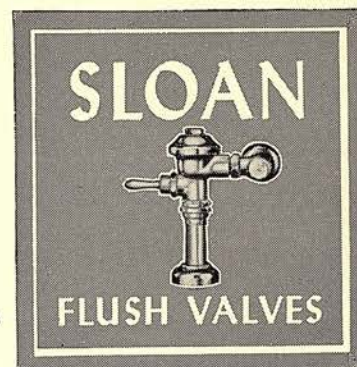
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