ARCHITECTURAL RECORD

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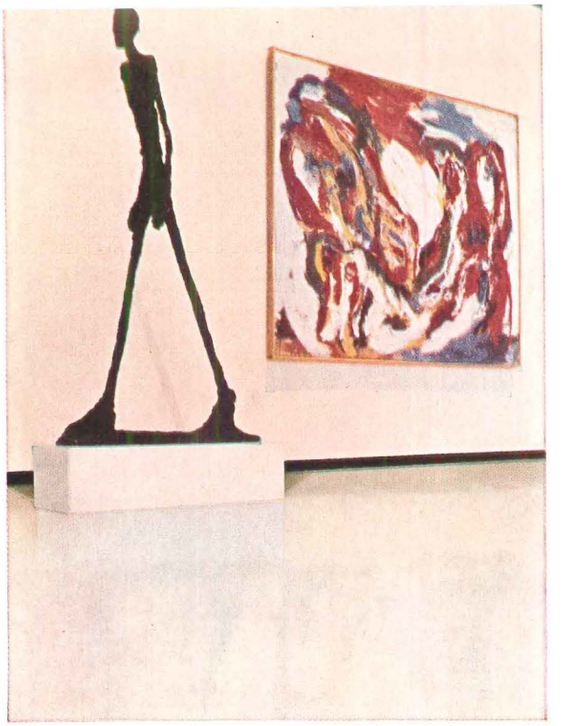
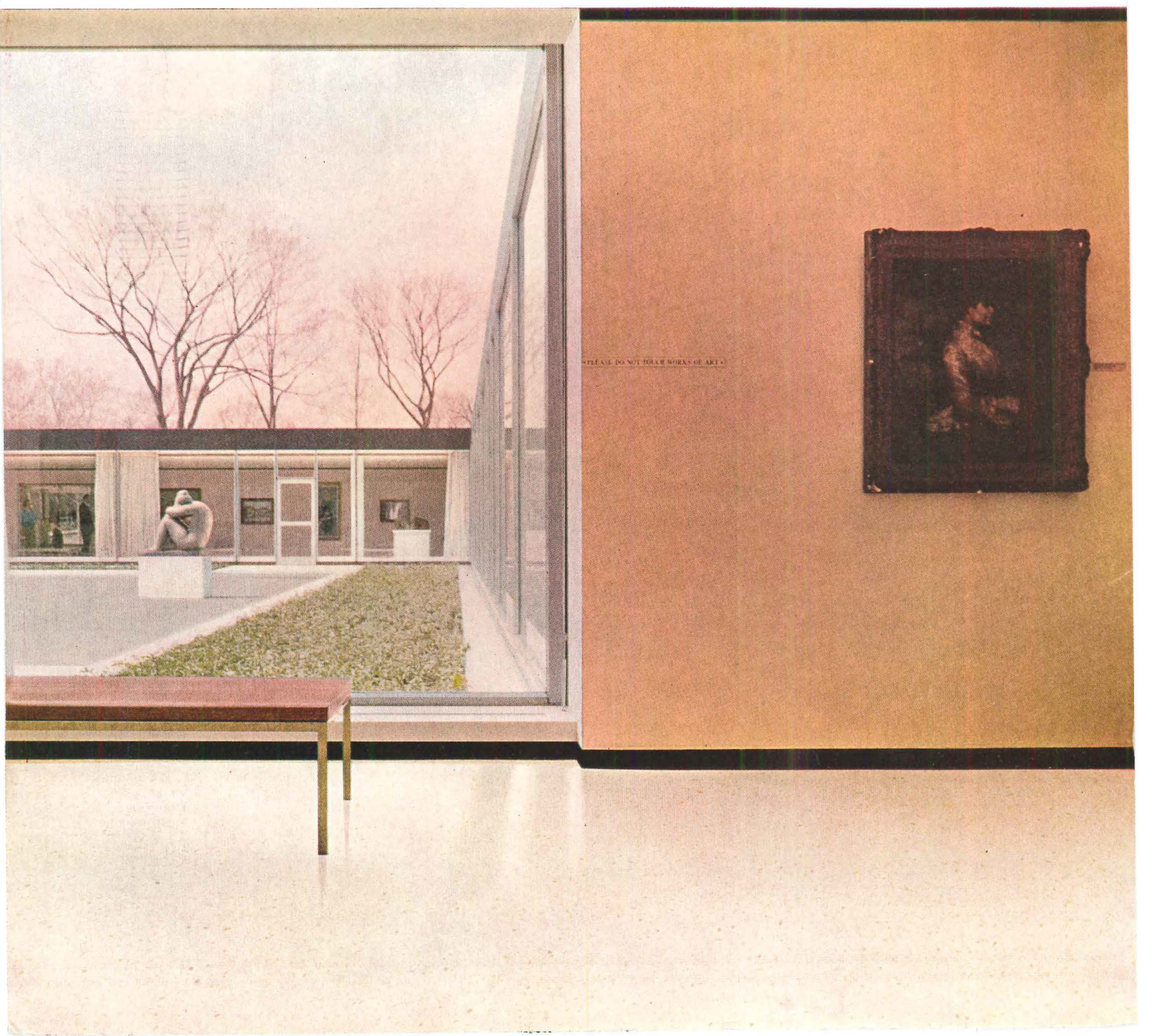
BUILDING TYPES STUDY: SCHOOLS

ARCHITECTURAL DETAILS: MINORU YAMASAKI

DESIGN FOR WORSHIP: SAARINEN CHURCH AND YAMASAKI SYNAGOGUE

FULL CONTENTS ON PAGES 4 & 5

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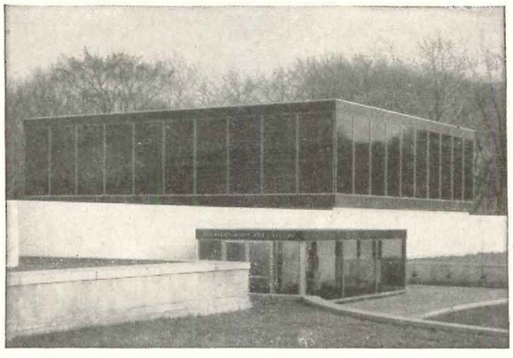

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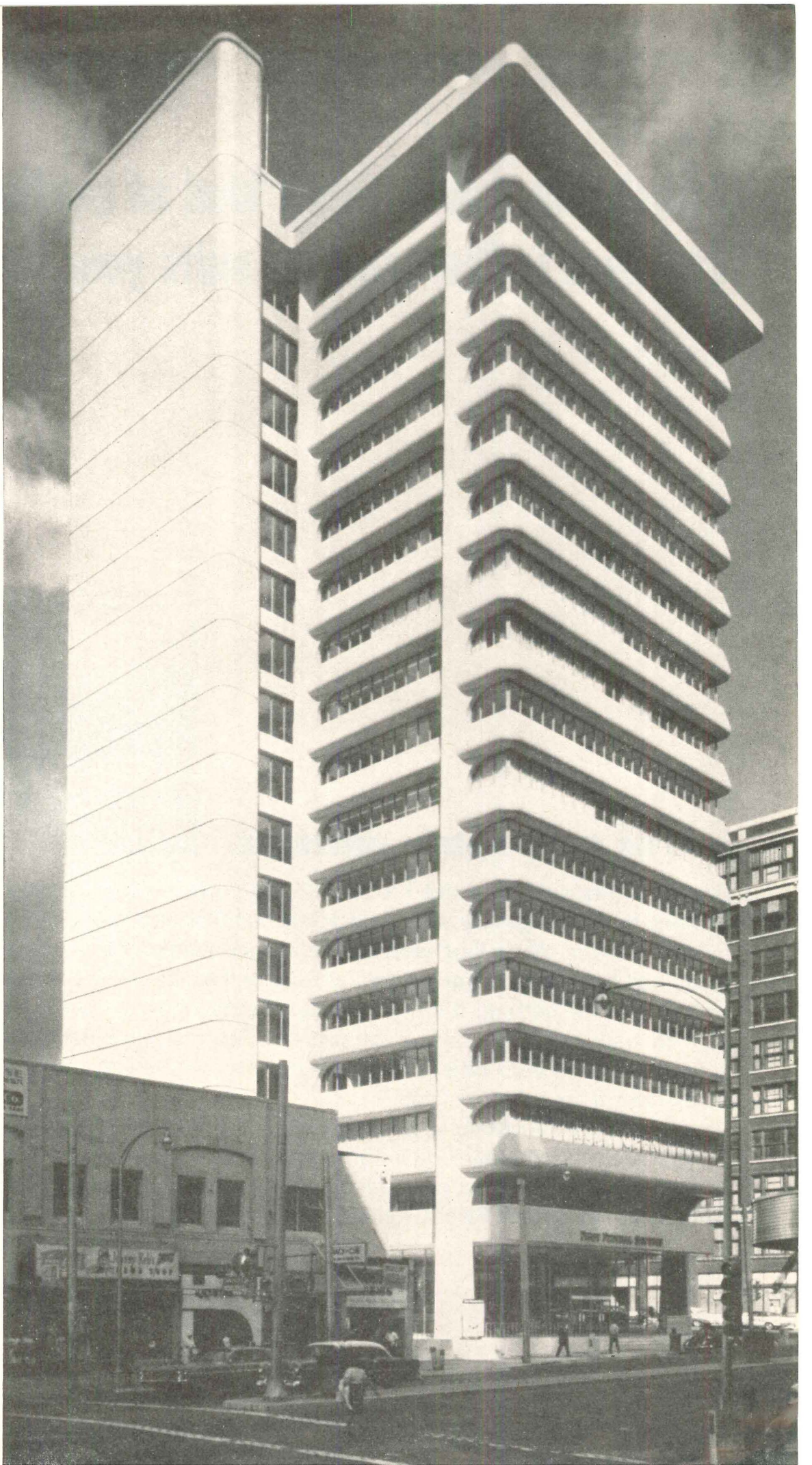

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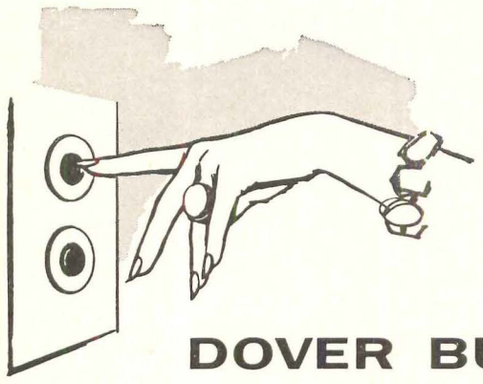

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HOW PHILADELPHIA'S DESIGN FOR URBAN GROWTH IS DEVELOPING

The concept of a creative design structure as the key to urban planning and development and its application in Philadelphia were eloquently described by Architect Edmund N. Bacon, executive director of the Philadelphia City Planning Commission, in a RECORD *article three years ago. Now we take a look at how that design structure is developing, and at its architectural results.*

HOSPITAL DESIGN AND FUNCTION

Next month's Building Types Study on hospitals will review, with generous abstracts, a forthcoming book, "Hospital Design and Function," by E. Todd Wheeler, to be published by McGraw-Hill in October. A supplementary presentation of hospital buildings, large and small, will point up current attention especially to room layout, nursing unit arrangement and traffic simplification for personnel and materials.

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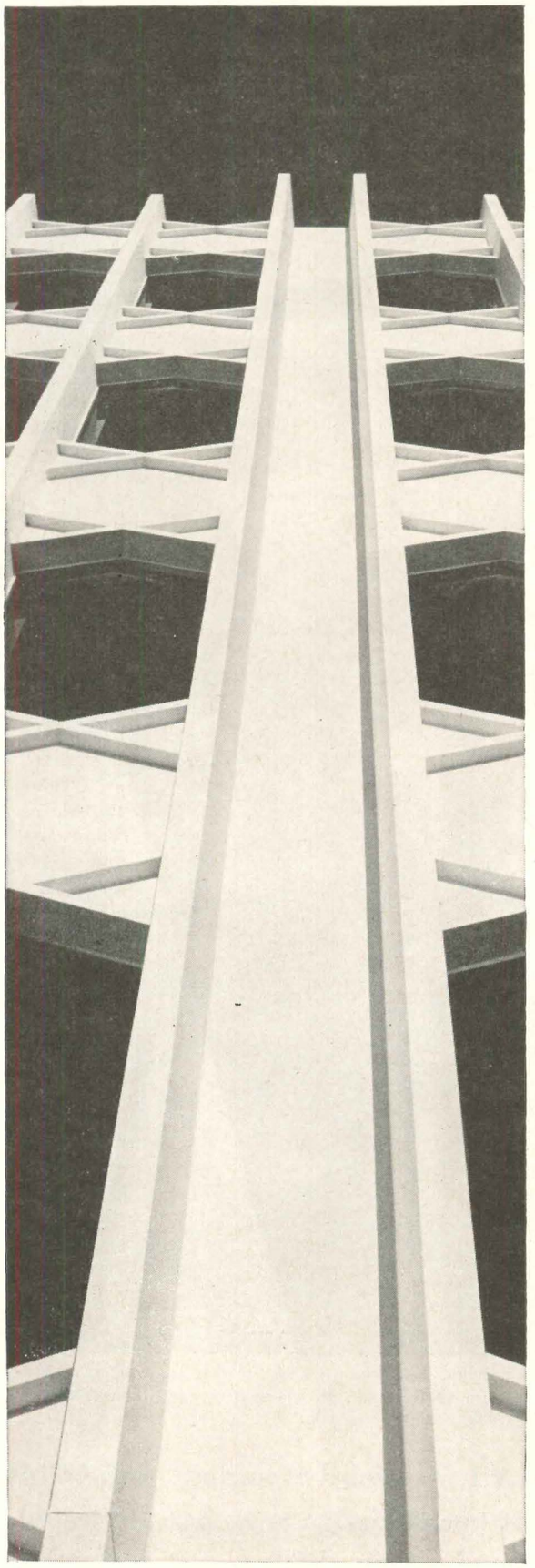

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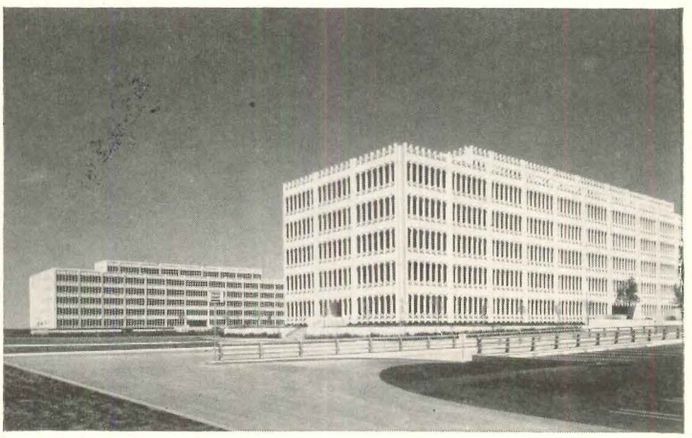

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They CAN Afford Architecture

In days of old, architects, like the ladies of the court, preferred the wealthier, more powerful clients. Without wealth or power there was no architecture. Sin didn't always require wealth, but architecture did. So the world of architecture grew up with a distinct orientation toward the golden sun of wealth. And the sun-worshippers can't seem to stop making the same old salaams.

For a long while now architecture has been trying to purge itself of the habits of thinking which originally sprang from the idea that architecture sprang from wealth. Money, of course, meant arrogance, ostentation, pretension, monumentality, and so on. The religious purpose in much of the early architecture did not change the fact that design did so generally equate with fairly flamboyant display.

Efforts of the modern school to find new motivations have been all to the good, but the old association of architecture and wealth is deeply ingrained.

A confrère, Joseph Watterson, editor of the A.I.A. Journal, phrased it this way: "For 5,000 years we have let architecture grow to maturity with two faces, one toward the rich —kings, religions, governments, corporations—the other toward the poor—the masses of people, not necessarily poor in the economic sense, but poor in the sense that they are not getting the benefits that architecture can give them. And *that* face wears a blindfold. Until we can begin to tear off that blindfold, the profession of architecture is not living up to its mission."

If architecture does have these two faces, certainly we can't be very happy with either of them. We don't like to think of architects as just couturiers for the wealthy (whatever the attractions); we do like to think that a noble profession does have a higher call. We don't really like the thought that the masses are merely to be allowed to peer at buildings done for others.

The blindfold is there, nevertheless. Around the RECORD office recently, we have talked pretty seriously about architecture in housing, in urban renewal, architecture to improve living conditions. We have run over the familiar cries of architects —"We are not interested in housing" —"We can't do anything decent in housing"—"No money in it." Architects plan and build housing, but they don't consider it represents architecture.

Yes, yes, there are difficulties. But there is that blindfold, too.

As for the difficulties, there is considerable promise that they will gradually diminish. Government housing officials assured us (last month's RECORD) that they were serious about wanting better architecture, better building design, better living conditions, in any housing sponsored or financed with government assistance. The new Rome will not be built in a day, but an architect is entitled to take a good hard look at the expressed intention of the housing commissioners.

Don't forget, too, that a perhaps deeper change is in progress. Wealth is, if not exactly redistributed, at least generally increased and more widely spread. The poor we may have always with us, but they are getting less poor by the year. Somebody remarked that in the current 20 years (up to 1970) our standard of living will have doubled. I'm still waiting for my share, but we all know living standards are increasing. Kids go to college with cars, with wives and kids. Then they have two cars, six kids, two houses.

That blindfold leads to two serious errors. One, the wealth-and-masses idea is long gone. Two, the architectural approach so based is also an anachronism.

Most people can afford architecture today. Not wealthy architecture. Not for Pitti Palaces. But for housing, cities, schools, colleges, offices, stores, resorts, hotels, marinas, garages, churches, and on and on. We are in the biggest building boom of all time. Most of these building types are not getting the best of architectural study.

Perhaps Watterson explains it properly with his blindfold thought. We need a new look at the growing wealth of our time, and at its purposes and ambitions.

Maybe we need a new architecture for it.

—*Emerson Goble*

GAO REPORT ATTACKS PHA FOR DESIGN "EXCESSES"

The spending practices of the Public Housing Administration and its over-all supervision of low-rent housing programs have come under sharp scrutiny and criticism by the Government Accounting Office. In a 68-page report to the Congress the GAO attacks PHA's alleged loosening of its control over the design of its projects and the selection of materials.

Architects will note with regret that the GAO seems to regard with suspicion any advance over a bare minimum standard of housing. In effect, the report attacks not cost but amenity, and it questions the propriety of many of the humanizing elements good design has been able to bring within the stringent budget limitations of public housing.

The report recommends that the Housing and Home Finance Administrator require the PHA Commissioner (1) to define the term "elaborate or extravagant design or materials" in sufficient detail to provide the Local Housing Authorities with well-defined criteria for planning future projects that will conform to the intent of the statute and (2) to instruct the PHA regional directors not to concur in plans for projects which provide for designs or materials exceeding the specified criteria.

The report's list of such "excesses" includes: outside ornamentation; unusual design for building walls; extra-quality facing brick; hard wood flooring; awning-type aluminum windows; marble interior window sills; refrigerated air conditioners; costly kitchen cabinets; cast iron plumbing fixtures; unusual door locksets; high-cost dedication plaques and monuments; ornamental walls and planter curbs; and community facilities.

The GAO report admits that establishing adequate criteria would not be a simple matter, but asserts this would be necessary in order to decrease the costs of projects. The GAO feels that "reduction of the development cost of projects would allow PHA to contract for construction of more dwelling units with the amount authorized by the housing act, thereby accommodating more families."

The report does not argue that cost-per-room limits have been exceeded but that cost-per-room limits are not enough to preclude the use of "elaborate or extravagant designs or materials." Thus many projects not exceeding the statutory limitations were found to contain many of the "excesses." The GAO attributes this to the fact that the statutory limitations do not restrict design excesses in site improvements and non-dwelling structures and equipment. Furthermore, in cases where the Housing Act of 1949 authorizes increases in the limits of costs per room, "the determinations of costs in such cases do not show whether decent, safe and sanitary dwellings could be built at costs below the basic limits because the LHA's plans for the projects may provide for elaborate or extravagant designs or materials."

In calling for the establishment of new mandatory criteria, the report sees the need for a tightening of controls over the low-rent program by the Federal agency. The GAO claims that excessive costs have often been incurred because "PHA has encouraged LHA's to use more initiative and imagination in their plans and designs . . . by discontinuing most of the mandatory standards . . . and by eliminating detailed reviews of final plans and specifications."

The report states that local responsibility extends only to "the administration of the projects" and that PHA should maintain "responsibility relative to planning and construction." In loosening its controls, PHA has eliminated many mandatory requirements, though retaining them as guidelines. The report states that "by February 1962 all references to the statutory requirement that projects not be of elaborate or extravagant designs or materials had been eliminated." However, in PHA's Low-Rent Housing Manual of September, 1963, this requirement was still included as mandatory.

That the findings of the report have not been greeted with accord by the housing agency is pointed out in the report itself. In his letter of transmittal, Comptroller General Joseph Campbell states that PHA Commissioner Marie McGuire "generally did not agree with our conclusions" and that HHFA Administrator Weaver "advised us that he had no comments in addition to those presented by the Commissioner."

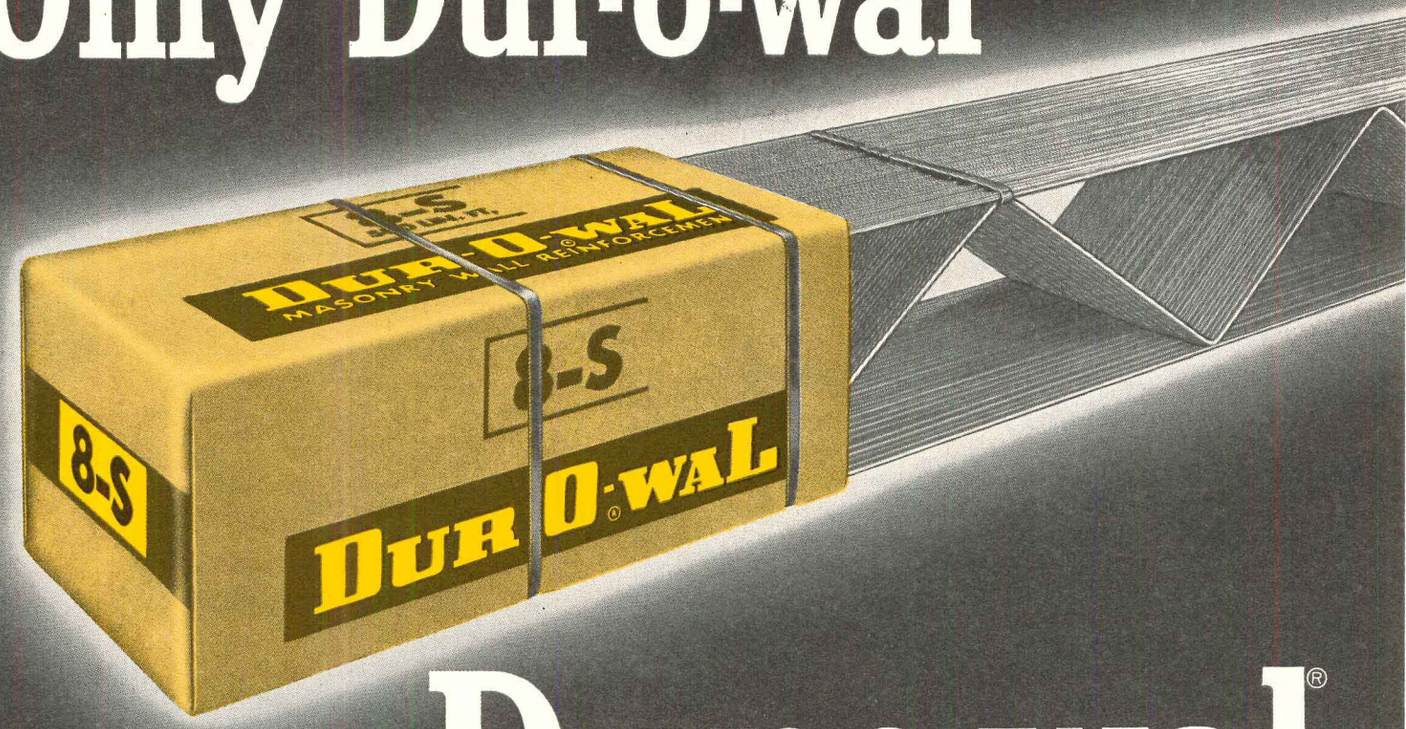
In Mrs. McGuire's response to a draft of the GAO report, she remarked that the "recommendation that PHA set standards defining elaborate or extravagant design or materials is not supported by evidence of legislative intent, and may be in conflict with the clear legislative intent favoring local responsibility and discretion." Furthermore she stated: "We believe the draft report fails to recognize the fundamental changes in emphasis brought about by the Housing Act of 1949 and subsequent amendments."

These dissenting remarks indicate that the real divergence of opinion is not so much on specific facts cited by the report but rather on the more basic issues of interpreting PHA's sphere of action. The report admits that in almost all cases its grievances are not the result of the low-rent housing projects' exceeding the cost-per-room limitations but rather that in a more general way "PHA may not have taken full advantage of the opportunities for promoting economy."

The GAO report remarks that recent practices of the PHA are incompatible with the objective of Congressional limitations that the "projects are (to be) built at the most economical cost consistent with providing decent, safe and sanitary dwellings, simple in design and, to the extent practicable, constructed of inexpensive materials." The report claims that the PHA has "placed greater emphasis on the environmental and esthetic aspects of housing rather than on the promotion of economy."

Thus the report criticizes the policies of redirection which have generated the more recent activities of PHA—the attempt to concern itself with public housing's role in the development of the entire urban complex. Its efforts in this direction have been based on an interpretation of the changing objectives of Congress, as indicated in the Housing Act of 1949 which stated that the goal of a national housing policy was "a decent home and *a suitable living environment* for every American." Such considerations, along with subsequent reductions of tight, centralized restrictions, the GAO report seems to find inconsistent with its interpretation of PHA's delegated task.

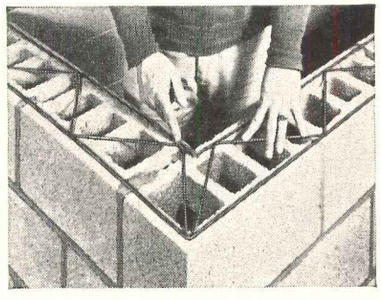
Only Dur-o-wal®



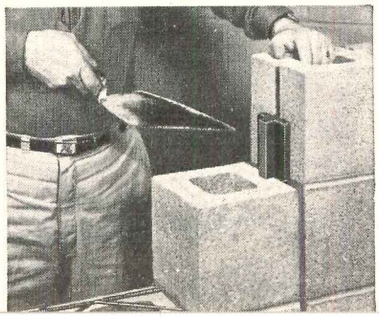
is Dur-o-wal®

the original masonry wall reinforcement with the truss design

When you ask for Dur-o-wal, you deserve to get *Dur-o-wal*. This is not a common masonry wall reinforcement, and there is no other brand "just as good." Dur-o-wal increases horizontal flexural strength of 8-inch block walls up to a proved 135 per cent. Does better than brick headers for the compressive strength of composite masonry walls. It's the universally acknowledged best in reinforcement for all kinds of masonry walls. So make sure you get the real thing: Look for the truss design which embodies the most efficient known principle for resistance to stress. And look for the Dur-o-wal end-wrap shown above. Want better walls? Want the facts? Write for Dur-o-wal Data File.



STRENGTH WITH FLEXIBILITY—this basic masonry wall requirement is met for sure (and economically) when Dur-o-wal, above, is used with the ready-made, self-flexing Rapid Control Joint, below.



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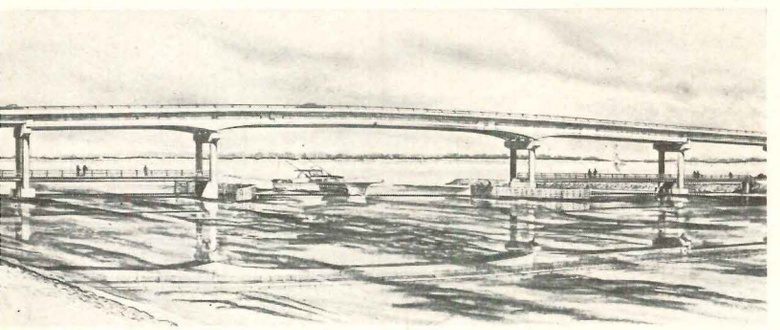
- Pueblo, Colo., 29th and Court St.
- Phoenix, Ariz., P.O. Box 49
- Aurora, Ill., 260 S. Highland Ave.
- Seattle, Wash., 3310 Wallingford Ave.
- Minneapolis, Minn., 2653 37th Ave. So.
- Hamilton, Ont., Canada, 789 Woodward Ave.

For more data, circle 4 on Inquiry Card

FIRST AWARD: Phoenix Convention Center, Phoenix, Arizona.
Architect: Perry Neuschatz
Associated Architect: Gary Call
Structural Engineers: T. Y. Lin and Associates.
Jury comment: "An excellent example of a design which is entirely functional yet achieves a striking appearance . . . . It is true to its purpose and environment (and) achieves simplicity and unity, although the requirements of the building are far from simple"



SPECIAL BRIDGE AWARD: Sebastian Inlet Bridge, Florida
Engineers: Howard, Needles, Tammen & Bergendoff
"Completely precast prestressed 1,548-foot bridge. . . . The 180-foot center span has special significance because of construction problems which would occur in the swift current and tidal conditions which exist in the Sebastian Inlet. Because of the use of precast prestressed concrete, no false work is required, a most important consideration"

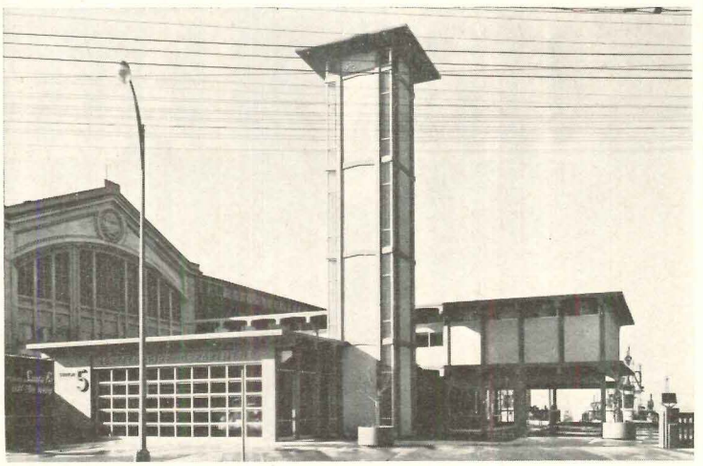
P.C.I. HONORS ELEVEN STRUCTURES IN AWARDS PROGRAM

A circular convention center in Phoenix, Arizona, was selected as the First Award winner and the design of the Sebastian Inlet Bridge in Florida was chosen for a special Bridge Award in the 1964 Prestressed Concrete Institute Awards program. Nine other structures were given Merit Awards for their significant contributions to the advancement of prestressed concrete.

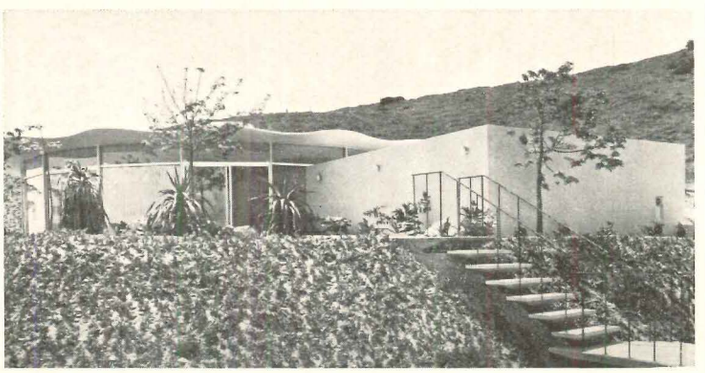
A five-member jury, composed of architects and engineers, based its decisions on the factors of design excellence, engineering advances and the understanding and exploitation of the inherent qualities of prestressed concrete. Richard M. Bennett, F.A.I.A., Chicago, was chairman of the jury. Other members were: J. Roy Carroll, F.A.I.A., Philadelphia; Maurice Robillard, C.I.A., Montreal; G. Brooks Earnest, engineer and president of Fenn College, Cleveland; and S. Kenneth Johnson, engineer, Los Angeles.

Exhibits of all the award winners will be on display at P.C.I.'s annual convention September 20-25 at the Mayflower Hotel in Washington, D.C.

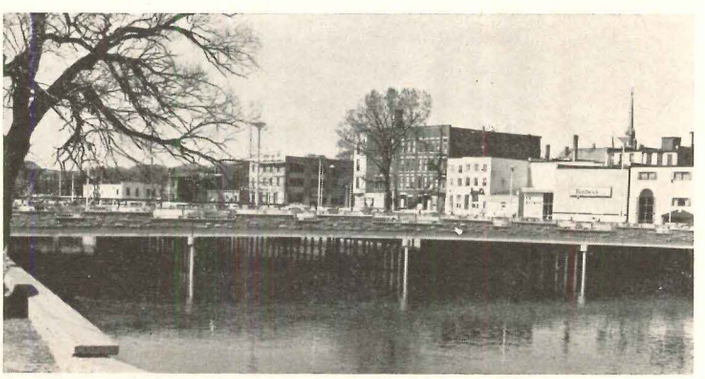
NINE MERIT AWARDS



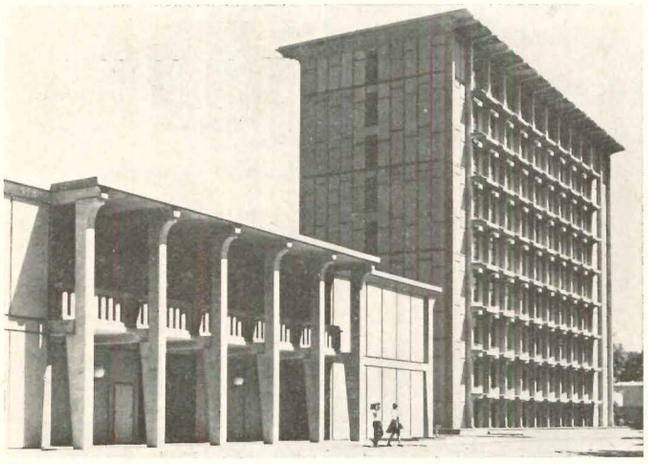
Fire Station No. 5, Seattle, Washington
Architects: Durham, Anderson and Freed
Structural Engineer: John H. Stevenson
"The character of this building explains itself in simple, clear-cut terms. The lines and dimensions of the station's prestressed concrete tees determine the proportions of windows, wall panels and other parts of the facade . . ."



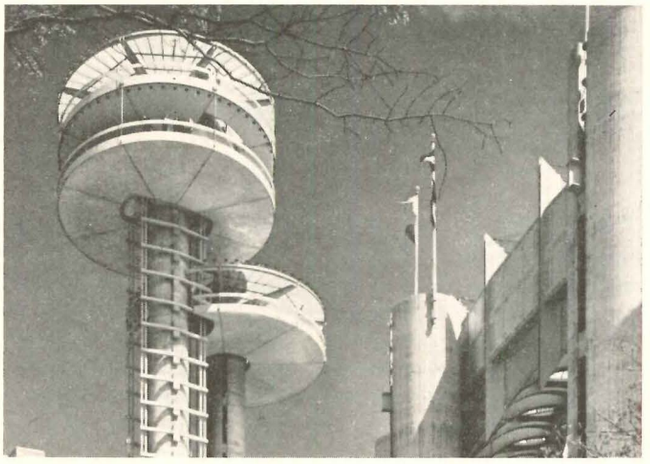
Residence, Laguna Niguel, California
Architect: George Bissell
Consulting Engineers: Scherrer-Baumann Associates
"To obtain an unusually shaped concrete roof with a hollow core, [the designer] applied prestressing in a way new in home construction—by post-tensioning of a thin shell of concrete applied over an air-filled plastic bag"



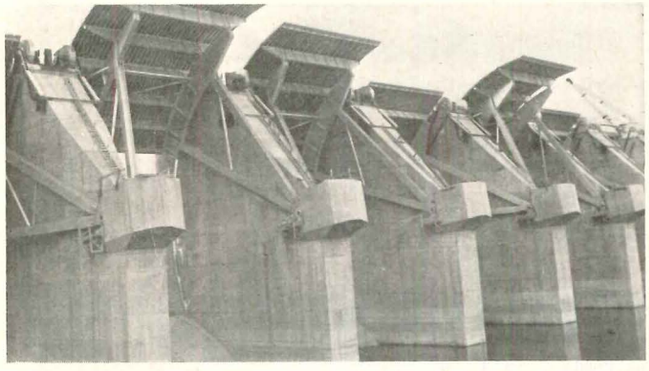
Parking plaza, Janesville, Wisconsin
City Engineer: Roger E. Krempel
"An engineer solved a problem which plagues virtually every American community . . . by building a prestressed concrete parking plaza over the river which runs through the downtown area. From the standpoint of economy, it was ideal . . . the plaza provides an ideal use of air rights"



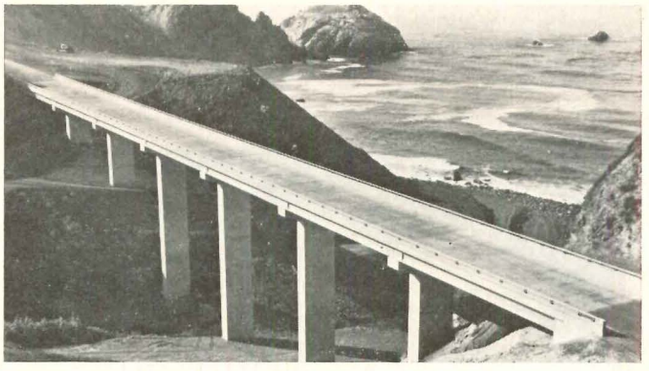
Classroom and office building, University of California, Davis Campus, California
Architects: Gardner A. Daily and Associates
Structural Engineers: T. Y. Lin and Associates
"A very important engineering advancement is represented in the complete use of precast prestressed concrete in a nine-story structure"



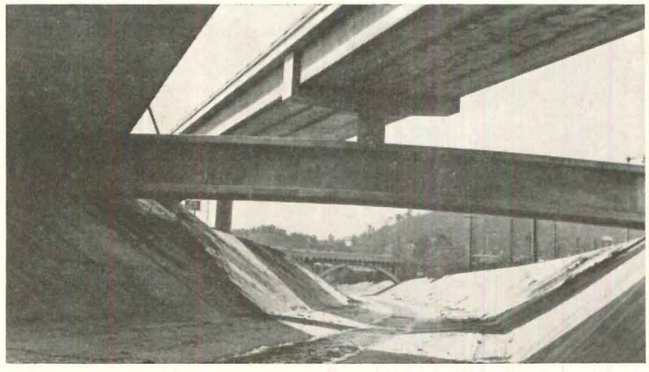
Observation Towers, New York State Pavilion, World's Fair
Architect: Philip Johnson
Structural Engineers: Lev Zetlin and Associates
"The towers create the atmosphere of fantasy that people look for at a World's Fair, but they do it by following sound engineering principles. That the highest tower sets a record for the height-to-width ratio is very impressive"



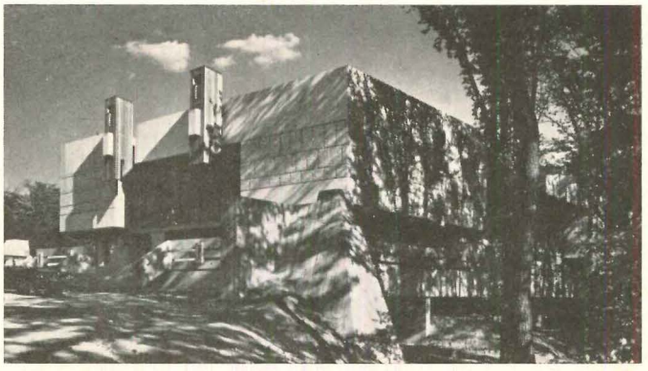
Tainter Gate Anchorage, Wanapum Dam, Columbia River, Washington
Structural Engineers: Harza Engineering Company
"The use of a prestressed concrete system cuts down on the mass and makes possible a much simpler design of the entire gate system"



Willow Creek Bridge, California
State Highway Engineer of California: J. C. Womack
"Few bridges do as well in blending with their environment as does this one. . . . At the same time, it is extremely pleasing to the engineer because it used the minimum amount of material and yet provides complete safety"



Carrying beams over the Arroyo Seco channel, California
State Highway Engineer of California: J. C. Womack
". . . an ideal solution to a complex engineering problem. A maze of freeway interchanges at varying levels must be carried over the flood control channel. The design of the beams simplified the entire system of grading the various interchange levels. It is a highly intelligent approach . . ."

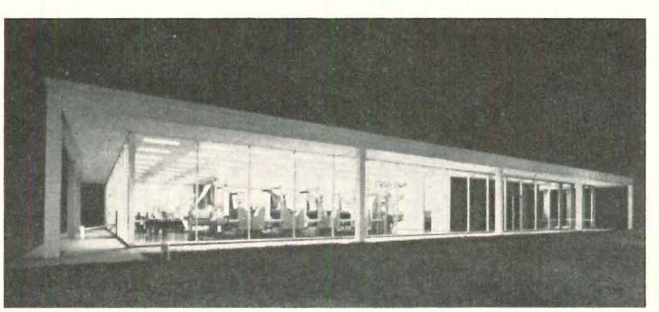


Japanese Canadian Cultural Center, Toronto, Canada
Architect: Raymond Moriyama
Structural Engineers: G. Dowdell and Associates
"The center proves the possibility of acheiving a distinct national identity in a design which uses standard prestressed concrete members. . . . There is splendid integrity between architectural and structural considerations"

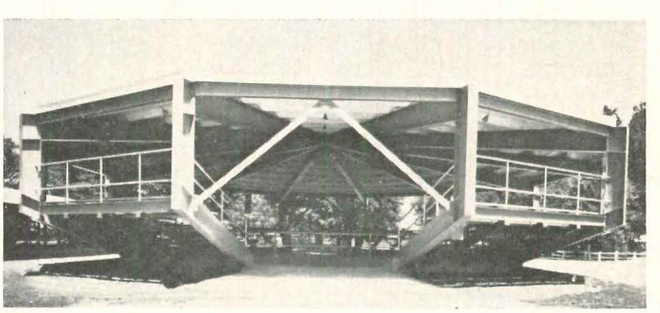
TWELVE BUILDINGS GET A.I.S.C. AWARDS

Twelve steel-framed buildings were chosen to receive Architectural Awards of Excellence by the American Institute of Steel Construction. A jury of five architects and engineers selected a varied range of building types from 140 entries, the largest number to date in this five-year-old competition. Commenting on their choices, the jury agreed that "the increasing facility of both architects and engineers is evidenced by the superb craftsmanship of these buildings." The jurors especially noted the growing "imaginative use of steel" producing a "great variety of approaches" and the improvement in site planning by "opening up spaces around buildings."

Members of the jury were: Leo A. Daly, A.I.A., Omaha, Neb.; Morris Ketchum Jr., F.A.I.A., New York; Henry L. Wright, F.A.I.A., Los Angeles; Paul Weidlinger, consulting engineer, New York; and Philip N. Youtz, dean, College of Architecture and Design, University of Michigan. The winning architects will receive inscribed plaques, and certificates will be presented to the owners, structural engineers, contractors and steel fabricators.



The Daily Journal Building, Franklin, Indiana
Architects: Skidmore, Owings & Merrill
General Contractor: Dunlap & Company, Inc.
Owner: Home News Enterprises
Steel Fabricator: International Steel Company



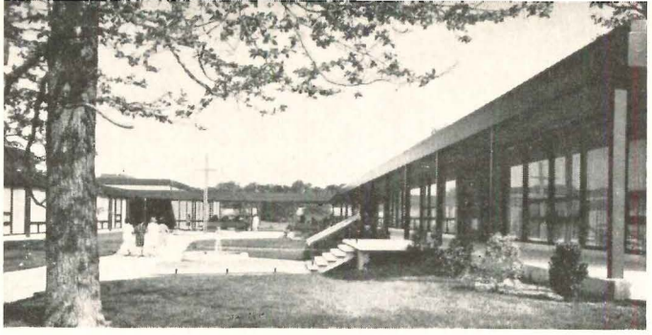
Judging Ring, Los Banos, California
Architect: Raymond R. Franceschi
Structural Engineer: Leroy F. Greene
General Contractor: T. Falasco, Inc.
Owner: City of Merced, California
Steel Fabricator: Pittsburgh-Des Moines Steel Company

California Credit Union League Headquarters Building
Pomona, California
Architects: Balch-Hutchason-Perkins
Structural Engineers: Ropp & Ropp
General Contractor: Gattman & Mitchell

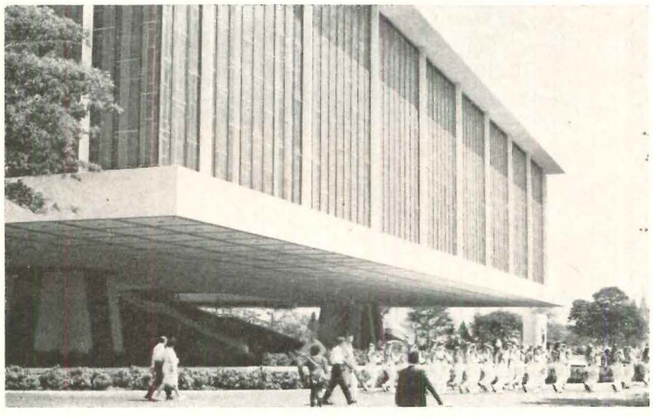
Westinghouse Molecular Electronics Laboratory
Elkridge, Maryland
Architect: Vincent G. Kling
Structural Engineers: Allabach & Rennis
General Contractor: Kirby & McGuire, Inc.
Steel Fabricator: Derby Steel Company

Michigan Consolidated Gas Company Office Building
Detroit, Michigan
Associated Architects and Engineers: Minoru Yamasaki—Smith, Hinchman & Grylls
General Contractor: Bryant & Detweiler Company
Steel Fabricator: American Bridge Division
United States Steel Corporation

Bethany Fire Station, Bethany, Oklahoma
Architects: Locke, Miner & Smith, Inc.
Structural Engineer: A. M. Eudaley
General Contractor: LippCo Construction, Inc.

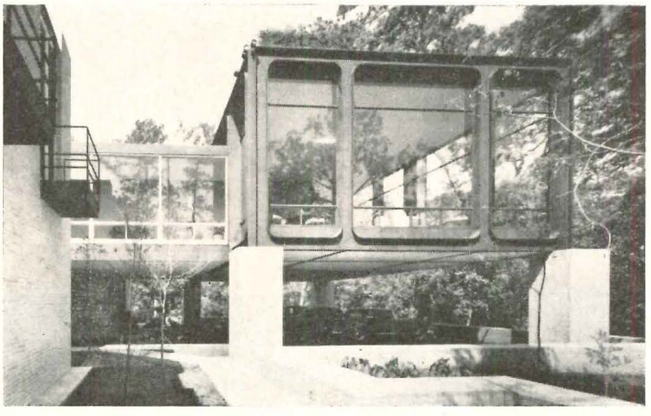


Academic Center, Gwynedd, Pennsylvania
Architects: Nolan Swinburne and Associates
Structural Engineers: Severud-Elstad-Krueger, Associates
General Contractor: John P. Donovan
Owner: Sisters of Mercy, Philadelphia, Pennsylvania

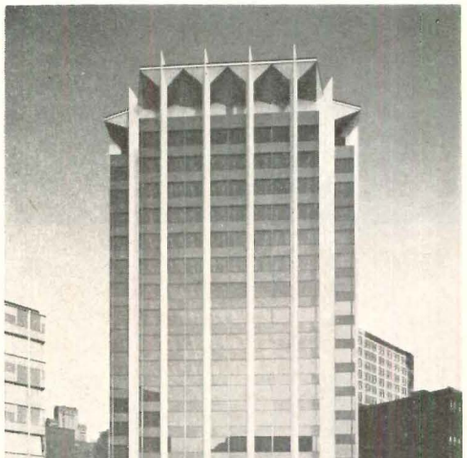


Joseph W. Molitor

United States Pavilion, World's Fair, New York
Architects: Charles Luckman Associates
Structural Engineers: Severud-Elstad-Krueger, Associates
General Contractor: Del E. Webb Corporation
Steel Fabricator: Bethlehem Steel Company

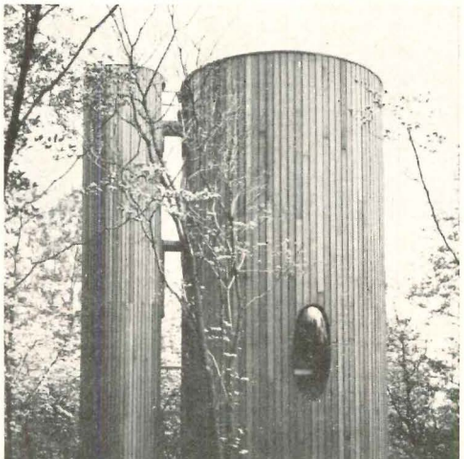


Residence for Mr. and Mrs. John F. Maher, Houston, Texas
Architects: Howard Barnstone and Partners
Structural Engineer: R. George Cunningham
General Contractor: Ivanhoe Company
Steel Fabricator: Mosher Steel Company

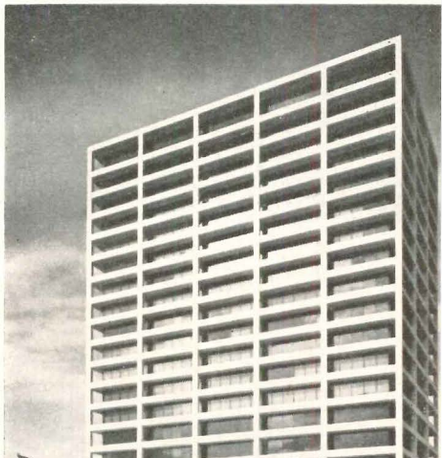


Hedrich-Blessing

United States Gypsum Company Building
Chicago, Illinois
Architects: The Perkins & Will Partnership
(Edward Colin, structural engineer)
General Contractor: A. L. Jackson Company
Steel Fabricator: American Bridge Division
United States Steel Corporation



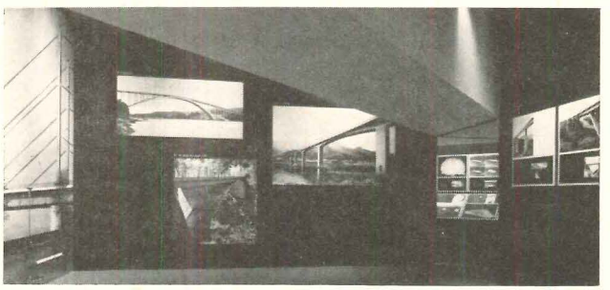
Residential Bath Tower
Stony Point, New York
Architect: M. Medcalfe
Structural Engineer: Arthur P. Hall
Owner and General Contractor: M. Medcalfe



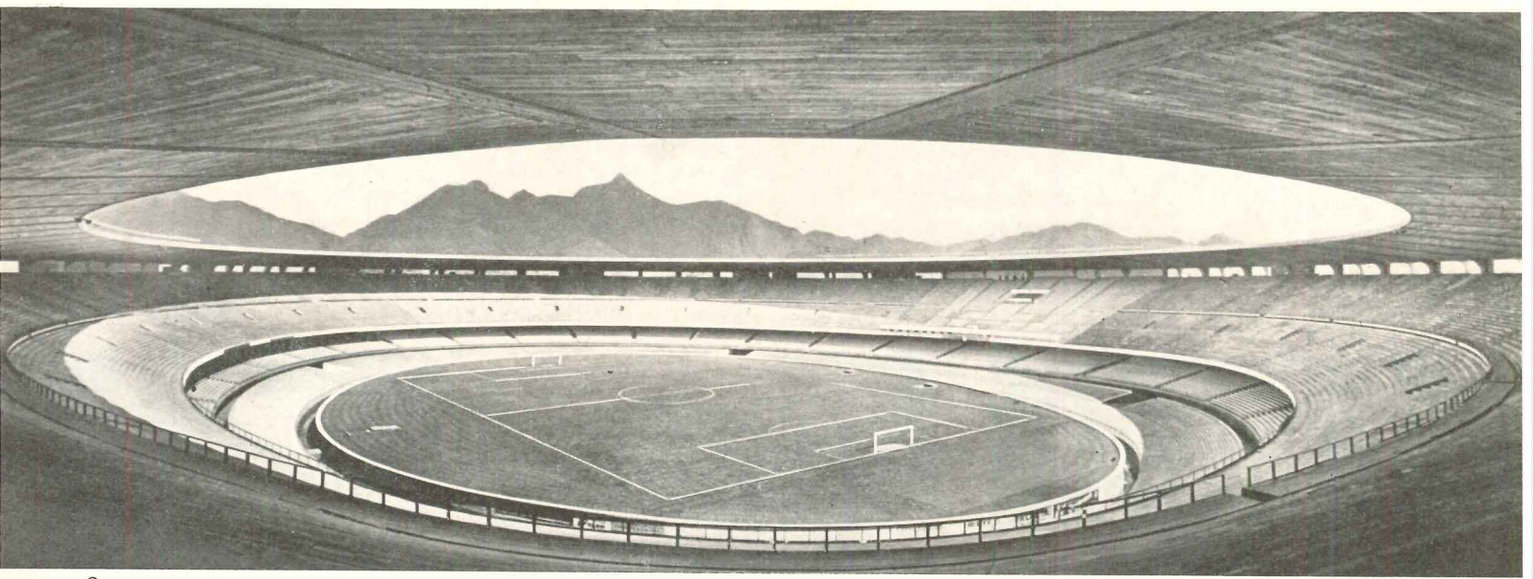
BMA Tower, Kansas City, Missouri
Architects: Skidmore, Owings & Merrill
General Contractor: Winn-Senter
Construction Company
Owner: Business Men's Assurance Co.
Steel Fabricator: Kansas City
Structural Steel Company

SIGNIFICANT FORMS AT ENGINEERING SCALE

20th Century Engineering, an exhibition selected and installed by Arthur Drexler at the Museum of Modern Art, is a dramatic response to the "poetry" of the modern art of construction. Bridges, dams and stadia, immense enclosures, quasi-mechanical objects and even great dislocations of earth give awesome testimony to the individual boldness and ingenuity of their designers. The display of 193 projects from 28 countries will be on view until September 15, after which it is expected to travel. A major book by Mr. Drexler, supplementing his catalogue, is forthcoming.



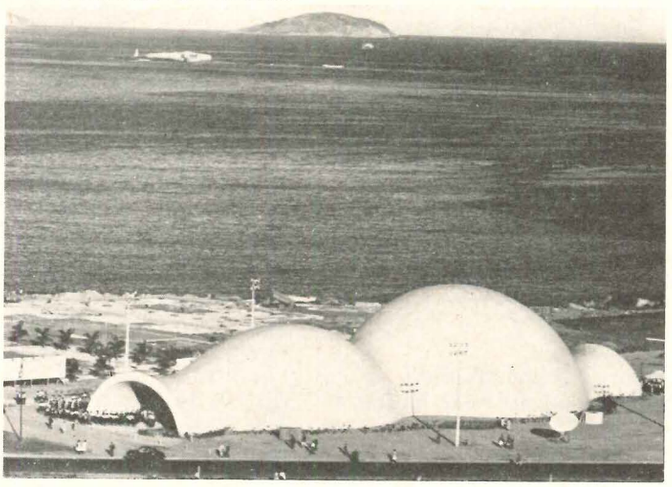
George Cserna



2

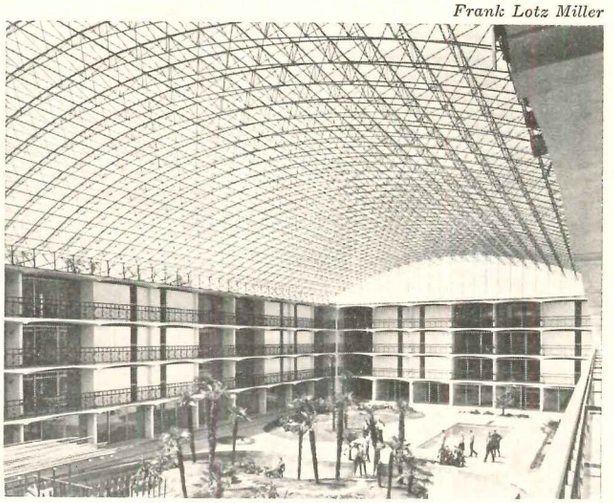
courtesy Kasper Winkler & Co.

Mozart, courtesy Victor A. Lundy



5

Frank Lotz Miller



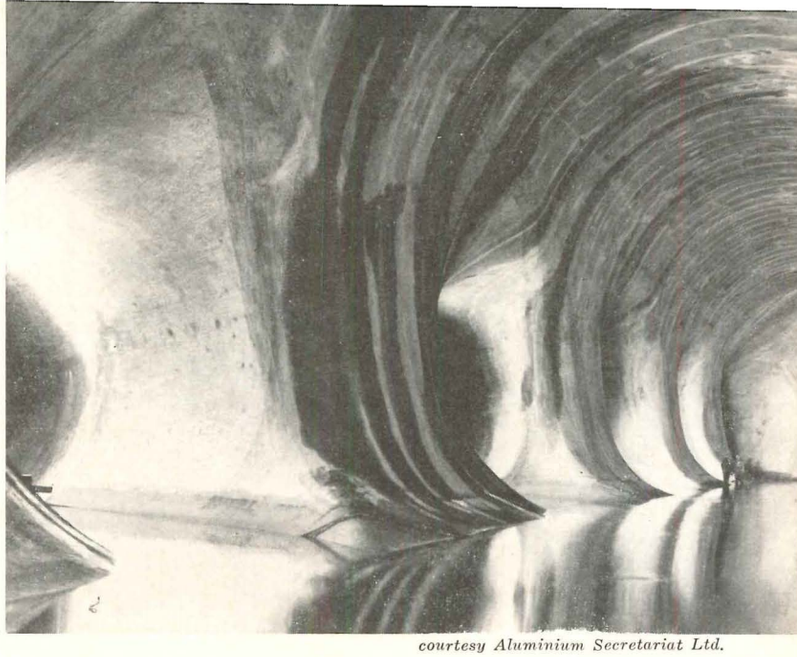
6

Catalogue descriptions of projects shown:

1. Chute-des-Passes hydro-power station, penstock manifold. Peribonka River, Canada. 1959. H. G. Acres & Co. Penstock manifold connecting concrete lined intake tunnel; length: 6 miles; diameter: 35 feet, with the steel lined penstocks of five turbine generators in the underground power house

2. Maracanã stadium. Rio de Janeiro, Brazil. 1952. Fragoso, Noronha, Baungart and Costa. Architects: Galvão, Bernados Bastos, Dias Carneiro, Azevedo. Canopy roof. Steel beams, reinforced concrete; cantilever span: 98 feet; maximum capacity: 220,000 spectators

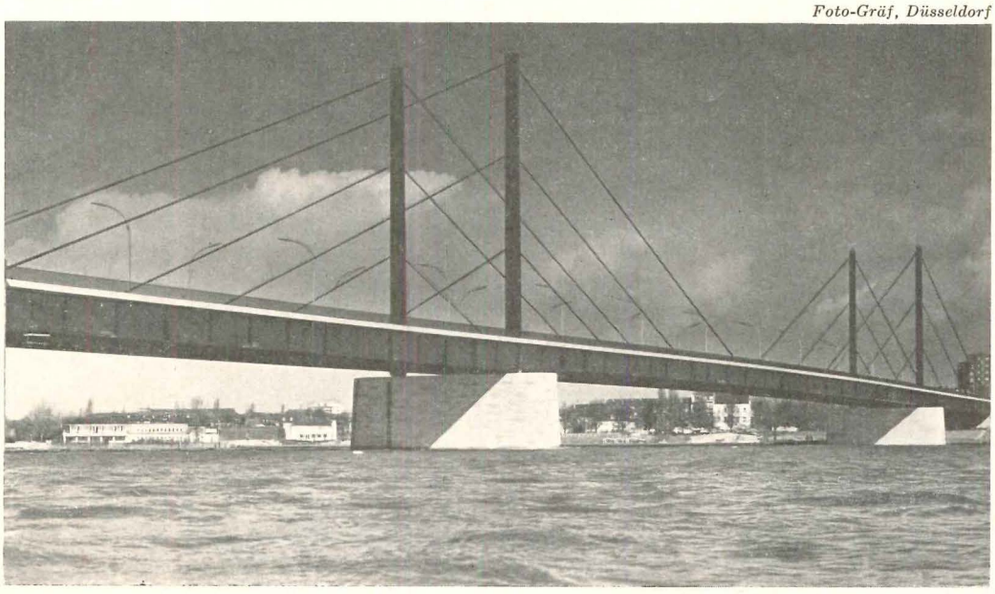
3. Theodor Heuss Bridge over the Rhine River. Düsseldorf, Germany. 1957. Department of Bridge Construction, City of Düsseldorf (Franz Schreier), Fritz Leonhardt, Karl Schaechterle, Louis Wintergerst. Architect: Friedrich Tamms. Steel box girders and orthotropic deck plate suspended by parallel cables from four pylons (Harp system); span: 852 feet; total length: 476 feet



1

courtesy Aluminium Secretariat Ltd.

Foto-Gräf, Düsseldorf



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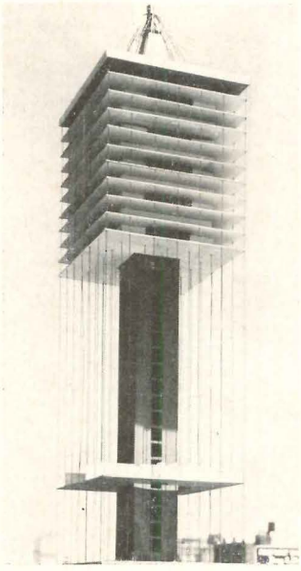
George Cserna



4

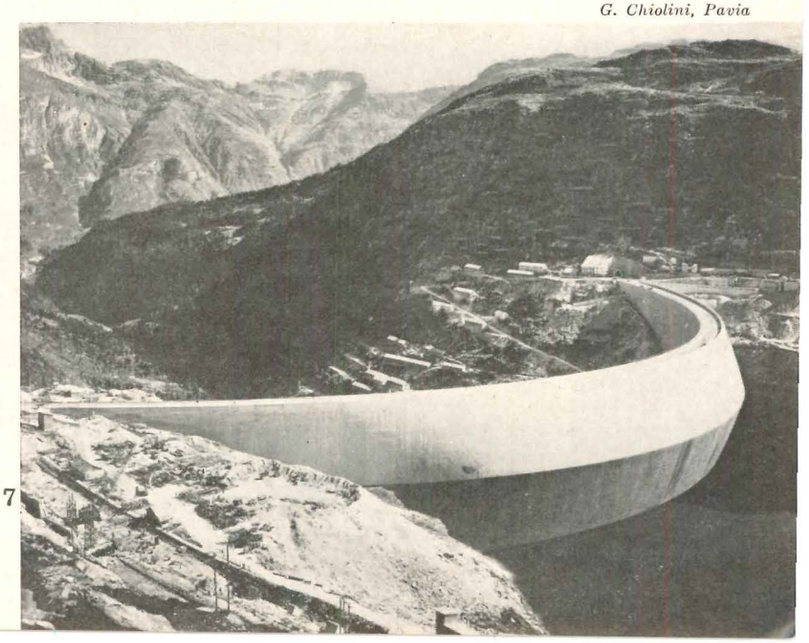
4. "Times Square" office building. Project proposed for New York. 1963. Architect: Clive Entwistle. 40-story tensile structure; slip formed concrete core and cable suspended floor slabs precast on site

5. Atomic Energy Commission, inflatable exhibition building. 1960. Birdair Structures, Inc. Architect: Victor A. Lundy. Pneumatic membrane structure; air-supported double nylon skin; length: 300 feet; maximum width: 126 feet

6. "Studio Arms" apartment building, covered patio. Baton Rouge, Louisiana. 1964. William J. Mouton Jr. Architects: Paul Mouton, Max Cannon. Vaulted space frame of triangular steel truss elements; rise: 16 feet; weight: 4 pounds per square foot; clear space: 200 by 100 feet; covered with tempered glass

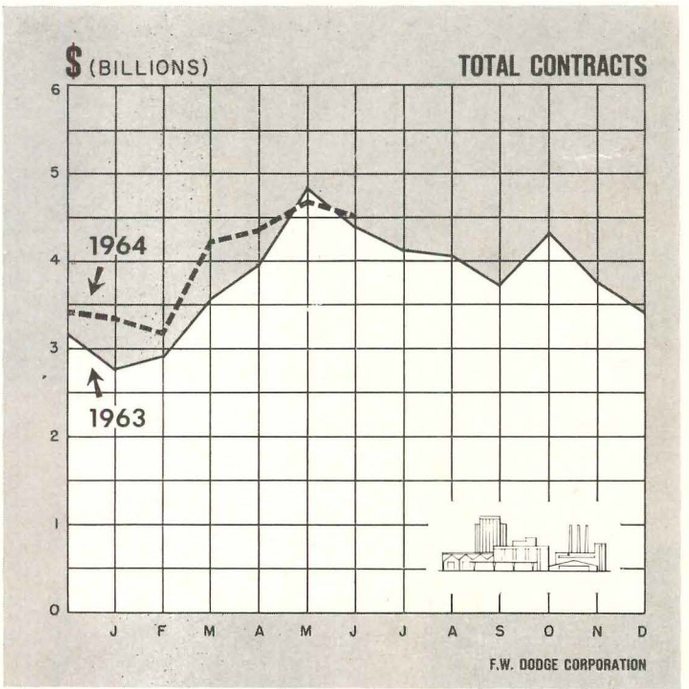
7. Valle di Lei Dam. Reno di Lei River, Switzerland. 1960. Claudio Marcello (Edison Group). Arch dam of parabolic horizontal layout; height: 469 feet; maximum overhang: 86 feet; crest length: 1,968 feet (widest arch dam to date)

G. Chiolini, Pavia

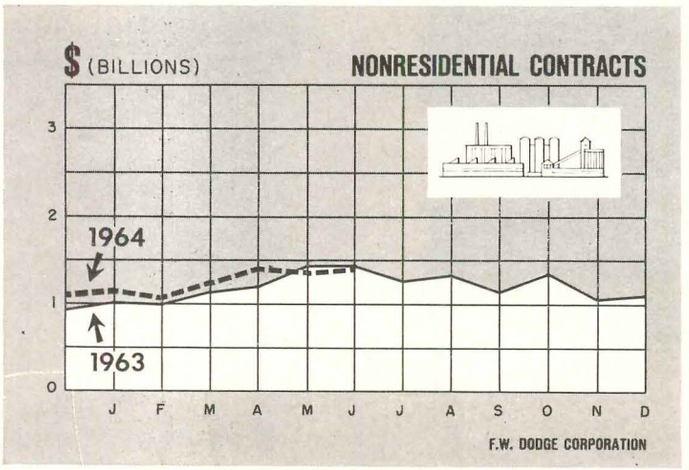


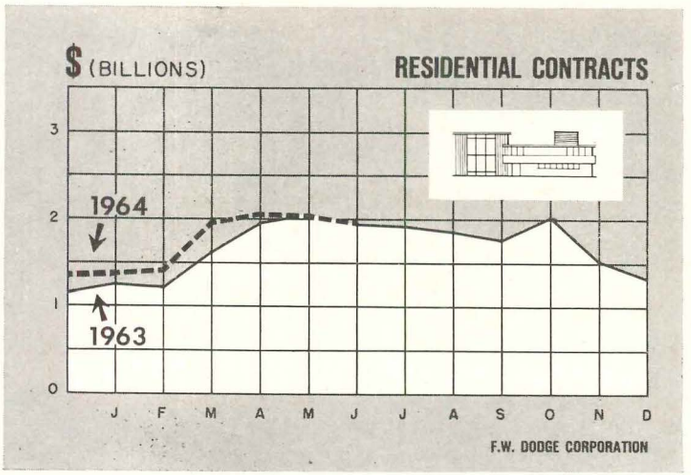
7

BUILDING ACTIVITY: THE HIGH PLATEAU



Total contracts include residential, nonresidential and non-building contracts





With a mighty surge in the final quarter of 1963, the volume of new construction reached an all-time peak last December, held close to that level for one more month, and then slipped back, coming to rest on a high plateau by midyear. That's the over-all impression given by the F. W. Dodge Index—the seasonally adjusted indicator which measures current construction contract value against the norm of activity during the base period 1957-59.

The Dodge Index closed out the second quarter with a June reading of 138, exactly where it stood for the two previous months. By contrast, the earlier December peak was 148, and the average of the fourth quarter came to 146—some 6 per cent above the level of the most recent three-month period. And although the decline has apparently been arrested, the modest reversal in the trend of building activity was a broad one, cutting across most types of residential and nonresidential building alike.

Much like the behavior of the total construction Index, the residential building component showed an almost constant level of activity during the second quarter of this year. Before that, housing reached a sharper peak than the whole of the construction industry, and reached it a bit later, as well. The housing market was still rising in strong fashion during the first three months of 1964, even after the total Index began to slip. In the second quarter, however, residential contract value broke from its high and rising pattern to settle back to the nearly 10 per cent lower rate of the quarter just past. That's the gloomy side of the story; the brighter side of the same data is that the midyear rate of new housing contract value was still higher than that experienced in eight of the 12 months of 1963, our best housing year to date. In a way, that's a pretty good measure of just how strong the record first quarter of 1964 really was.

Nonresidential building also slid off moderately in the second quarter. The slide wasn't as severe, though, partly because nonresidential building never quite reached the dizzying altitude that housing did to begin with, and partly because a few of the many nonresidential building types—stores and schools, for a pair of important examples—actually showed slight improvements in contract value (after seasonal adjustment) in the second quarter.

A comparison of the year-to-date totals of contract value for the first six months of 1964 with those of the same period last year presents the data in a somewhat different (and more favorable) light. This is because in the early part of 1963, although the trend of building activity was rising, the level was substantially lower than it has been recently; currently, the level remains relatively high, even though (for the past several months, at least) the trend has been declining.

Measured against the first half of 1963, the most recent six months showed a gain of 7 per cent in the value of residential building. Apartments scored the biggest lead, 17 per cent, while one-family housing led by 3 per cent.

Nonresidential contract value was ahead by 5 per cent at the midyear point, with industrial building up 12 per cent to lead all other building categories. Of the other two major nonresidential types, schools were ahead a strong 9 per cent, while commercial building held barely even with last year's cumulative value.

George A. Christie, Senior Economist
F. W. Dodge Company
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Building Construction Costs

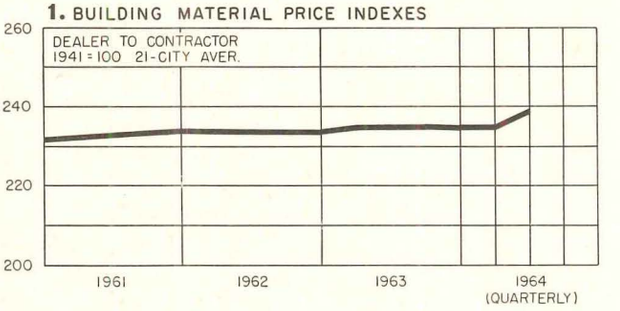
By Myron L. Matthews
Manager-Editor, Dow Building Cost Calculator, an F. W. Dodge service

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.

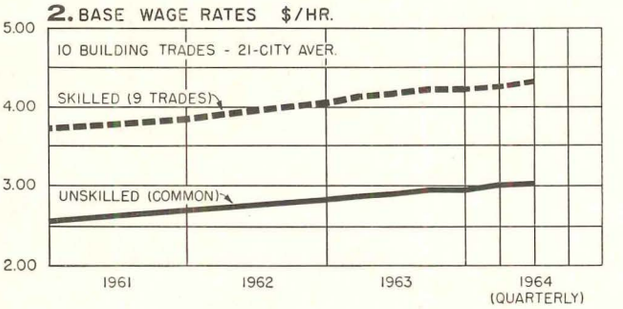
A. CURRENT BUILDING COST INDEXES—AUGUST 1964
1941 Average for each city = 100.0

Metropolitan Area	Cost Differential	Current Dow Index Residential	Current Dow Index Nonresidential	Per Cent Change Year Ago Res. & Nonres.
U.S. AVERAGE— 21 Cities	8.5	265.1	282.4	+2.51
Atlanta	7.1	299.8	318.0	+3.29
Baltimore	8.0	268.6	258.7	+2.52
Birmingham	7.4	246.3	264.9	+3.32
Boston	8.4	238.7	252.7	+2.93
Chicago	8.8	295.3	310.6	+2.72
Cincinnati	8.8	256.0	272.1	+2.52
Cleveland	9.3	267.2	284.0	+2.19
Dallas	7.8	251.2	259.5	+1.74
Denver	8.3	272.4	289.5	+3.02
Detroit	8.9	266.2	279.4	+2.56
Kansas City	8.3	238.8	252.8	+1.55
Los Angeles	8.4	268.9	294.2	+2.53
Miami	8.4	263.9	277.0	+2.24
Minneapolis	8.9	265.0	281.7	+1.90
New Orleans	7.9	239.4	253.7	+1.25
New York	10.0	274.5	295.3	+2.49
Philadelphia	8.7	264.6	277.8	+2.62
Pittsburgh	9.1	251.4	267.3	+2.88
St. Louis	8.9	258.5	273.9	+2.82
San Francisco	8.5	339.1	371.0	+3.36
Seattle	8.5	242.1	270.5	+1.82

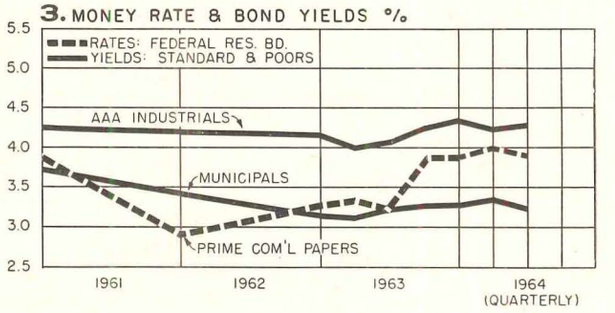
1. BUILDING MATERIAL PRICE INDEXES



2. BASE WAGE RATES $/HR.



3. MONEY RATE & BOND YIELDS %



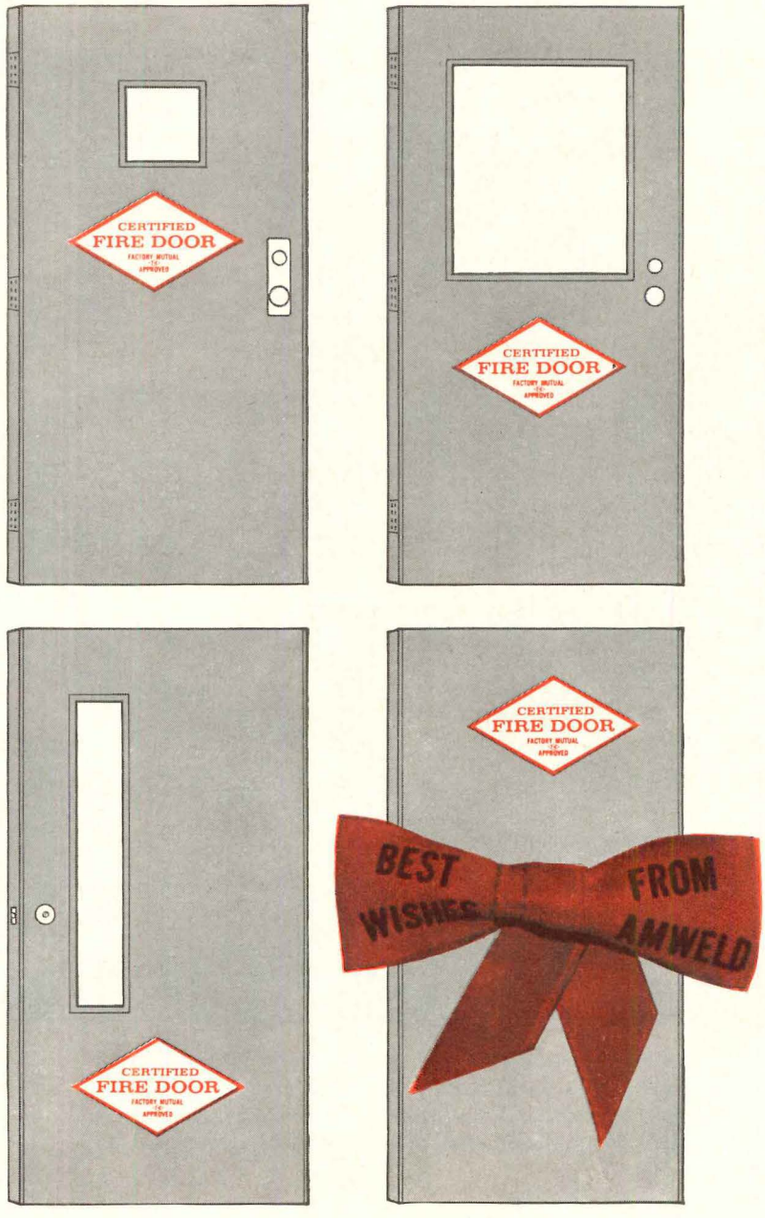
B. HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES — 1941 average for each city = 100.0

Metropolitan Area	1952	1957	1958	1959	1960	1961	1962	1963 (Quarterly) 1st	2nd	3rd	4th	1964 (Quarterly) 1st	2nd	3rd	4th
U.S. AVERAGE 21 Cities	213.5	244.1	248.9	255.0	259.2	264.6	266.8	269.4	270.3	273.4	275.0	274.7	276.8		
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	312.3		
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	279.3		
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	259.9		
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	247.9		
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	304.5		
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	267.1		
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	278.4		
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	255.6		
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	284.7		
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	274.7		
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	248.0		
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	286.1		
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	272.1		
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	277.1		
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	248.9		
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	286.9		
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	273.1		
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	262.7		
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	268.8		
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	360.9		
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	262.0		

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 ÷ 10.0 = 80%) or 20% lower in the second city

TABLE B. Costs in a given city for a certain period my 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 ÷ 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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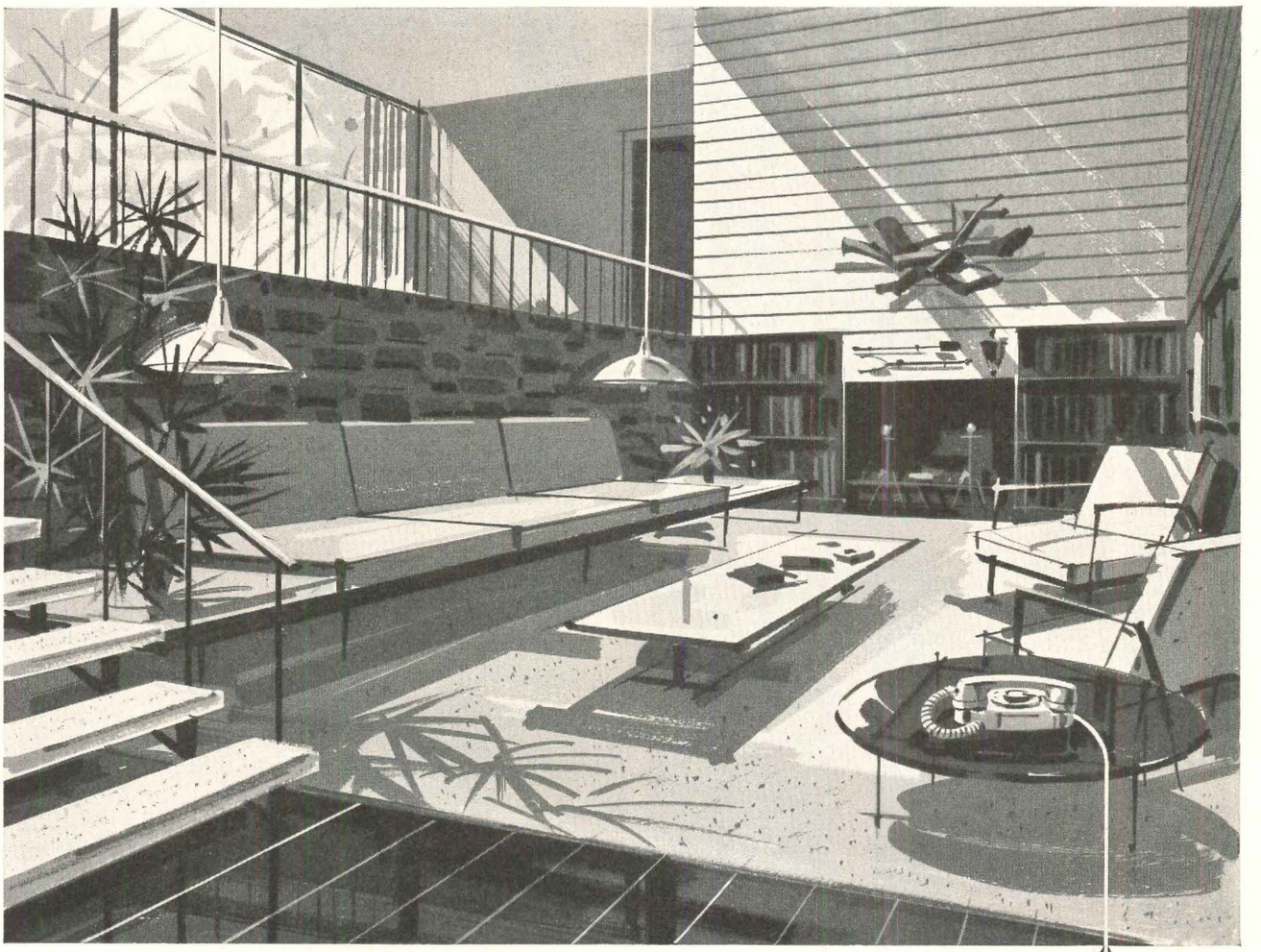

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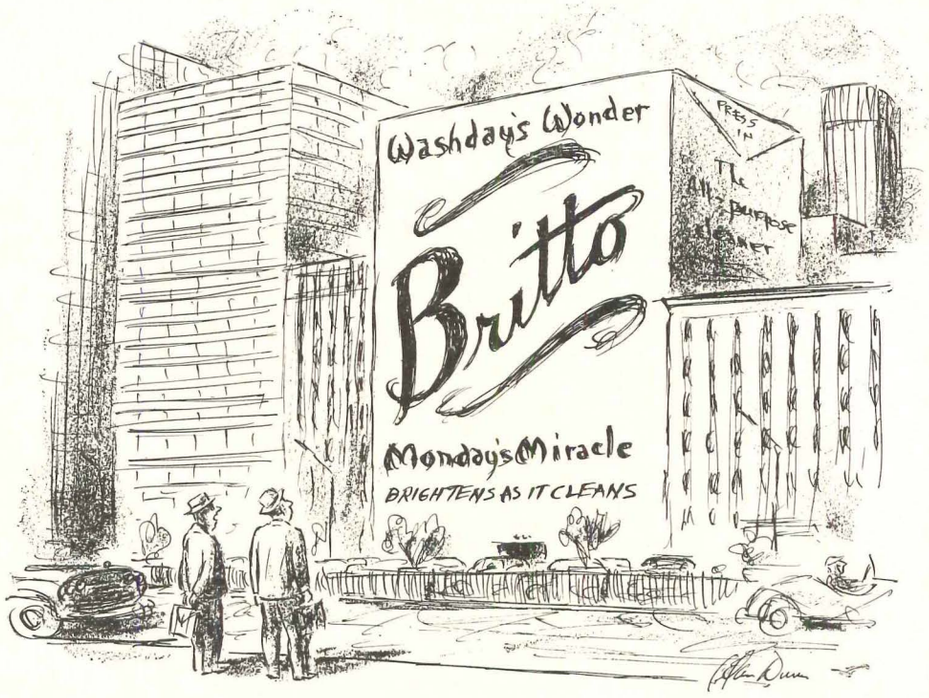

—Drawn for the RECORD *by Alan Dunn*

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JOINT ORGANIZATION OF BUILDING INDUSTRY GROUPS?

A group of architects, engineers, general contractors, material producers and distributors and specialty contractors met in Washington, D.C., on July 29 to explore the possibility of forming a national committee representing the major segments of the building industry. Representatives of six organizations were able to agree on basic areas to be examined in greater detail at their next meeting on October 15.

Calling themselves the Building Construction Coordinating Committee, the representatives set forth certain objectives, problems and programs to be discussed and some possible methods for accomplishment. Though they were only in an exploratory phase at the moment, they were reported to have agreed that by establishing a unified front, the various segments of the industry could better solve the problems facing them both jointly and individually—e.g., the invasion by "unqualified persons" of their professional and business fields, and the growing problems of organized labor and governmental agencies.

Representing the American Institute of Architects at the meeting were Executive Director William H. Scheick and Robert J. Piper of the A.I.A. staff and John Stetson, F.A.I.A., chairman of the Committee on A.I.A.-Associated General Contractors National Liaison. Others in attendance were: Donald A. Buzzell and Henry A. Naylors Jr., Consulting Engineers Council; A. M. Young and John L. Haynes, Producer's Council; John McGaughy and Milton Lunch, National Society of Professional Engineers; John K. Bowersox and John Healy, Associated General Contractors; and Charles I. Berrell and Robert L. Higgins, Council of Mechanical Specialty Contracting Industries. Chairman was John Stetson.

The July meeting grew out of preliminary discussions held jointly by the A.I.A., C.E.C., and A.G.C. in February on the feasibility of forming the Building Construction Coordinating Committee. As now conceived, the national committee would be composed of representatives of the five major segments of the industry—architects (and related design professionals), all types of engineers, contractors (general and home builders), material producers and distributers, and sub- and specialty contractors.

An executive committee is envisaged, composed of five men, one each representing the above-mentioned sectors in addition to a general committee, composed of five members from each segment. Committee members would act as a liaison between the committee and the associations or trade groups they represent.

Such a national organization would then be able to take action on such problems as professional liability; registration; design, contract and construction practices; product information and techniques; public affairs and legislation; education; and inter-society liaison and cooperation. Liaison with government agencies, labor organizations and research programs could, it is felt, be carried out both on the national and local levels.

The future of this idea for coordinated cooperation now rests in the hands of the organizations and associations which would make up its membership. Before the meeting in October, the representatives will have had time to present their recommendations to their respective groups and thus gain official directives toward more formal and concrete proposals for organization.

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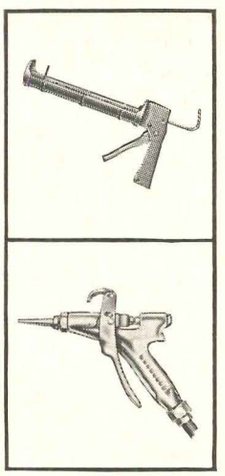

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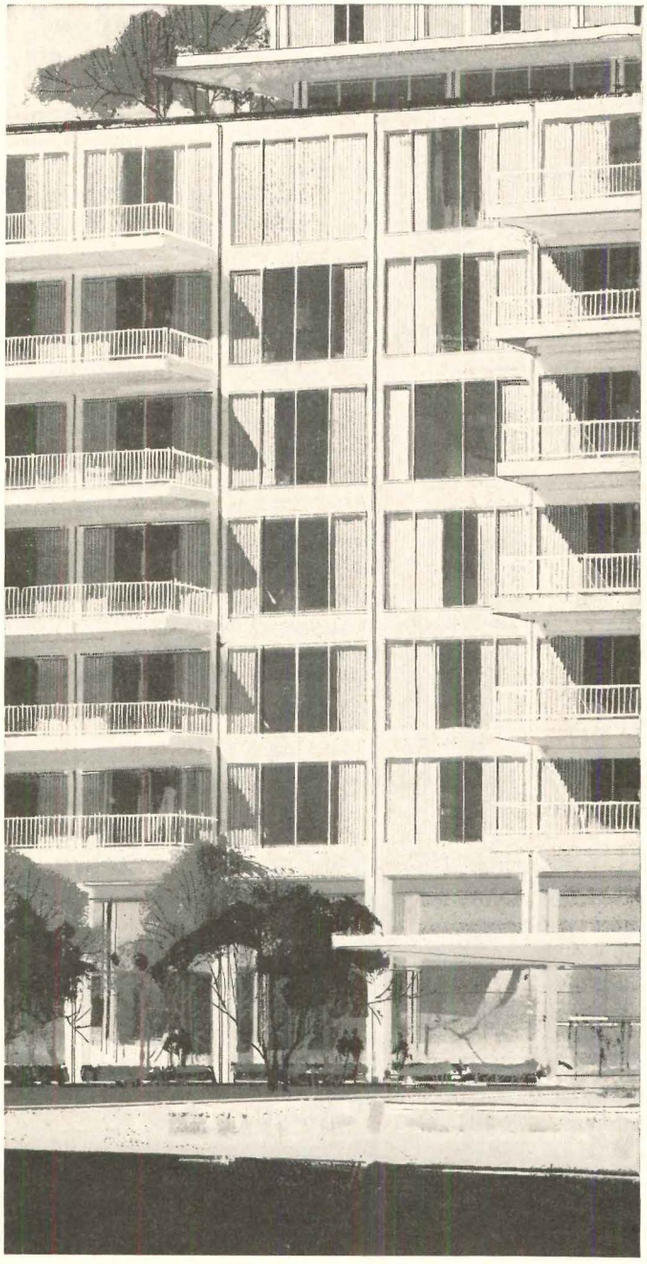

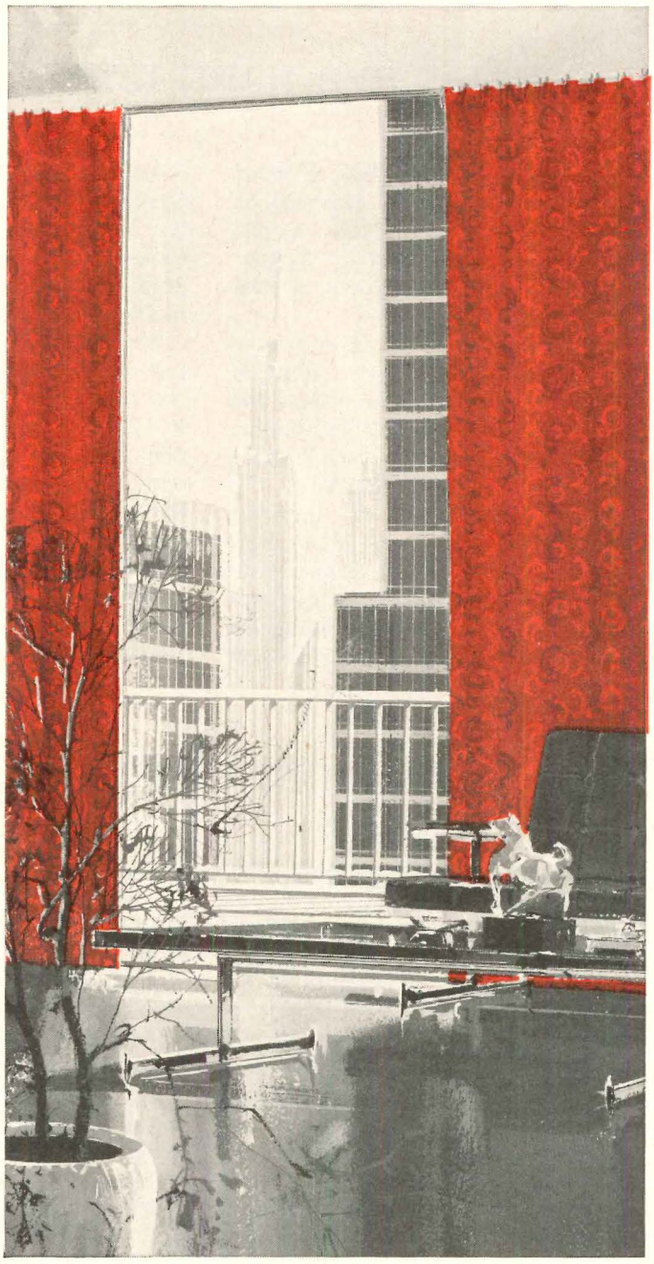

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L. ANDREW REINHARD DIES AT 72

L. Andrew Reinhard, whose firm of Reinhard & Hofmeister was one of three that designed New York's Rockefeller Center, died on August 2, in Bronxville, New York, at the age of 72.

Mr. Reinhard and Mr. Hofmeister were named by the late John D. Rockefeller in 1929 as architects for the $250 million Rockefeller Center, along with Corbett, Harrison & MacMurray and Hood & Fouilhoux.

Mr. Reinhard's work included buildings for the Chase Manhattan Bank, the Italian, Swedish and Waterman steamship lines, the Dun and Bradstreet home office building in New York, the surgical building and research center of the New England Medical Center, Boston, the World War II American Cemetery and Chapel at Neuville en Condroz in Belgium and the Deeds Carillon Tower in Dayton.

Mr. Reinhard received his training at the Mechanics Institute and the Beaux Arts Institute of Design in New York. In 1928 he formed the firm of Reinhard & Hofmeister. The name was changed to Reinhard, Hofmeister & Walquist in 1947, and the firm was dissolved upon Mr. Reinhard's retirement in 1956.

During his long career in architecture, Mr. Reinhard was a vice president and executive committee member of the New York Chapter, A.I.A., and a fellow of the national association. From 1945 to 1950, he served as a member of the National Commission of Fine Arts in Washington. He had also been a vice president of the Architectural League of New York and of the Municipal Art Society of New York.

For his work on Rockefeller Center, Mr. Reinhard was awarded gold medals by the Architectural League of New York and the Fifth Avenue Association. He also received the Grand Prix at the Paris International Exposition in 1937 and the Prize of Honor of the Fifth Pan-American Congress at Montevideo, Uruguay.

A.I.A. HEADQUARTERS COMPETITION ENTERS FINAL STAGE

Seven architectural firms have been selected from among 221 entrants to compete in the final stage of the national competition for the design of the new headquarters building of the American Institute of Architects.

The seven, who will each receive a $5,000 award, are: Donald Barthelme, F.A.I.A., Houston ; Jean Labatut, F.A.I.A., and Carr Bolton Abernathy, Princeton, New Jersey; C. Julian Oberwath, F.A.I.A., C. Julian Oberwath & Associates (Milton Thompson, associate in charge), Frankfort, Kentucky; Mitchell/Giurgola, Associates (Ehrman B. Mitchell Jr., A.I.A., and Romaldo Giurgola, A.I.A.), Philadelphia; I. M. Pei & Associates (participating designers: Ieoh Ming Pei, F.A.I.A.; Henry N. Cobb, A.I.A.; Araldo A. Cossutta, A.I.A.; James I. Freed; and Theodore J. Musho), New York City; and the Perkins & Will Partnership (participating designers: Saul Klibinow, Mozhan Khadem, Phillip A. Kupritz and John Holton), Chicago; and Charles R. Colbert, F.A.I.A., of New Orleans.

Judging the competition were: Hugh Stubbins, F.A.I.A., Cambridge, chairman; Edward L. Barnes, New York; J. Roy Carroll, F.A.I.A., Philadelphia; O'Neil Ford, F.A.I.A., San Antonio; and John Carl Warnecke, F.A.I.A., San Francisco. A. Stanley McGaughan of Washington, D.C., is the professional adviser.

The winner of the final stage will be announced on November 2, at which time all the competing designs will be revealed. In addition to the commission, the winner will receive a $10,000 advance on his fee.

ORGANIZE TO SELL "AMERICAN" BUILDINGS ABROAD

To capitalize on the tremendous expansion of U.S. business overseas, the Collins Tuttle & Company, Inc., real estate brokerage, investment and management firm of New York, has established an international organization to develop "American-type office buildings" in at least 25 cities around the world.

A newly-formed subsidiary, Collins Tuttle International, Inc. already has plans to erect four buildings: on the Avenue de Neuilly, Paris; the Porte de Namur, Brussels; the Centro Dirreccioni, Milan; and Taunsuslagge Strasse in Frankfurt. Negotiations are also well advanced for buildings in West Berlin, Rome and Madrid.

Mr. Tuttle, president of Collins Tuttle International, has stated that all design, construction and financing will be handled by local architects, contractors and investment institutions. The organization will employ centralized purchasing techniques whenever possible, and buildings will be "standardized along American lines insofar as local laws permit."

In order to realize these aims, a team of American consultants has been retained, including: A. Epstein & Sons, the Chicago architectural firm; the Deisel Construction Company; Saphier, Lerner, Schindler, a New York firm of interior designers; Meyer Brothers, operators of parking lots and garages; and the National Cleaning and Maintenance Corporation.

This team will be augmented by a system of international representatives of the company, located in principal cities abroad. Those already named are: Jean-Paul Ferroud, Paris; Duc de Seo de Urgel, Madrid; and Frau Pedro Candel, Frankfurt.

NATURAL CREAM • *Size—12"x12" Gauge—⅛" and 3/32"*

Ruberoid Travertine Vinyl-Asbestos Floor Tile

...a new texture...a new look of richness

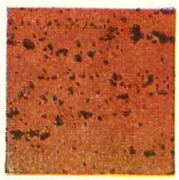
Now--the vein-textured marble of ancient Italy...with nature's subtle shadings and stratifications...has been captured in all its beauty in Vinyl-Asbestos by Ruberoid. Here is a tile for those floor areas where distinction and design are important. Quality built for quality performance...Ruberoid's new TRAVERTINE Vinyl-Asbestos Floor Tile.

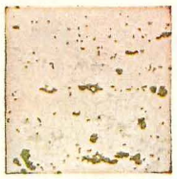
The TRAVERTINE sampler containing 3" x 3" samples of all colors and a full size 12" x 12" is yours for the asking. Ask your Ruberoid Sales Representative or write the company.

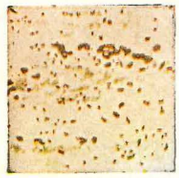
ET-205 AVOCADO

ET-204 CLAY BUFF

ET-202 GREIGE


ET-206 CLAY RED

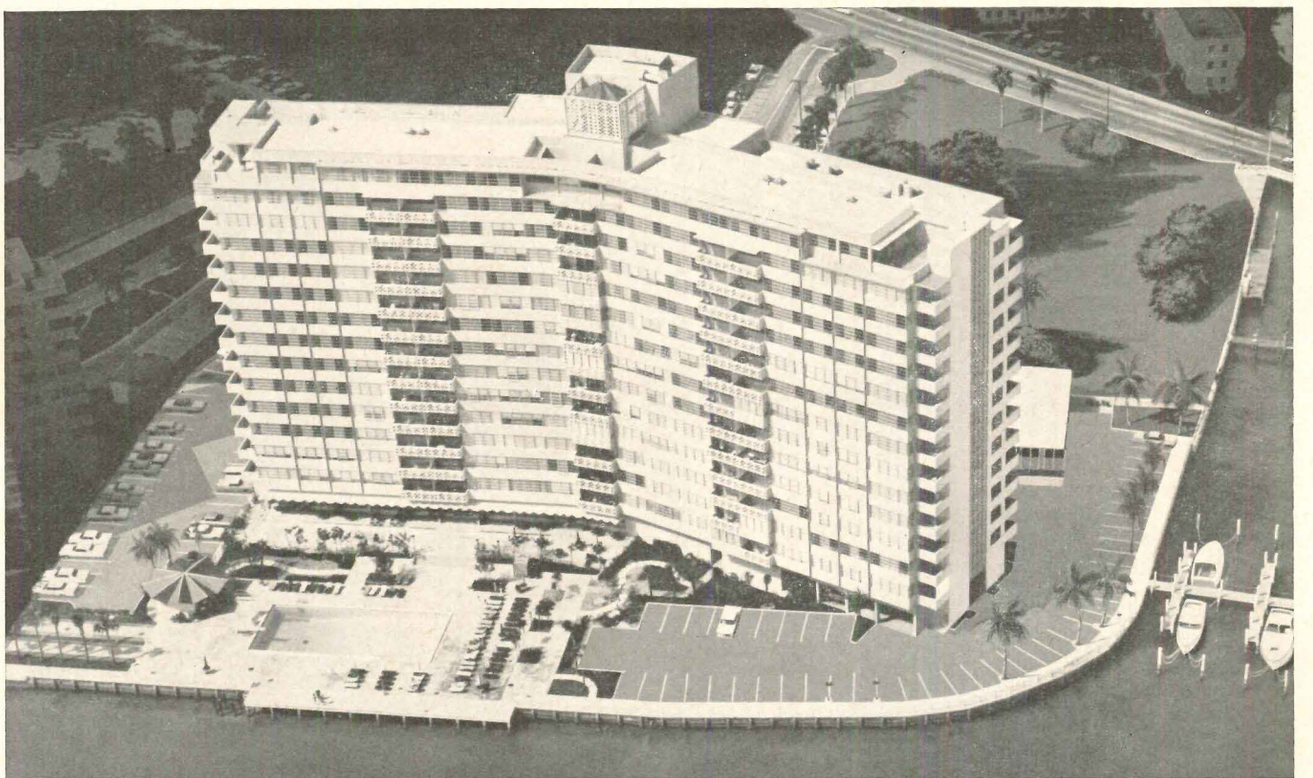

ET-201 IVORY


ET-203 NATURAL CREAM

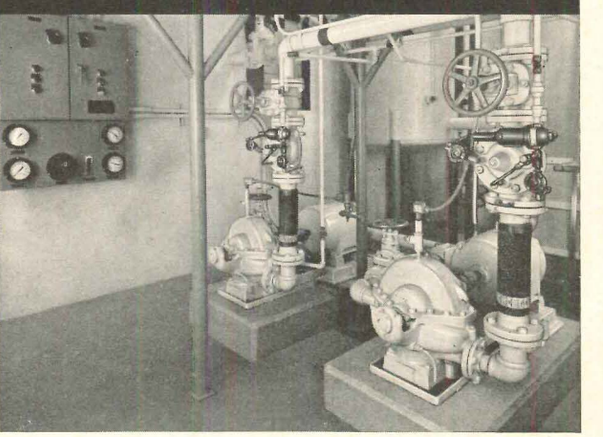
keep your eye on RUBEROID

RUBEROID
FINE FLOORING

The RUBEROID Co., 733 Third Avenue, New York 17, N. Y.



In Miami Beach . . . the Belle Plaza uses UNI-PRESSURE *



The pump room of the Belle Plaza illustrates the compactness of a Type II Uni-Pressure System. This equipment is designed to provide a minimum of 150 GPM and a system pressure of 83 psi.

Architect: **T. Trip Russell & Associates**
Engineer: **R. L. Duffer & Associates**
Plbg. Contractor: **Dade Plumbing Inc.**

A Tankless . . . Constant Pressure . . . Constant Speed Water Booster System

Provides one of Florida's newest apartment buildings with water at all times . . . at constant pressures . . . despite varying flow demands.

The increasing usage of the Uni-Pressure System in new buildings such as the modern 226 Suite, Belle Plaza rental apartments on Belle Isle, Miami Beach, Florida and Philadelphia's Park City West Apartments indicates the acceptance of this system. Over 200 system sales to date include the following advantages.

CONSTANT SPEED—No complex changing devices

CONSTANT PRESSURE—No "hunting" of control resulting in serious pressure variations

LOWER COST—Normally lower in cost than speed changing systems

LESS SPACE NEEDED—Requires space only for standard pump and motor

STANDARD SIMPLE CONTROL—No complex electrical, mechanical speed changing devices

NO TANK REQUIRED—Eliminates cluttered machinery room

NO SLIPPAGE—Speed changing drives have slippage factor—as much as 15%

Contact your nearest Chicago Pump distributor, or write direct for complete descriptive Bulletin 110.

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*Patents Pending

HYDRODYNAMICS DIVISION
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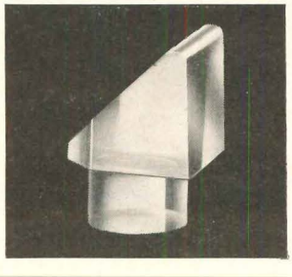
Today — This is Must Lighting to Protect School Grounds

If you're planning to light outdoor areas adjacent to walls—your prime choice should be Wallpack®. This is the *only* luminaire engineered specifically for wall-mounting—designed to conform with modern architectural concepts . . . ☐ Out-of-the-Carton—On-to-the-Wall . . . All components including InBilt ballast and Prismascope® (automatic off-and-on) Control are pre-wired at the factory for time-saving installation . . . ☐ Prismatic Refractor, molded of Endural® glass, resists shock, weather and depreciation. High utilization of light over wide-spread areas means fewer units required. Easy relamping and low maintenance provide added economies. Wallpack takes incandescent or mercury lamps . . . ☐ *Write for latest engineering bulletin.*

HOLOPHANE Company, Inc. *Lighting Authorities Since 1898* / *1120 Avenue of the Americas, New York 36, New York*

New photoelectric "off and on" automatic control

Prismascope



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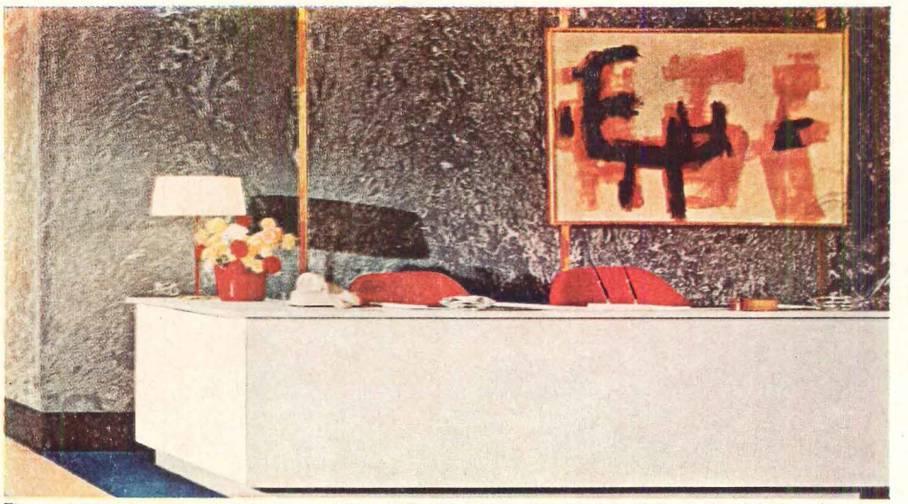
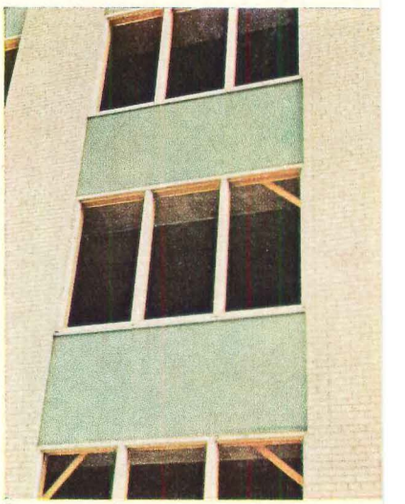
Holophane

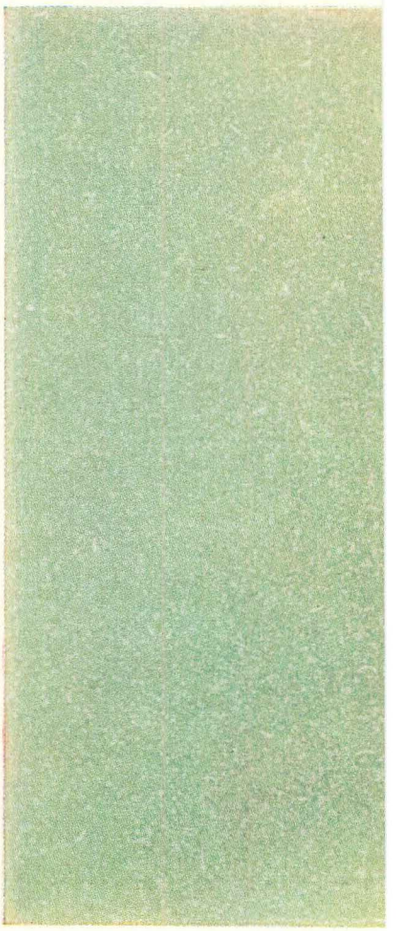


The custom-built desk is Meerschaum White Colorlith. The wall behind is White-in-Black Colorvein.

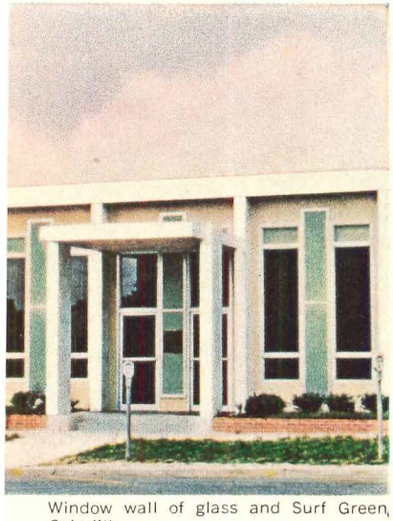


Spandrels of Surf Green Colorlith with masonry back-up.

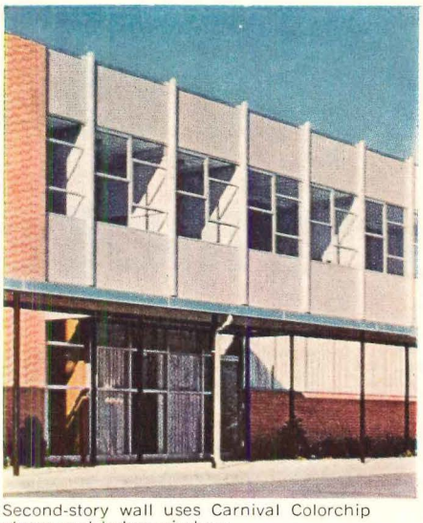
COLORVEIN® WHITE-IN-BLACK



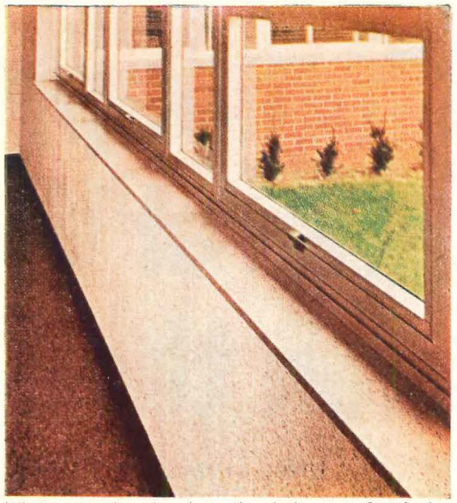
Versatile J-M Colorlith® products...Use them inside, outside and everywhere in between



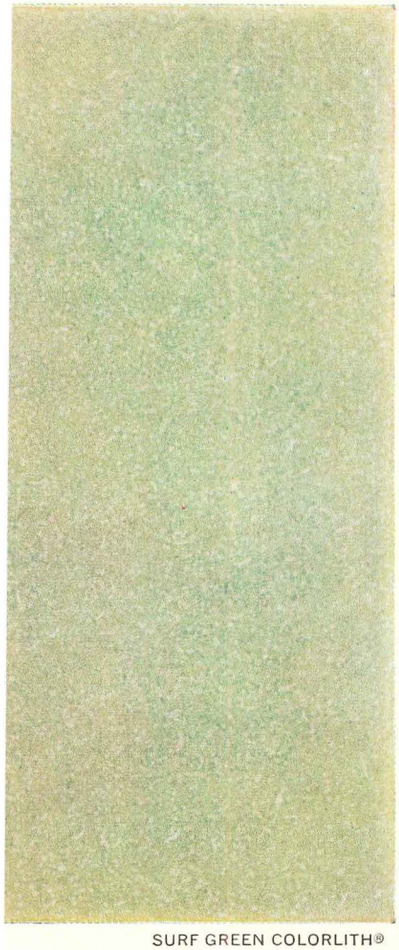
Window wall of glass and Surf Green Colorlith.



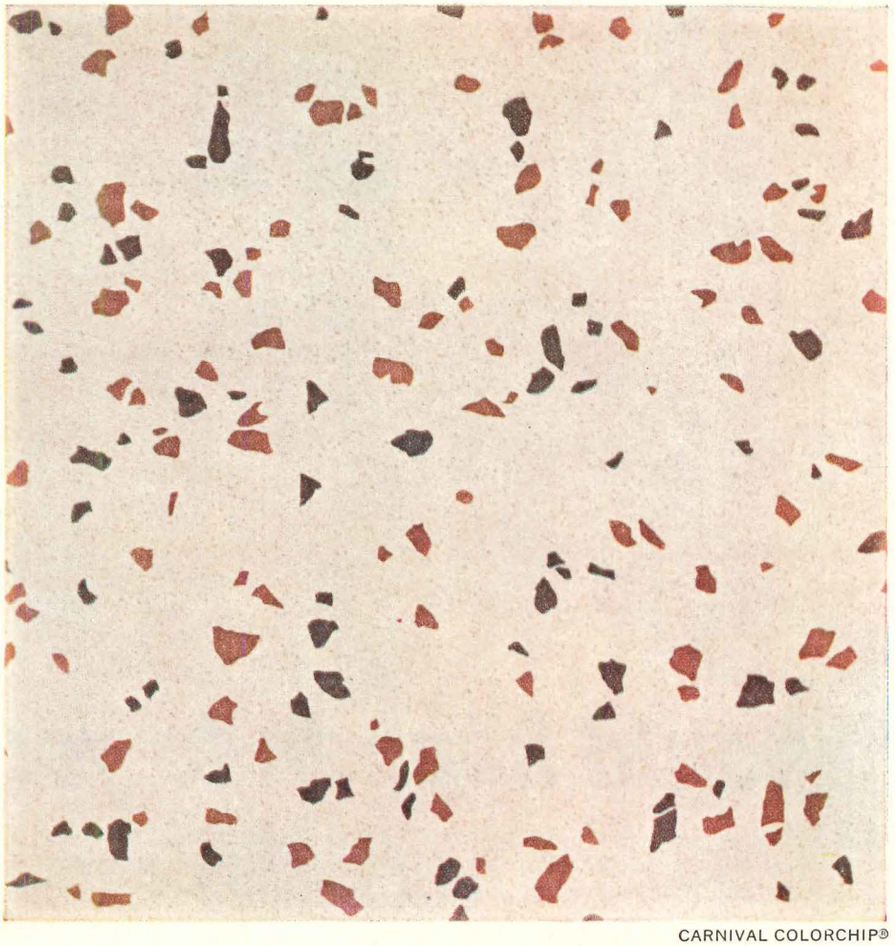
Second-story wall uses Carnival Colorchip above and below windows.



Window stool and wainscoting below are Carnival Colorchip.



SURF GREEN COLORLITH®



CARNIVAL COLORCHIP®

Interior walls, exterior walls, floors, partitions, wainscotings, furniture tops, window sills, stools . . . you name it, J-M Colorlith can be used for it. Matter of fact, Colorlith is *so* versatile you can build a whole room out of it. Colorlith can do anything slate and marble can do. Only better!

Colorlith products are made from an inorganic mixture of synthetic calcium aluminum silicate binder reinforced with finely dispersed asbestos fibers and mixed with chemically-resistant inorganic pigments and fillers. These ingredients, through the closely controlled use of water, pressure and heat, emerge as Colorlith products . . . modern "stone" materials of uniform strength and attractiveness with no stratifications to cause weakness. Available in a wide variety of Colorvein patterns, plain colors and Colorchip patterns. They're strong, durable, easy-to-clean and integrally colored. Thicknesses range from ¼" to 1¼". Standard panel size is 4 ft. by 8 ft.

For full details on the many forms of J-M Colorlith, write to Johns-Manville, Box 111, New York, N. Y. 10016. In Canada: Port Credit, Ont. Cable: Johnmanvil.

Johns-Manville JM JOHNS-MANVILLE PRODUCTS

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What happened to General Warehouse Co. when they turned out the lights?

"ACRYLITE* Skydomes save us $3466.00 a year in our Peoria warehouse," says Harry Dickelman, President

It should happen to you.

Mr. Dickelman is a very cost-conscious executive. He actually installed ACRYLITE Skydomes in a *leased* warehouse. But it's paying off. The installation is returning $3,466 a year savings on lighting costs. Over the course of his 20-year lease, that comes to a total savings of $69,320. Now he plans to put ACRYLITE Skydomes in his *own* new warehouse. All 100,000 square feet of it. Figures show his warehousing company will save over a quarter of a million dollars during the expected life of the building. This kind of savings should happen to you. And it can.

Almost without exception, ACRYLITE Skydomes pay for themselves out of savings every 2½ to 3 years. They are weather-proof, shatter-resistant and maintenance-free. Find out right now how ACRYLITE acrylic plastic skydomes can substantially reduce your artificial lighting costs.

Cyanamid's free folder explains how you can compute your savings before installation of the units. Send for it today.

CYANAMID

Write American Cyanamid Company,
Building Products Division, Dept. AR94
5 Bay State Road, Cambridge 38, Massachusetts

ACRYLITE* SKYDOMES

*TRADEMARK

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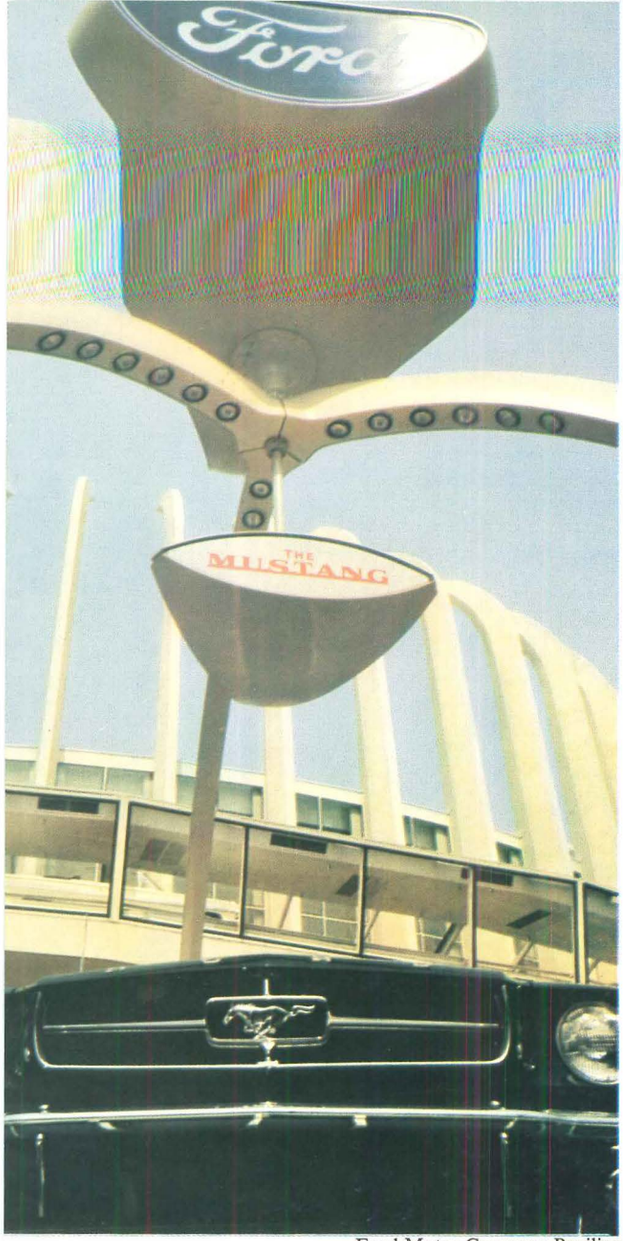
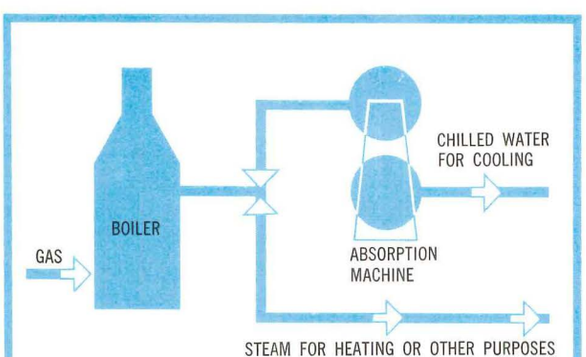


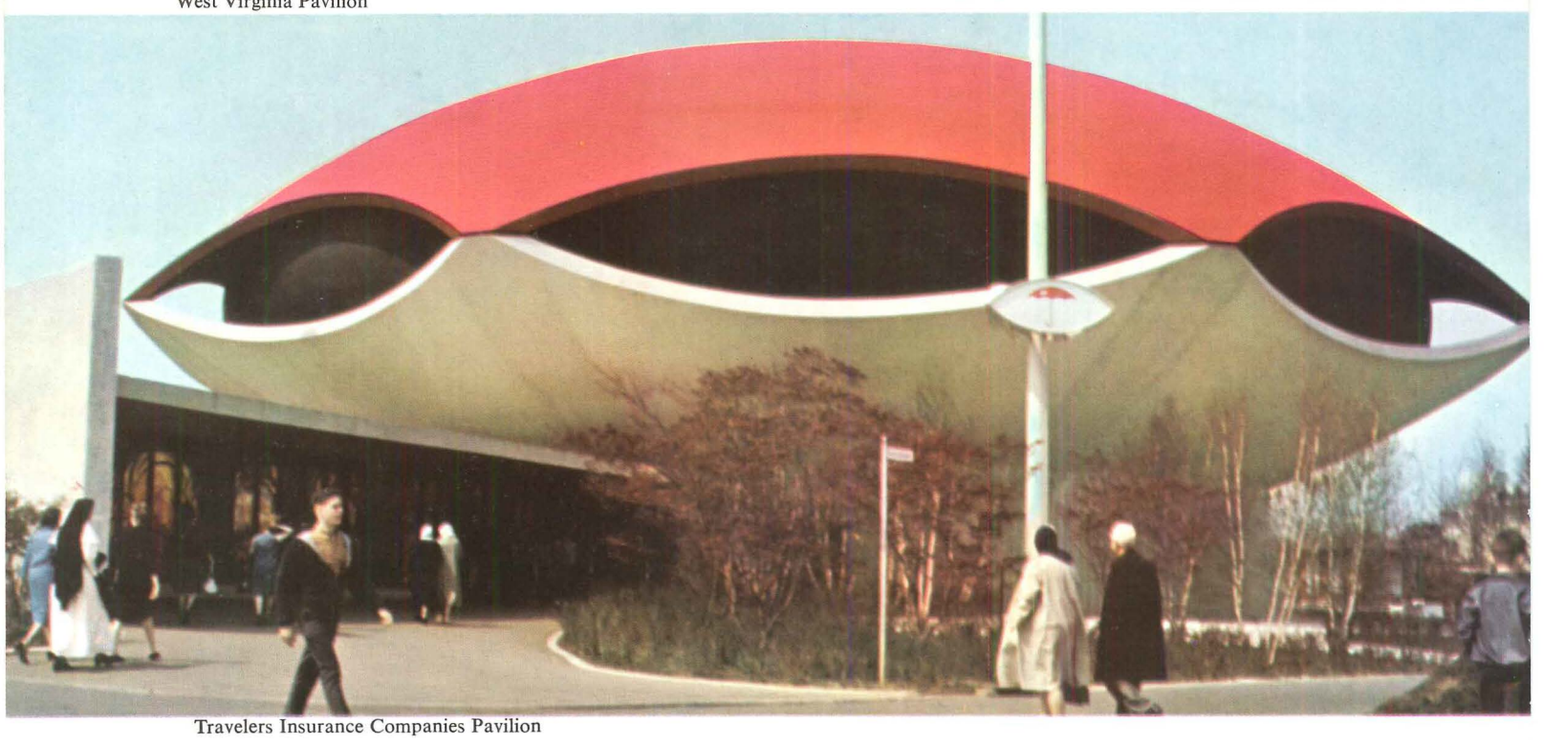
Ford Motor Company Pavilion

Highly flexible gas steam absorption systems cool these giant World's Fair showplaces efficiently and quietly

The advantages of a gas steam absorption system are striking. With no major moving parts, this kind of large tonnage unit is quiet and easy to maintain. In addition, these units operate with maximum flexibility, modulating from zero to full load at high efficiency. The same gas-fired boiler which powers the absorption machine is also used for heating the building, adding further to the efficiency of this type of cooling. No wonder gas and steam absorption were chosen to condition the air at the General Motors Pavilion (900 tons), the Ford Pavilion (1500 tons), and the United States Pavilion (1000 tons). This system is finding increasing favor in large apartment projects, shopping centers, commercial buildings, hotels and industrial plants.



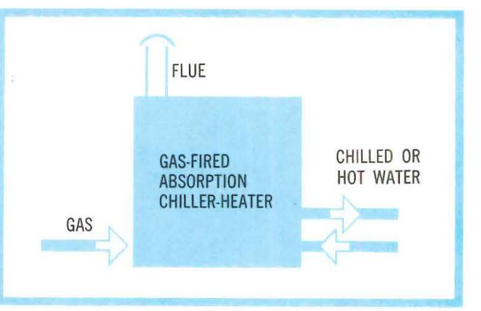
West Virginia Pavilion



Travelers Insurance Companies Pavilion

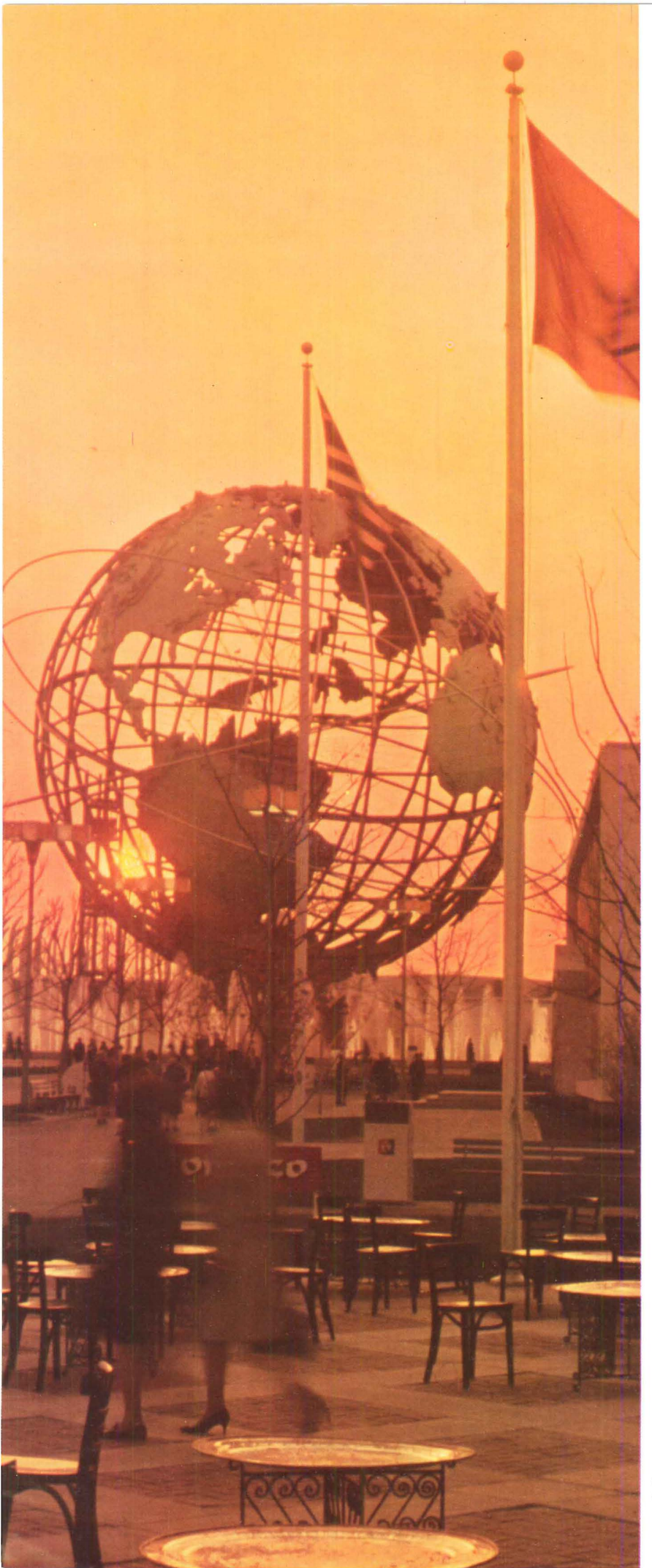
Gas direct-fired absorption units cool/heat economically at these Pavilions

In this type of system, a gas flame is applied directly to effect the absorption cycle. Important advantages include quiet operation, long life, low maintenance and low operating costs. The West Virginia Pavilion uses a total capacity of 50 tons, and the Travelers building has a 125 ton installation. Gas direct-fired absorption units are finding application in small commercial buildings—roof-mounted to conserve valuable space. Other units, in capacities ranging down to 2.5 tons, are used with increasing frequency in central residential heating and cooling applications.



General Motors Pavilion

United States Pavilion



Why Gas Energy was chosen for 80% of the cooling at the New York World's Fair

Read about the exceptional adaptability of Gas cooling to the most modern building designs. Learn how five basic systems prove the surprising flexibility, the economy and reliability of Gas Energy.

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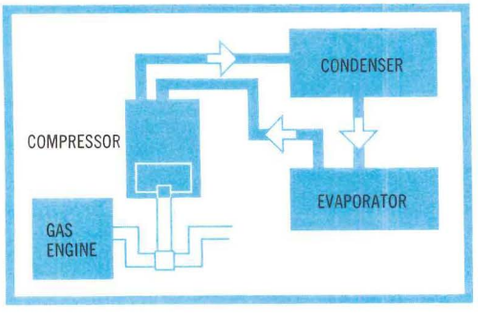
Hawaiian Pavilion

Protestant and Orthodox Center

Roof-mounted gas engine reciprocating compressors save space, operating costs

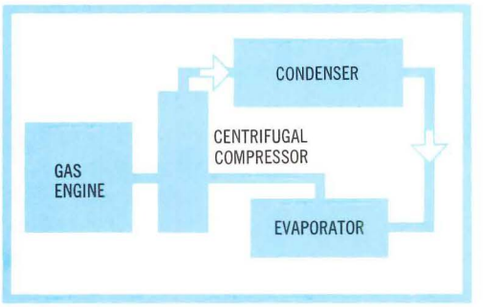
This system of Gas Energy cooling has wide application and is especially adaptable to roof mounting. Units are available in factory assembled and tested packages from three to 375 tons. The Protestant and Orthodox Center is cooled by a 250 ton system. The Hawaiian Pavilion is serviced by a total of 220 tons. Equipment can be air-cooled-direct-expansion or a chilled water system. Direct cost study comparisons show the gas engine reciprocating compressor offers outstanding operating economy. Chain stores are one of the major users of this equipment.



Transportation & Travel Pavilion

At this lavish Fair exhibit, a Gas engine centrifugal compressor offered low first cost

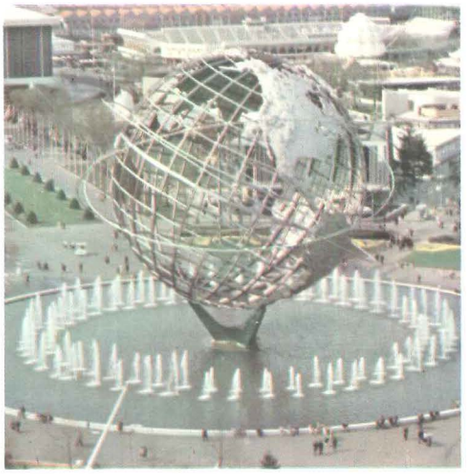
With a gas engine-driven centrifugal compressor, speed controls can add economy in operation to the low initial cost. At the Transportation & Travel Pavilion an 870 ton unit handles the cooling load, although installations can range from 90 to 1000 tons. Heat ejected through the engine exhaust gases and jacket water system is a useful by-product of the gas engine-driven centrifugal. The fact that the engine can be used to drive an emergency generator gives this system an important advantage for hospitals. Other applications include office buildings, plants and mills.



Festival of Gas Pavilion

Demonstrated at the Festival of Gas: the dramatic efficiency of a total energy system

Rapid progress has been made in the development of a new building energy concept...Gas Total Energy. In this system either a gas turbine or gas reciprocating engine drives a generator to supply electric power. At the same time, by-product heat is used for building heating, plant processing, or is converted to steam for use in an absorption cooling machine. The application of this new concept to over 100 industrial and commercial installations—from factories to motels—has resulted in substantial energy cost savings.



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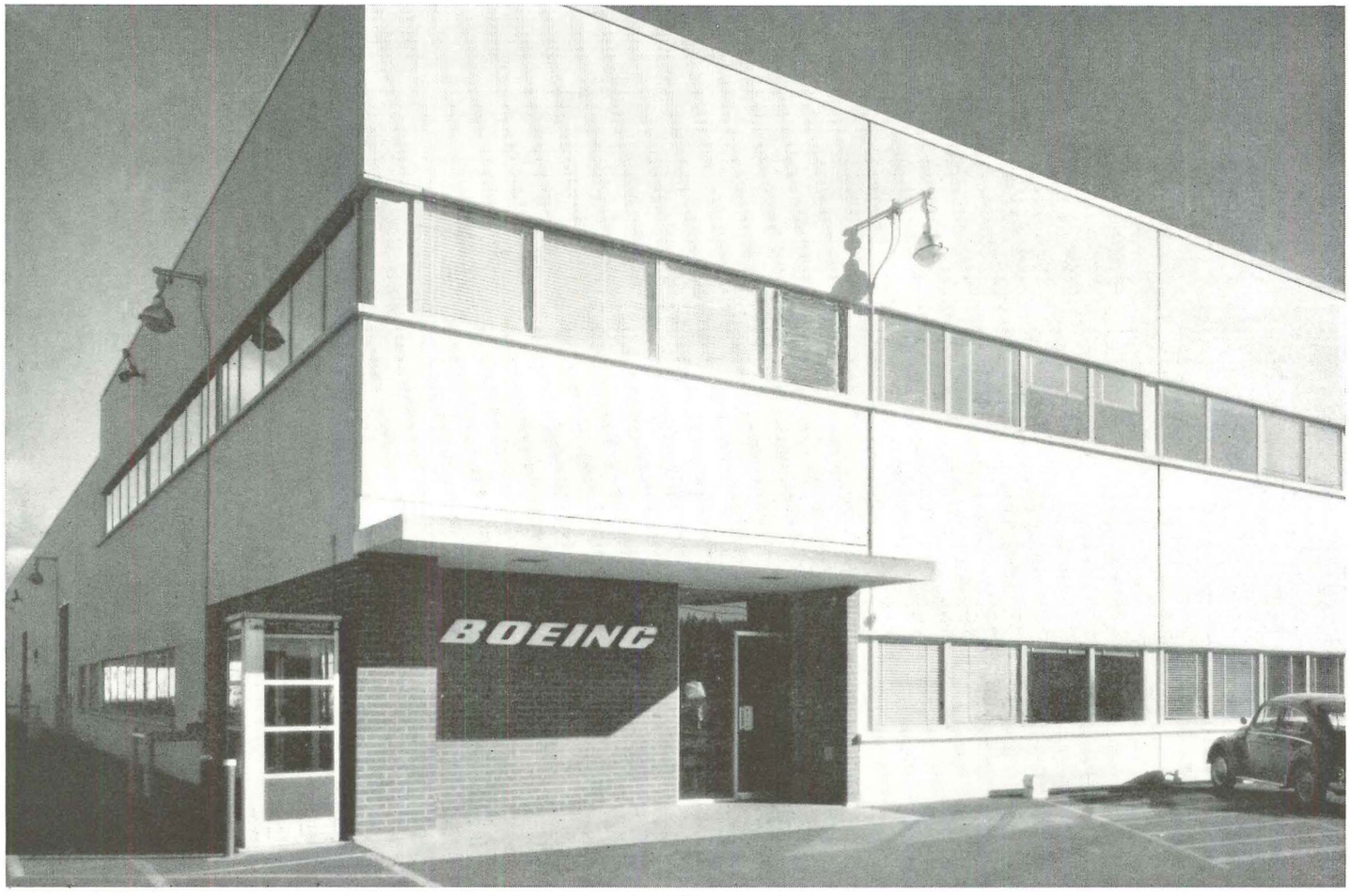
Gas Energy Leadership: Over 12,000 tons of gas cooling keep World's Fair visitors comfortable. Five basic systems do the job...each uniquely adapted to the needs and problems of the Fair's architects and consulting engineers. For information on how versatile, economical Gas Energy can meet your design needs, call your local Gas Company. Or write American Gas Association Inc., 605 Third Ave., N.Y., N.Y.

Pavilion	Architect Designer	Air Conditioning Manufacturer
Alaska	*A:* Olsen & Sands, Juneau Mandeville & Burge, Seattle Walter W. Stengei, N. Y. C.	Bell & Gossett
Bell Telephone Co.	*A:* Harrison & Abramovitz *D:* Jo Mielziner	Trane
Belgium Village	*A:* Hooks & Wax *D:* Alfons De Rijdt	Trane
Better Living Pavilion	*A:* John LoPinto & Assoc. *D:* American Institute of Interior Designers, Inc.	Ready Power
Billy Graham Pavilion	*A:* Edward Durell Stone	Arkla
Caribbean	*A:* Skidmore, Owings & Merrill	Ready Power
E. I. duPont de Nemours	*A:* Voorhees, Walker, Smith, Smith & Haines *D:* DuPont design staff	Carrier
Ford	*A:* Welton Becket Assoc. *D:* WED Enterprises, Inc.	York
Gas Incorporated	*A:* Walter Dorwin Teague Assoc.	Carrier
General Motors	*A:* Albert Kahn Assoc. *D:* GM Styling Staff	Trane
Greyhound at the World's Fair	*A:* Kahn & Jacobs *D:* The Displayers, Inc.	Trane
Guinea	*A:* Noel & Miller	Atmos-Pak
Hawaii	*A:* Reino Aarnio *D:* Lothar P. Witteborg	Ready Power
Hollywood	*A:* Oppenheimer, Brady & Lehrecke	Atmos-Pak
Hong Kong	*A:* Eldredge Snyder	Atmos-Pak
House of Good Taste	*A:* Jack Pickens Coble, Morris Ketchum, Jr., Edward Durell Stone, Royal Barry Wills Assoc.	Carrier
Indonesia	*A:* R. M. Soedarsono, Indonesia Max Urbahn, N. Y. C.	Ready Power
International Plaza	*A:* Ira Kessler, George S. Lewis, Lawrence Arens	Atmos-Pak
Ireland	*A:* Robinson, Keefe & Devane, Ireland *D:* George Nelson & Company, Inc., N. Y. C.	Atmos-Pak
Israel	*A:* Ira Kessler	Atmos-Pak
Japan	*A:* Kunio Maekawa, Tokyo *D:* Oppenheimer, Brady & Lehrecke Assoc.	Ready Power
House of Japan	*A:* Chapman Evans & Delahanty	Atmos-Pak
Korea	*A:* Kim Chung Up, Seoul *D:* Walter Dorwin Teague Assoc.	Bell & Gossett
Lebanon	*A:* Assem Salaam, Beirut Justin Henshell, N. Y. C.	Atmos-Pak
Liebmann Breweries, Inc.	*A:* Kahn & Jacobs	Ready Power
Malaya	*A:* Paul Leung, Kuala Lumpur Tippetts-Abbett-McCarthy-Stratton, N. Y. C.	Atmos-Pak
Mormon	*A:* Fordyce & Hamby Assoc.	Ready Power
National Cash Register Co.	*A:* Deeter & Ritchey	Carrier
National City Bank	*A:* William E. Lescaze	Atmos-Pak
New England	*A:* Campbell & Aldrich *D:* Exhibition Services International	Carrier
New Mexico	*A:* Henry Titus Aspinwall Assoc.	Atmos-Pak
N. Y. City Hall of Science	*A:* Harrison & Abramovitz	Trane
Pavilion of Paris	*A:* Ira Kessler	Atmos-Pak
Port Authority Heliport	*A:* Port of N. Y. Authority	Trane
Protestant & Orthodox Center	*A:* Henry W. Stone Kemp & Schwartz, Assoc. Arch.	Atmos-Pak
Sermons from Science	*A:* H. Robley Saunders *D:* Robert Chamides	Atmos-Pak
Socony Mobil Oil Co.	*D:* Peter Schladermundt & Assoc.	Atmos-Pak
Spain	*A:* Francisco Javier Carvajal Ferrer, Spain Kelly & Gruzen, N. Y.	Ready Power
Sudan	*A:* Noel and Miller	Atmos-Pak
Texas Pavilions	*D:* Randall Duell Peter Wolf William Parker McFadden	Atmos-Pak
Transportation & Travel	*A:* Clive Entwistle *D:* The Displayers, Inc.	Carrier Waukesha
Travelers Insurance Company	*A:* Kahn & Jacobs *D:* Donald Deskey Assoc., Inc.	Arkla
United States Pavilion	*A:* Charles Luckman Assoc. *D:* Cinerama Corporation	Carrier
WBT Tribes	*A:* William Kohn	Atmos-Pak
Wax Museum & Puppet Theater	*A:* John Harold Barry	Atmos-Pak
West Berlin	*A:* Ira Kessler	Atmos-Pak
West Virginia	*A:* Frederick P. Wiedersum Assoc. Irving Bowman *D:* David Ellies	Arkla
Wisconsin	*A:* Herbert Fritz, Jr., & Assoc. *D:* Hartwig Displays	Ready Power
W. F. Press Bldg.	*A:* Eggers & Higgins	Carrier
W. F. Administration Bldg.	*A:* Skidmore, Owens & Merrill	Carrier
W. F. Control Room		Arkla

What happens to Pliolite based paints after years of exposure?



Nothing.

Because PLIOLITE® synthetic resin binders assure resistance to weather; ward off destructive effects of moisture and alkalies in masonry.

For example, a major aircraft plant in Seattle was painted with a PLIOLITE based paint in 1957—its first and only coat. And despite the Northwest's salt air and heaviest rains, the finish is fresh-looking today.

Masonry paints based on PLIOLITE have proven their extreme durability around the country for over 15 years. In swimming pools, apartment houses, schools, churches, motels, grain elevators and "rec" room floors. For flat and enamel finishes, and even splatter paint.

Another advantage: PLIOLITE based paints cling where many others can't. Even to "green" masonry.

So specify PLIOLITE resins in masonry finishes. Nothing will happen — except a beautiful finish — for a long time.

For more information, and names of paint manufacturers using PLIOLITE, mail the coupon.

Goodyear Chemical Data Center, U-84
P. O. Box 9115, Akron, Ohio 44305

☐ Send brochure on PLIOLITE.

☐ Send Directory of paint manufacturers using PLIOLITE.

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Position_____

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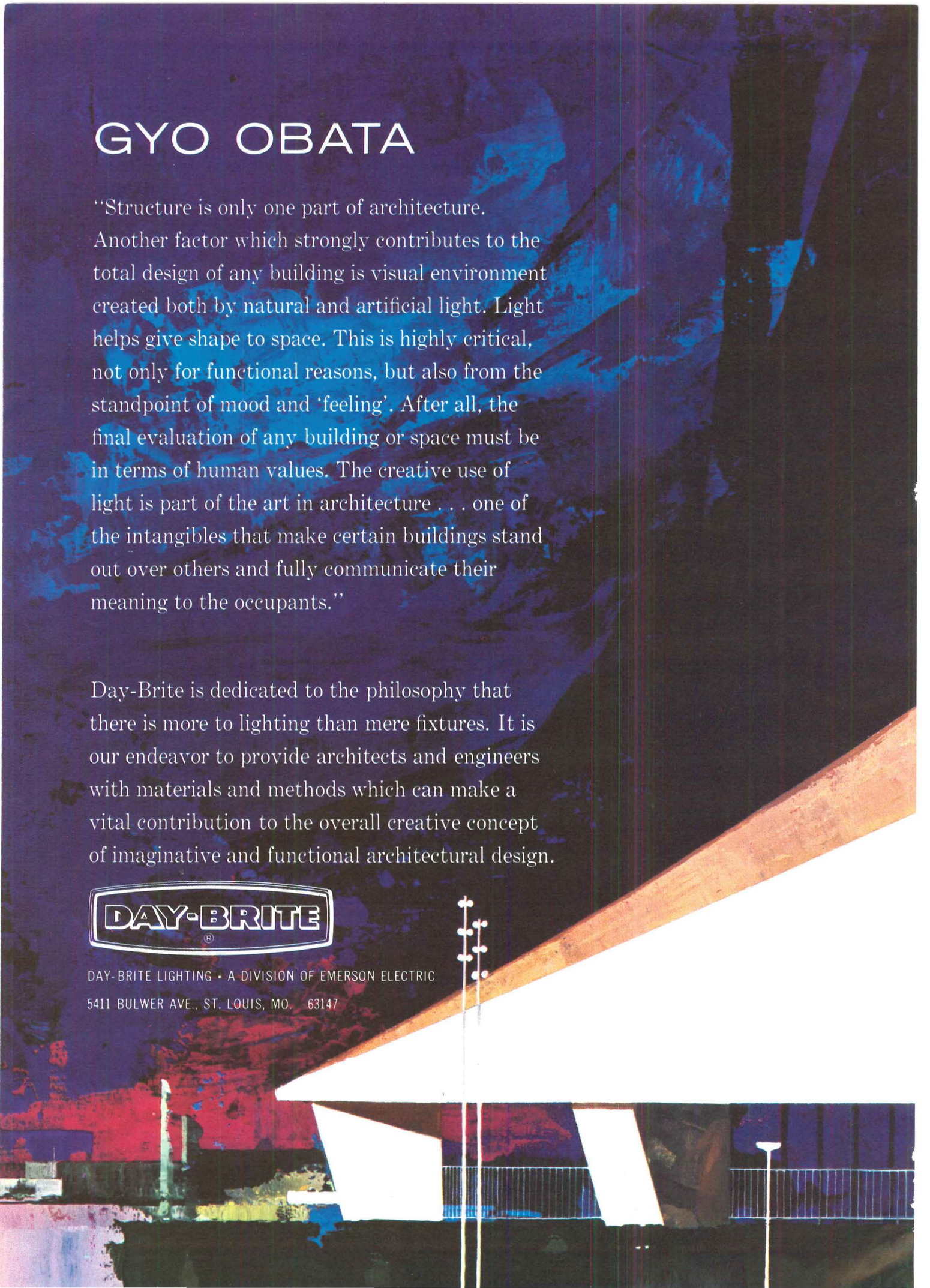

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"Structure is only one part of architecture. Another factor which strongly contributes to the total design of any building is visual environment created both by natural and artificial light. Light helps give shape to space. This is highly critical, not only for functional reasons, but also from the standpoint of mood and 'feeling'. After all, the final evaluation of any building or space must be in terms of human values. The creative use of light is part of the art in architecture . . . one of the intangibles that make certain buildings stand out over others and fully communicate their meaning to the occupants."

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HEATH

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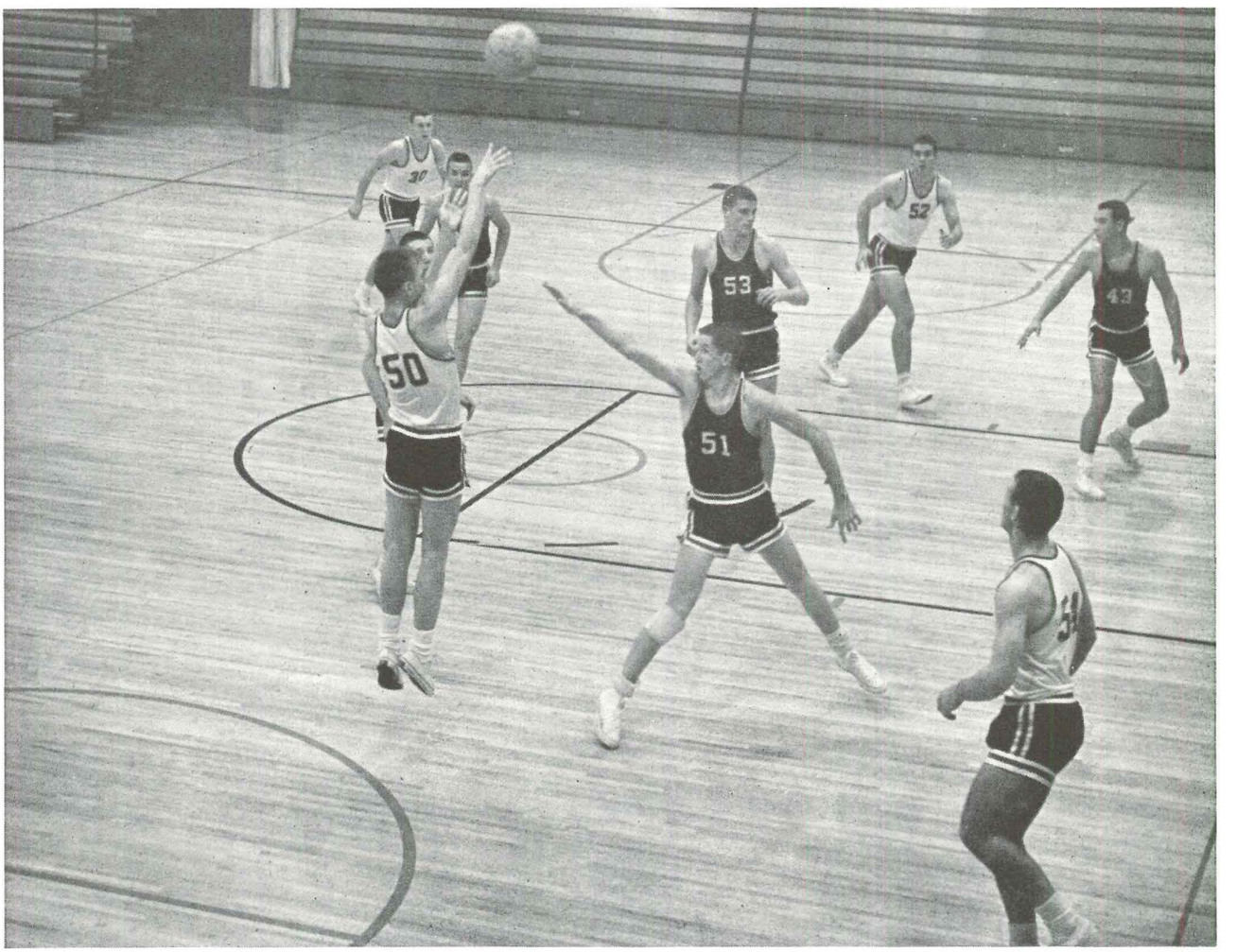

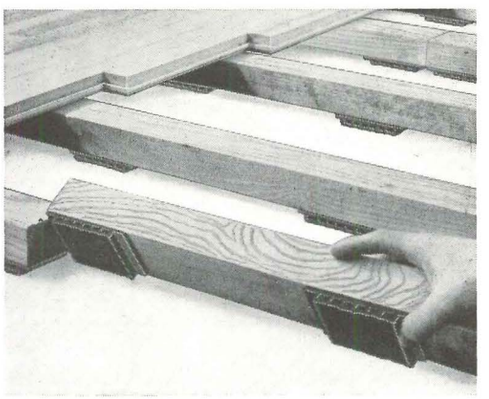

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Pacific Gas & Electric Co., San Rafael, Calif. Carl F. Gromme and Ralph B. Priestley, AIA, Architects General Contractor: MacDonald, Young & Nelson, Inc. KALCOLOR® aluminum curtain wall: Kawneer Company, Richmond, Calif., Niles, Mich.

P. G. & E. SPOTLIGHTS THIS SUNSCREEN EVERY NIGHT—IT'S SUNFAST KALCOLOR® ALUMINUM

KALCOLOR aluminum in a range of enduring colors—beautiful under any change of light—has made new shopping center and office design a pleasure. This office of Pacific Gas & Electric, for example, spotlights a gentle amber sunscreen; rich black framing; and a storefront of greys and amber. Day or night, its beauty is guarded by advantages of KALCOLOR anodizing—excellent color match, abrasion resistance, and resistance to discoloring. The colors match because they stem from alloy constituents (not dyes). Most important: KALCOLOR is the only anodized aluminum in a range of colors as wide as that represented in the circles below, already proven in existing exteriors. See Sweet's File 6a/Ka. To locate KALCOLOR products made by our independent fabricator customers call Kaiser Aluminum in your city . . . or write Dept. 845g, Kaiser Center, Oakland 12, California.

KAISER ALUMINUM

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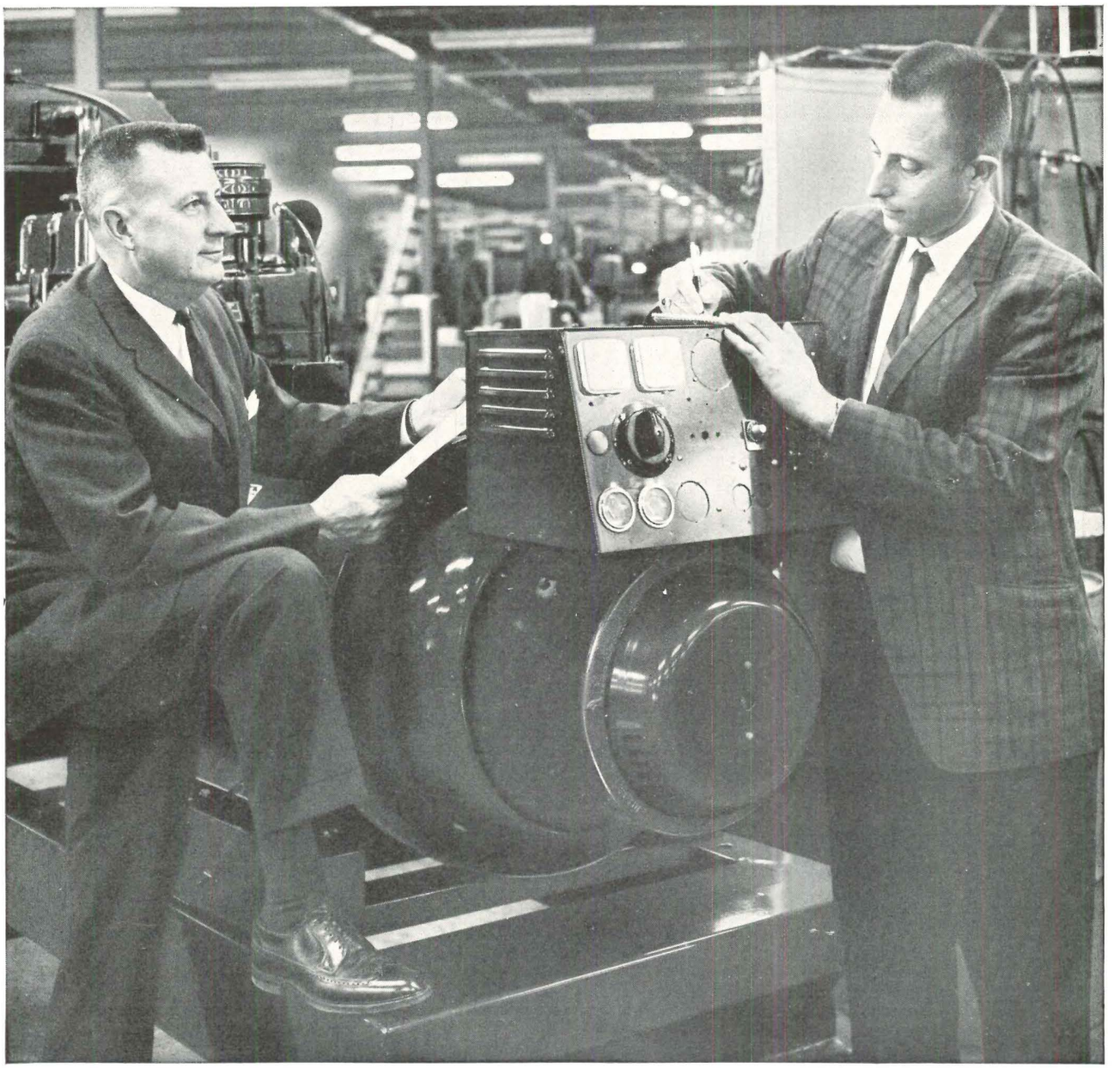

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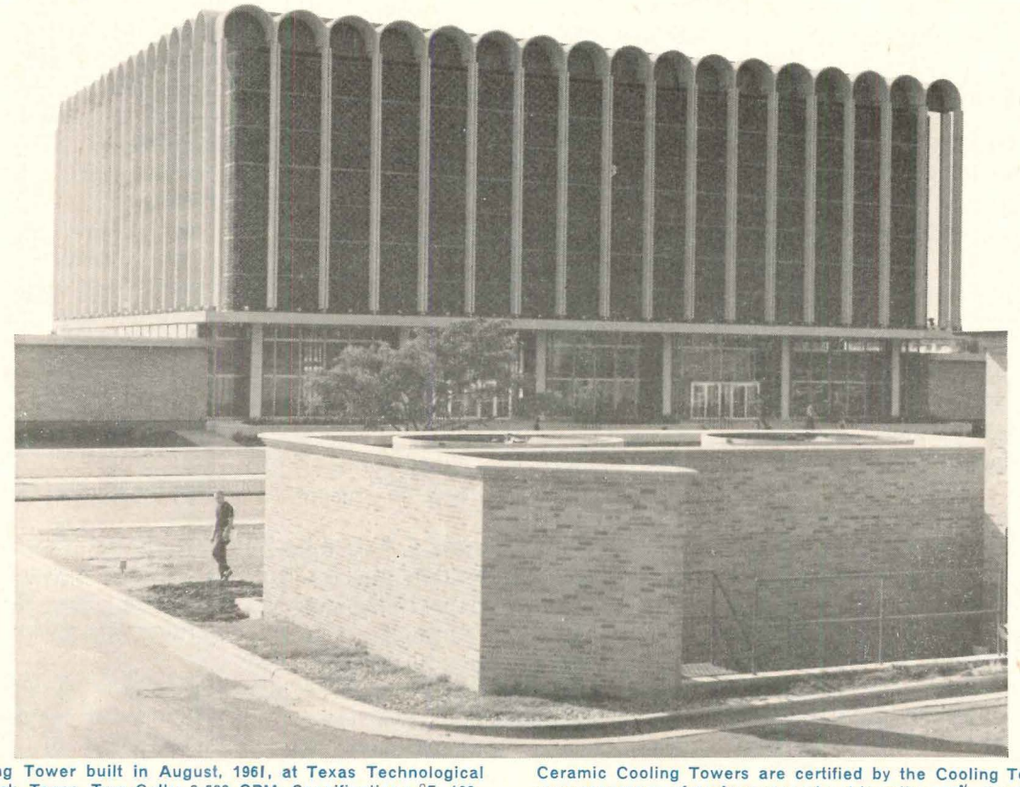

Ceramic Cooling Tower built in August, 1961, at Texas Technological College, Lubbock, Texas. Two Cells; 3,520 GPM; Specifications °F: 100-85-74. Architects: Davis, Foster, Thorpe and Associates, Inc., Architects and Engineers, El Paso, Texas; Consulting Engineers: Zumwalt & Vinther, Engineers, Dallas, Texas.

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A monthly roundup of reports on new books of special interest to architects and engineers

This Month's Books

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C. Harry Atkinson, How to Get Your Church Built ... 50
P. M. Bardi, The Tropical Gardens of Burle Marx ... 128
Ervin J. Bell, The Architectural Index for 1963 ... 50
Howard B. Bentley, Building Construction Information Sources ... 50
Lionel Brett, The World of Architecture ... 61
Alan Burnham, New York Landmarks ... 124
E. A. Fisher, The Greater Anglo-Saxon Churches ... 116
Robert L. Herbert, The Art Criticism of John Ruskin ... 132
William A. Katz and Roderick G. Swartz, Problems in Planning Library Facilities ... 116
Robert W. McLaughlin, Architecture, Creating Man's Environment ... 120
Frank P. Merlo and W. Donald Walling, Guide and Checklist for Planning Community College Facilities ... 50
Michael Pattrick and Michael Tree, A Career in Architecture ... 124
Harold E. Roth, Planning Library Buildings for Service ... 61
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Harold Wickliffe, The Colonial Houses of Worship in America ... 120
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Planning Data for Community Colleges

GUIDE FOR PLANNING COMMUNITY COLLEGE FACILITIES. *By Frank P. Merlo and W. Donald Walling. 40 pp., illus. $2.00.* CHECKLIST FOR PLANNING COMMUNITY COLLEGE FACILITIES. *By Frank P. Merlo. 25 pp. $1.00.* KIT FOR PLANNING COMMUNITY COLLEGE FACILITIES *(both Guide and Checklist). $2.90 Division of Field Studies, Graduate School of Education, Rutgers, The State University, New Brunswick, N.J.*

These publications are based on the findings of the community college facilities project conducted by the Division of Field Studies with the cooperation of professional organizations, Federal and state officials and community colleges and other authorities recommended by the American Association of Junior Colleges. Purpose was to ascertain the basic factors in the planning of comprehensive community college facilities.

Subject matter of the Guide ranges from the need for and definition of the community college to such specific data as area requirements for various general and special areas and formulas for calculating number and size of such areas in relation to curriculum and enrollment.

The Checklist comprises more than 300 questions in 14 categories which are recommended as the basis of acquiring the information needed to program any specific community college project.

Research Guide

BUILDING CONSTRUCTION INFORMATION SOURCES. *By Howard B. Bentley. Gale Research Company, Book Tower, Detroit 26, Mich. $8.75.*

This book offers annotated listings of information sources on U. S. building construction by types of sources —bibliographies, dictionaries, handbooks, government publications, periodicals, periodical indexes, directories, associations, research programs, libraries and statistics. There are also sections on building codes and zoning ordinances and on construction management.

It is an unpretentious but highly knowledgeable compilation by the librarian of Architectural Forum of a far broader range of building information sources than is covered by any previous publication. While it is intended primarily for librarians and researchers in the construction field, it should be a useful tool in the library of any architect or engineer.

Periodical Index

THE ARCHITECTURAL INDEX for 1963. *Compiled and edited by Ervin J. Bell. The Architectural Index, P.O. Box 945, Sausalito, Calif. 65 pp. $5.00*

The latest edition of the only published annual index to American architectural periodicals again offers an invaluable source of information on material published in seven periodicals—Arts and Architecture, Architectural Forum, ARCHITECTURAL RECORD, House & Home, Interiors, Progressive Architecture and the Journal of the American Institute of Architects.

Entries are arranged alphabetically by building type, by architect or designer and by geographic location (state or foreign country).

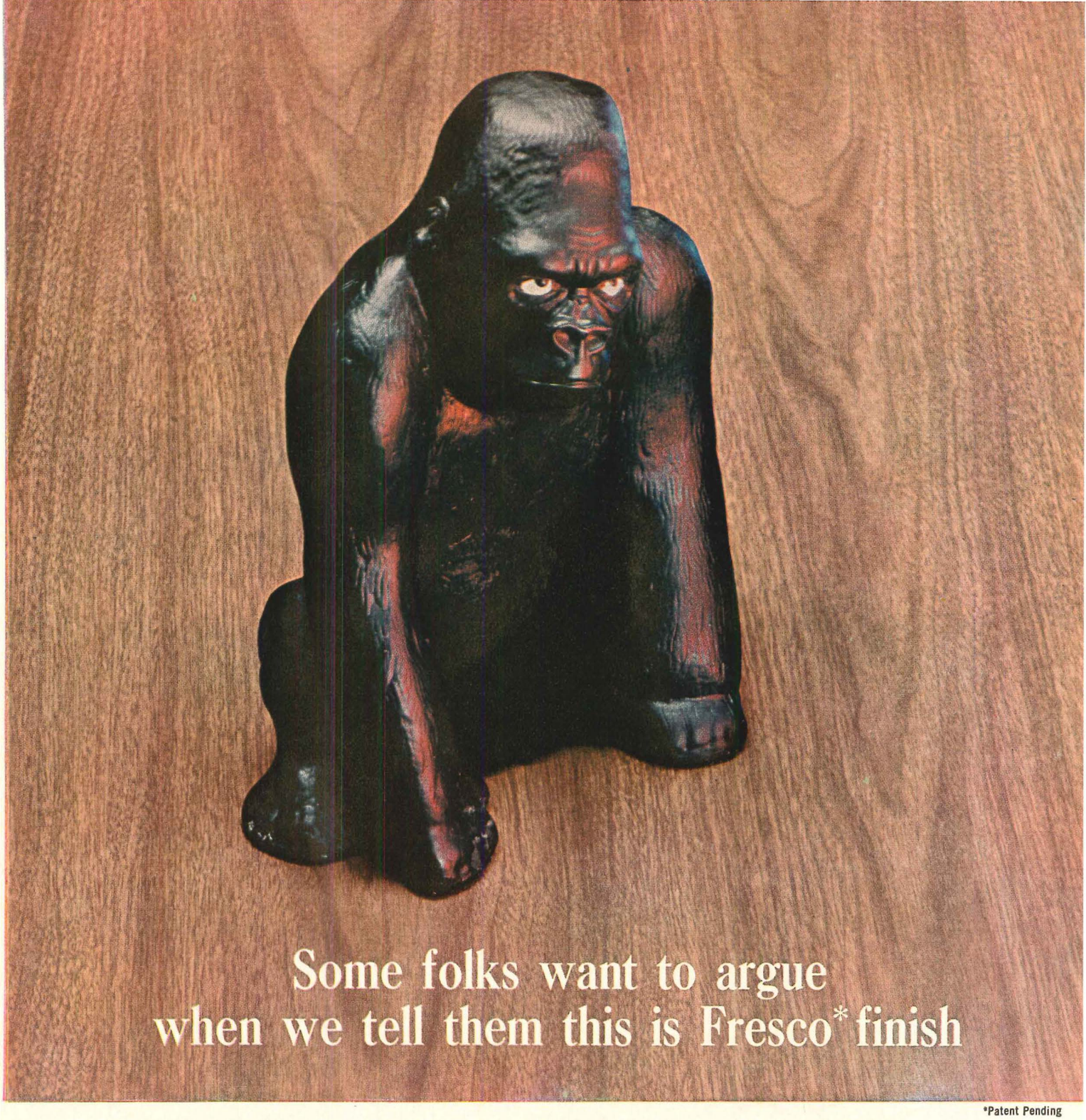
Today's Church: Getting It Built

HOW TO GET YOUR CHURCH BUILT. *By C. Harry Atkinson, Doubleday & Company, Inc., Garden City, N.Y. 217 pp., illus. $4.95.*

The editor of Protestant Church Buildings, a quarterly magazine affiliated with the Christian Herald, has written what his publisher describes as "a complete, step-by-step guide to the business of building a church, written especially for the inexperienced clergymen and laymen who serve on church building committees." As a former executive director of the National Council of Churches' Bureau of Church Building, Mr. Atkinson has had wide experience with the problems of such committees.

The book is a comprehensive and sensible account of the considerations involved in organizing committees, developing a program, and selecting

continued on page 54



*Patent Pending

(Not fine wood)

And who can blame them? Nevamar's new Fresco finish looks for all the world like wood. Even you may be tempted to give it a long, hard second look. Fresco finish also feels like wood. Run your fingers across its surface. Feel the grain! Now who's kidding whom? It's almost indecent that anything so rich and natural-looking should also be able to resist burns, stains and all the hard knocks that a family can dish out. Fresco finish is another trend-setting product of The Nevamar Company, creators of P-T and No-Glare finishes. Discover all of Nevamar's exciting new dimensions of quality and design.
Call your Nevamar representative and see for yourself. Your imagination will take it from there!

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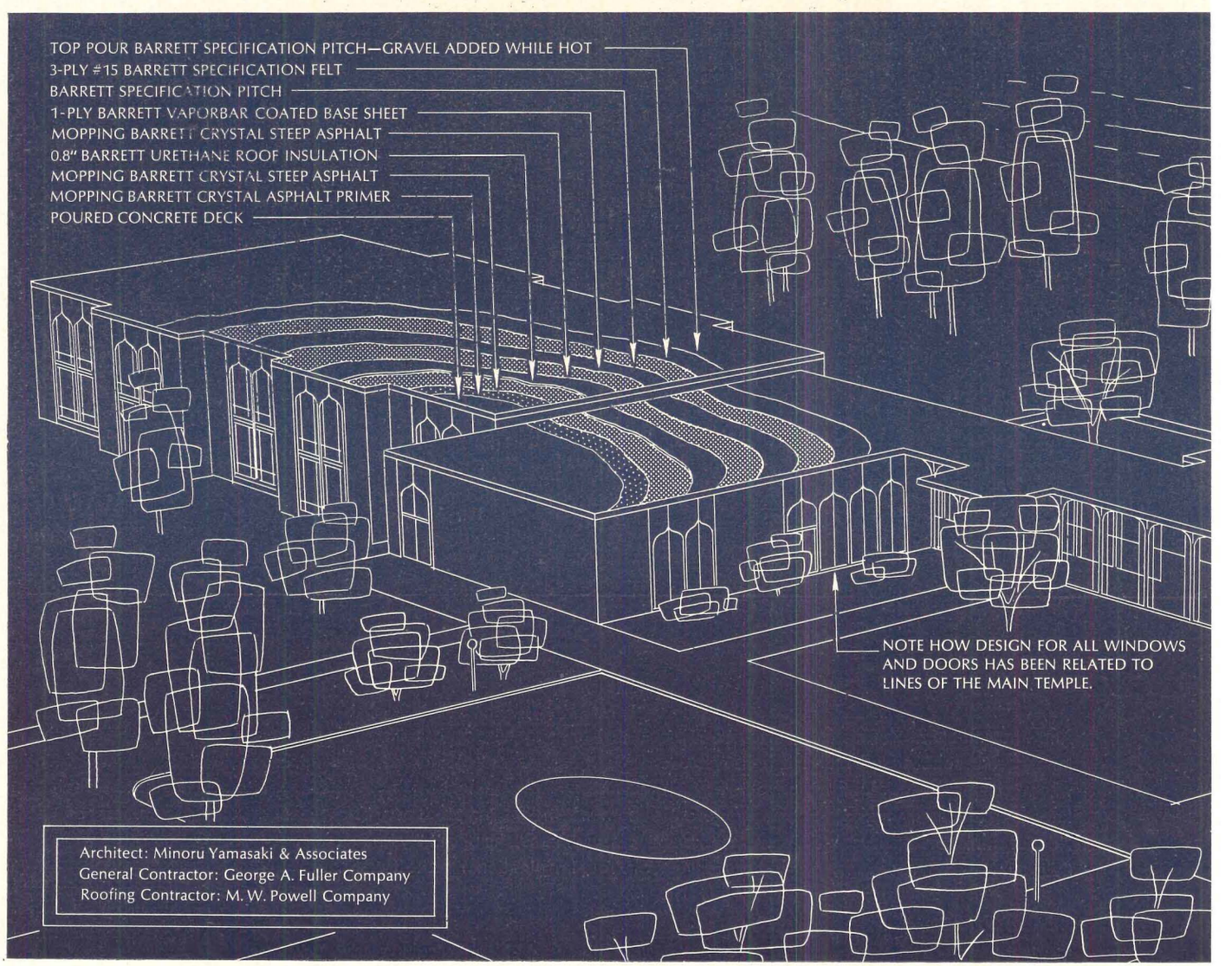
Barrett...exciting new building materials from chemistry



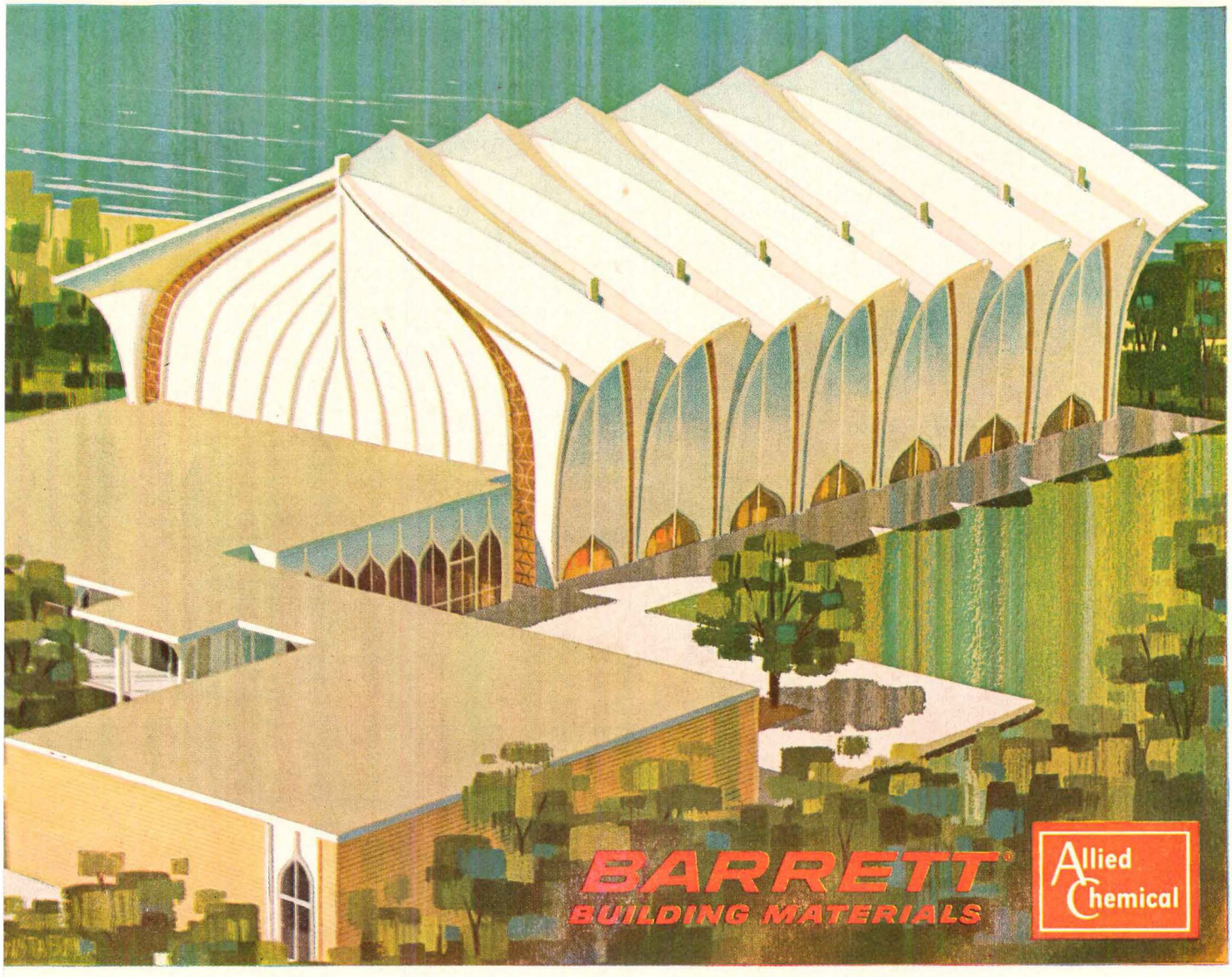
Barrett Urethane permits extra thin roof to accent sculptured beauty of Yamasaki-designed temple!

In designing Chicago's new North Shore Congregation Israel in Glencoe, Illinois, a major element in the esthetic relationship between the flat-roofed front buildings and the main temple itself is the thin "facing" edge of the flat area. Architect Minoru Yamasaki solved this critical design problem by specifying Barrett Urethane Insulation for the entire roof area of approximately 208 squares.

Utilizing 3′ x 4′ x .8″ panels of Barrett Urethane with Barrett Built Up Roofing, Mr. Yamasaki was able to combine the desired thermal-efficiency-to-thickness ratio, plus a K-factor of 0.13, the lowest in the industry, with the narrow side contour line specified in his design. You have only to look at this magnificent temple to see how effectively the building materials used have fulfilled his requirements.

For your next project, take advantage of the new design freedom which Barrett Urethane Roof Insulation offers. Ask your Barrett representative for full details. Or write to: Barrett Division, Allied Chemical Corporation, Dept. AR-4, 40 Rector Street, New York 10006.

The Marina Towers—twin 60-story Chicago apartments are protected by Barrett Built Up Roofing and felt waterproofing. Bertrand Goldberg Associates of Chicago are the architects.



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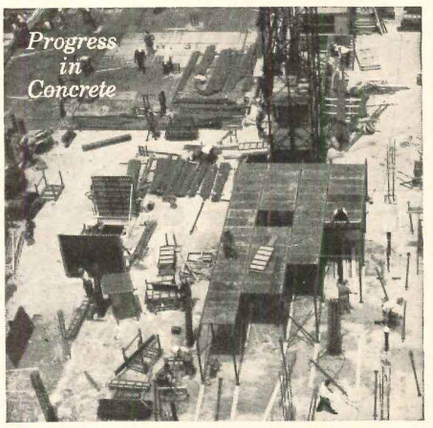

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NEW METHOD OF FLAT SLAB FORMING FOR MULTI-STORY HIGH-RISE CONSTRUCTION

Symons Slab Shore System uses Symons standard Steel-Ply Forms, normally used for vertical wall forming, for all decking requirements. Material adaptability, ease of assembly, speed of erection and stripping are among its advantages over conventional flat slab forming.

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Required Reading

continued from page 50

and working with an architect. Its comprehension of and sympathy with the role of the architect are notable; and there is a chapter on "Contemporary Church Architecture" which ought to be read by any church building committeeman who has ever opposed it. A generous and well-annotated bibliography deserves special mention.

Architects concerned with Protestant church design might well consider putting this book in the hands of clients, and for architects without experience in this field it would offer an excellent introduction to current requirements, practices and attitudes.

Comparative Drawings of Houses

VARIOUS DWELLINGS DESCRIBED IN A COMPARATIVE MANNER. *By Richard Saul Wurman. Joshua Press, 322 South Camac St., Philadelphia, Pa. Unpaged., illus. $6.65.*

Produced by second-year architectectural students of the School of Design at the University of North Carolina, this book started life as a design exercise. Richard Wurman set the exercise for his students with the fourfold aim of familiarizing them with the particular dwellings themselves, acquainting them with the idea of plan-space relationships, teaching them a means of building description and visualization, and showing them how deeper understanding can often be gained from the study of buildings as a group.

Thirty-five dwellings from different countries and different periods are described through the media of perspective drawings and plans, all to the scale of 1 inch to 32 feet. The drawings were originally constructed at 1 inch to 16 feet and then reduced by half. An appendix of 15 additional plans is added at the end of the book.

The drawings are beautifully executed and the printing and layout unusually good. The consistency of scale which makes possible genuine comparisons between buildings, sometimes has an adverse effect on the

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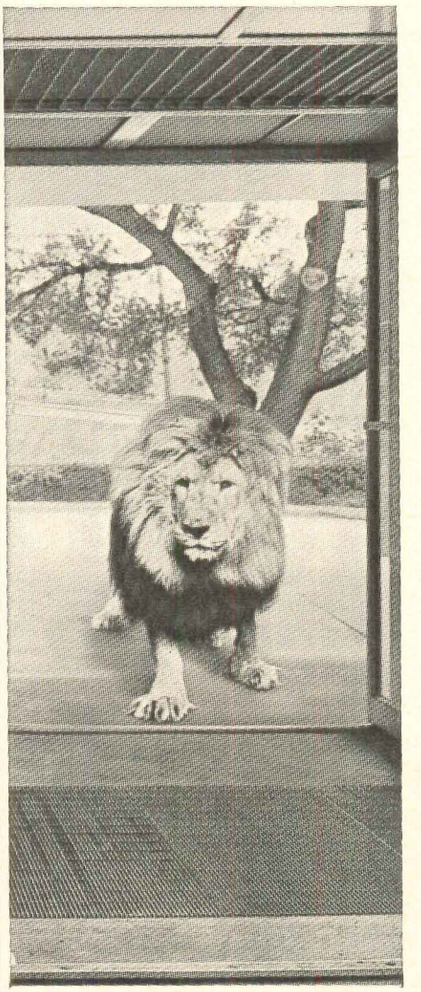

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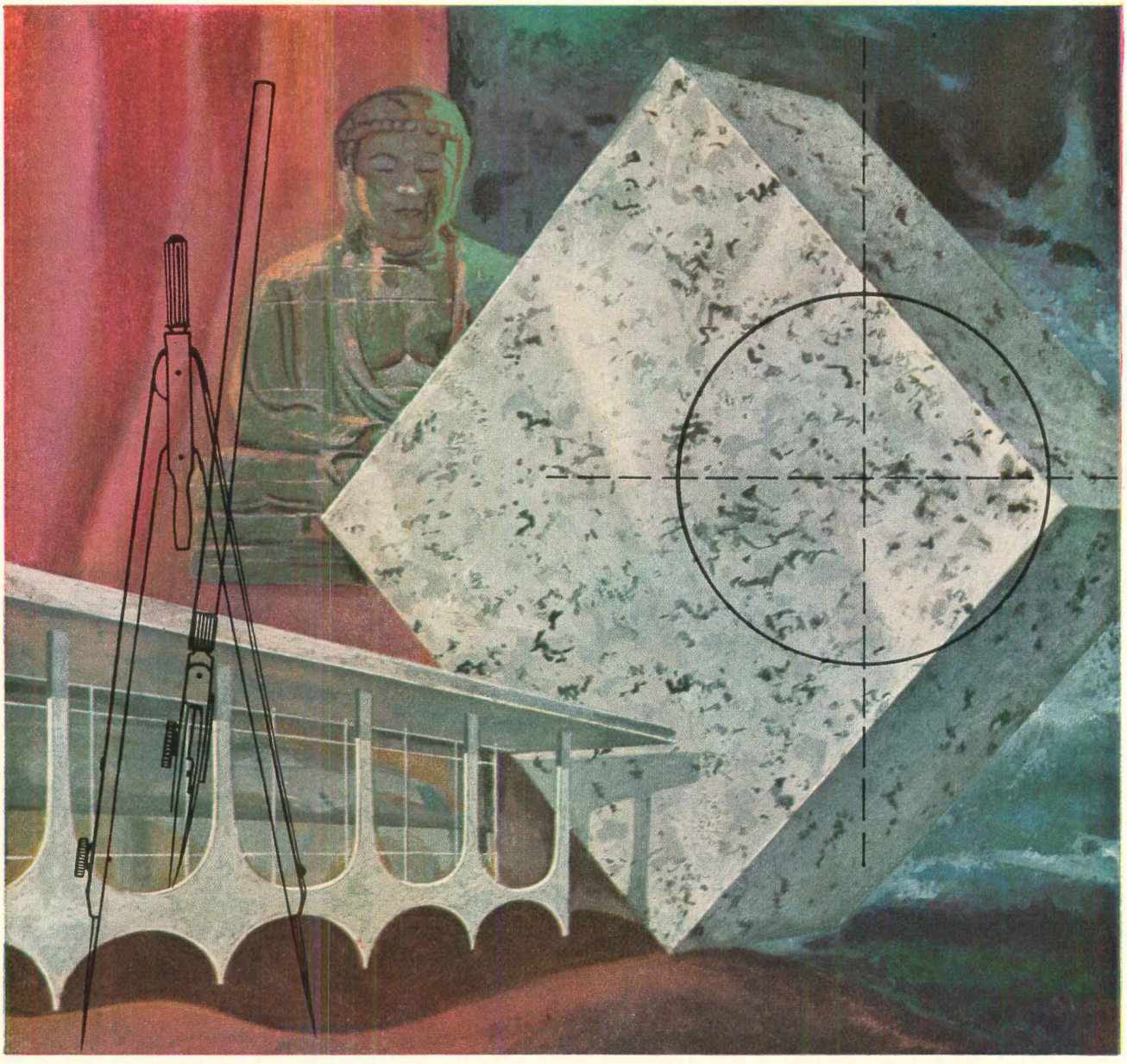

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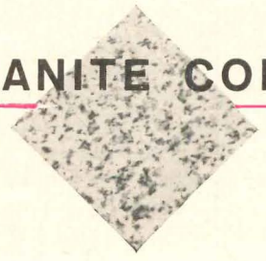

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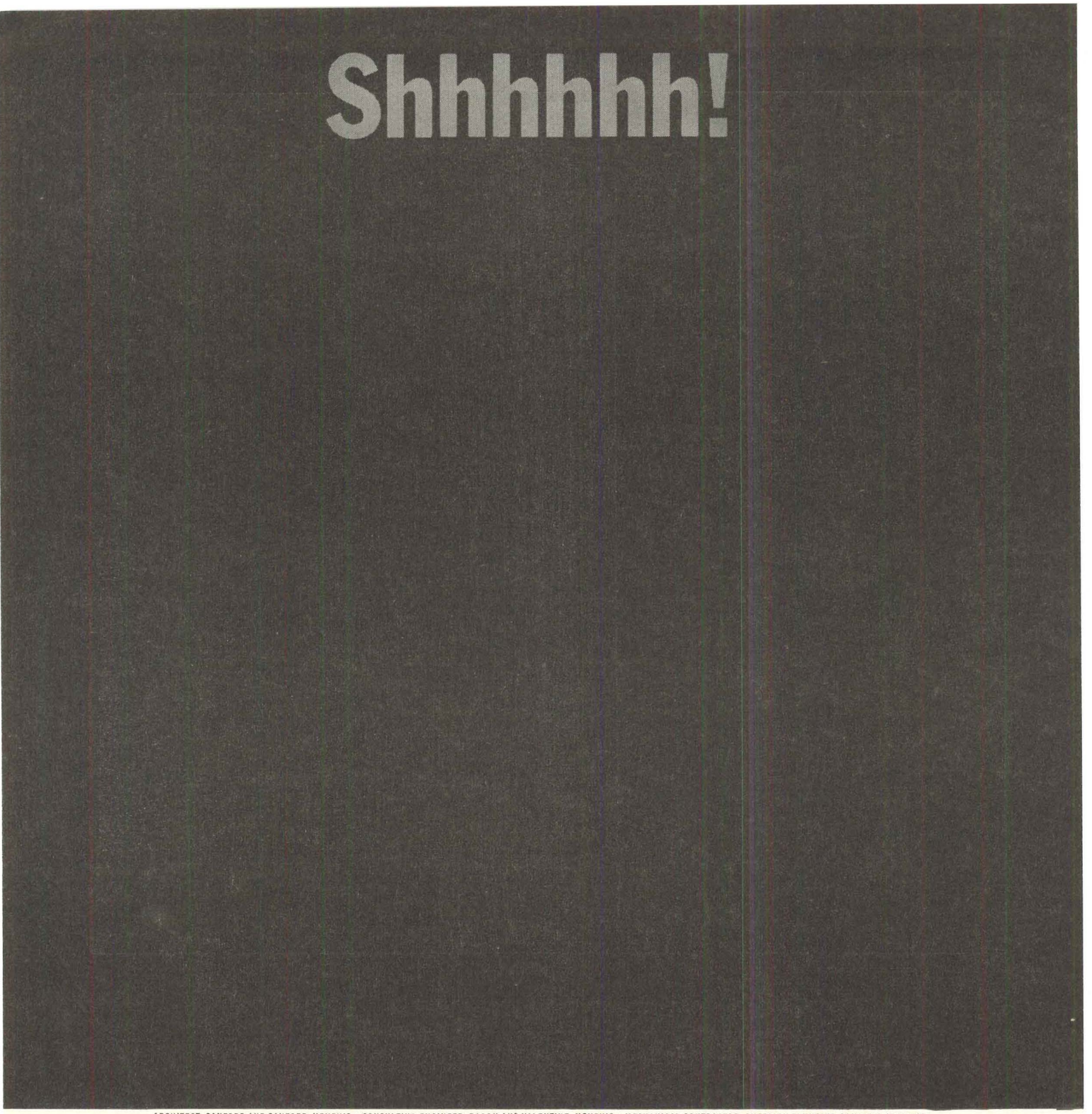

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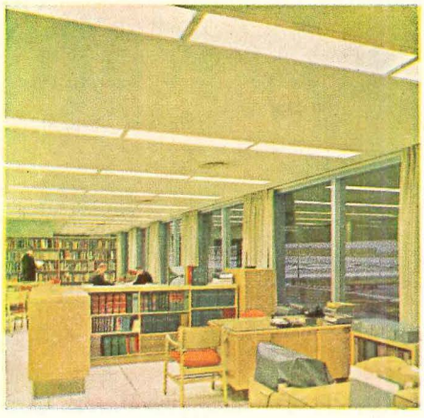
3M Company Administration Building, St. Paul, Minnesota. Architects & Engineers: Ellerbe, St. Paul.

Lighting for prestige buildings



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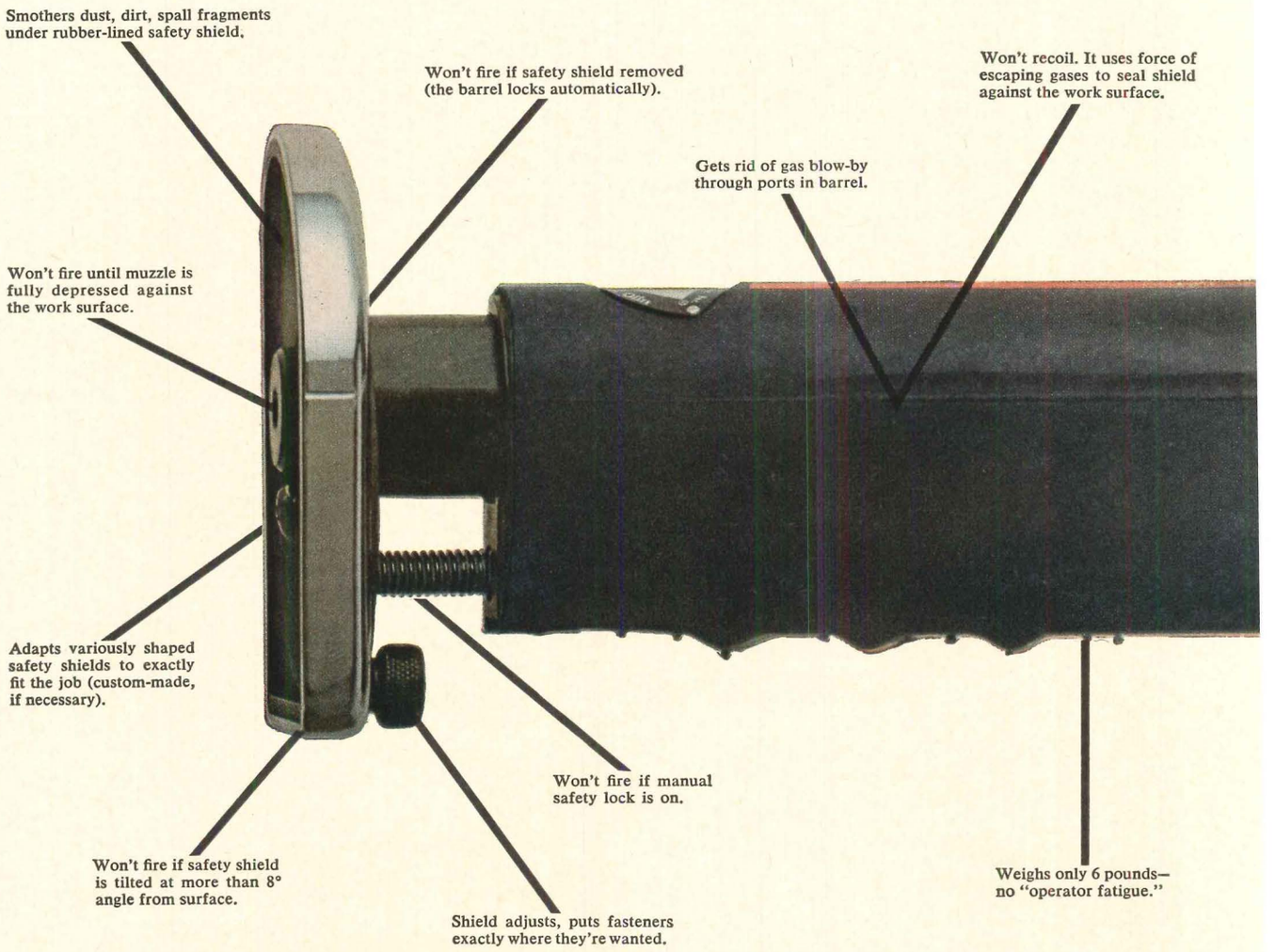

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Now. Pull the trigger.

Nothing happens.

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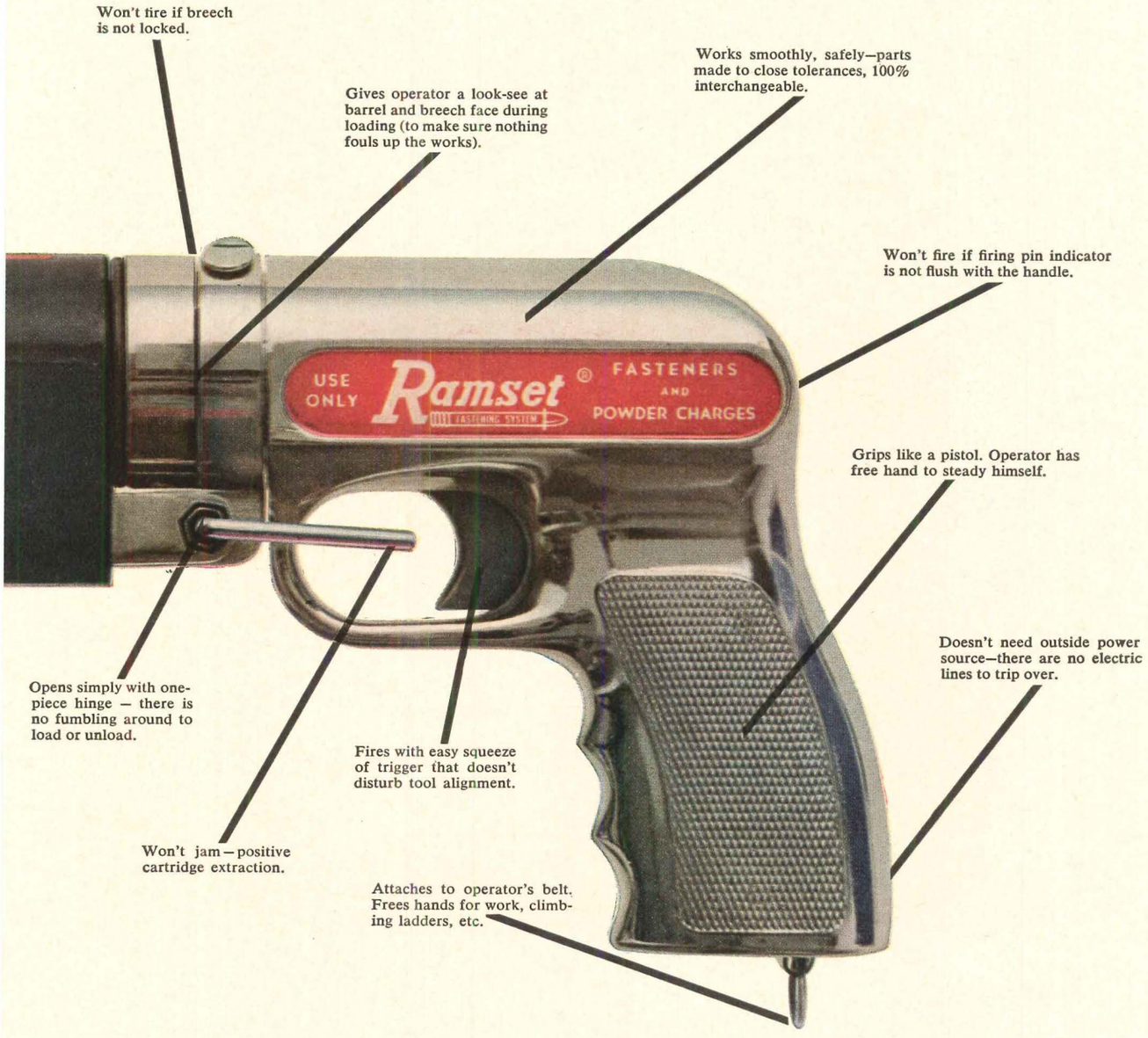
Before a worker can use our tool we also insist that he pass our training course, conducted right on the job by one of our own Ramset factory-trained specialists.



about itchy trigger fingers.

And, to prove it, he has to carry our accredited operator's card.

When he's finished, he not only knows how to be a safe operator; he can open, unload, reload and fire the Ramset tool in 20 seconds. And average a phenomenal 120 fastenings an hour—*eight times* more than by ordinary drill and plug methods.

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We've also got a powder-actuated tool called Flite-Chek® (so safe it'll catch fasteners in its muzzle if they're fired incorrectly). And a piston-operated tool called Pow-R-Set.® And a hammer-in-tool we call Shure-Set.® And Tru-Set® fasteners. And Dynabolt® masonry anchors.

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Come to think of it, he's probably our number one safety device.

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an inside story about the birth of an idea by Bradley Washfountain

cheaper by the half dozen

A revolution is underway in modern shower-room planning, and Bradley Column Showers are at the forefront. Why? Because Bradley Columns started the entire swing to *group* showers, proving they could serve up to six people at one time with only *one* set of plumbing connections — saving valuable space and cutting installation costs as much as 80%! Bradley Columns caught on fast because they also provided more design freedom; increased traffic flow; saved water and maintenance costs. (They were so successful that they prompted the development of four other Bradley Group Showers: Multi-Stalls, Wall-Savers, Modesty Modules and Panelons.) In short, Bradley Columns added up because their expenses *didn't*. And, today, they're saving money, space and time in modern buildings across the country — because architects know that showering is cheaper by the *half*-dozen. *Ask your Bradley representative for assistance on specific applications. And write for latest literature. Bradley Washfountain Co., 2377 West Michigan Street, Milwaukee 1, Wisconsin.*

Bradley

For more data, circle 47 on Inquiry Card

Required Reading

continued from page 54

study of a particular building, by making the drawing too small for complete clarity.

This is an excellent student production which will undoubtedly be of interest to many architects whose student days are far behind them. Richard Wurman is justified in feeling that it represents a step towards "the evolution of a means of graphic communication in the form of a visual language of architectural intention."

Stories of Architecture

THE WORLD OF ARCHITECTURE. *By Lionel Brett. Thomas Nelson & Sons, 18 E. 41st St., New York 17. 120 pp., illus. $3.00.*

This up-to-date short history of world architecture, intended for the lay reader, traces the main periods of architecture from mud hut to Brasilia showing how one style grew out of another and how different materials and new methods have had influence on the design of buildings.

The survey is concise, the comments are intelligent and the style is readable. Unfortunately the pace of the narrative introduces questionable generalizations, but in the end the lay reader should have a fair view of what architects have accomplished.

ARCHITECTURE. *By Mario Valmarana, The Odyssey Press, Inc., 850 Third Ave., New York 22. 45 pp., illus. 95 cents.*

A compact history of architecture has appeared in The Odyssey Library, a new series of books, each a survey of one area of knowledge. The book is written by Mario Valmarana, who teaches the history of architecture at Columbia University, and illustrated by Peter Spier.

Mr. Valmarana has presented an informative and very readable little book that tells in remarkably compact form the story of architecture and, like Mr. Brett's book, is intended for the lay reader.

Library Planning

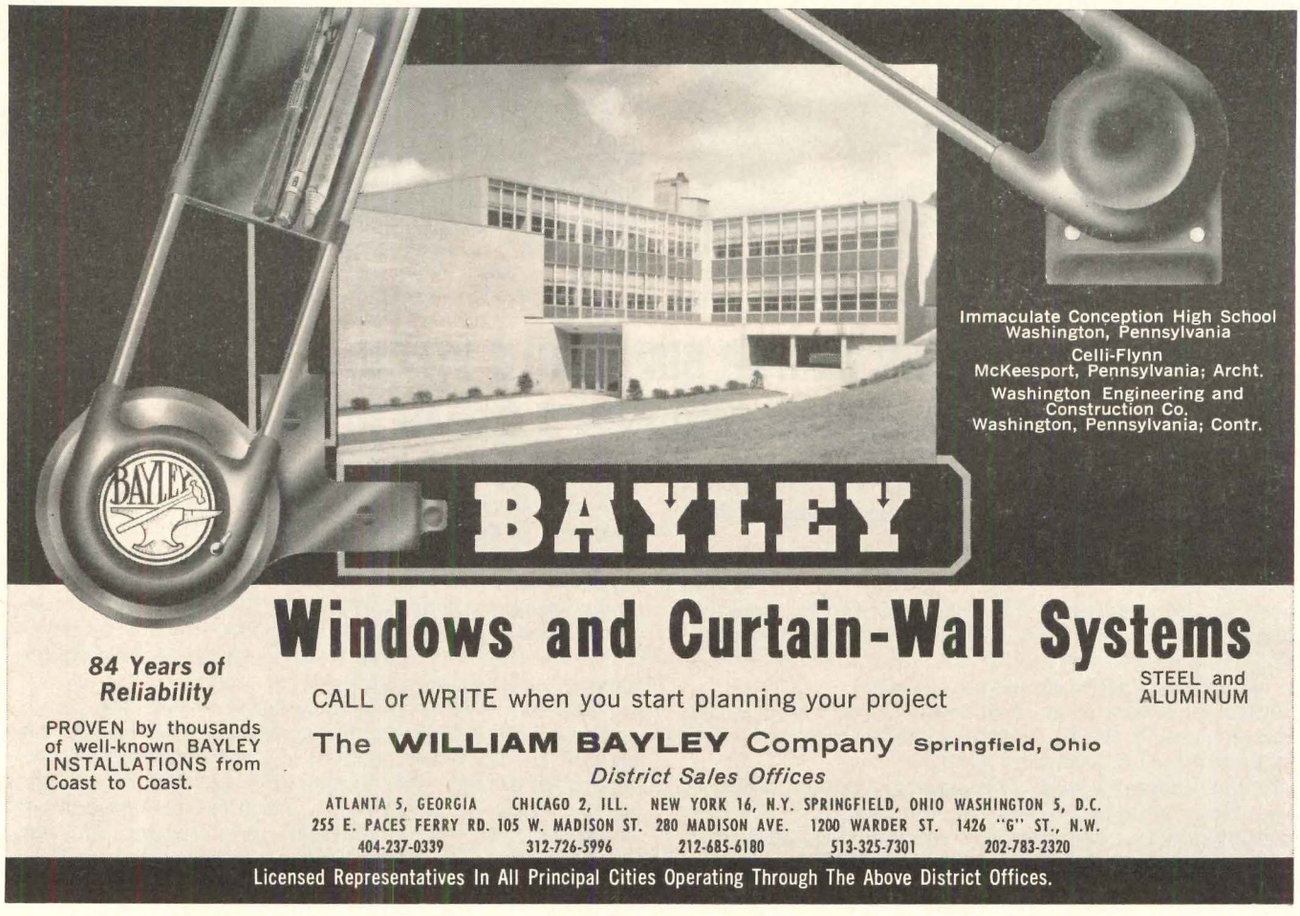
PLANNING LIBRARY BUILDINGS FOR SERVICE. *Proceedings of a Library Buildings and Equipment Institute, July 6-8, 1961. Edited by Harold L. Roth. American Library Association, Publishing Department, 50 East Huron St., Chicago, Ill. 127 pp., illus. $3.75.*

Design of college, university, public and school library buildings, with emphasis on service to the user, was the subject of an Institute held at Kent State University July 6-8, 1961, under the sponsorship of the Section on Buildings and Equipment of the American Library Association Library Administration Division.

The Proceedings, which have now been published under the editorship of the chairman of the sponsoring section, include the prepared papers and panel discussions as well as plans and photographs of 16 libraries along with the texts of the presentations of their architects or librarians.

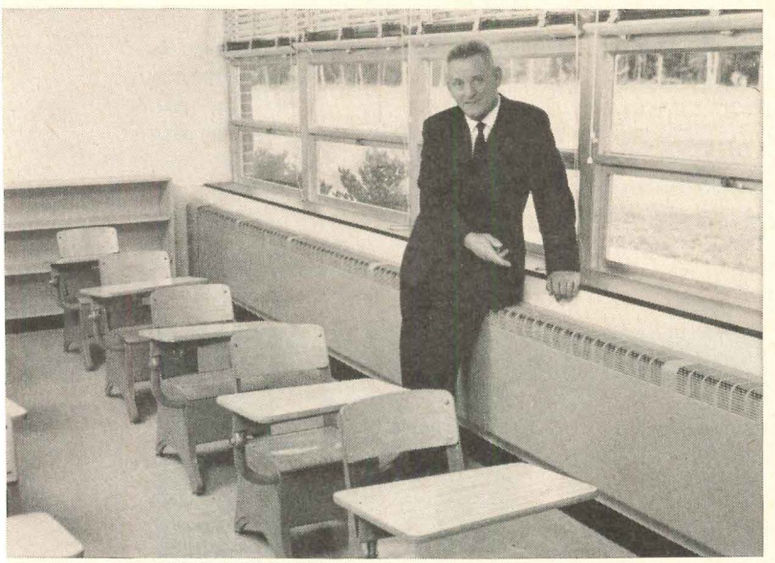
Formal papers covered such topics as elements of planning; evaluation

continued on page 116

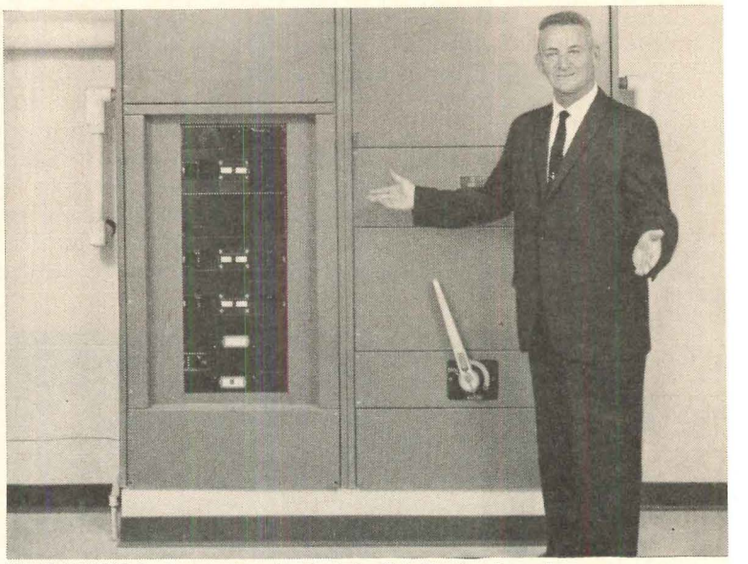


For more data, circle 48 on Inquiry Card

KEY FIGURES in City of Virginia Beach total electric school design are, left to right in foreground, Frank W. Cox, Superintendent of Schools; J. C. Lindsey, Superintendent of Maintenance; Ernest F. Stone, Superintendent of Construction. Trio left to right in background includes B. S. Martin, Virginia Electric & Power Company representative; John S. Waller of Waller & Britt, Architects; Denard L. Gusler, P.E., of Vansant & Gusler, Consulting Engineers.



CLEAN, UNOBTRUSIVE electric radiant sill heat for classrooms wins Supt. Stone's approval both for efficiency and appearance. Simplicity of installation and operation help keep overall costs down.



SPACE-SAVING features of main electric distribution board are emphasized by Supt. Stone. All controls for entire school's total electric design are contained in this single unit.

TOTAL ELECTRIC DESIGN SIMPLIFIES VIRGINIA SCHOOL CONSTRUCTION AND KEEPS COSTS DOWN

Architect and engineer join City of Virginia Beach officials in praising the flexibility and space-saving features of total electric design for schools

According to Frank W. Cox, dynamic City of Virginia Beach Superintendent of Schools, total electric design is saving his community close to $100,000 per high school in initial construction and equipment costs, with proportionate savings on smaller elementary schools.

But the decision to go with total electric design in the City of Virginia Beach school system was not just snap judgment based on economy alone.

After considerable study of comparison figures, Ernest F. Stone, Superintendent of Construction, and J. C. Lindsey, Superintendent of Maintenance, recommended total electric design: electric heat, total electric kitchen operation, electric water heating, and lighting levels designed for specific task performance.

With the assistance of architects Waller & Britt, consulting engineers Vansant & Gusler, other architects and engineers, and Virginia Electric & Power Company, eleven total electric schools have been built in the City of Virginia Beach in the past four years, or are now under construction.

The results have been nothing short of spectacular. In addition to the original $100,000 saving on construction and equipment, maintenance costs have dropped 88% and custodial attention has been reduced to a routine minimum. Thus, the City of Virginia Beach is using total electric design to build better schools for less money.

Facts like these may be meaningful to you, too.

For architects and consulting engineers, total electric design offers the modern method of combining heating, cooling, water heating, and lighting into one efficient operation using a single source of energy. If you are interested in how it can help you with commercial and industrial buildings, contact your local electric utility company. They will welcome the opportunity to work with you.

BUILD BETTER ELECTRICALLY

Edison Electric Institute, 750 Third Avenue, New York 17

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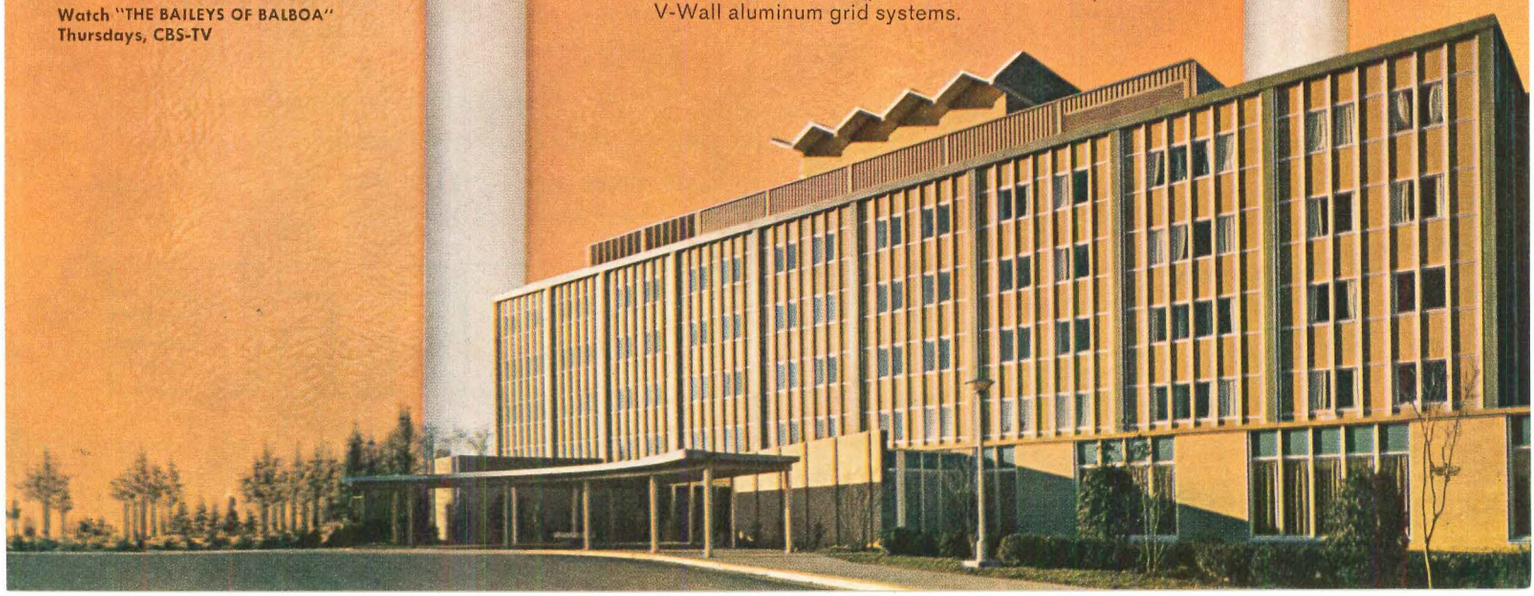
Porcelain enamel adds practically limitless design opportunities to

Aluminum In modern Architecture

Reynolds Aluminum for extruded components and as a base for porcelain enamel means not only light weight and freedom from rust, but also a handsome architectural appearance. Multiply the many surface textures by the wide selection of colors available and you have practically limitless variety. You also have a fade-resistant surface that is hard, resistant to shock and abrasion and impervious to most acids and alkalis. For the hospital illustrated and for commercial and industrial institutional buildings of every description, porcelain-enameled Reynolds Aluminum provides long life and low upkeep... together with interesting color contrast in trim, spandrels and wall areas. For more information, write Reynolds Metals Company, Richmond, Virginia 23218.

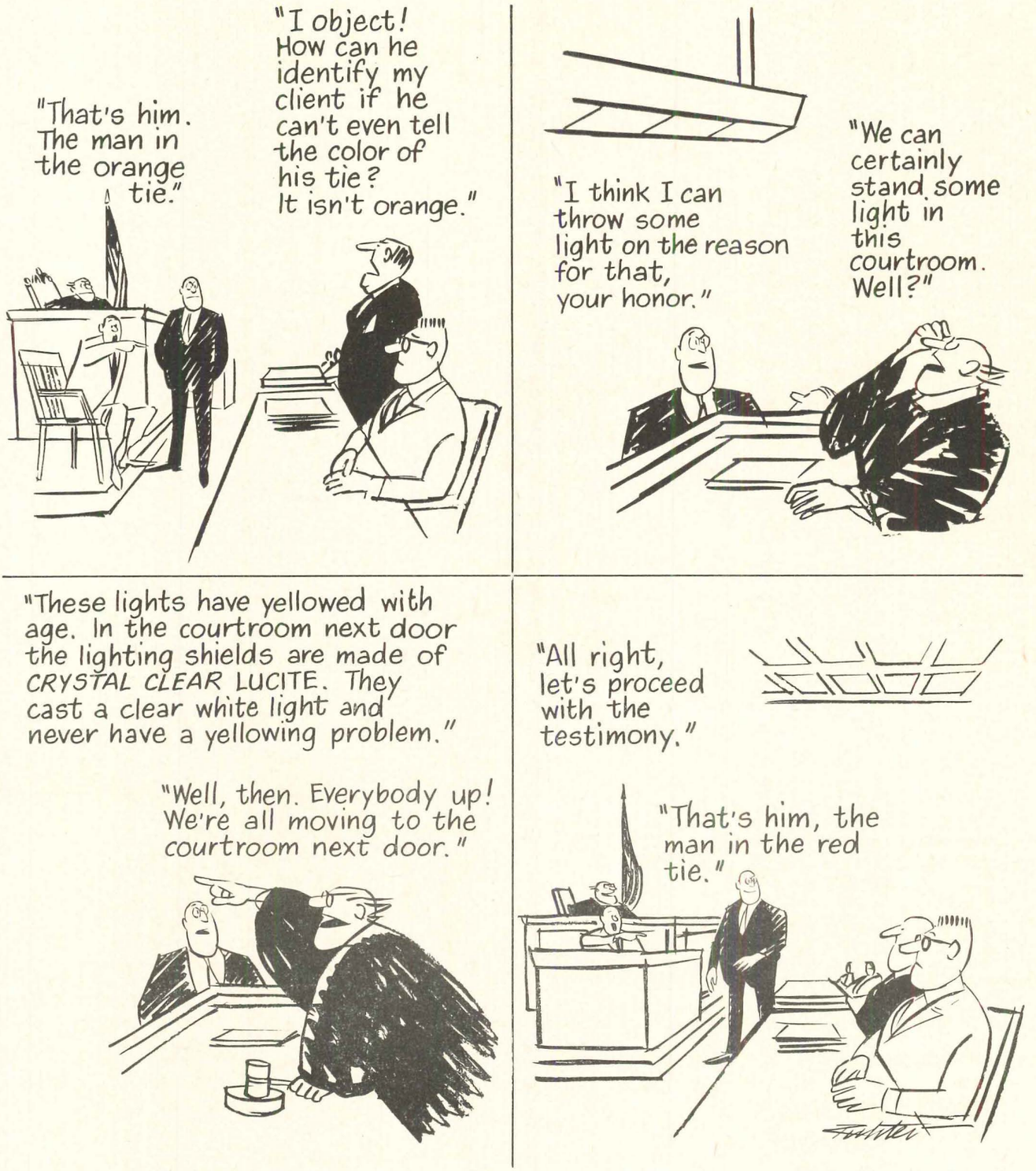
RIVERSIDE HOSPITAL, NEWPORT NEWS, VA.

Forrest Coile & Associates, architects.
Prack & Prack, Pittsburgh, associate architects.
H. H. Robertson Company, Pittsburgh & Connersville, Ind., manufacturers and erectors of curtain walls, Vitralume (porcelain on aluminum) and V-Wall aluminum grid systems.



REYNOLDS
where new ideas take shape in
ALUMINUM

Watch "THE BAILEYS OF BALBOA"
Thursdays, CBS-TV



For a clear, white light on your questions—write for free lighting booklet and more information on acrylic lighting shields made from LUCITE. Write: Du Pont Company, Dept. AR-9, Room 2507L, Wilmington, Del. 19898. (Du Pont does not make or sell lighting shields, but supplies LUCITE acrylic resin and acrylic monomer to lighting manufacturers.)

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For more data, circle 51 on Inquiry Card

ARCHITECT: *RUDOLPH A. MATERN*—BUILDER: *HEDGES GOUGH LUMBER CO.*

PELLA

PELLA Wood Casement Windows are the only windows with ROLSCREEN®, the original "instant screen." Then, self-storing storms and stainless steel, spring-type weather stripping make year 'round comfort-conditioning easier . . . more efficient. For traditional themes, specify muntin bars that snap in and out. And, here's a money-saving angle: PELLA Casements are the *only* wood windows designed to permit installation in masonry and other openings *without* wood bucks, brick mould or exterior trim. Choose from 18 ventilating units to 24″ x 68″ glass size and 48 fixed unit sizes. (Flat frame screens also available.) Mail card.

"Instant screens" that roll up and down

ROLSCREEN® is the original inside screen that rolls down in spring . . . up and out of sight in fall. User-tested by millions. It is always "new" to most people. Only PELLA Wood Casement Windows have the genuine ROLSCREEN feature.

WOOD CASEMENT WINDOWS

Pella also makes Wood Multi-Purpose and Twinlite® Windows, Rolscreens, Wood Folding Doors, Partitions and Sliding Glass Doors.

BUILDER: *CAMBRIDGE VILLAGE DEVELOPMENT CO.*

PELLA

Awning window convenience in the traditional style

No wonder women love these PELLA Wood Multi-Purpose and Twinlite® Windows that can be left open even while it's raining. With their traditional look, these awning-type windows can be used singly, stacked, in ribbons or as casements. Then, they can even be topped off with PELLA trapezoidal units. Regular or diamond muntin bars snap in and out to speed painting and cleaning. New . . . operating hardware and other parts co-ordinated in bronze-color tones. Self-storing storms and screens plus stainless steel weather stripping contribute to year 'round comfort-conditioning. Sash locks in 10 positions with Glide-lock® underscreen operator. (Roto operators, too.) Mail card.

WOOD MP and TWINLITE® WINDOWS

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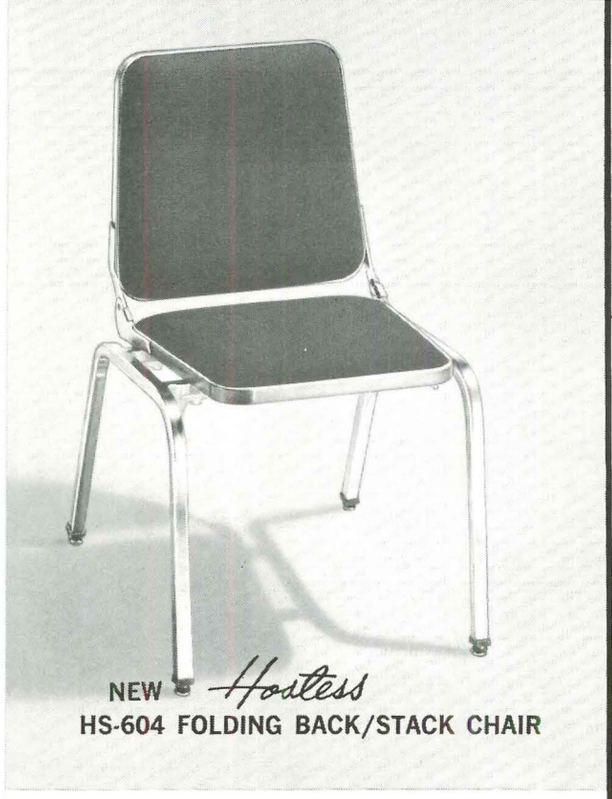
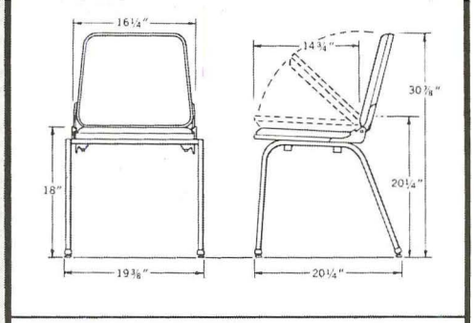


NEW *Hostess*
HS-604 FOLDING BACK/STACK CHAIR



sits up...

with the inviting comfort of fully-upholstered Polyfoam seat and fold-down backrest, mounted to non-tip, square tubular wide-stance legs. Mix-or-match seat and back colors of Scotchgarded woven fabric, or Naugahyde Chromata. Correlated leg finishes in brushed satin Chrome or Brass.

folds down...

to protect upholstered areas and permit more chairs to each compact stack. Special hinge withholds undue back pressure on seat, allows units to store on or under tables, conveniently out of the way.

stacks away...

quickly and easily in compact storage to 12 high on a dolly and still clear 80" doorway. Special nylon guides assure positive unit alignment — no tilt or topple at any convenient stacking height.

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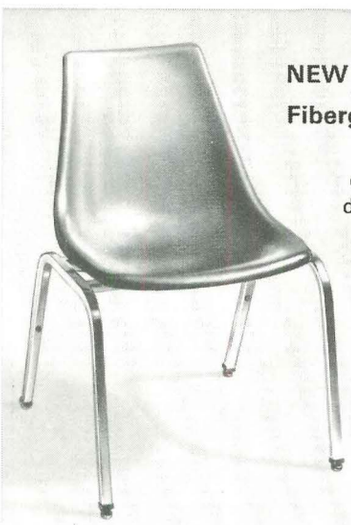

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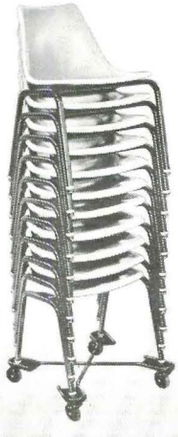
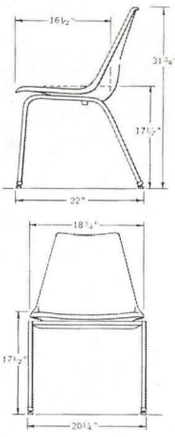
Fiberglass Stack Chair

Fresh contemporary design of beauty and durability in stackable seating. Contour-curved shell, in 7 colors, is unitized to wide-stance, square tubular legs — in brushed Chrome or Brass, or baked enamel finishes. Self-leveling foot glides.

Series 6000 units stack to convenient heights without tipping.



Note spacious shell, wide-stance legs for maximum comfort and seating stability.



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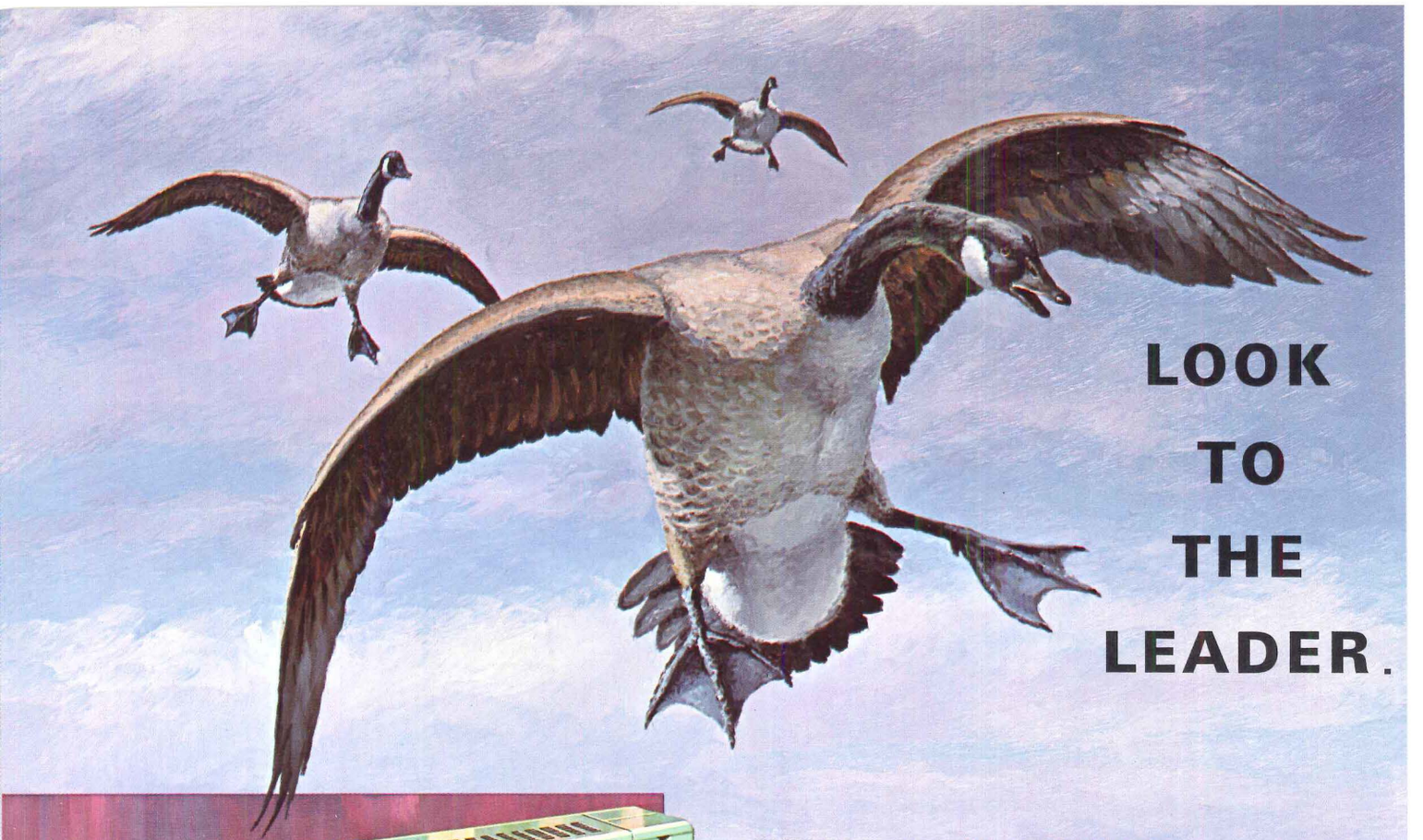
SIDE and ARM CHAIRS

Popular fiberglass series with upholstered foam seat pad — leg or swivel/pedestal base, tilt action optional.

Hostess
DECORATOR FOLDING CHAIRS

Top auxiliary seating — slim-line X-frames, upholstered comfort, wide range of fabric/frame color combinations.



LOOK TO THE LEADER.

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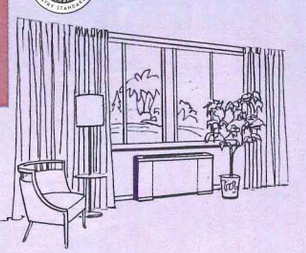
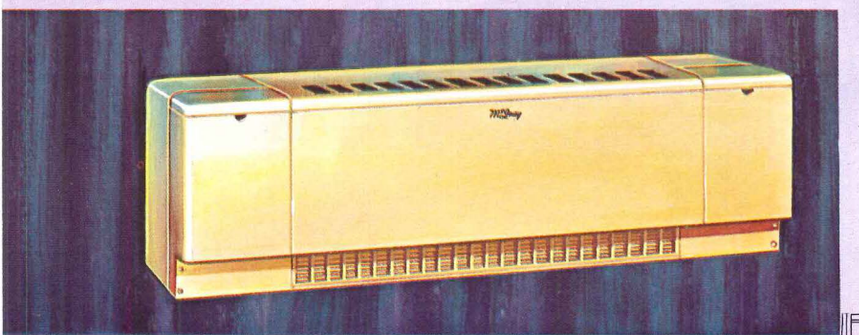
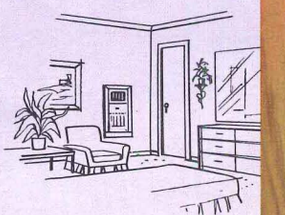
You'll find a McQuay Seasonmaker fan coil unit to fit your specific engineering *and* architectural requirements. How do we know? We offer 5 lines, 15 models, 78 sizes. For special job requirements, McQuay offers you application data, manufacturing flexibility and the know-how you'd expect from a leader.

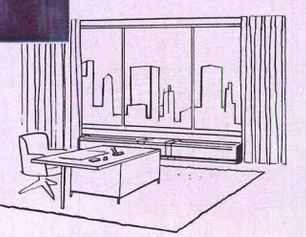


THIN LINE SEASONMAKER. Modern as today's buildings, this remote air conditioner measures just 8½" *thin*—25" high. Four types—floor, basic, ceiling and hideaway—from 220 to 1240 cfm. Three-speed fan control. *Whisper-quiet* operation.





LO-LINE SEASONMAKER. Ideal for today's full-width, floor-to-ceiling glass walls. Only 14½" high in free-standing, flush wall or concealed models. From 200 to 1200 cfm. Cabinet extensions for tandem and wall-to-wall installations. Special acoustically-treated cabinet for *whisper-quiet* operation.



SEASONMAKER, JR. This flexible unit is ideally suited for year-round conditioning of motels, hotels, apartments, residences. Available in recessed or free standing models —150 or 300 cfm sizes. Air volume easily modulated within range of 50 to 100%. *Whisper-quiet* operation.

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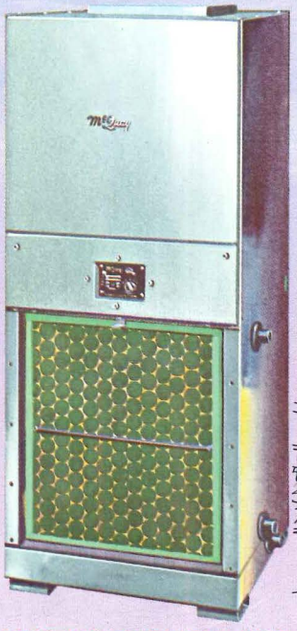
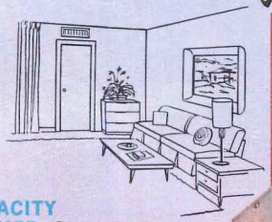
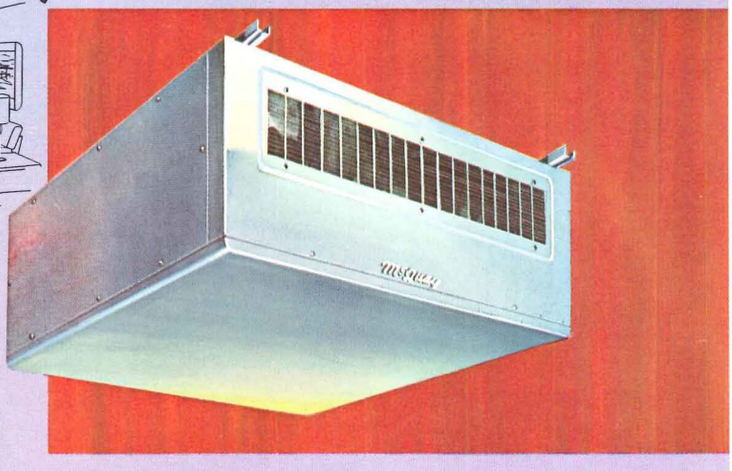
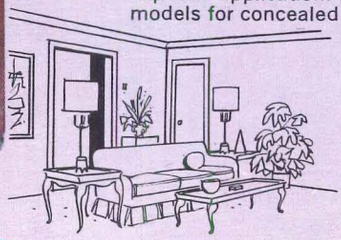




LARGE CAPACITY SEASONMAKER. One to ten ton nominal cooling capacity in direct expansion or chilled water fan coil units. Choose direct drive or belt drive units in 500 to 3,000 cfm ranges. Decorator styled cabinets on ceiling models for exposed application. Hideaway models for concealed application.





APARTMENT SEASONMAKER. Combines the simplicity of fan coil units with the advantages of a central station system. Lowers initial equipment and installation costs for multi-room apartments. Simplifies control systems. Reduces maintenance problems. *Whisper-quiet*, extremely efficient. Vertical models, upblast or downblast discharge, from 800 to 2,000 cfm with 5-step speed fan control.

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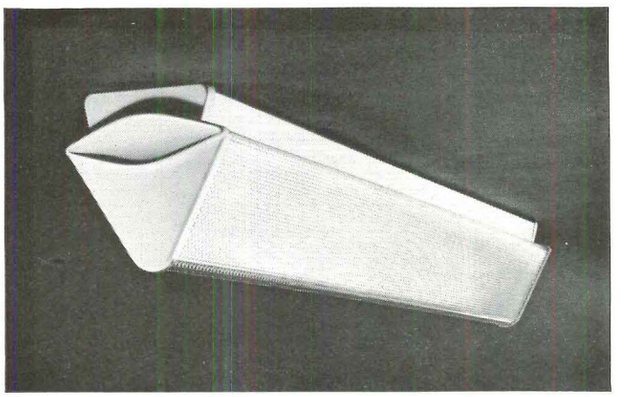
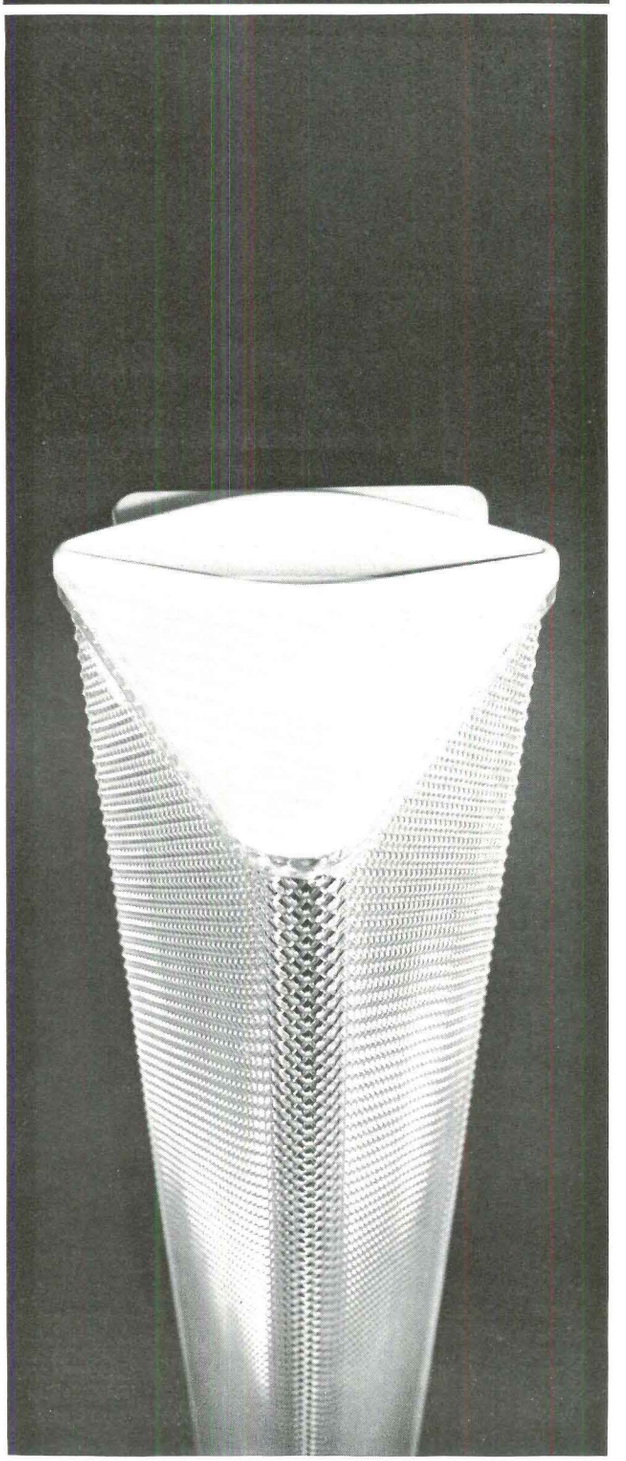
New LPI Vee-Lens is the best way to light a corridor





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 celluose 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

LPI® FLUORESCENT LIGHTING

Lighting Products Inc., Highland Park, Illinois 60036

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THE GARY STORY

"Gary's first all-steel structures are outstanding for their architectural beauty and durability. The interior design of these schools and the structural materials provide low-cost operation and maintenance from which the community will profit, in savings, for years to come."

—Mrs. Dina Adams, President, Gary, Ind. School Board

"The building solution is gratifying in offering beauty of design, precision workmanship, rapid construction, lowest possible maintenance costs for years ahead, and the highest degree of flexibility to adapt to curriculum and instruction changes."

—Mr. Eugene D. Straight, Architect, Bennett & Straight, A.I.A.
(represented above by Mr. James A. Robertson, Chief Field Supervisor)

"I consider these schools to be our most outstanding in structural beauty, function, and durability. The Board is also pleased with the per pupil cost —far under the average for new secondary schools built in Indiana during the same year."

—Dr. Leroy W. Bingham, Past President, Gary, Ind. School Board

For the inside story of the Gary Schools, turn the page . . .

The Gary Story: two junior high schools for 2700 students ready for occupancy 41 weeks after contract award —built with USS Ambridge Coordinated Building Components

The Bailly and Beckman Junior High School buildings for Gary, Indiana, were ready for occupancy 41 weeks after the construction contract award. As a result of the AmBridge Coordinated Building Component system, erection time was reduced to a minimum and precision field assembly was assured.

Fast erection. The USS AmBridge system enabled inclusion of the structural steel framework, exterior panels, interior partitions, doors and frames, and metal roof deck in one bid. The modular steel frame and steel roof deck were completed in only one month. Erection of exterior panels was completed within 3 months. Interior panels were installed in less than four months. Had it not been for a six-week building trades strike, these dates would have been even more impressive.

Expandable and flexible. Both the Bailly and Beckman Junior High School buildings were designed for expansion. Each department can be increased physically to meet growing enrollments. Accommodations include classrooms, administration and consultation areas, eleven science labs, five art rooms, six home economics rooms, kitchens, four gymnasiums with electrically-operated partitions, two libraries, six music rooms, seven industrial arts and drafting rooms, two cafeterias with stages, and other facilities.

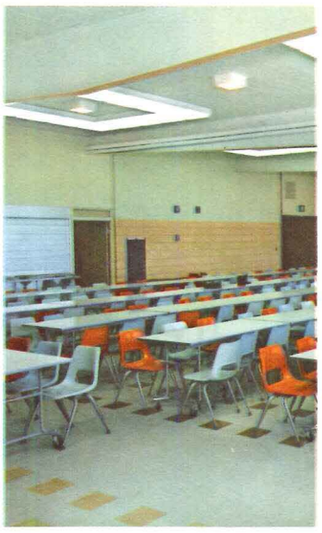
Interior steel partitions can be altered with ease (and with 100% salvage) to meet changes in curriculum and teaching methods. The AmBridge partitions have highly effective sound retarding qualities and, being clad in vinyl, are virtually damageproof.

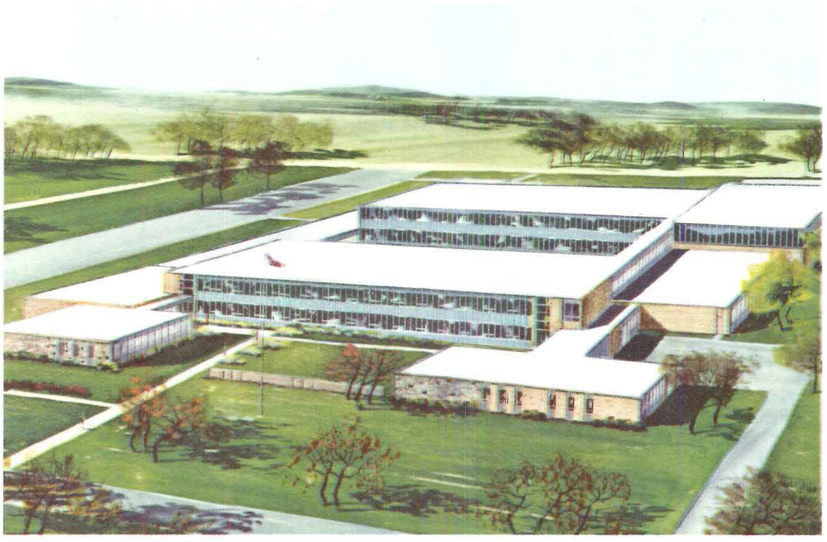
Low maintenance. The USS AmBridge exterior panels are porcelain enameled to specifications of the Porcelain Enamel Institute. Panels are kept looking like new with only occasional mild detergent cleaning. Vinyl-clad interiors are easily cleaned with just soap and water. The steel doors and panels can't shrink, warp, or crack. All components offer weathertight, verminproof, noncombustible construction. Gary school officials expect maintenance costs to be rock botttom.

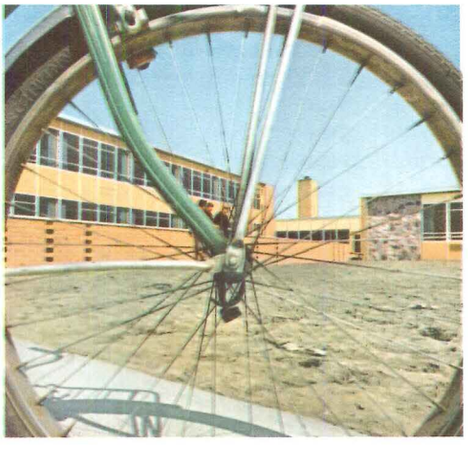
Beauty and the Best. USS AmBridge Coordinated Building Components offer the highest quality construction available, yet at modest cost (the Gary schools were built with per-square-foot and per-pupil costs well below the national average). Exterior panels offer a choice of 47 porcelain enamel exterior colors, rigidized stainless steel, and 26 interior or exterior baked enamel finishes. Only AmBridge offers eight vinyl-finished interior colors *at no extra cost*. These panels allow varied expressions of color, texture, and design, which may be combined with other building materials for striking aesthetic effects. The structural frame can be varied to fit the architect's desire, permitting folded plate or hyperbolic paraboloid structures. Fenestration can be varied to produce pleasing facade treatments. And AmBridge Components permit expansion without marring the school's original appearance, assuring perfect color match between the original building and the addition.

For more information about USS AmBridge Building Components, write American Bridge Division, Room 1831A, 525 William Penn Place, Pittsburgh, Pa. 15230.

USS and AmBridge are registered trademarks.







American Bridge
Division of
United States Steel

Atlanta Towers, 22-story, 120-unit apartment. Aeck Associates, Inc., Architects.

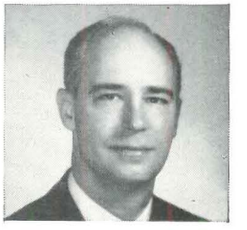
Why Atlanta Towers went total-electric... by General Electric

The new 120-unit Atlanta Towers is the latest total-electric Gold Medallion project of developer A. B. Simms, and is equipped by General Electric from its zone-electric heating and cooling units to its modern electric kitchens.

Mr. Simms gives the following reasons for building Atlanta Towers to Gold Medallion standards and selecting General Electric's equipment and program: **1. Reasonable initial investment. 2. Economical operating costs. 3. Flexibility in performing maintenance. 4. Individual room control for heating and cooling. 5. Wide range of equipment and appliances which can be included as standard equipment in each apartment. 6. Valuable electrical system design counsel. 7. Promotional support to speed rentals.**

"We feel that on the basis of economics, tenant appeal and dependability of performance, the decision to go all-electric was a sound business decision, and we are enthusiastic with the results."

Find out how General Electric's engineering and design assistance and customized promotional programs can be of service in your total-electric projects by writing: Construction Market Development Operation, General Electric Company, Appliance Park, 6-230, Louisville, Kentucky.



A. B. Simms, the developer of Atlanta Towers, is now building Bay Shore Towers in Tampa, Florida, another total-electric Gold Medallion high-rise apartment equipped by General Electric.

GENERAL ELECTRIC

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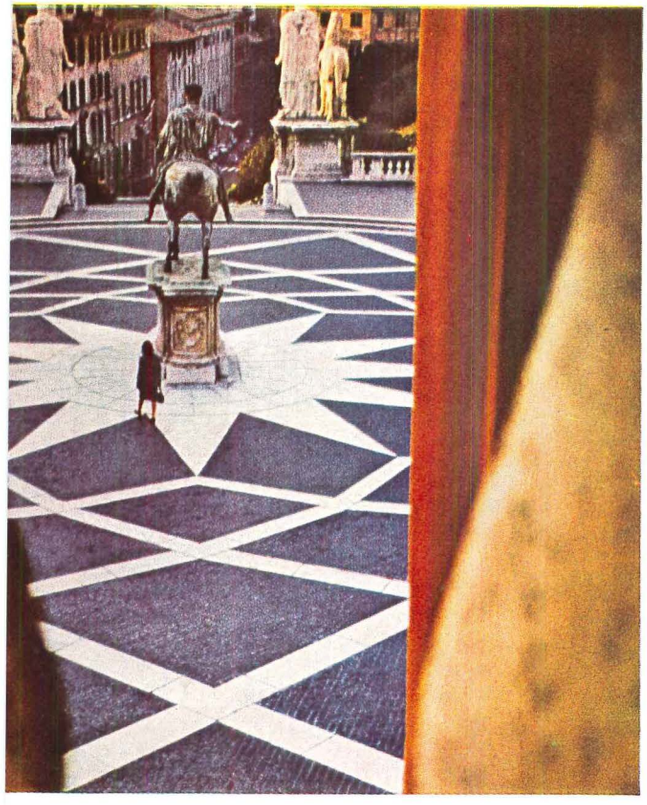
This is Amtico's flooring designer, Nancy Mayer, at Il Campidoglio in Rome.



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.

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COOLING BEAUTY FOR A POST OFFICE.....

WINDOWED SCREEN WALLS OF WHITE CEMENT CONCRETE

Facing a broad plaza, and a modern civic center beyond, the new Houston Post Office combines dignity with dramatic eye appeal.

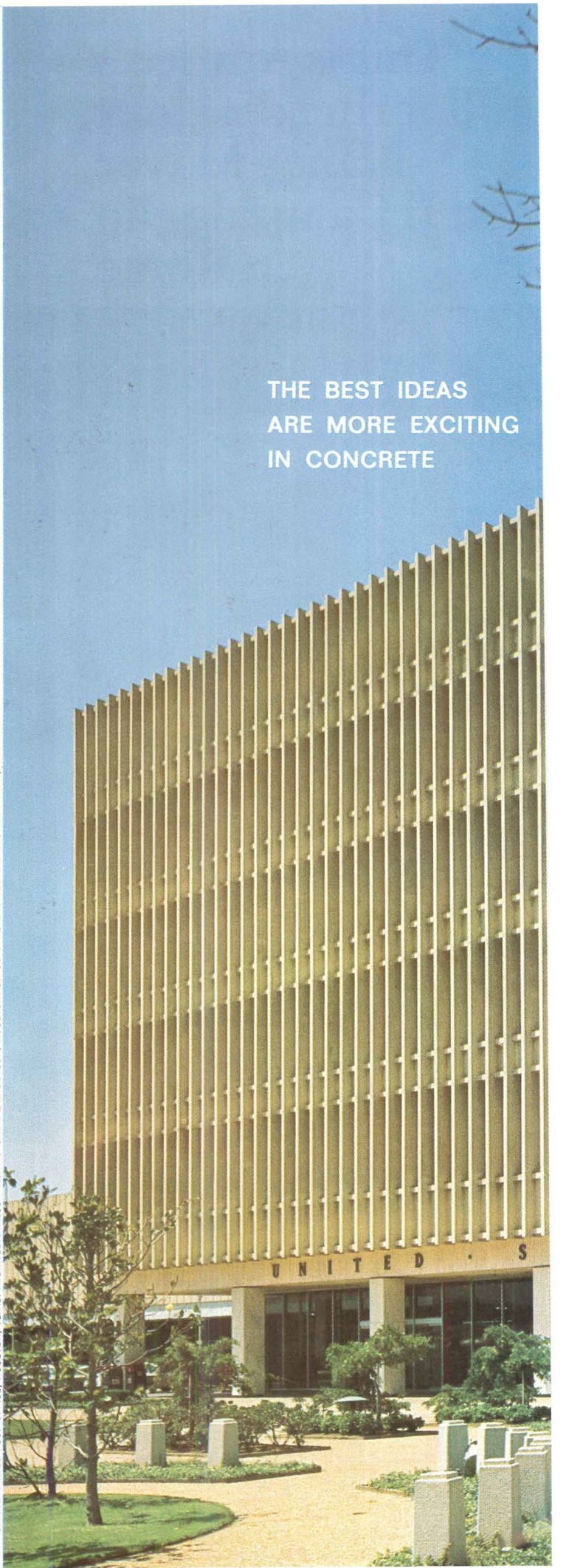
Some 880 open "windows" of precast concrete give its curtain wall panels a latticed look and form a grillwork that effectively baffles the Texas sun. Made up of fins and spandrels set 2′8″ in front of black glass panes, these screen walls are bolted directly to the structure's reinforced concrete frame. To achieve the clean, sparkling look, all the exposed concrete units were cast with white cement, accented with translucent quartz aggregate. The same surface treatment is repeated in plaza details.

Everywhere today, architects are finding that concrete's unique versatility in both form and finish provides wide-ranging freedom of expression for important structures of every style and type.

PORTLAND CEMENT ASSOCIATION

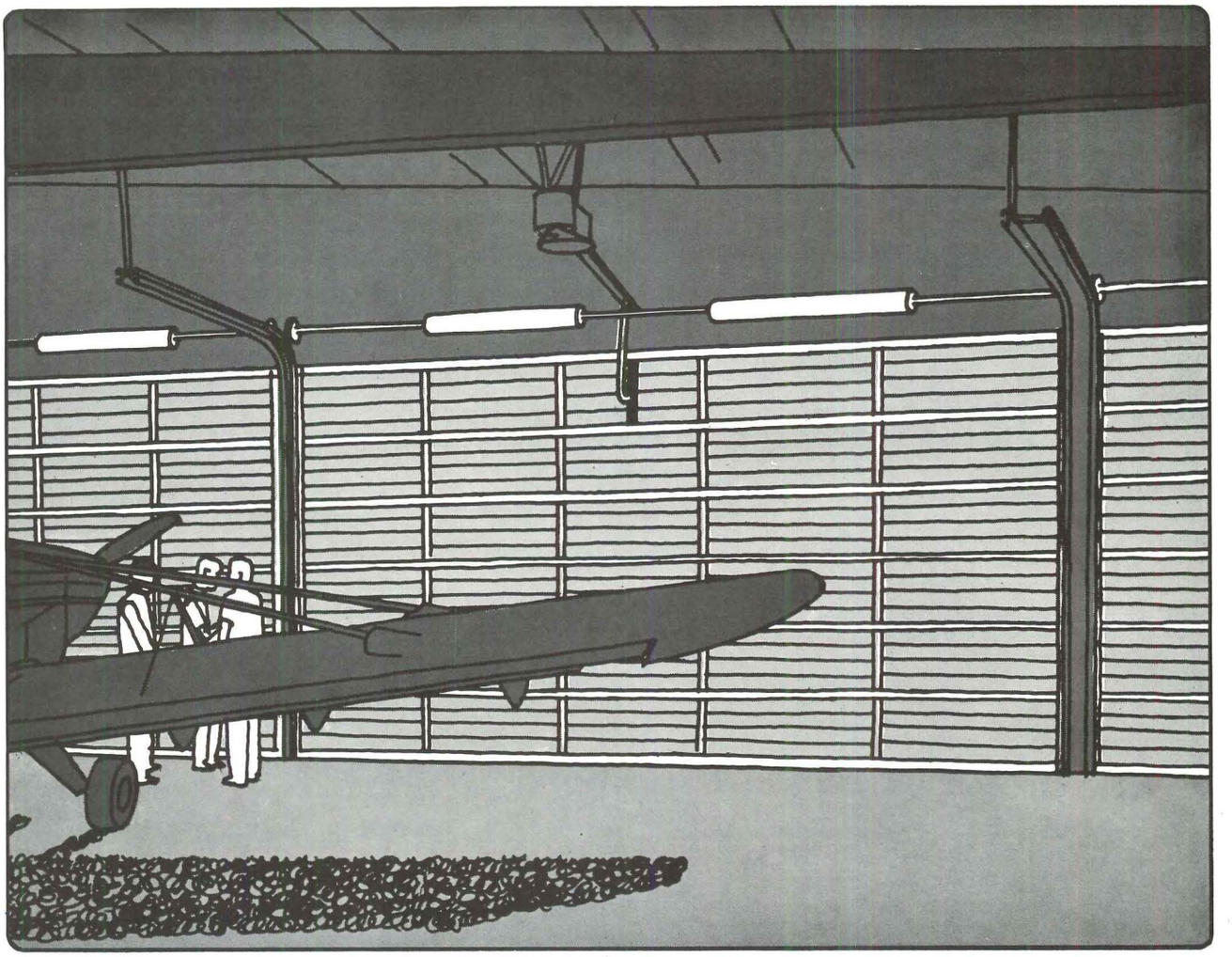
An organization to improve and extend the uses of concrete

THE BEST IDEAS ARE MORE EXCITING IN CONCRETE



UNITED STATES POST OFFICE, HOUSTON, TEXAS. ARCHITECT: WILSON MORRIS CRAIN & ANDERSON, HOUSTON. STRUCTURAL ENGINEER: WALTER P. MOORE, HOUSTON.

POST · OFFICE



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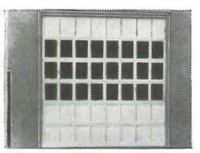
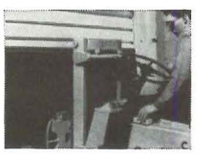
Filuma Garage Doors Are Fully Protected Under U. S. Patent Nos. 194094, 3104699

Filuma is available in residential sizes, too



Frantz also makes wood doors in all sizes



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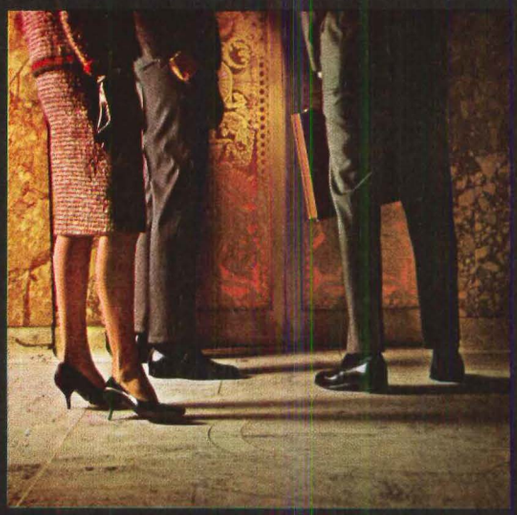

People waiting for elevators or

Elevators waiting for people?

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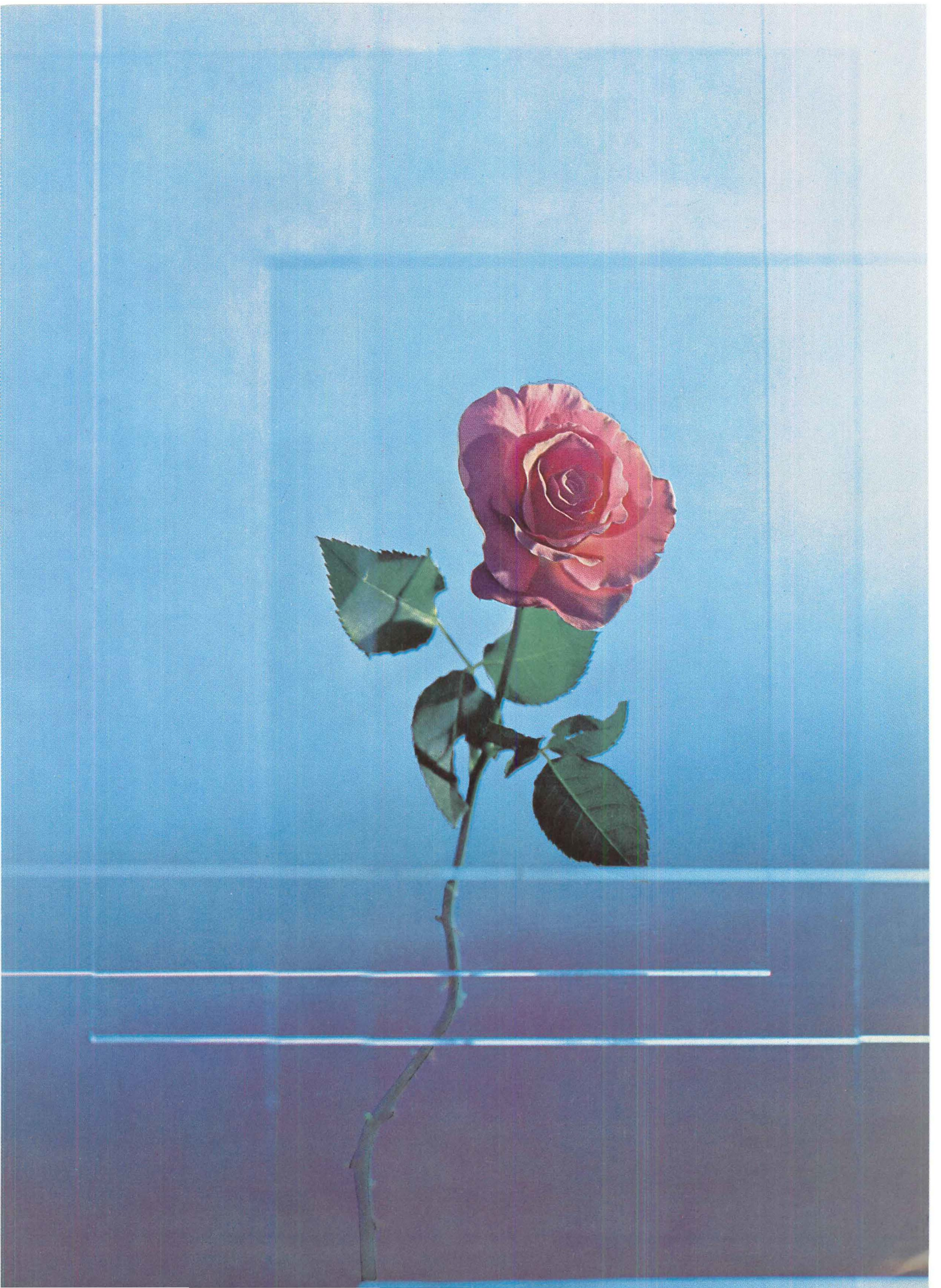

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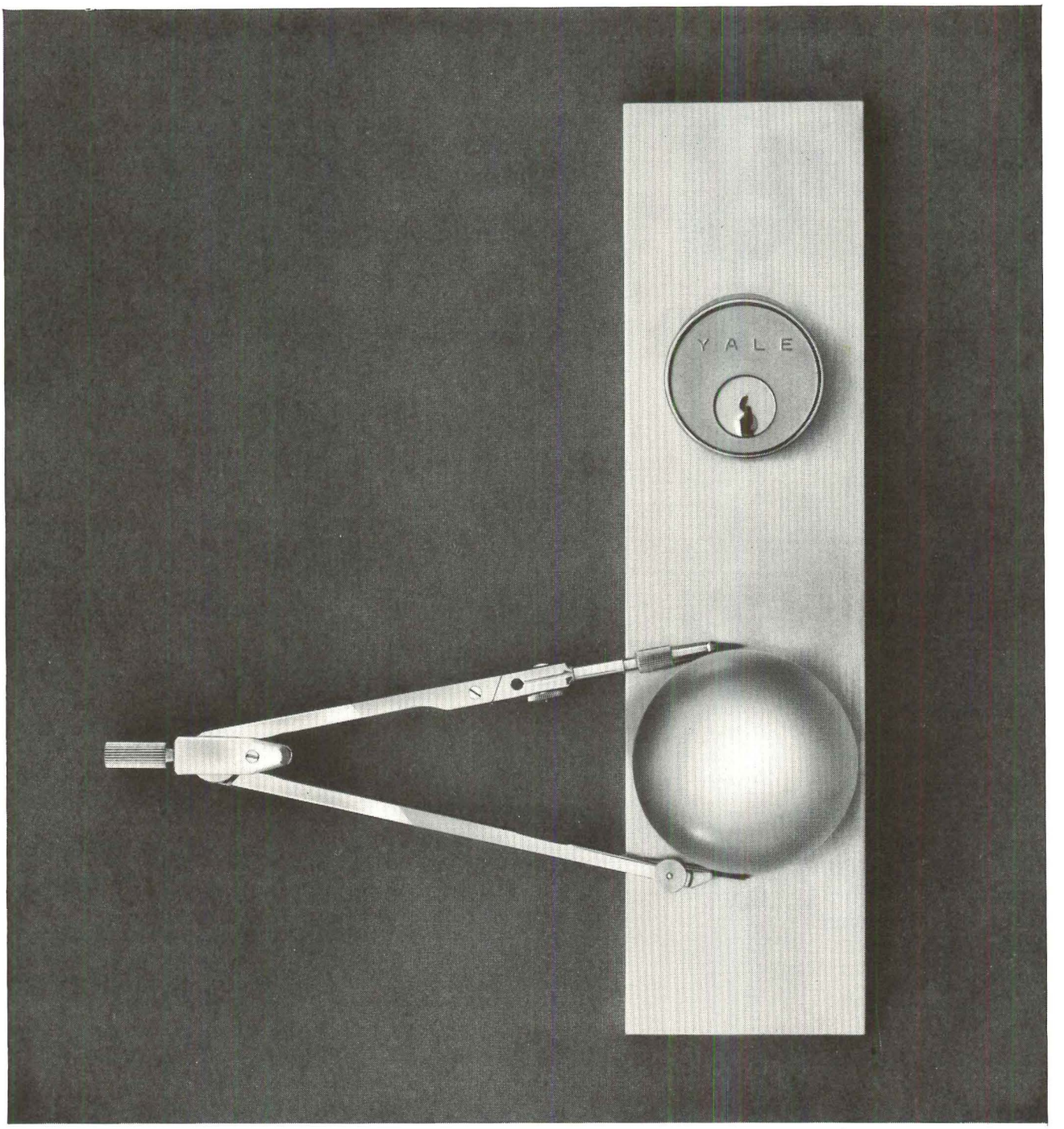

Sphere+Cylinder+Rectangle=Finlandia

The newest Yale mortise lock design, Finlandia, is a graceful fusion of geometric elements. Its knob is a perfect sphere—the essence of classical simplicity. A raised collar gives a flush profile to the rugged Yale cylinder. Clean, sharp lines of the rectangular escutcheon plate are unmarred by any visible attaching screws (inside as well as out). All parts are combined to achieve a dynamic balance for smart, modern appearance. Available in all standard finishes including stainless steel, Finlandia adds a new dimension to Yale integrity of design.

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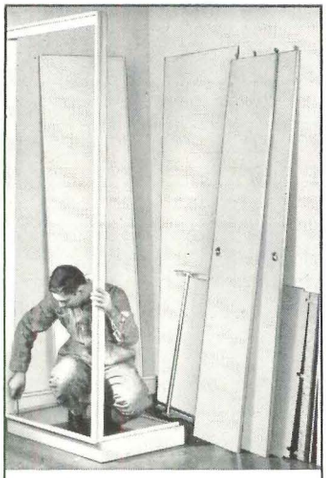
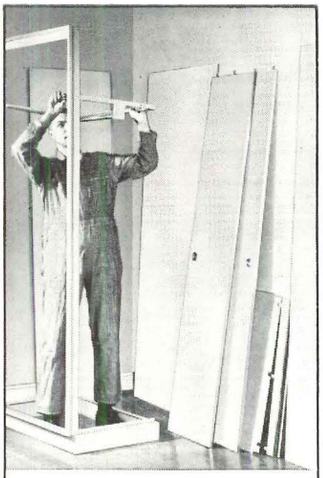
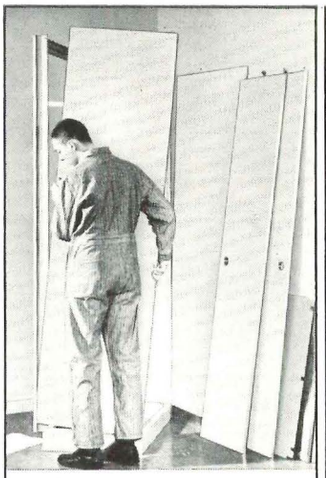


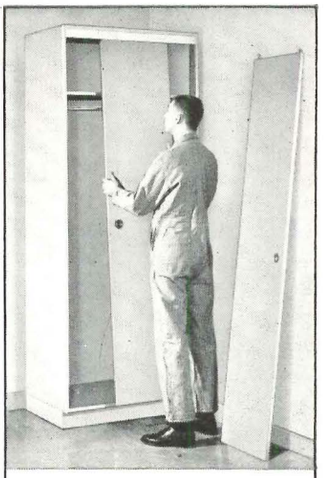
Dorm Line wardrobe goes up in 15 minutes! First step: front angle frame bolts to toe base. (Bolts are numbered for each step of the assembly operation.)



U-shaped shelf support angle, with hang rod attached, bolts to front frame. This angle supports side panels or wardrobe itself when side panels are not used.



Side panels insert into front frame; edges are routed to fit channels. Back panels (if used) slide into side panel grooves. Panels bolt to shelf support angle.



Top, shelf and bottom are inserted and bolted. Hanger brackets and doors are installed. Door guide plate attaches to floor to complete the unit.

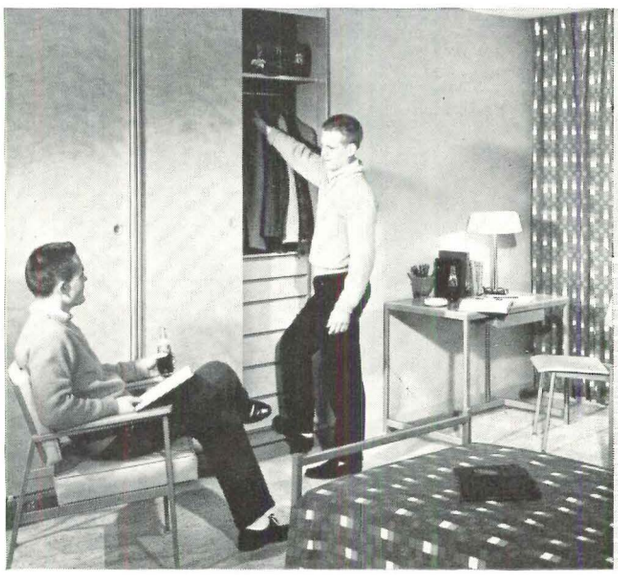
"INSTANT WARDROBES" *another flexibility feature from* DORM LINE *by* SIMMONS

Solve dormitory storage problems in minutes—the time it takes to erect Simmons Dorm Line wardrobes. Get long-range value, too. Only Dorm Line wardrobes offer welded steel frames. They won't sag or buckle...take rough treatment easily.

Even the attractive finishes are designed for durability. Choose from dent and abrasion-resistant laminate facings. Or complete your Dorm Line wardrobes with satin-gloss paints, specially formulated to withstand burns, chemicals and strong cleaning compounds.

Of course, like all Dorm Line furniture, these wardrobes fit standard or odd-shaped rooms...make the best possible use of space. So whether you're remodeling or starting fresh, see these time and money-saving wardrobes soon.

Better yet, write for the comprehensive Dorm Line brochure. Yours free and without obligation.



Dorm Line wardrobes, chests, desks and chairs create good-looking, practical rooms. Beds equipped with Beautyrest mattresses or other fine bedding made specially for dorms, complete the picture.

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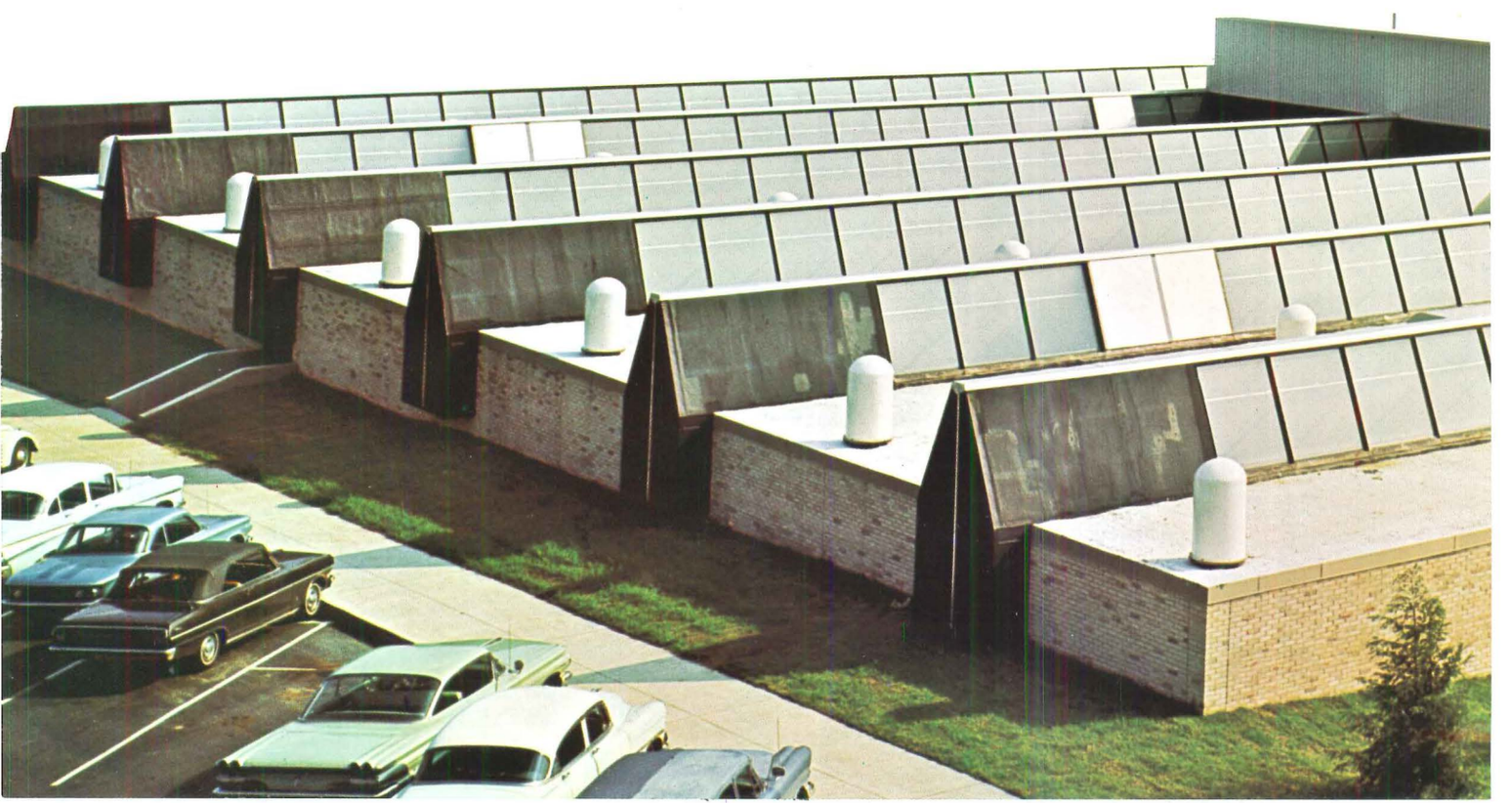
Nuweld skylights

Offices and laboratories: Edgerton, Germeshausen & Grier, Inc., Bedford, Massachusetts.

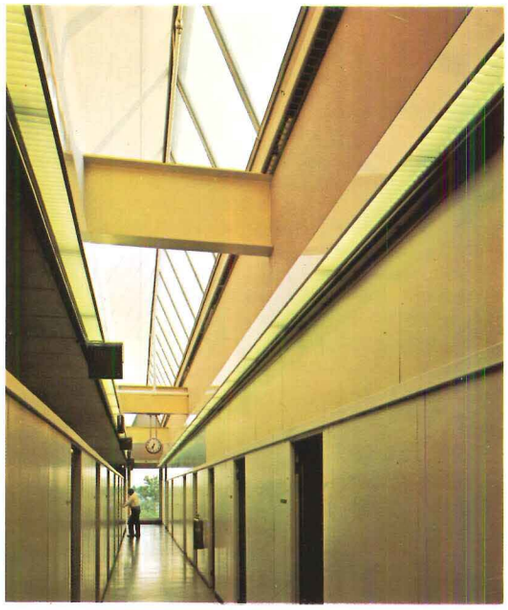
Architects: Charles Luckman Associates.

© American Saint Gobain 1964

SKYLIGHT ENDS form a dramatic series of accents across the face of the building. White panels under the Starlux plate glass windows are porcelain enameled steel. Dark band along ground level is black corrugated metal over insulation.



brighten an enclosed laboratory

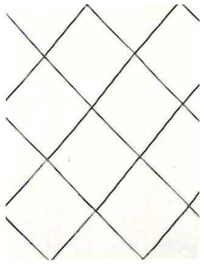


NATURAL LIGHT floods hallways traversed by Nuweld-covered skylights. Clear window at end of corridor is glazed with ASG's Starlux® twin-ground polished plate glass, and affords views of the surrounding countryside from the laboratory's hilltop site.

The skylights that run like upturned blades atop this crisply executed electronics facility play two vital roles. They help the architects—Charles Luckman Associates—to achieve their goal of creating "an awareness of light" inside an almost totally walled-in building. And, row on uniform row, they form the dominant motif of the structure's exterior design.

Glazed with 11,000 square feet of ASG's Nuweld® polished wired glass, the skylights parallel the building's 250-foot long east-west corridors. The Nuweld in the skylights admits abundant natural daylight from the north (south faces are covered with opaque roofing material), and eliminates dim interior spaces along the corridors.

On the exterior, the skylights terminate in overhanging gables hooded with black-painted cement asbestos. Set down into the wells of the corridors, the gable ends form a rhythmic counterpoint to the clean-lined simplicity of the building's facades.



To this imaginative use of skylights, Nuweld polished wired glass brings the highest degree of clarity, strength and fire-retardance. Nuweld, one of the many versatile patterned glasses by ASG, is also available with a light-diffusing hammered pattern of raised adjacent lenses, and with an obscure, moderately light-diffusing Velvex® pattern.

Your ASG distributor will be happy to show you the ASG family of Nuweld and hexagonal-pattern wired glasses. Or, for complete information on the full ASG line, write: Dept. D-9, American Saint Gobain Corporation, P. O. Box 929, Kingsport, Tennessee 37662.

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ASG
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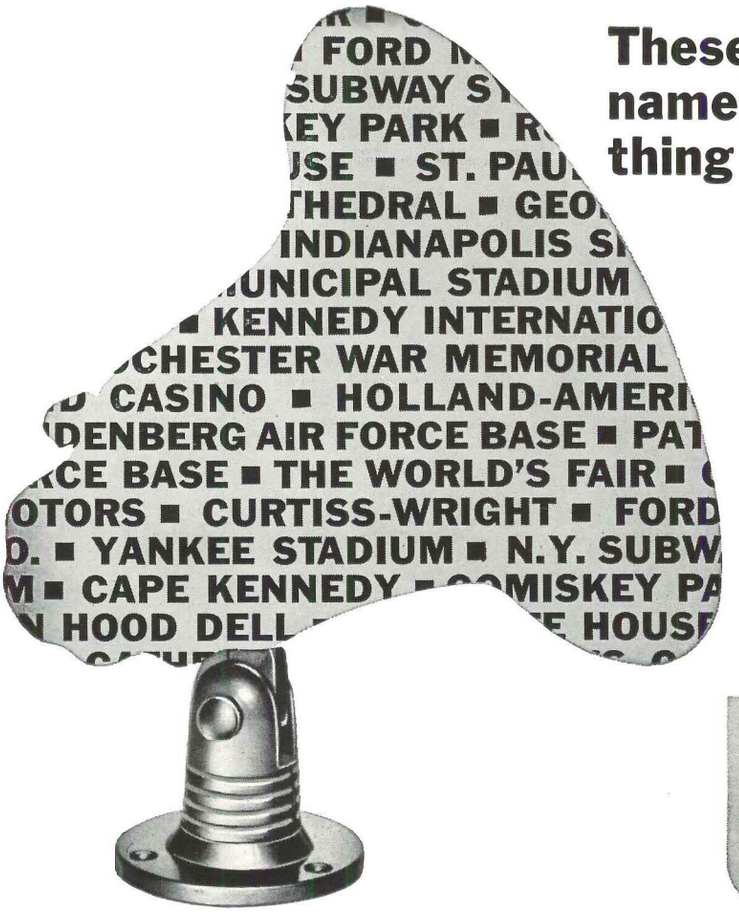

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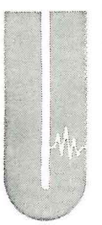
How do you choose public address loudspeakers when you are called upon for a professional recommendation? You could make tests. You could listen to a number of brands. Or, you could specify University (more University speakers are used by commercial sound specialists than all other makes combined.) Reasons: High "A" (High Audibility) design provides a degree of intelligibility that has never been matched; and the kind of dependability that caused a missionary to tell us that after five years of outdoor use—in a torrential rain region of Africa—his University speakers never failed him! And we can quote you thousands of similar reports on University Speakers used throughout the world.

FREE! 66-page Sound Planning Handbook. Price: $1.00—but free to architects and engineers. Write: Desk AR-9, LTV/University, Div. Ling-Temco-Vought, Inc., 9500 West Reno, Oklahoma City, Oklahoma.



LTV UNIVERSITY

A DIVISION OF LING-TEMCO-VOUGHT, INC.

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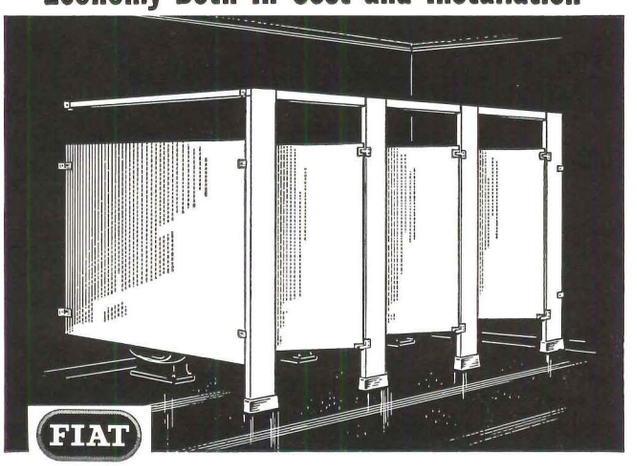
This Toilet Enclosure Design Offers Economy Both In Cost and Installation



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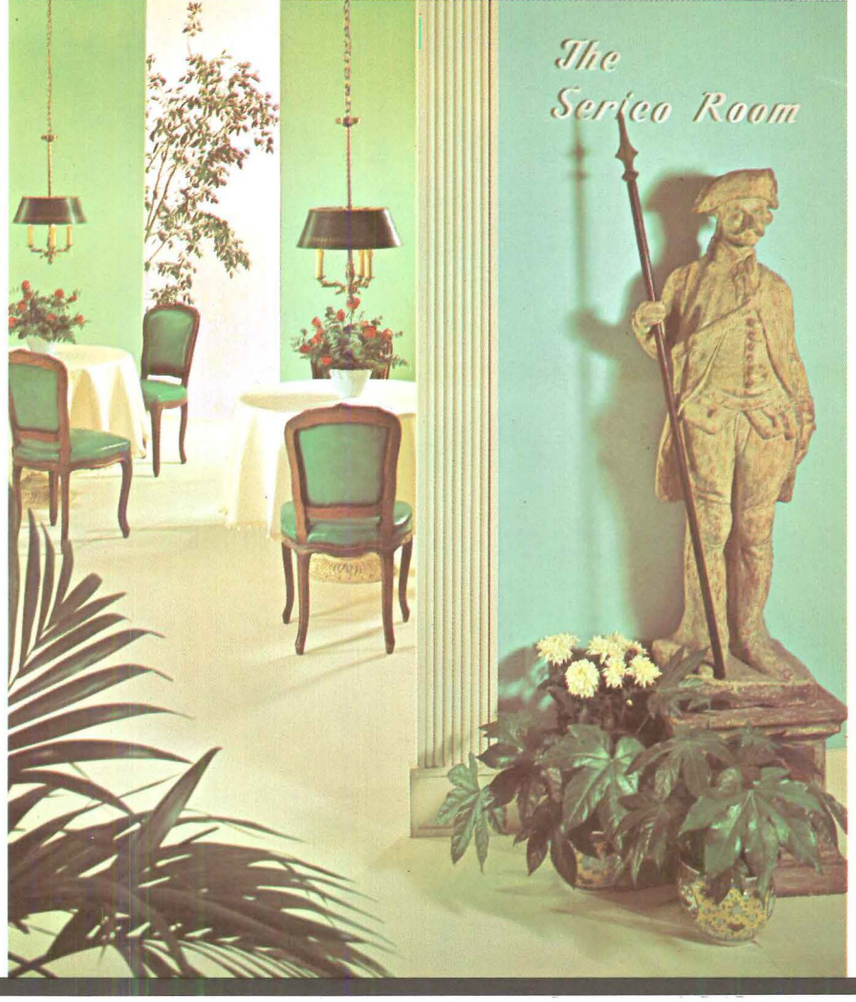

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Genuine Naugahyde
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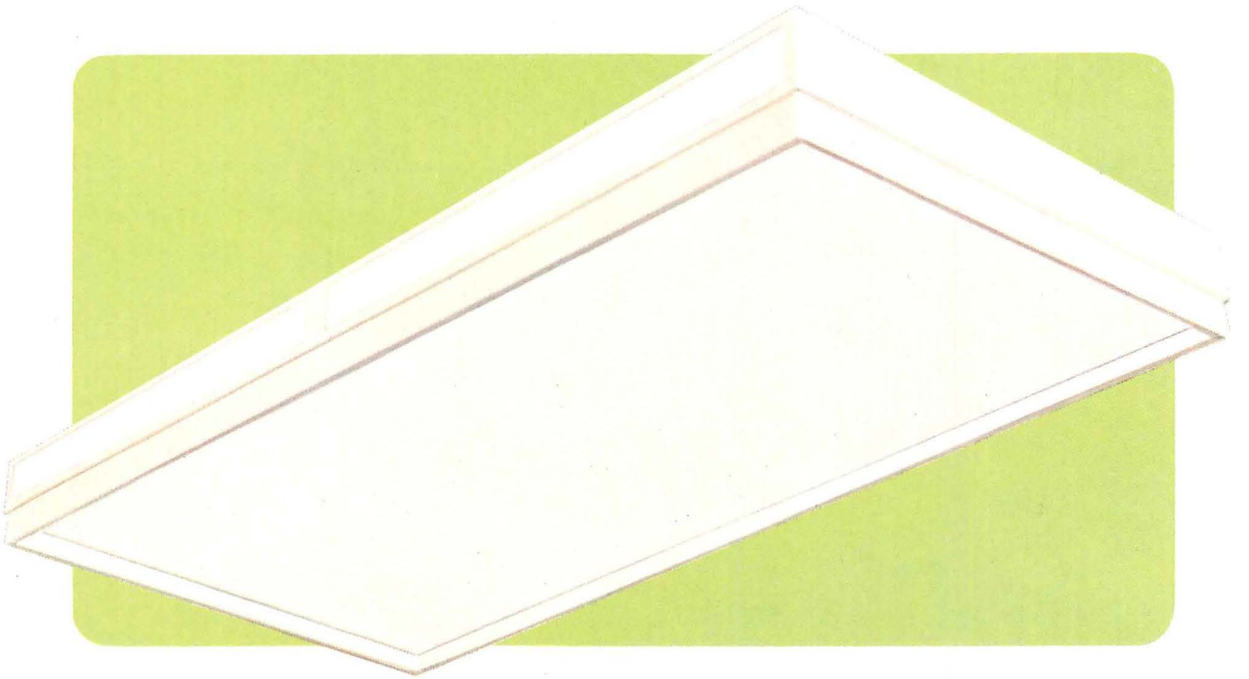

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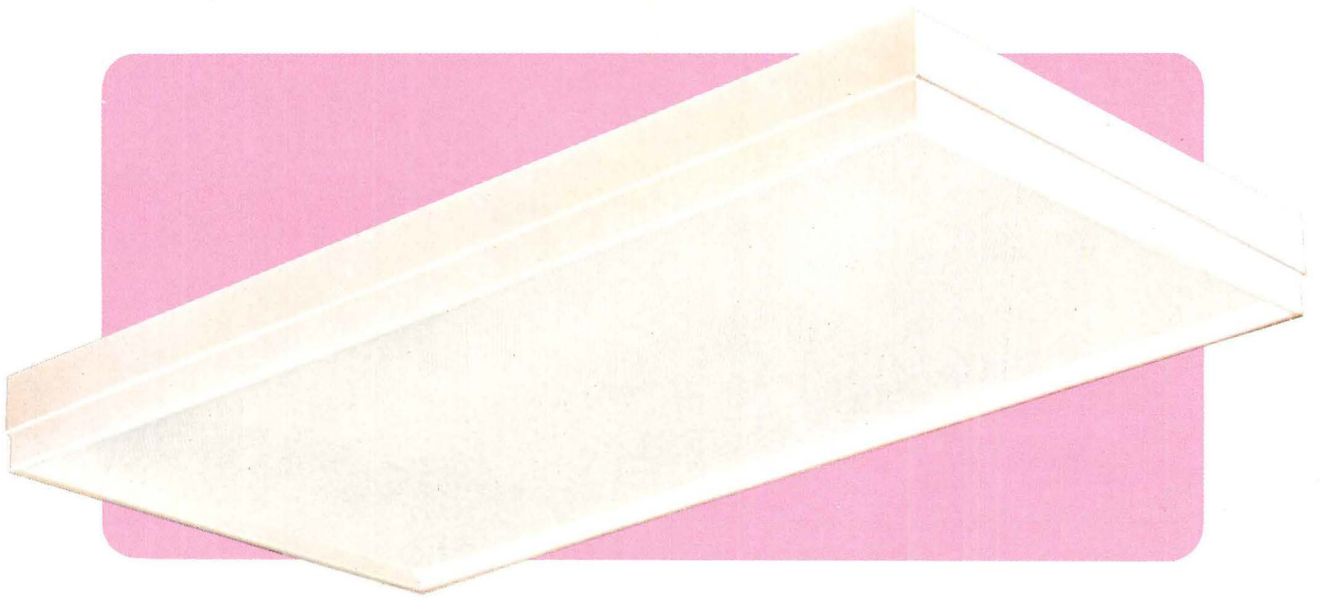

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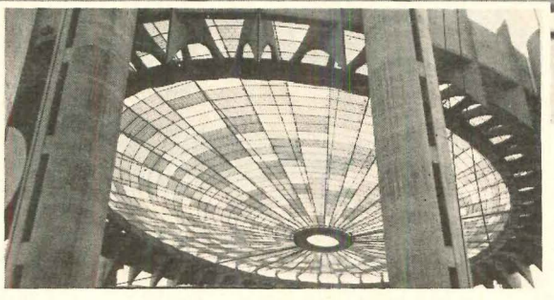

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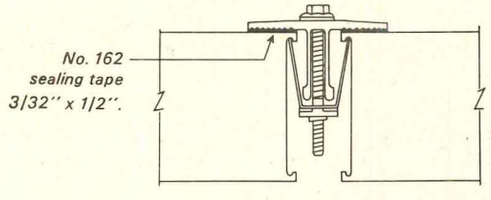

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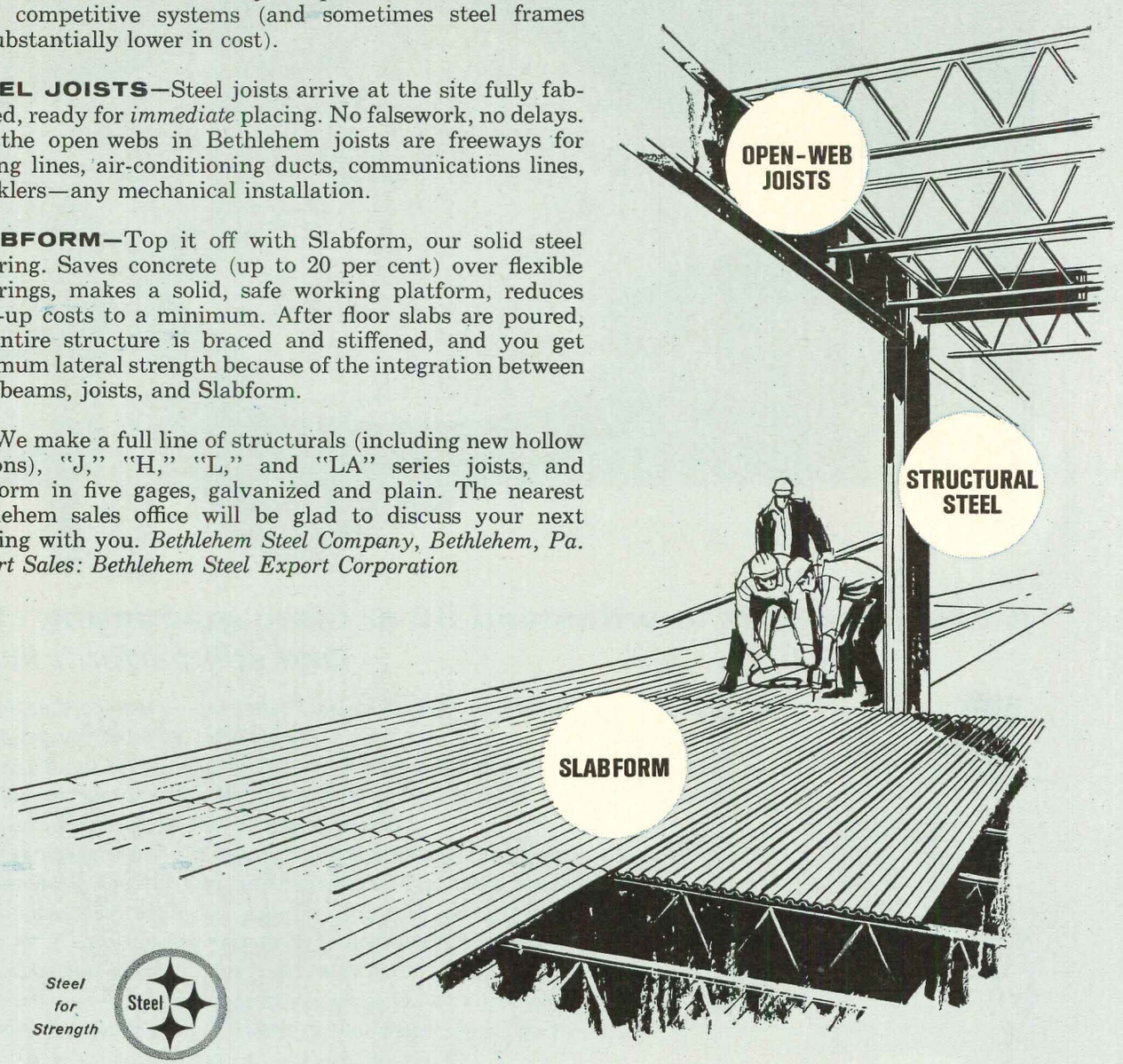

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THE FUTURE OF RESEARCH

Extracts from a paper given before the Royal Institute of British Architects. Lord Llewelyn-Davies is Professor of Architecture at University College London and Peter Cowan is Director of Architectural Research

By Richard Llewelyn-Davies and Peter Cowan

The future of research, in the context of this paper, is also the future of building and architecture. Very little has been said or written on this topic in the recent past—nothing to compare with the prophecies of the pre-war period by Gropius, Le Corbusier and Frank Lloyd Wright. Perhaps the output of prophetic texts is in inverse ratio to prosperity and activity. It is very natural, in a period like today, that most of us should concentrate on the fascinating and important tasks arising from our daily work. It is hardly possible to raise one's head to look at the future without seeming to turn aside from the present. But we need to do so. Architecture faces a very critical and challenging future which offers great opportunities, but in which we might very well fail in our duty to society. We shall not succeed unless we can envisage and debate the future and take action to meet it.

The external situation, which sets the future task for the industry and the professions, has been well stated by Doxiadis.[1] Population explosion, and even more violent growth of cities, increasing productivity, and technological revolution mean that within the professional life of a young architect qualifying this year, more building will be done than in the whole of the previous history of mankind. What is more, this fantastic volume of building will have to be mainly *designed and planned building,* whereas in the past only a tiny proportion was designed; most of it just happened. The building industry, and all the professions concerned with building, thus face an explosive expansion of responsibility and must plan to meet it.

The challenge facing our profession today is this: to bring architecture back into the main stream of this century which is, as Mies Van der Rohe has said, the stream of *Science and Technology.* Happily architects have now escaped from the false 19th-century idea that art and science are somehow opposed, and that the more we have of one, the less we have of the other. But it is one thing to accept philosophically that science and scientific thinking are an integral part of the art of architecture. It is another to accept in practice the need for scientific research as an essential part of the activities of a profession such as ours. Among architects there still exists some feeling of hostility and suspicion towards research. It is not very often voiced today, because research has become fashionable. It is, nevertheless, important for us to try to see what this feeling is based on in order to eradicate it.

The most serious reason for the somewhat slow acceptance of research by our profession arises because we have attempted to carry on, rather longer than any comparable profession, a prescientific concept of our work. We have persisted too long in believing that change, progress, development and innovation could spring from the daily practice of our work and did not require the creation of independent bodies of men, specializing, separated to some extent from the rest of the profession, and devoting themselves wholly to research. The only sure basis for any profession lies in the store of special skills and knowledge which it assembles for dealing with the particular problems assigned to it by society. Architects are today still living on the stock of traditional knowledge and skills built up by the effort of our predecessors. We are adding to this stock, bit by bit, from daily practice in the tradition of craft development. But in the scientific society of today craft processes are too slow.

The reasons why we must abandon our traditional attitude are clear, they have been argued elsewhere and have now received general acceptance in theory.[2] It remains to pass over into action.

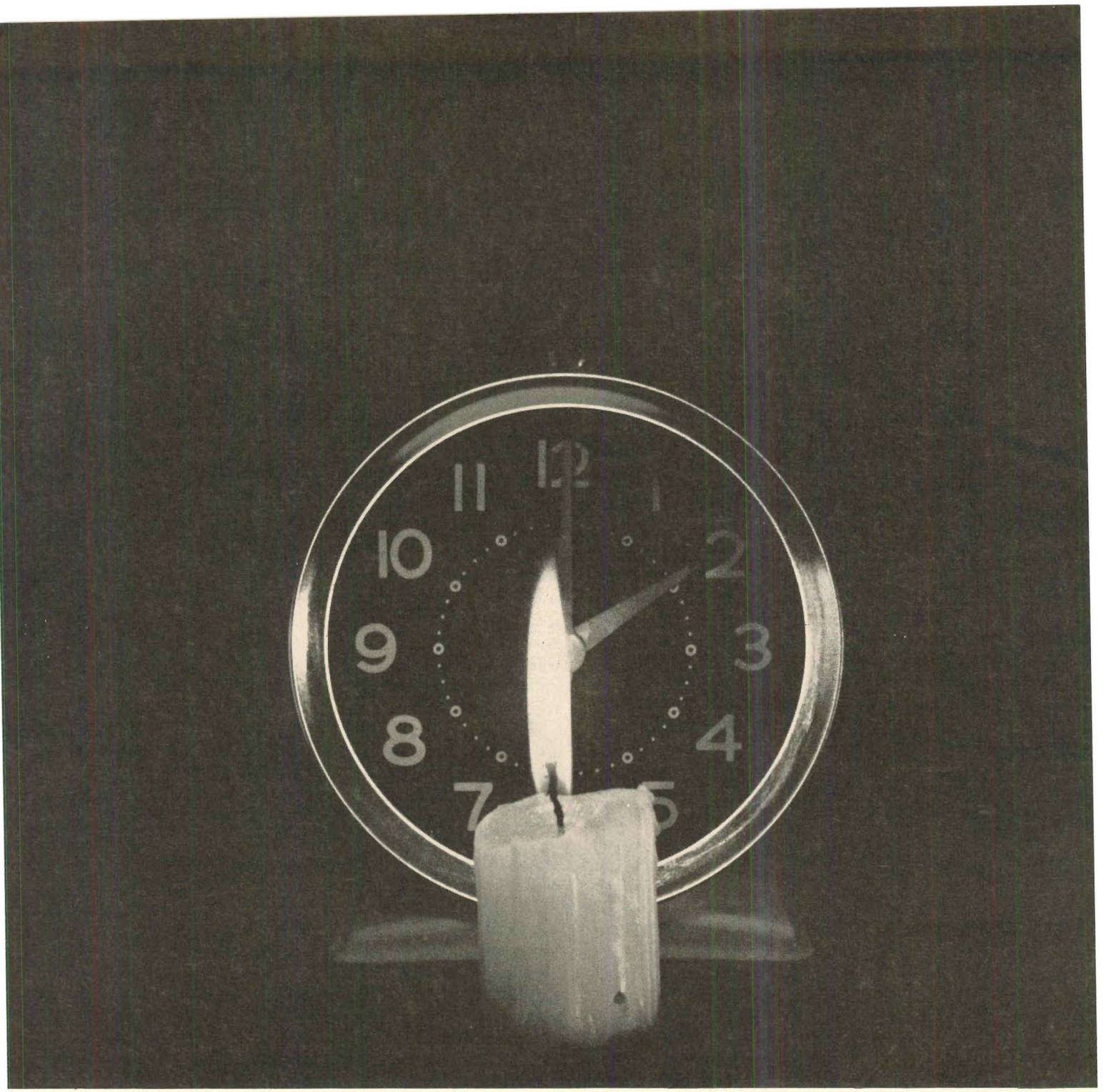
Before we can discuss what needs to be done we must look shortly at research as it is today. The present authors in a recent paper have investigated the current volume of research activity for building and architecture in terms of money and men.[3] By either reckoning, the present level of activity is ridiculously low. Further, whereas most other branches of research are expanding at a steady rate, con-

continued on page 108

[1] Doxiadis, C. A., "Architecture in Transition," Hutchinson, London, 1963

[2] Llewelyn-Davies, R., "Deeper Knowledge, Better Design," ARCHITECTURAL RECORD, New York, April 1957, pages 185-191, and Cowan, P., "Research," Journal of the Royal Institute of British Architects, Vol 68, No. 6, April 1963, page 210

[3] Llewelyn-Davies, R. and Cowan, P., "How Much Research," Journal of the Royal Institute of British Architects, Vol 70, No. 4, April 1963, page 158



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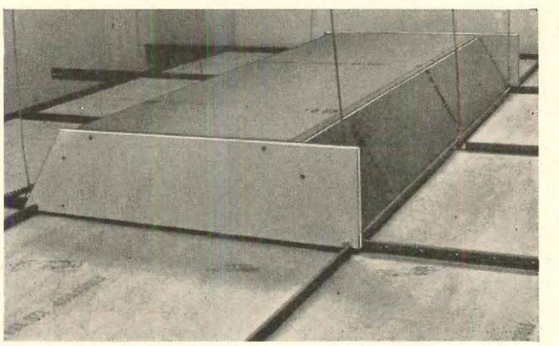

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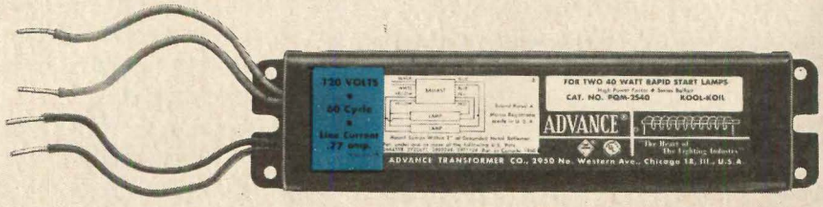

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sistent with the growth in the national income, in the field of building and architecture, research is, if anything, actually declining. Therefore, the gap between research activity in our field and that in others is increasing year by year, and day by day.

Research activity in other fields is usually discussed under a classification proposed by Zuckerman.[4] This divides research, irrespective of the topic studied, into three principal forms: *Basic Research, Applied Research* and *Development.* These terms are not always understood, and are sometimes misapplied by architects. In architecture and building we are apt to regard many forms of activity as research which are in fact not research, and would not be so regarded in other fields where there has been longer experience and greater activity. For instance, in engineering, the design of a modern, up-to-date coal-fired power station is *advanced practice.* Such a design will incorporate many new ideas quite unlike power stations of even a few years ago. The design of an atomic power station is *development work.* The study of atomic reactors is *applied research,* and atomic physics is *pure research.* If we translate this into our own terms, we might say that the design of a system of building such as "Clasp" or "Nenk" is advanced practice, that the structural experiments of Buckminster Fuller are development work, that user research, such as the Nuffield study into hospital function, is applied research, and that basic research in architecture hardly exists.

But what is basic research? By what test can we say of a particular study or project that it is basic research rather than applied or development work? There are two criteria by which basic research can be identified. One, and the most important, is that every piece of basic research stands on the shoulders of preceding work and supports the work that follows. It forms part of a continuous series and each bit of it relates to what has gone before or what comes afterwards. If basic research is the trunk of a tree, then applied research and development are branches. From time to time pure research throws up a new idea. This has to be translated from a research result into something that can be used in daily life. At this point applied research and development work begin.

The second criterion which can be used to identify a basic study is a curiously paradoxical one. Basic study is essentially narrow in focus, it is usually carried on by men who have specialized in a narrow branch of their subject, to which they consecrate their lives. But, and this is where the paradox comes in, a successful piece of basic research, though on a very narrow front, may have immensely wide repercussions in practice. Let us give an example. Today, a small proportion are born with inherited mental defect. We have to solve the problem of looking after, housing and educating a certain number of mentally deficient members of our population. A great volume of applied research by people from a wide range of disciplines is going on into this problem. But, while this work goes on, in University College, London, Lionel Penrose has been engaged on a research project concerned with chromosomes, which are the basis of human genetics. He has made discoveries which have pointed to the mechanism by which one type of mental deficiency is transmitted by one generation to the next. His work will lead in the fullness of time to the reduction and perhaps elimination of this particular sector of the problem. Penrose's work will not only have an effect on the problem of mental defect, but it will have far-reaching effects on the whole range of human ills which are genetically influenced. Here is a very vivid example of the nature of pure research.

Of course, basic research is no substitute for, nor is it in any way better than, applied research and development work. We cannot do without one any more than we can do without the other. Without basic research we should not make the essential progress we need; we should not reach radical solutions to our problems. But without applied research and development work we should never be able to use the results of basic research. It must also be remembered that vital as it is basic, research is comparatively cheap. A handful of scientists made the basic discovery of nuclear fission. Tens of thousands of men and millions of pounds were needed to apply and develop this discovery into atomic bombs and atomic power.

The question of what research work is most needed can be discussed either in terms of the topics on which research should be directed, or in terms of *basic research, applied research* and *development.* So far it has generally been discussed in relation to topics. It has been said, for instance, that research should concentrate upon housing, university buildings, prefabrication or some other topic seen as of immediate urgency. There should, of course, be some selection of priorities in research, and questions of immediate national urgency should be tackled first. But it will be a fatal mistake for our profession and for the building industry if at this point in time we consider the immediate questions as the only ones.

To make a satisfactory plan for the future we must consider the problem, not in terms of the topics for research, which will be many and varied, but under the headings of *basic work, applied research* and *development* which have already been described and explained in this paper. Unless we do so, we shall not succeed in ensuring the necessary groundwork of basic study from which practical applications have to derive. We should condemn ourselves

[4] Office of the Minister for Science, "Report of the Committee on the Management and Control of Research and Development," Her Majesty's Stationery Office, London, 1962, paras. 17-18, pages 6-8

over the next half-century to developing more and more refined methods for using out-of-date materials and more and more refined methods of planning for functions which society no longer requires. Further, although there may be an immediate attraction in devoting the whole of such limited resources in men and money as may be available to crash programs of research into immediately important matters, before very long such a policy would prove itself wasteful. The reason for this is that applied research and development, while it may solve the problem to which it is directed, does not produce any by-products of knowledge available over a wider field. Applied work is intrinsically expensive and usually involves a considerable number of men and a large amount of money. It must always be justified in relation to its immediate requirements and the immediate advantage of solving a particular problem. It is unlikely to yield material which will be of value in solving other problems, outside the topic directly under attack.

Need for Unified Research Program

In one sense it is true to say that there is no such thing as basic research in architecture. Architecture is not a subject like physics, chemistry, history or economics. It is a practice, or an art, like medicine. The practice of architecture rests upon the use of knowledge provided by a rather wide range of fundamental subjects on which architecture depends. These subjects include physics and chemistry, engineering science, social sciences, economics and history. It is from these that the fabric of architectural knowledge must be built up. Therefore, most of the fundamental research which will contribute to architecture will not be carried out by architects, and may not even have as its original object any definite contribution to our problems. But it is, nonetheless, important to us that this work should proceed. Fundamental studies of the type which may yield revolutionary results affecting our work must be supported and assisted.

It is impossible to list all the fields in which scientific research might revolutionize our work. But one or two may be worth quoting. First, building materials. The chemical and petro-chemical industries are today capable of producing materials with almost any specified combination of properties. Not very long ago a new material was needed to survive the conditions which would obtain on the nose cone of a rocket; this material was in due course produced. It has had many other applications and many people will be familiar with it in the form of a frying pan in which you can cook without using fat. But no one has yet posed this kind of challenge to industry from the point of view of the future problems of building.

Still more important is the contribution which could be made from basic studies in social sciences, including geography and economics, to the problem of what is needed in human settlements, in our cities and in our buildings. It will not be sufficient to tackle these questions as purely a piece of applied research. We will also need to promote the development of fundamental geographic, economic and sociological studies which are going to provide the methodology, trained manpower and basic ideas for the planning and designing of future settlements.

Some, although far too little, applied research is already in progress, but more is badly needed. The most urgent necessity of all is to see established a vigorous applied research into the problems of city growth and change. We have now belatedly become aware of the direction the present forces for change and development in our cities are leading us. We are also beginning to see how the town planning legislation which we adopted so hopefully shortly after the war is failing in its objectives. It seems probable that in Britain, and in many other countries, there will be a strong will to do something really creative with our future cities, but this "will" could be frustrated if we are forced to act on the basis of our present very limited knowledge of the realities which govern the pattern by which our towns and cities grow and change. It is, therefore, of the greatest importance that serious, systematic studies into the past and present state of our cities and the economic and social forces which are molding them, should be undertaken immediately. This applied research will be an expensive affair. It needs substantial teams properly equipped, with facilities to collect information by surveys and to process data through electronic equipment, if it is going to give us the sort of material we need.

Lastly we come to development. Development is in other industries very closely linked with production. In the aircraft industry, in the design of power stations, in shipping, development work is primarily in the hands of the firms engaged in production and does not fall upon the shoulders of the purchaser or user of the product. In our field, up to the present, development work has generally been carried out by the user rather than by the producer. We must expect this to change. As building becomes industrialized we must expect to see a shift of development work from the user to the producer. It is properly placed on the production side because so much of development consists in exploring the methods and materials available for the realization of the design and ensuring that the best, most efficient, satisfactory and economical are chosen. Development work will probably be comparatively easy to promote and finance. In those fields where competition obtains, industry engages in development in order to keep up with competitors. In other areas, where the com-

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petitive element may be absent, development contracts are the accepted method by which the purchasing body, whether it be government or local authority or even a private concern, can ensure that effective development takes place.

Is there any field of pure architectural research which could be carried on mainly by architects and would be concerned to build up some basic body of knowledge and methodology, purely related to our own subject? Up to comparatively recently, the present authors have doubted the existence of any such branch of knowledge. We have tended to the view that architecture is essentially a synthetic subject and that its basic intellectual structure is an amalgam or synthesis of a number of other subjects rather than something in its own right. But we have recently modified our view. We now believe that, while most of the knowledge and research which is needed for architecture and building is fed in from other fields, there is, nevertheless, one exceedingly important field in which pure architectural studies are possible—indeed not merely possible, but urgently needed. We have reached this view as a result of studies in which we have become involved at University College. These studies are concerned with growth and change of buildings, and groups of buildings, that is to say, towns and cities. We have been concerned to look at a building as something which exists in time as well as in space, as the outcome of certain social pressures and social requirements; to look at the growth, consolidation, decline and decay of buildings as a function of historical and social change. Such studies open up new fields for architectural research. The goal will be the discovery of some consistent patterns, connecting and explaining the observed phenomena of building. If success is achieved, the practical outcome will be considerable and fundamental. It may enable us to make useful predictions of building need, both quantitative and qualitative, without which all planning is bound to fail, as it has in the past.

It is generally accepted that new forms of organization will be needed if research is to be expanded to the extent that is urgently necessary. Various ad hoc proposals have been put forward and some of these are valuable, but so far there has been no attempt to suggest a comprehensive plan of action. A comprehensive plan is necessary and should be our immediate concern. The present structure of research organization in Britain can be briefly summarized as follows: the Minister of Science is responsible at cabinet level for the promotion of research. He discharges this responsibility through three principal agencies—the Medical Research Council, the Agricultural Research Council and the Department of Scientific and Industrial Research. While the D.S.I.R. deals with many different sectors of the national life and many different industries, the M.R.C. and the A.R.C. have each a single, defined field of interest. They review the problems of medicine and agriculture and plan ahead to meet them by research. They are free to support research in many different ways. They give grants and fellowships to universities, they set up research units within universities and they also establish, when necessary, research institutions of their own. As a result dramatic successes have been achieved. Progress of British medicine has been rapid, in great part as a result of the research promoted by the Medical Research Council. British agriculture is possibly the most efficient and scientifically advanced in the world, again largely thanks to research. Today no such body is charged with the responsibility of promoting similar studies for the benefit of building and architecture.

As a nation we cannot afford to fail, at this moment in time, to come to grips with the total problem of architecture and planning—the problem of the man made environment—in which future generations will live. The only way we can hope to succeed is by the immediate establishment of a new Research Council for the study of the built environment, which will plan and sponsor research into architecture, planning and building. This council should be modeled on the successful examples before us, the Medical Research Council and the Agricultural Research Council.

But if we are successful in establishing this new research council, we architects shall have a great deal to do to set our own house in order. If research gets the impetus it needs from a new Research Council, will our profession be able to meet the challenge? This will depend on the schools of architecture and particularly on those in universities. Architecture now stands at a historic turning point. Up to today we have been able to base our professional progress on the experience of practice—from tomorrow we must base it on organized research.

Medicine faced this change about 50 years ago, when Abraham Flexner wrote his historic reports on medical education in the United States. Led by Flexner, the medical profession revolutionized its concept of the role of the medical schools in relation to medical practice. Before Flexner the schools of medicine were little more than a systematized version of apprenticeship—with students learning the craft from successful practitioners acting as part-time teachers, just as in so many architectural schools today. As such, they were unable to do more than transmit the lessons of practice from one generation to the next. Now they are changing into something very different—into centers of research and basic education. We must, therefore, now consider how to transform our schools of architecture into centers of research, which can take over the torch of architectural progress, and ensure that future generations get the cities, villages and homes that they have every right to expect.

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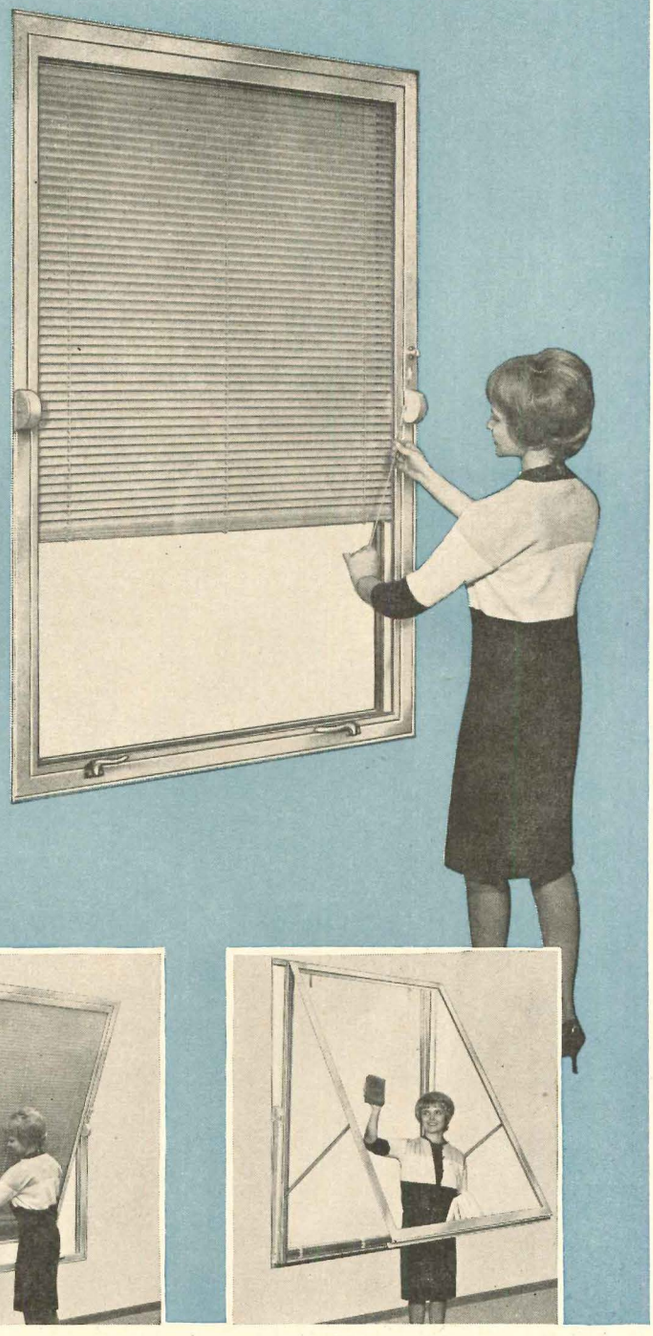

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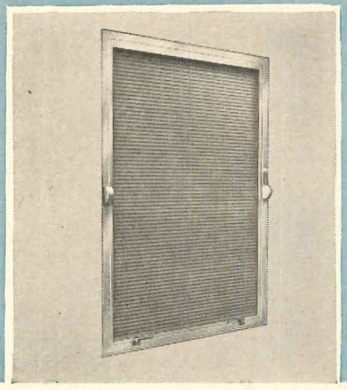

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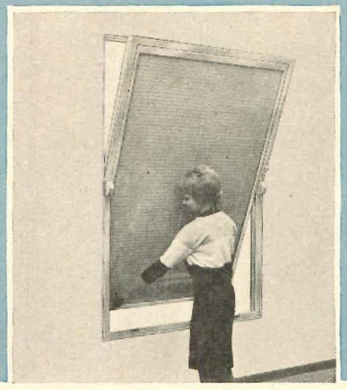

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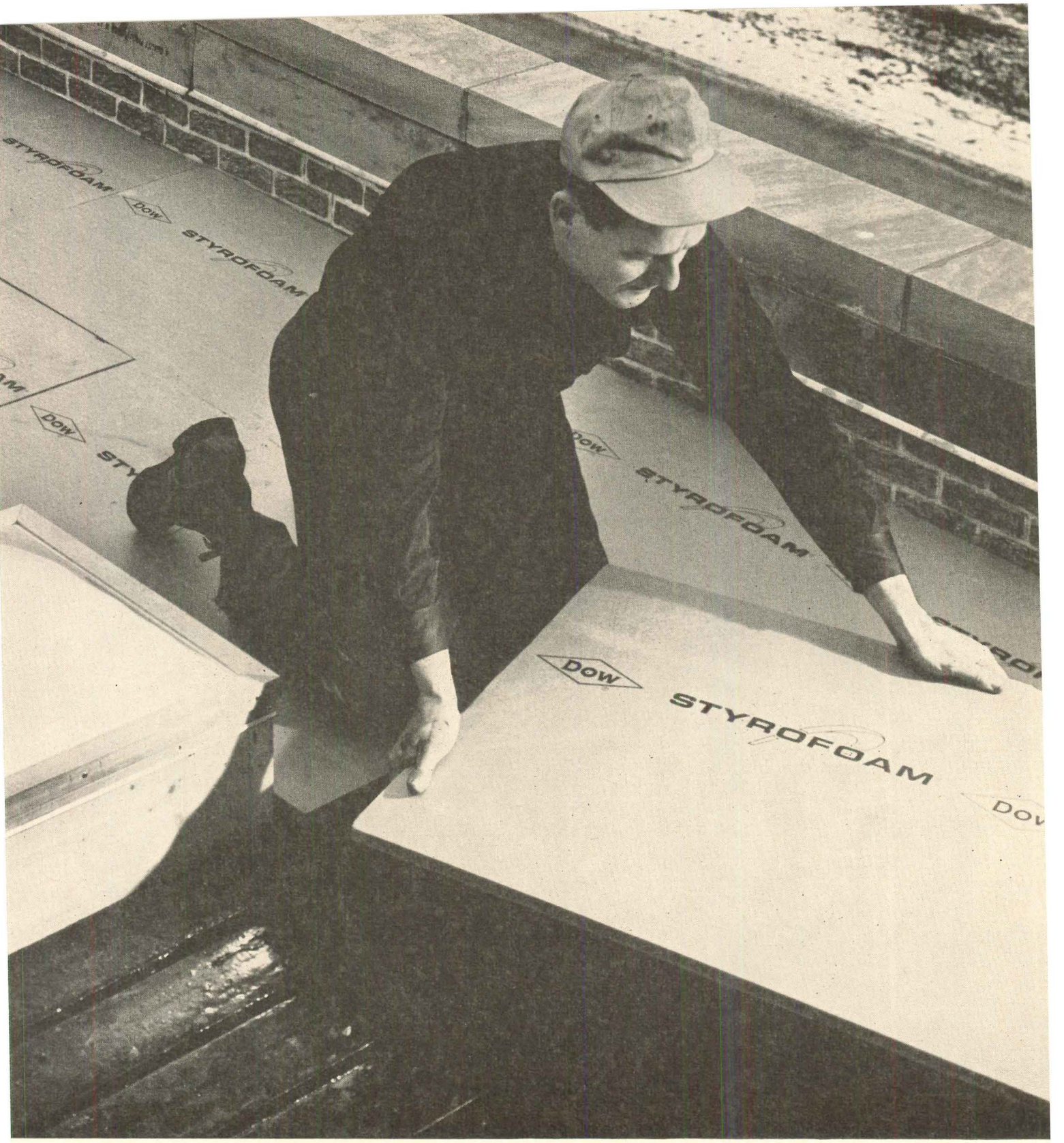

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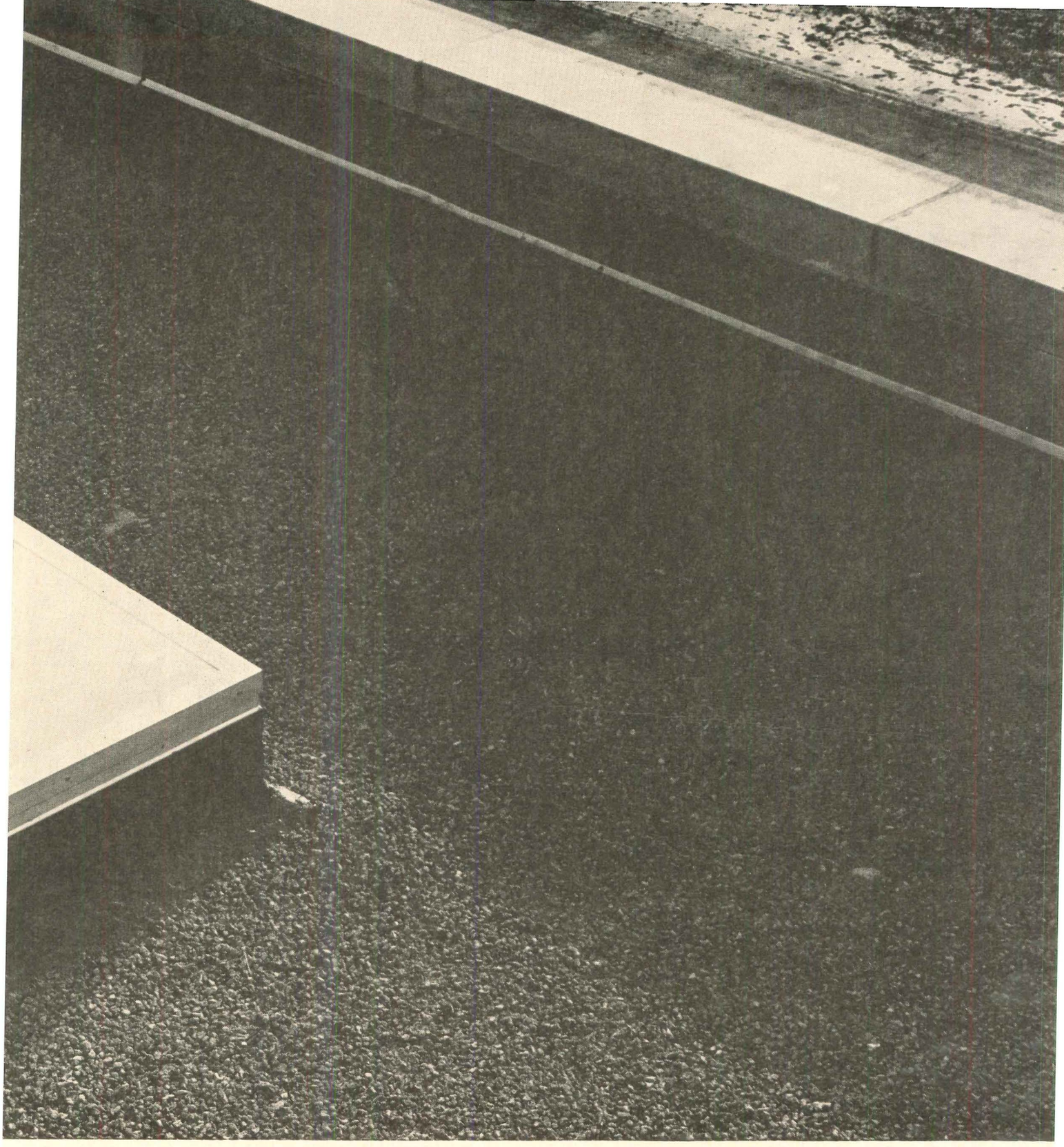

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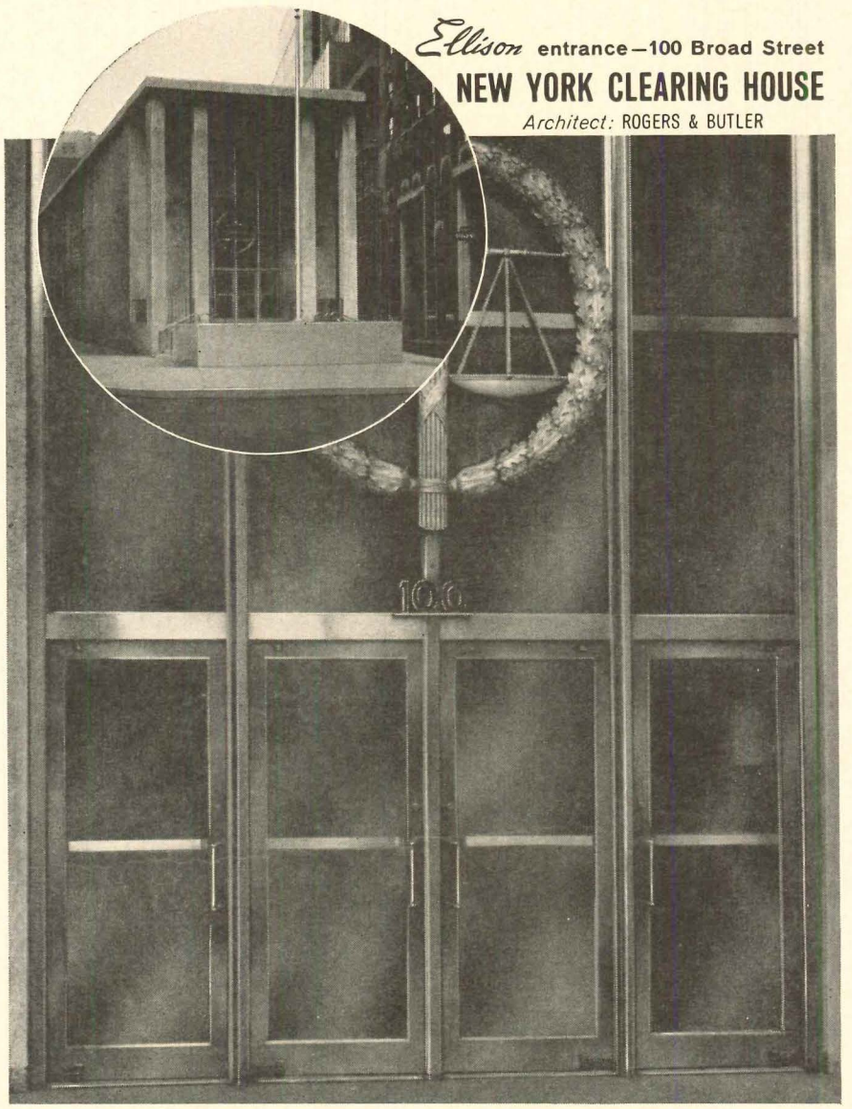

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Required Reading

continued from page 61

of wood, metal and plastic equipment; environmental control; and human mechanics in relation to equipment. The place of school library facilities in the new curricula was among the subjects of panel discussions.

PROBLEMS IN PLANNING LIBRARY FACILITIES (*Consultants, Architects, Plans and Critiques*). *Proceedings of the Library Buildings Institute conducted at Chicago July 12-13, 1963. Edited by William A. Katz and Roderick G. Swartz. American Library Association, Publishing Department, 50 East Huron St., Chicago, Ill. $4.25.*

The 1963 Library Buildings Institute sponsored by the Library Administration Division of the American Library Association prior to the A.L.A. general conference offered sessions on the library building consultant, college and university libraries, public libraries, school libraries and (for the first time at an A.L.A. Institute) Hospital and Institution Libraries.

The published Proceedings present the formal papers and panel discussions on topics ranging from programing and the role of the architect to such special problems as library planning for correctional institutions and the "physically limited." Presentations (with plans) of 21 libraries are included.

Churches

THE GREATER ANGLO-SAXON CHURCHES. *By E. A. Fisher. Faber and Faber Limited. Published in America by Taplinger Publishing Co., Inc., 119 West 57th Street, New York 19, N.Y. 452 pp. illus. $35.00.*

Although a good deal has already been written on Anglo-Saxon art and architecture, most of the published material is in the form of papers in archaeological journals, which give detailed descriptions of individual monuments. Many of these journals are out of print and difficult to obtain. E. A. Fisher has collated the in-

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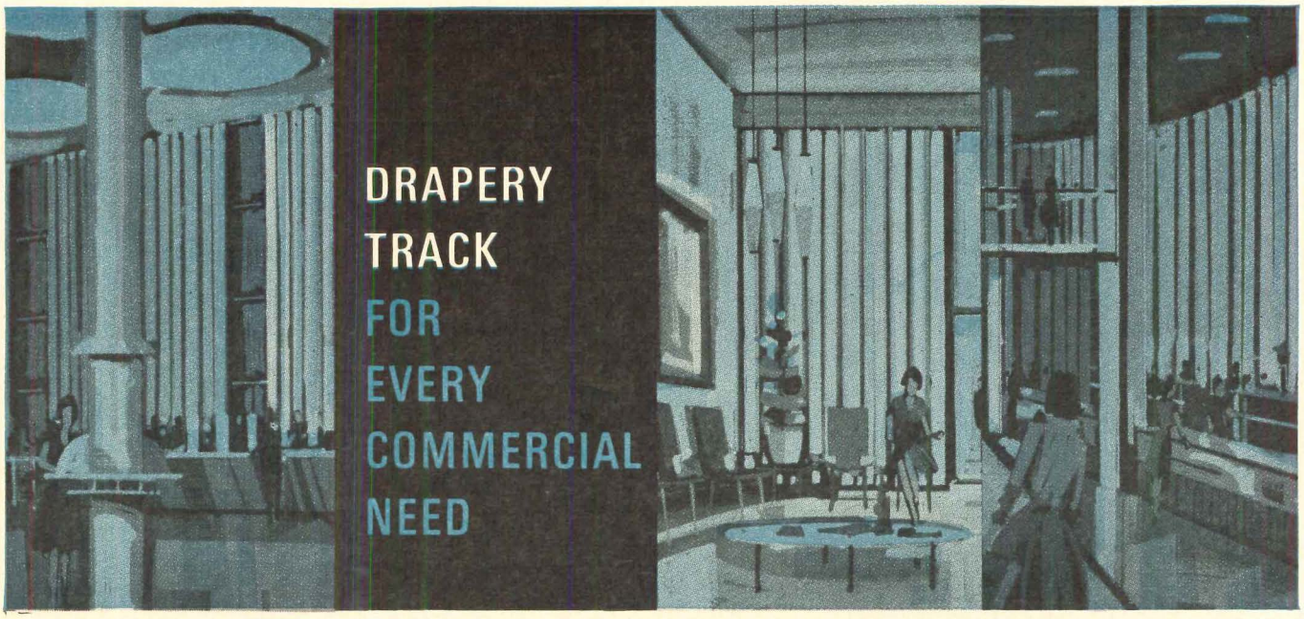

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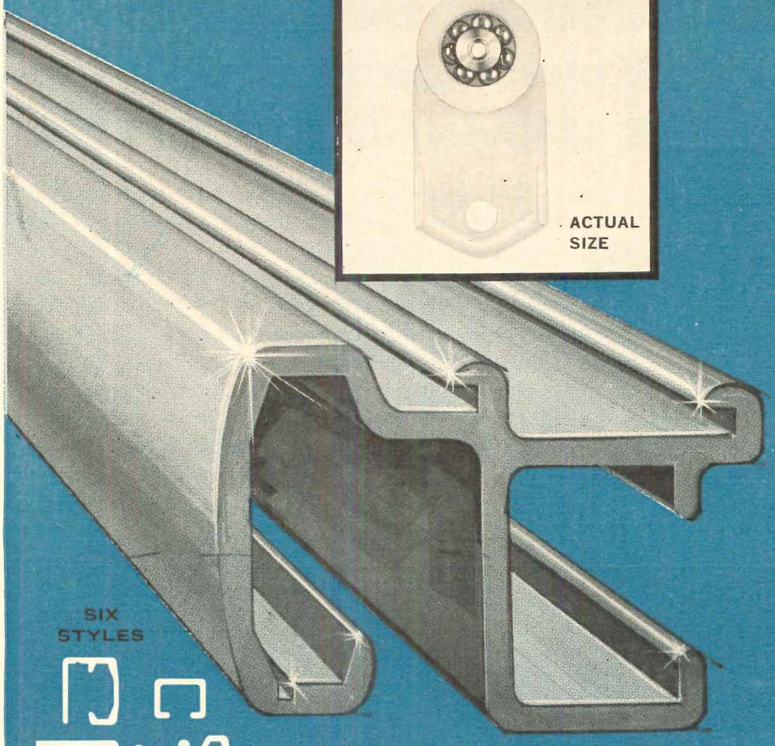

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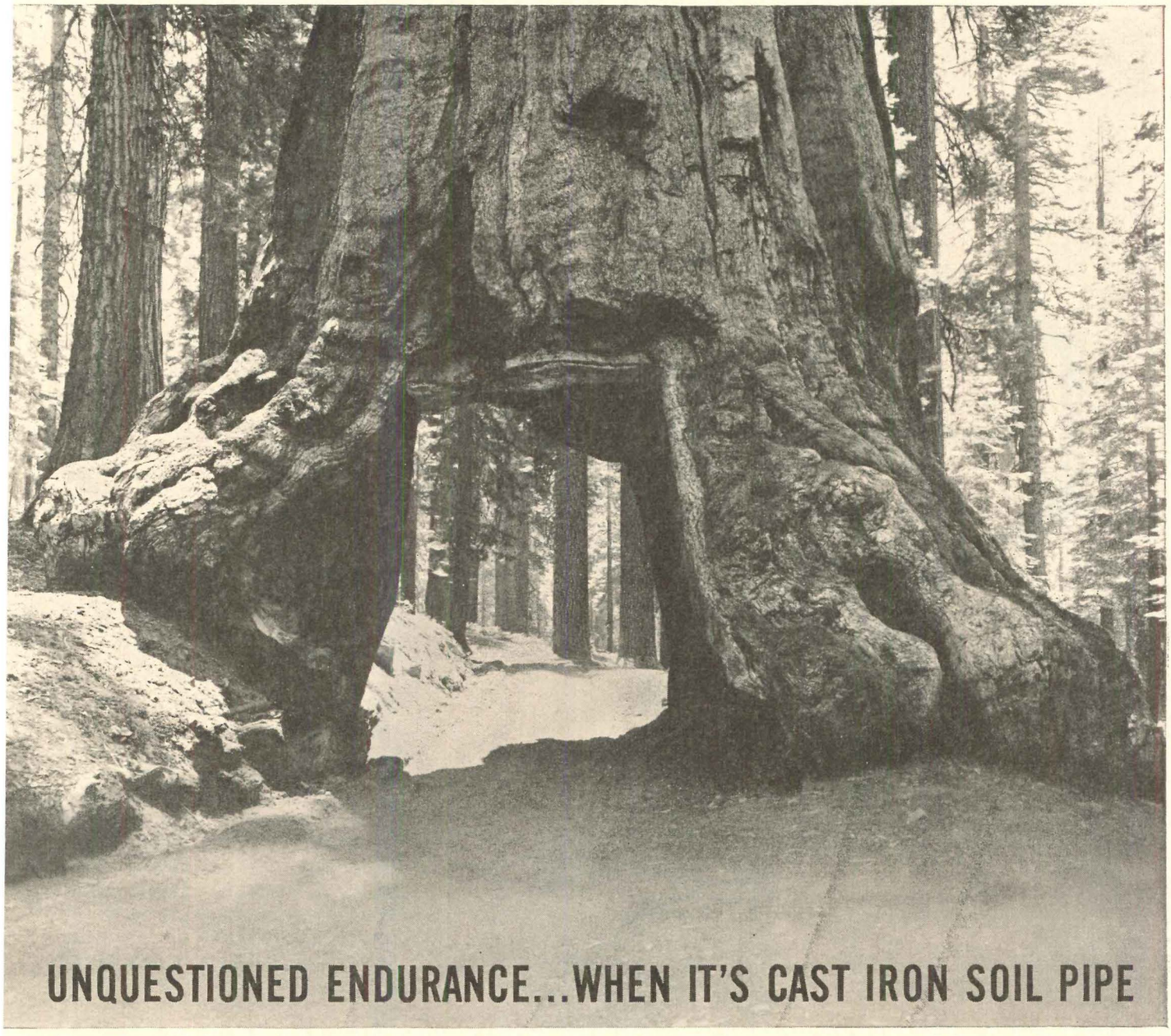

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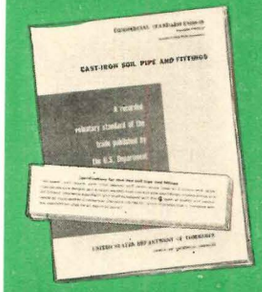

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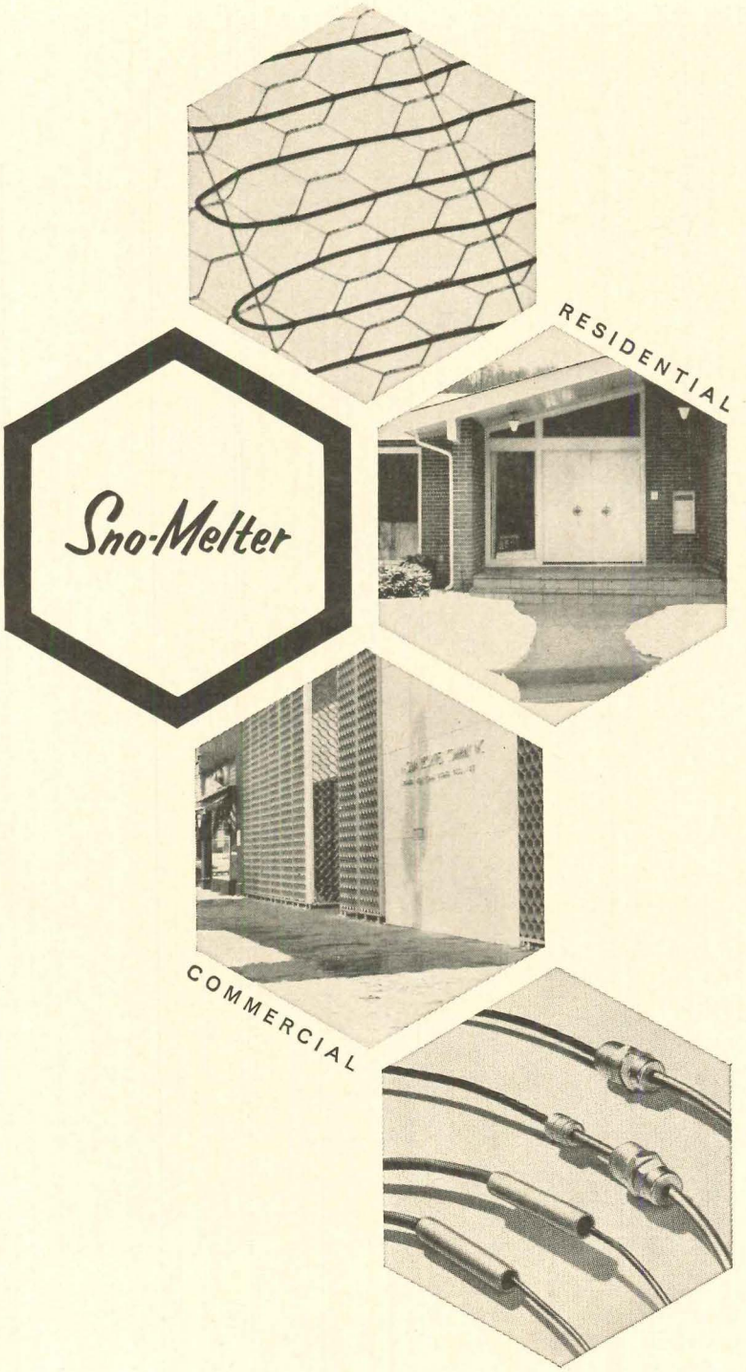

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Required Reading

continued from page 116

formation contained in these papers and by adding his own historical analysis has produced a book which "records, describes and as far as possible traces the architectural history of the greater Anglo-Saxon churches."

This is a scholarly work, which is primarily intended for architectural historians who have a specialized interest in pre-conquest architecture. It is, nevertheless, a valuable reference work for visitors to the churches and contains a useful index of the sites of the buildings still in existence. The collection of 230 photographs at the end of the book is likely to be the chief attraction for architects.

THE COLONIAL HOUSES OF WORSHIP IN AMERICA. *By Harold Wickliffe Rose. Hastings House Publishers, Inc., 151 East 50th Street, New York 22, N.Y. 574 pp., illus. $22.50.*

Harold Wickliffe Rose's presentation of the 345 surviving Colonial churches built between 1607 and 1789 shows the significance of Telipianis architecture as an expression of American cultural diversity. Twenty religious denominations from Shakers to Sephardic Jews are represented. Each church is described and illustrated. The quality of the photographs is generally very good and the descriptive material is lively and is punctuated with interesting historical details, which provide the reader with quick glimpses into the lives of the early congregations. Architectural tourists will find this book an invaluable guide.

Career Guides

ARCHITECTURE, CREATING MAN'S ENVIRONMENT. *By Robert W. McLaughlin. The Macmillan Co., 60 Fifth Ave., New York, New York. 201 pp. $3.50*

Intending students of architecture will find this a succinct examination of architecture as a career. What the student of architecture does, what an architect's working life is like, what

continued on page 124

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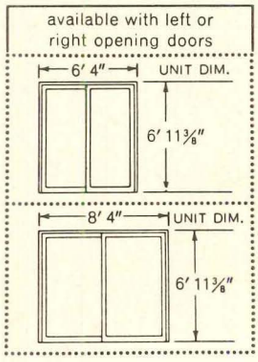

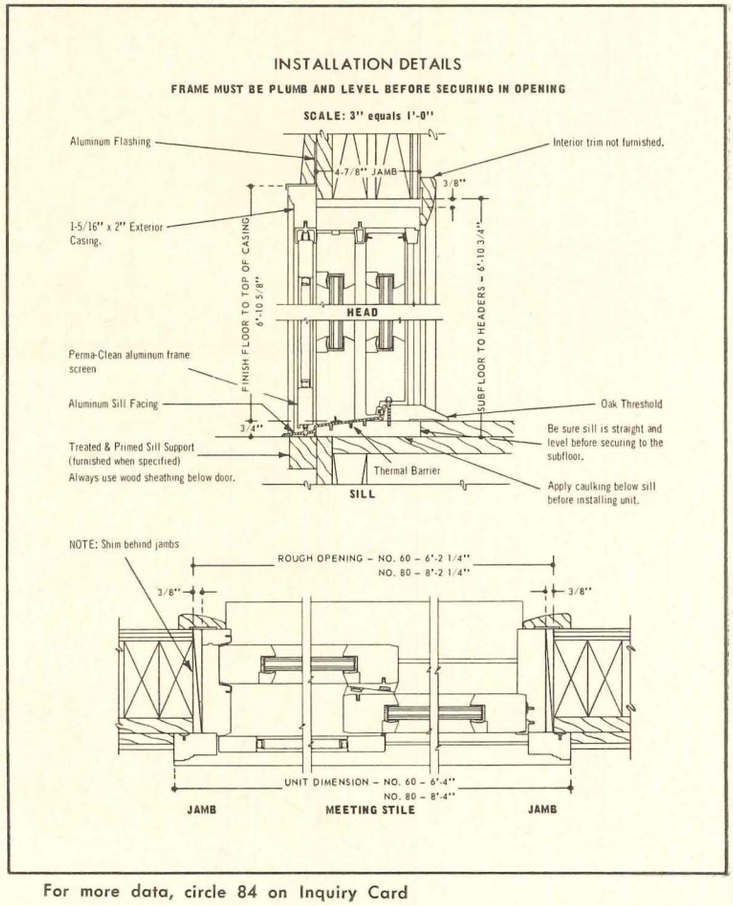

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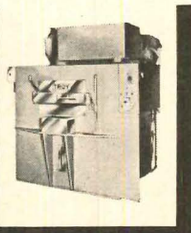

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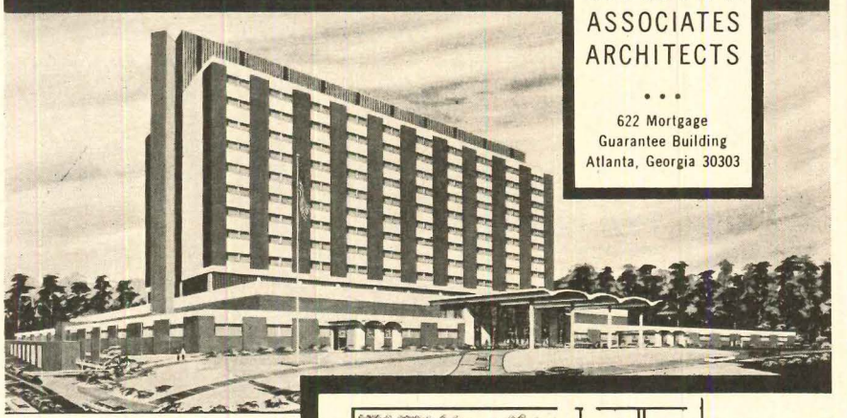

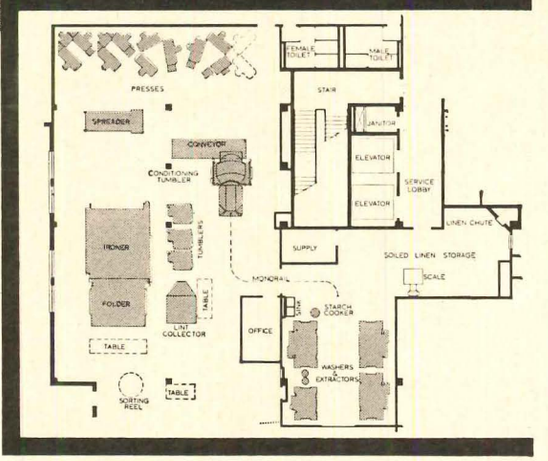

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Required Reading

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are the facets of the profession—all discussed with an explicitness derived from the personal anecdote and experience of Mr. McLaughlin, director of the School of Architecture at Princeton University, and an architect of long experience in practice.

A CAREER IN ARCHITECTURE. *By Michael Pattrick and Michael Tree. Museum Press Ltd., 26 Old Brompton Road, London, S.W. 7. Distributed by Sportshelf, P.O. Box 634, New Rochelle, N.Y. 127 pp., illus. $4.25.*

This book is an interesting guide to the practice of architecture in Great Britain. It describes the history of the architectural profession from the earliest times, including the changing role of the architect in the welfare state, and goes on to give a realistic explanation of the methods of training and the career of architecture today, taking into account American, English and Continental systems.

More on New York

NEW YORK LANDMARKS. *Edited by Alan Burnham. Wesleyan University Press, Box 360, Middletown, Connecticut. 430 pp., illus. $12.50.*

Probably the most comprehensive presentation of notable New York City architecture ever to be published, Alan Burnham's text and collection of photographs is a superb documentation of the buildings designated by the Municipal Art Society of New York as architecturally deserving of preservation.

The editor is well-known as an architectural historian, and the text includes an analysis of styles significant in American building design, as well as sensitive esthetic evaluations of individual buildings.

There are 150 full-page photographs of the buildings, each with a description and a map showing its location. All the landmarks are listed with date, architect, style, location and special features noted in a separate index. An exhaustive bibliography of New York architecture is included.

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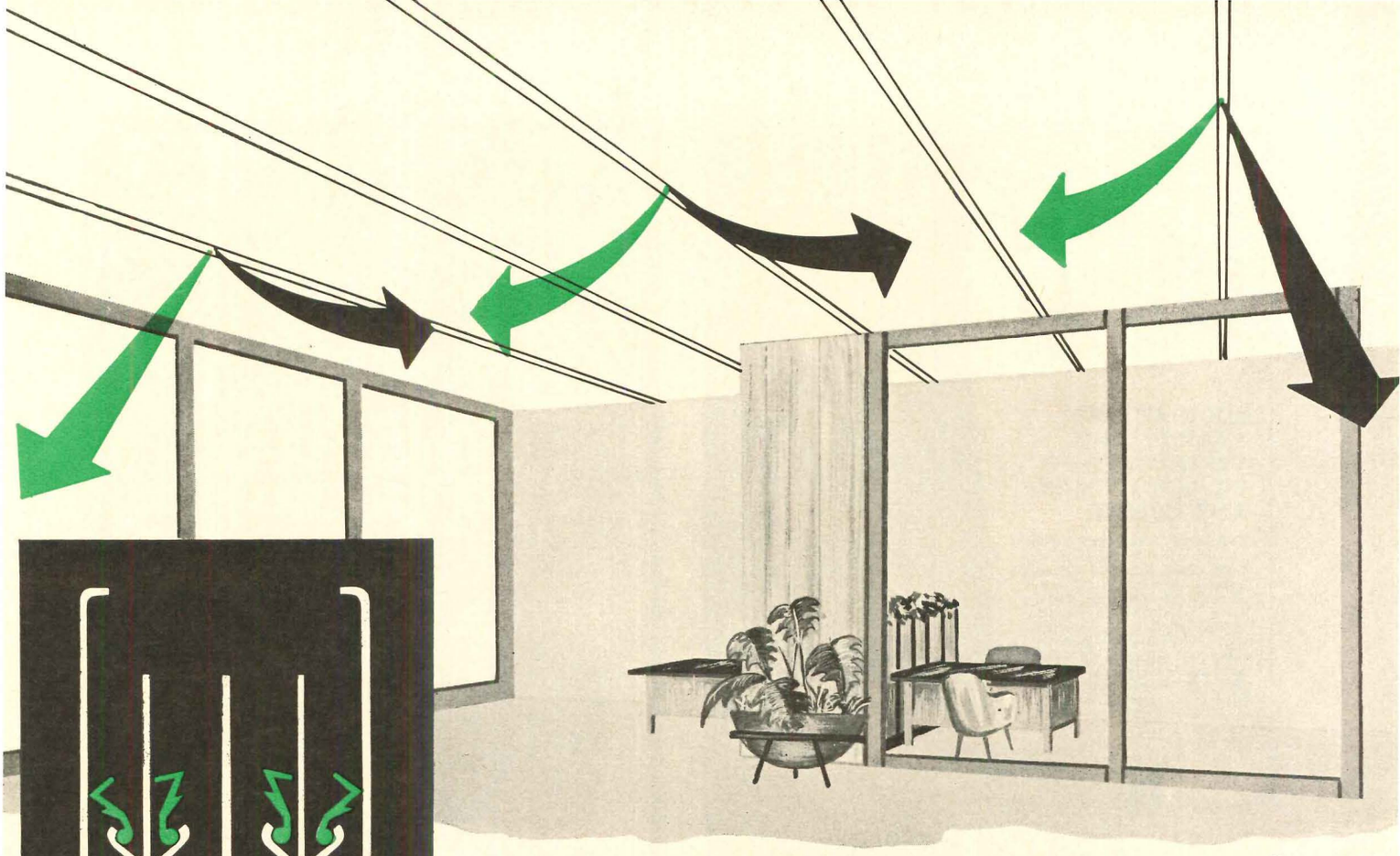

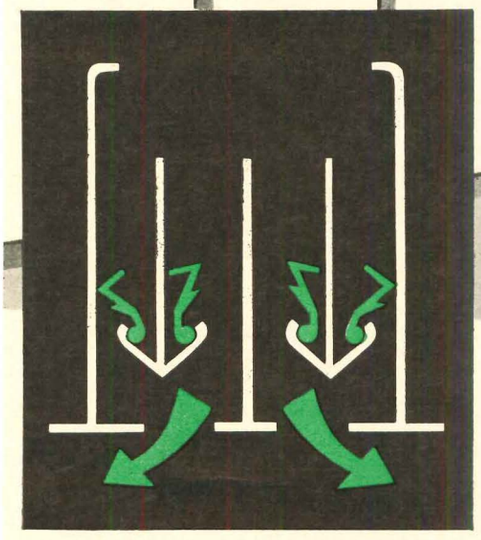

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ANEMOSTAT® PRODUCTS DIVISION
DYNAMICS CORPORATION OF AMERICA
Scranton, Pennsylvania

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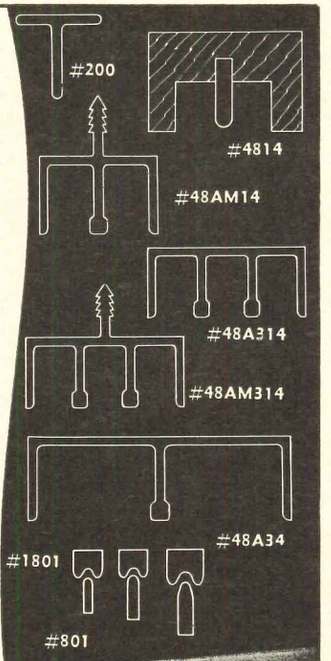
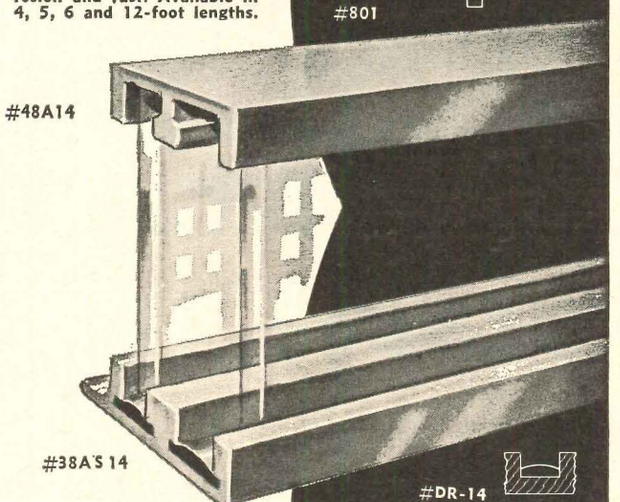
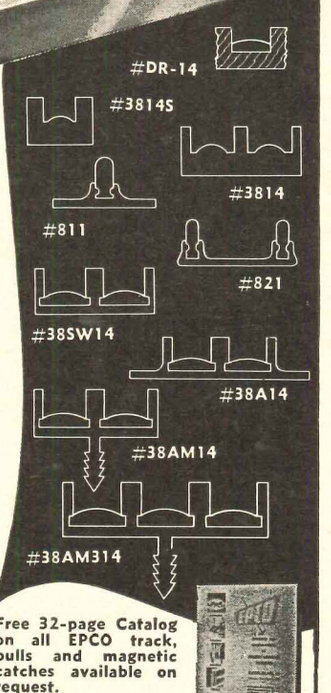
LOOK AT THE VARIETY AND VERSATILITY OF E-Z GLIDE TRACK AND GUIDES!

E-Z Glide Track and Guides are designed to meet all requirements for good appearance, simple and quiet operation, and easy installation in a variety of ways. The tracks utilize a self-lubricating, machined, vulcanized fibre of extreme hardness and low coefficient of friction. It resists wear, corrosion and rust. Available in 4, 5, 6 and 12-foot lengths.







#200 T-guide of ext. alum.
#4814 guide, wood with fibre divider
#48AM14 ext. alum. guide
#48A314 ext. alum. guide
#48AM314 ext. alum. guide
#48A34 ext. alum. guide for ¾" doors
#1801 fibre glides, 2 to door
#801 fibre track, into kerf
#48A14 ext. alum. guide
#38AS14 ext. alum. track
#DR-14 fibre track for ¼" panel, fits into preformed groove
#3814S fibre track for ¼" panel
#3814 fibre track, ¼" by-passing panels
#811 ext. alum. track, fibre insert. Use with #1801 or #2801 glides on ¾" doors
#821 ext. alum., fibre insert. Use with 1801 or 2801 glides on ¾" doors.
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#38A14 ext. alum. track, fibre inserts for ¼" panels
#38AM14 ext. alum. track
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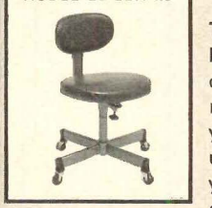
MODEL LD-22M-TC



The Cramer Draftsman's Chair lets a busy man totter on the brink of a big idea without fear of an ignominious fall. ■ Only Cramer gives you a forward tilt seat that relieves under-leg pressure, is adjustable to your comfort. It also rocks back comfortably to give you a long look at your work. The thick, generous seat that adjusts easily and quickly to any height drafting table, is available in a wide choice of cover materials and colors. ■ Only Cramer has an adjustable foot ring that slips up and down in a twinkling. Casters or glides have a sure-footed 22-inch spread. There's also a fingertip adjustment on the back rest so you can set the inch-thick cushion exactly where you want it. ■ For a free descriptive brochure, write: Cramer Posture Chair Company, 625 Adams St., Kansas City, Kansas 66005

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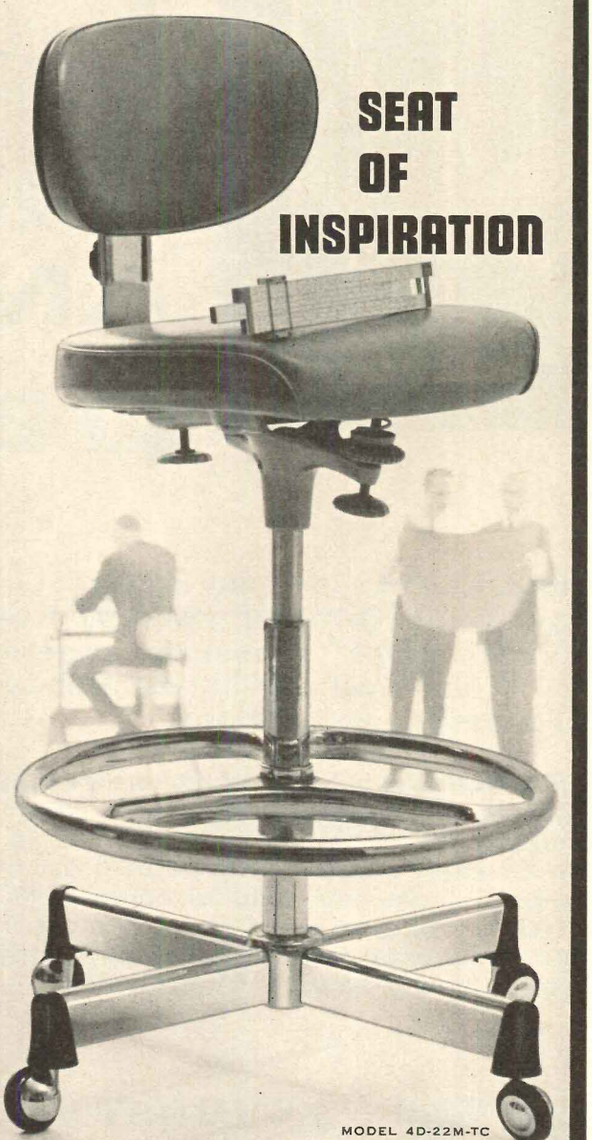

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St. Louis Planetarium
St. Louis, Missouri
Architects: Hellmuth, Obata & Kassabaum, Inc.
St. Louis, Missouri

...tough and resilient as natural rubber plus outstanding resistance to weathering!

Here is an architectural roofing system that provides *all* the toughness and elasticity of natural rubber *plus* the added advantage of remarkable resistance to weathering.

Not a paint but a combination of two well-known DuPont elastomers—Hypalon* and Neoprene—that protect, beautify and waterproof thin-shell concrete roofs of unusual geometric design. Outstanding example is the SECO-protected roof on the St. Louis Planetarium. Can also be used just as effectively on lightweight concrete, exterior grade plywood, certain types of insulating materials . . . and many other surfaces.

Hairline cracks on monolithic substrates are easily bridged by the highly elastic SECO membrane—surface maintains a beautiful and seamless plastic film. Structural load is less than 20 pounds per 100 square feet—less than 1/25 of conventional roofing systems. Self extinguishing—will not support flame.

Write today for catalog on the complete line of SECO protective coatings!

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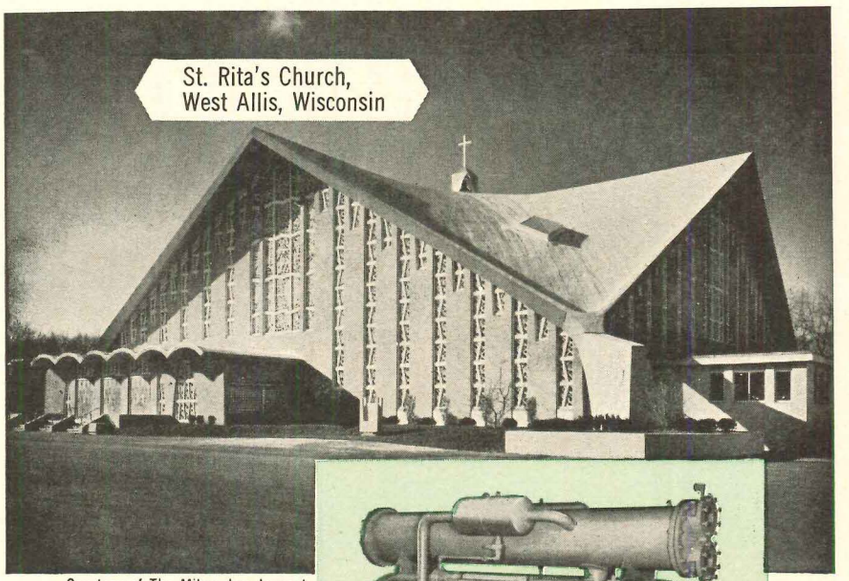
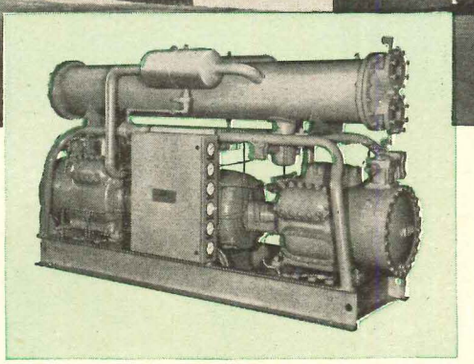


Courtesy of The Milwaukee Journal



Air conditioned by a Vilter duplex 320 VMC condensing unit. St. Rita's church is 53 ft. high at its center. Its hyperbolic paraboloids are joined to four concrete buttresses, diagonally tied together at bottom to resist a thrust of 44 tons.

Vilter® is "going places" ...wherever modern construction demands reliable air conditioning

Modern and efficient, Vilter air conditioning equipment readily fills the comfort cooling requirements of a wide variety of commercial and industrial buildings. Fully adaptable to contemporary design, Vilter's record of reliability assures low operating cost and virtually trouble-free operation. A recent installation is the Vilter duplex 320 VMC condensing unit which helps air condition St. Rita's Church, West Allis, Wis. This uniquely-designed church can accommodate 1,450 parishioners and features a quadruple, hyperbolic paraboloid thin shell roof, the largest installation of its type in the Midwest.

The condensing unit at St. Rita's incorporates two Refrigerant 22 open-type 320 VMC compressors (one four and the other a six cylinder unit, both direct connected to a single electric motor) and a 16" dia. x 9' long condenser. The compressors include a capacity reduction feature which enables them to closely match varying load conditions and thereby effect operating savings.

One of the more important features of the Vilter 320 VMC compressor is its unique piston design which results in quieter operation and longer life as the piston more positively "conforms" to design clearances at all time, regardless of operating temperatures. Other important features include freely interchangeable components and ease of access, both of which result in low service costs.

Vilter offers a full line of compressor units, condensing units and packaged water chillers incorporating the 320 VMC compressor. This equipment is available in capacities from 15-100 tons. Higher capacities can be achieved with duplex units or multiple-unit installations. Contact your nearest Vilter representative or dealer for complete details.

Ask for Bulletins Nos. 143 and 348.

Pastor — Rt. Rev. Msgr. F. P. Arnold
Architect — Mark F. Pfaller Associates Inc.
Consulting Engineer — Robert J. Miller Associates
General Contractor — Voss-Hrdlicka Co.
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Required Reading

continued from page 124

A fascinating and informative book for all visitors to New York and for those who love the city, "New York Landmarks" will be of special interest to architects.

NEW YORK: PEOPLE AND PLACES. *Text by Percy Seitlin. Photographs by Victor Laredo. Reinhold Publishing Corporation, 430 Park Ave., New York 22. 192 pp., illus. $12.50.*

This very readable collection of essays focuses upon various New Yorkers and the New York that is most visible and important to them. In an effort to isolate what is peculiarly New Yorkish, Percy Seitlin presents a miscellaneous and delightful picture of the city. His style is personal, conversationally direct and anecdotal.

In Victor Laredo's 160 fine photographs, ". . . the real emphasis is on the personal and the little known." Specifically, they are of dramatic architectural contrasts, amusing and whimsical building ornamentation, and familiar landmarks as well as human activities.

Architects will be interested in the variety of New York facades photographed. Percy Seitlin writes with an awareness that New York's architecture characterizes its people, as it succeeds or fails in responding to the needs, interests and tastes of New Yorkers of many decades.

"Gardening" as Art

THE TROPICAL GARDENS OF BURLE MARX. *By P. M. Bardi. Reinhold Publishing Corp., 430 Park Ave., New York, N.Y. 160 pp., illus. $15.00.*

Gifted with an uncanny ability to make art of nature, Burle Marx has made no small contribution to the Brazilian architectural movement of today. He is a landscape artist who has succeeded in cultivating and acclimatizing tropical flora to create gorgeous spreading gardens, Brazilian style, that may fare as well as the English picture garden in the history of landscaping.

continued on page 132

New see-through skin〰from Monsanto

Hunt no more for the perfect daylighting panel. It's here—Lustra-Span* Vinyl Panels. They're tough. And give you far more design opportunities, at surprisingly low cost. Panels can bend around 90° corners or lengthwise on 100″ radius. They require no maintenance. Non-combustible, non-corrosive. In corrugated or flat sheets, both a snap to install. Sound ideal? Lustra-Span Vinyl panels are—for skylighting and vertical glazing. For more data and installation guide, write: MONSANTO, Building Products, Department 804XI, 800 North Lindbergh Blvd., St. Louis, Missouri 63166.

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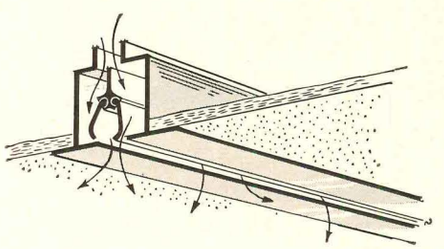
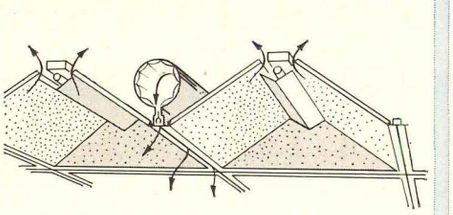
NEW Titus...

New simplicity, versatility... new design freedom for today's integrated modular ceilings! Specify a Titus ceiling air diffusion system and be sure of sound air distribution that will fully meet today's needs... as well as tomorrow's.



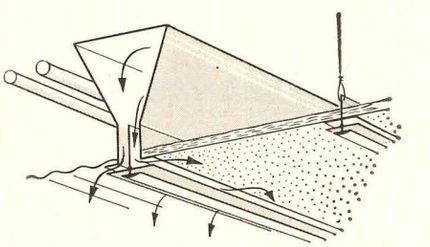
TITUS MODULinear...

Outstanding architectural design for continuous line use. 180° adjustable air pattern. 1, 2, 3 and 4-slot models. Extruded aluminum.



TITUS COV-Aire...

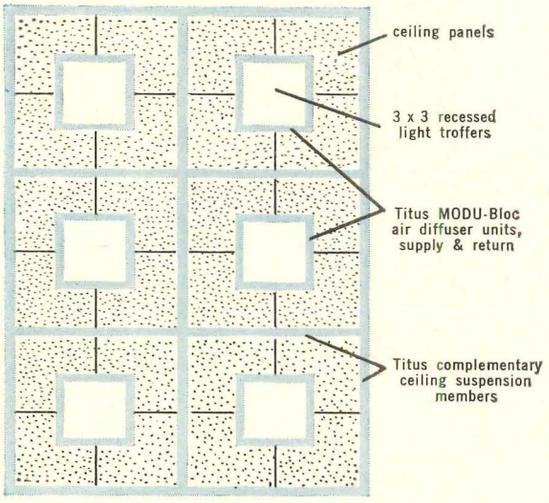
Offers the ultimate in modern architectural design and sound air diffusion for cove-type ceilings. Wide flexibility of air pattern adjustment.



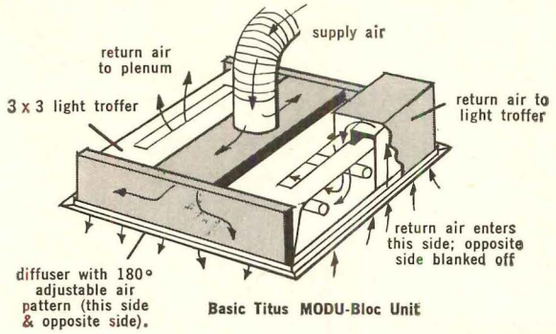
TITUS LINEAR-Tee...

Simplified, soundly engineered air distribution that integrates completely into the lighting and paneling of nearly any type modular ceiling.

air diffusion system for modular ceilings



Titus Modular Ceiling System
(Blue designates units by Titus)



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A ceiling air diffusion system and complementary ceiling suspension system that provide the maximum in efficiency, flexibility and economy in integrating SOUND AIR DIFFUSION, good lighting and acoustical control.

MODU-Bloc diffuser units offer **tremendous versatility** in handling air -- provide the necessary air patterns and air flow rate control to satisfy the most demanding requirements. **ONE SET** of vanes controls **BOTH** air pattern (adjustable 180° to full vertical, full horizontal or any pattern in between) and air flow rate control -- including blank-off. Each MODU-Bloc unit can handle **both supply and return air.**

AND HERE IS THE MOST MODERN ARCHITECTURAL DESIGN! The extruded aluminum complementary ceiling support members fully match in appearance the smartly styled linear design of MODU-Bloc diffusers.

by TITUS®

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☐ Please rush literature on the new Titus Air Diffusion System for Modular Ceilings. Also send literature on: ☐ TITUS MODU Linear ☐ TITUS COV-Aire ☐ TITUS LINEAR-Tee.
☐ Have Titus Representative call on me.

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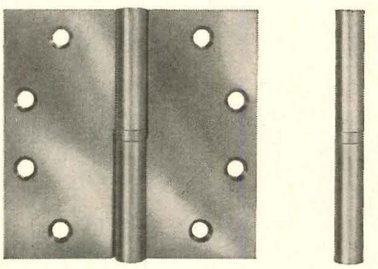
McKinney Moderne Hinges

.... Specified for the New Spring Branch Memorial High School in suburban Houston, Texas

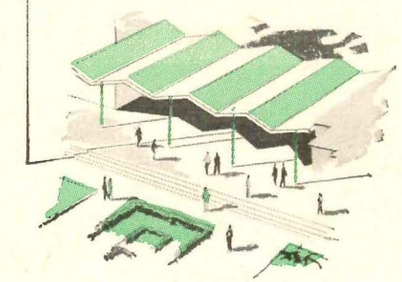
For the Spring Branch Memorial High School in suburban Houston, Texas, Architects Koetter and Tharp, A. I. A., insisted on hinges complementary to the modern design of the building—hinges clean and sleek. Of all the hinges submitted the McKinney Moderne best met these requirements. It has modern design. It has the built-in quality of flush stainless steel oil-impregnated bearings and stainless steel pins. They combine to assure a hardware job with hinges that will last and last through countless cycles while always retaining their modern good looks. Next time you write a hardware specification, write in McKinney Moderne Hinges . . . choice of quality-conscious consultants.

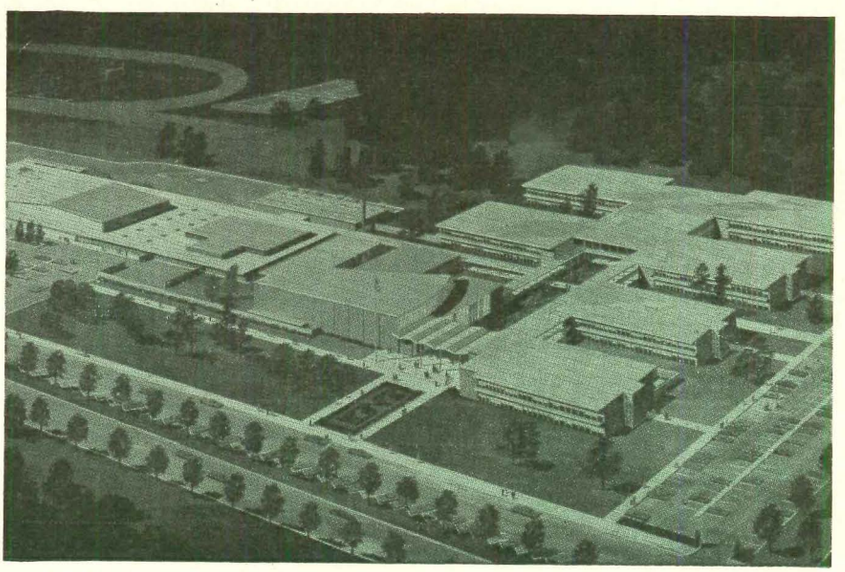


McKINNEY

SCRANTON, PENNSYLVANIA 18505 / IN CANADA: McKINNEY-SKILLCRAFT LTD., TORONTO 3, ONT.

Project: Memorial High School, Spring Branch Independent School District
Architects: Koetter and Tharp, A. I. A., Houston, Texas
General Contractor: Marshall Construction Co., Houston, Texas
Hardware Specification: Peden Iron & Steel Co., Houston, Texas
Larry Adams, A. H. C.
McKinney Hinges: 150 pair McKinney Moderne Hinges for all classroom doors
40 sets McKinney Anchor Hinges for all exterior doors
plus additional quantities of other McKinney extra heavy bronze hinges





For more data, circle 93 on Inquiry Card

Required Reading

continued from page 128

These photographs, plans and descriptions include the notable gardens of Caracas and the Beira Mar of Rio de Janeiro. Plans for Brasilia and the Botanical Gardens of Sao Paulo are also included.

Ruskin

THE ART CRITICISM OF JOHN RUSKIN. *Edited by Robert L. Herbert. Anchor Books, Doubleday & Company, Inc., Garden City, New York. 430 pp. Paperbound, $1.45.*

Although it is primarily focused on painting, this anthology includes selections from Ruskin's more famed writings on architecture. The passages are a refreshing review of Ruskin's architectural criticism.

Books Received

PROBLEMS IN PLANNING LIBRARY FACILITIES. *Proceedings of the Library Building Institute, Chicago, July 12-13, 1963. American Library Association, 50 East Huron St., Chicago, Ill. 208 pp., illus. $4.25.*

HOW TO RUN MORE EFFECTIVE BUSINESS MEETINGS. *By B. Y. Auger. Grosset & Dunlap, Publishers, New York 10. 157 pp. $5.95.*

DECORATION. *Volumes I and II. By the staff of Connaissance des Arts. French & European Publications, Inc., 610 Fifth Ave., New York 20. 79 Boulevard St. Germain, Paris. Vol. I. 328 pp., illus. $27.50. Vol. II. 320 pp., illus. $27.50.*

AMERICAN ARCHITECTURE. *By Thomas H. Creighton. David McKay Co., 750 Third Ave., New York, N.Y. 85 pp., illus. $1.95.*

ARCHITECTURAL ENGINEERING—NEW STRUCTURES. *By Robert E. Fischer. McGraw-Hill Book Company, 330 W. 42nd St., New York 36. 214 pp., illus. $10.00.*

ROOF DESIGN. *By Paschen von Flotow with Horst Leiermann. Karl Kramer Verlag, Stuttgart. 212 pp., illus. DM 32.*

THE HOUSING YEARBOOK—1964. *By The National Housing Conference, 1025 Connecticut Ave., NW, Washington, D.C. 120 pp., illus. $3.00.*

THE URBAN PROCESS. *By Leonard Reissman. The Free Press of Glencoe, The Macmillan Company, 60 Fifth Ave., New York, N.Y. 255 pp. $6.50.*

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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.

*All figures for typical West exposure, New York City.

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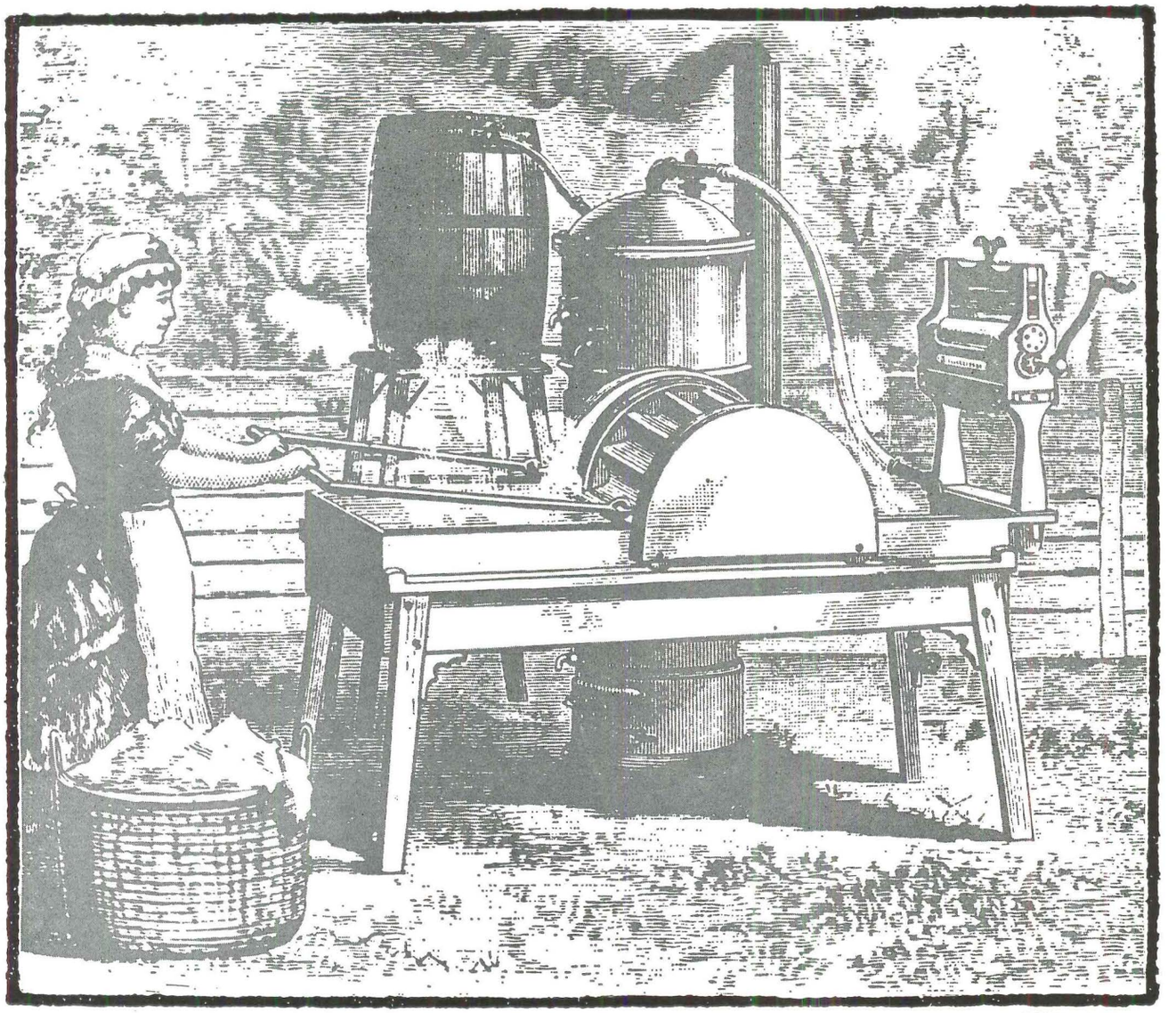

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They give case histories and suggestions for providing more efficient linen supply service in hospitals, motels, hotels, schools and restaurants, as well as for commercial firms, professional offices and various institutions. Write today.

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Call your Ceramic Tile Contractor or write for full details. Summitville Tiles, Inc., Summitville, Ohio.

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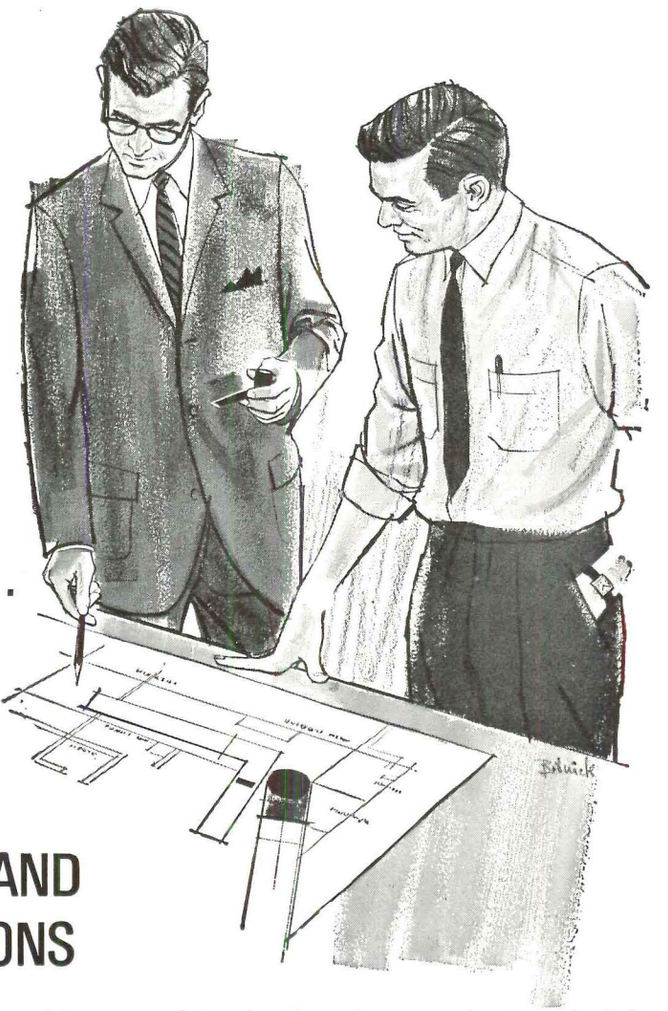
you specify
the space.....



NORRIS PRE-FABRICATED WALK-IN COOLERS, FREEZERS AND COOLER-FREEZER COMBINATIONS WILL FIT

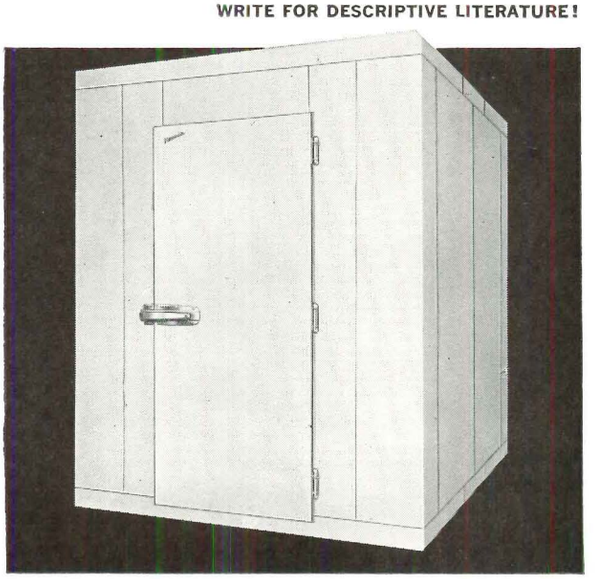
Norris pre-fabricated walk-in coolers, freezers, and cooler-freezer combinations meet any space requirements. Available with or without floors, these versatile walk-ins are supplied in two- and three-foot wall sections, four-foot door sections (7½′ high), and can be set up quickly in virtually any space, any location. The only tool required for installation is a light hammer.

The modular panels of Norris walk-ins are all-metal, with no wood to absorb moisture, and extremely light weight. Standard exteriors are bonderized steel finished in grey baked enamel, interiors are 22-gauge galvanized metal, with custom exteriors or interiors optional at extra cost. Ideal for every institutional, commercial, or industrial refrigeration need, Norris walk-ins can be supplied with the proper self-contained or remote refrigeration equipment to meet any application.

LIGHT WEIGHT

AS LOW AS 4½ LBS. PER SQ. FT.—REDUCES FREIGHT COSTS!

WRITE FOR DESCRIPTIVE LITERATURE!



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This emblem protects you from false air delivery claims on range hoods and exhaust fans

The HVI emblem guarantees trustworthy air delivery ratings. You'll find it only on range hoods and exhaust fans whose performance has been certified by independent tests at Texas A & M College. All are designed to meet FHA requirements. This emblem is now carried by two out of three range hoods and exhaust fans.

Send for free 12-page "Home Ventilating Guide" that keys air delivery ratings of fans to room sizes and includes HVI recommendations on number of air changes per hour, types of exhaust fans and range hoods, location of fans and hoods, selection of accessories, installation of ducts.

Full information also available from HVI members: Aubrey Mfg., Inc. • Berns Air King Corp. • Broan Mfg. Co., Inc. • Emerson-Pryne Co. • Fasco Industries, Inc. • Kich-N-Vent Division, Home Metal Products Co. • Miami-Carey Division, The Philip Carey Mfg. Co. • Nautilus Industries, Inc. • Nutone, Inc. • Roberts Mfg. Div., Rangaire Corp. • Swanson, Inc. • Trade Wind Division, Robbins & Myers, Inc. • Ventrola Mfg. Co.

HOME VENTILATING INSTITUTE

1108 STANDARD BUILDING, CLEVELAND, OHIO 44113

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OUT OF THE
WEST
COMES THE
HOTTEST
BRAND
IN YEARS

RUF-X
NINETY

NEW

RUF-X NINETY

SIDING
BY MASONITE

Rugged beauty for home buyers

building economy for you

get both with new RUF-X NINETY siding

From the famous X-ninety siding family comes Ruf-X-ninety with its deep-textured, rough-sawn surface. Here's siding that captures the rich outdoor flavor of western living. Captures its rugged qualities, too—Ruf-X-ninety won't split, splinter or crack. It resists denting and weather extremes, holds its good looks through the years with minimum maintenance and repairs.

Building benefits: uniform, grain-free panels of Ruf-X-ninety cut, shape and nail with ease. They're prime coated for fast finishing with stain or paint and back sealed for added moisture protection.

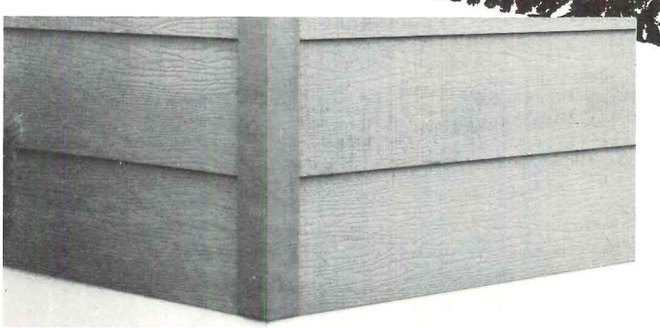
Get all the facts about this distinctive western style siding. Call your Masonite representative or write for Ruf-X-ninety folder. Masonite Corporation, Dept. PB-9, Box 777, Chicago 90, Illinois.

MASONITE

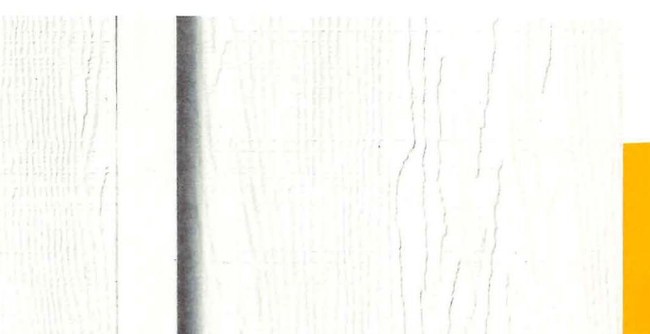
shows the way!

Masonite and X-ninety are registered trademarks of Masonite Corporation

Ruf-X-ninety grooved siding: grooves spaced vertically 8″ O.C. (4′ wide; lengths 7, 8, 9 and 16′)



Ruf-X-ninety lap siding: 7/16″ thick, 12″ wide and 16′ lengths.



Ruf-X-ninety siding: available in convenient panels 4′ wide in same lengths as grooved panels for use with batten strips.

Do you always get the exact carpet you specify?

Pity.

You might do better.

It happens all the time at Lees.

Nobody knows better than Lees how tricky it is to spec the best carpet you can get for exactly what you want to pay.

So we question specs. And if we can do better by you, we tell you.

We might warn you to get a tougher carpet if you don't want to be in trouble.

We might show you how we can give you more luxury for what you want to pay.

We might come up with a stock carpet so close to what you specified, you can't tell the difference. Except in price. (This happens often. We have more colors than anyone else in the business. And probably more carpets in stock.) Etcetera.

Now if you still want us to stick to your original specs, okay.

Except sometimes.

Sometimes we get specifications that we refuse to follow as they are.

If we did, we'd have to skimp. Or make up a "bargain" carpet. Or an unrealistic carpet. Or a carpet that will look good for a month and die on the floor in a year.

We won't.

We won't sacrifice quality.

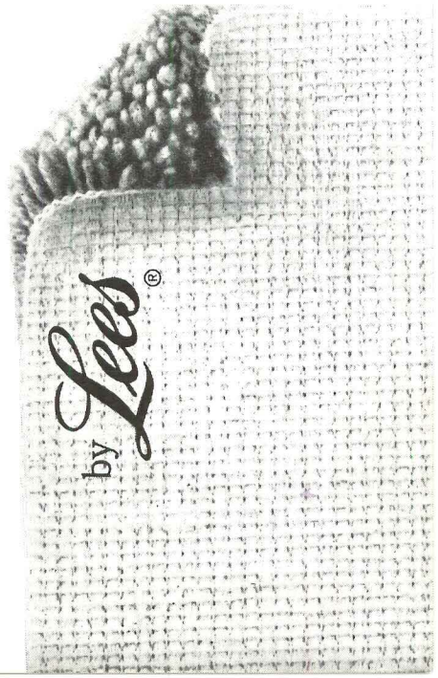
We won't make a carpet that isn't right.

But it's not altruism.

If we gave you a second-rate carpet and you got stuck with it, would you come back for more?

For a lot of good, down-to-earth reasons, "those heavenly carpets by Lees."

Write to Commercial Carpet Department, James Lees and Sons Company, Bridgeport, Pennsylvania, and we'll send you more information.



©JAMES LEES & SONS CO., BRIDGEPORT, PA., A DIV. OF BURLINGTON INDUSTRIES

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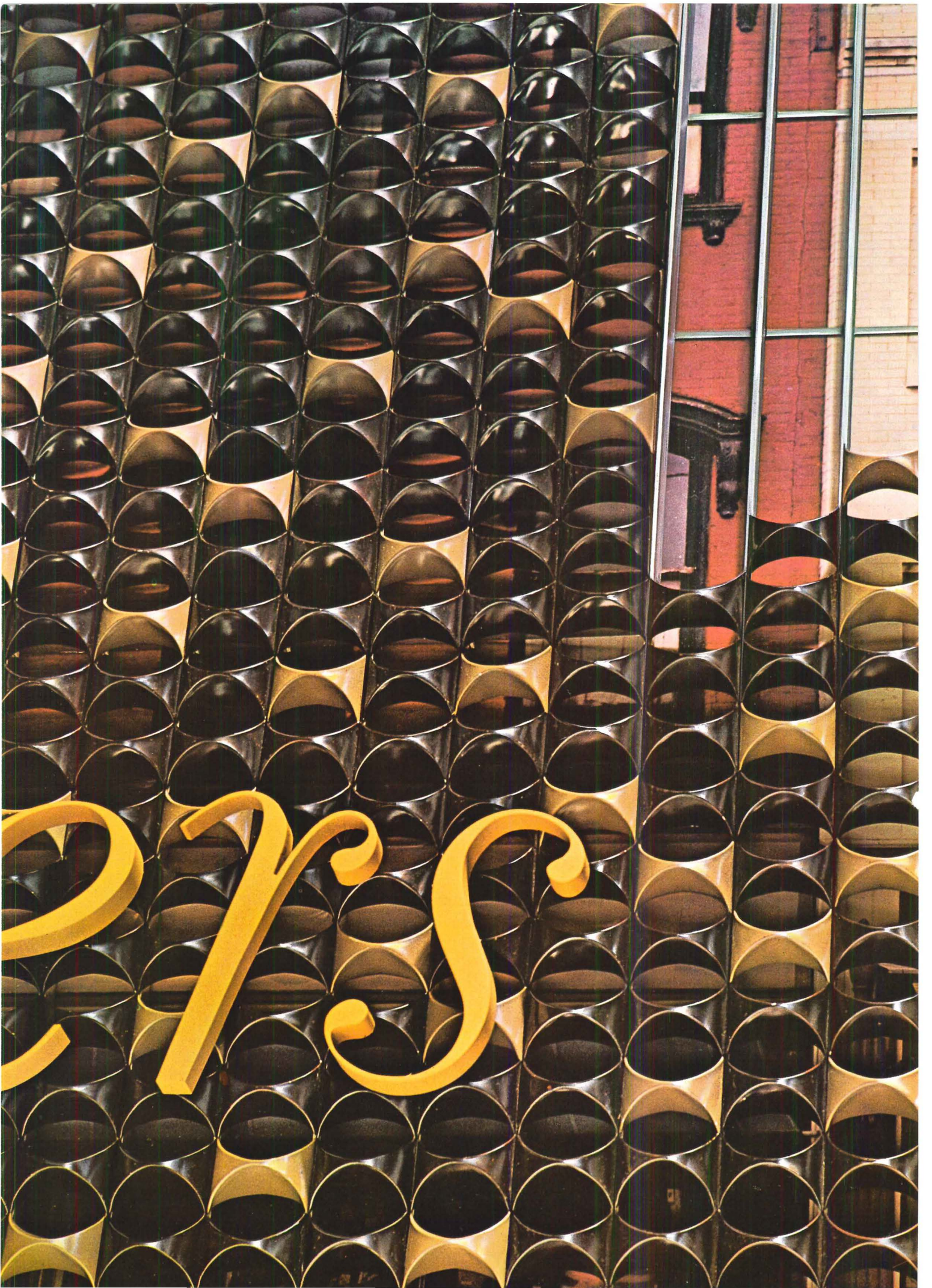


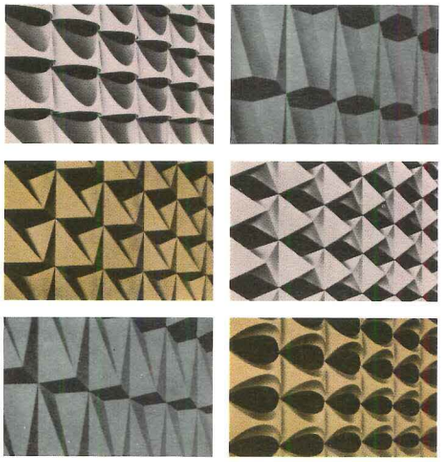
USE NEW SOL-DEC II PANELS TO COVER OLD FACES WITH FORM, TEXTURE AND BEAUTY

If it's just too good to tear down, but not much good as it stands, hide it with Sol-Dec II® Panels, Alcoa's economical new way to cover old faces—handsomely. This model helps you to visualize architecturally the effects you can obtain with this new method of renewing old structures.

Sol-Dec II Panels' economy (from simplified assembly and erection as well as lower initial cost) makes this unique Alcoa® Aluminum architectural screening available for a host of new applications (limited only by your imagination).

You choose from six new architectural patterns, blanked and formed in aluminum sheet .032 in. thick, 24 in. wide. Sol-Dec II Panels are available in mill finish, in all of the Alumalure® baked-enamel colors, in clear Alumilite* finish architectural colors or Duranodic* 300 finishes. The new fast pressure locking installation system, combined with larger panel sizes, adds up to remarkable savings for your clients.

Alcoa architectural sales engineers or any one of our six jobber-erectors will be glad to advise you on applications of Sol-Dec II or special design details. While special patterns are not generally practical for small buildings, inventive use of the standard Sol-Dec II Panels results in an infinite variety of unique facades.



Call your nearest Alcoa sales office, or write Aluminum Company of America, 1696-J Alcoa Building, Pittsburgh, Pa. 15219, for your free copy of our new booklet *Sol-Dec II by Alcoa*.

These six nationally-known, nationally-respected architectural fabricators are licensed Alcoa Sol-Dec II Panel jobber-erectors.

Architectural Manufacturing Company of America, a Division of Shower Door Company of America, P. O. Box 20202, Atlanta, Ga. 30325.

Architectural Products Division of H. H. Robertson Company, Connersville, Ind. 47331.

Brown Manufacturing Company, P. O. Box 14488, Oklahoma City, Okla. 73114.

Construction Specialties, Inc., P. O. Box 481, 55 Winans Avenue, Cranford, N. J. 07016.

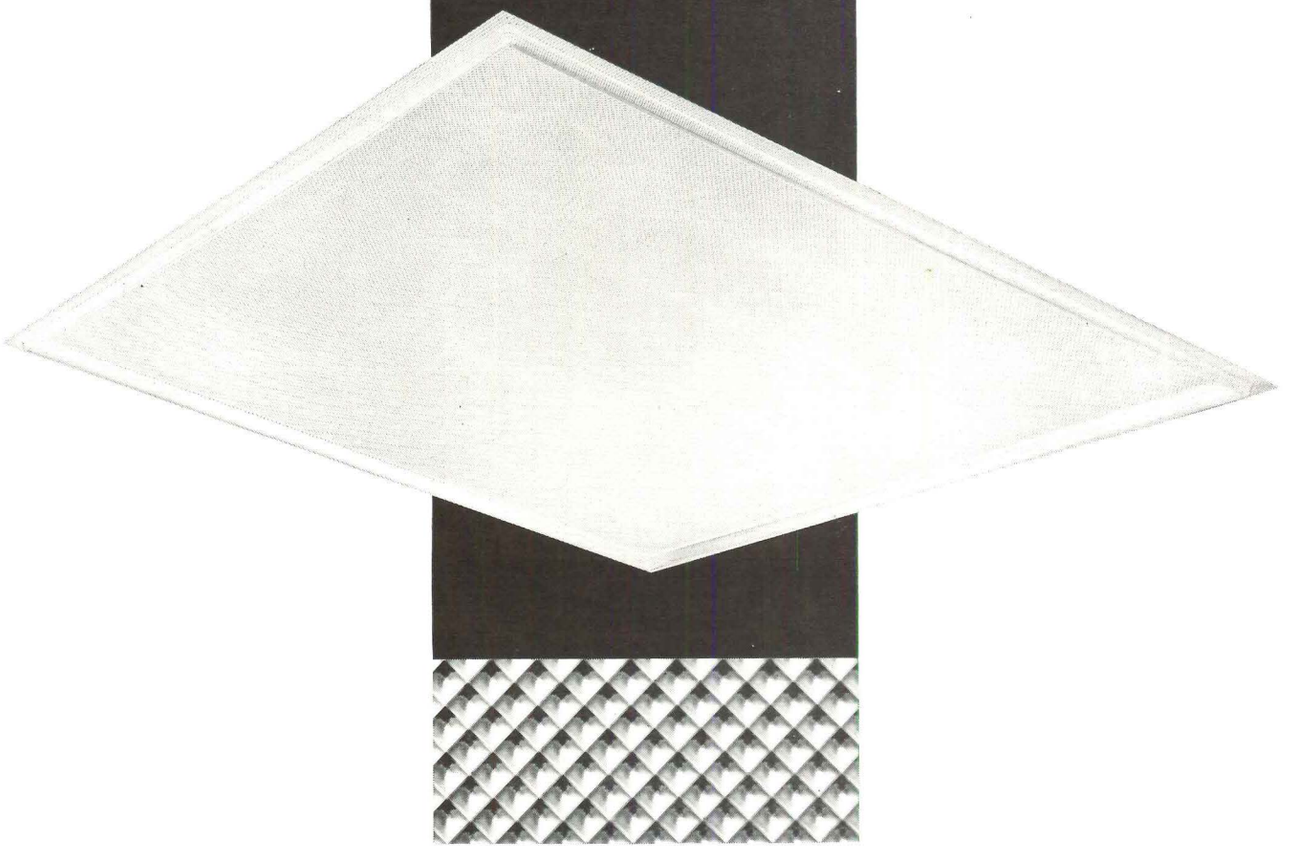
Livers Bronze Company, P. O. Box 6206, Kansas City, Mo. 64126.

Northrop Architectural Systems, Subsidiary of Northrop Corporation, 5022 Triggs Street, Los Angeles, Calif. 90022.

*Trade Name of Aluminum Company of America

ALCOA

new beauty and quality for lighting



YES. A 4x4 PRISMATIC!

THE BIG ONE. A unique "sculptured" panel. 16 square feet of sparkling prismatic lens (KSH's new K-12 pattern). Think about it! This new 4x4 gives you the architectural value of large, unbroken islands of light. And, it also assures brightness control the most persnickety lighting engineer will approve. You sure can't get all that with pans or louvers. How about including THE BIG ONE in the lighting plan you're designing now?

The lens represents only a small fraction of lighting costs, yet it controls the total result. Buy the best. They're by KSH.

K-S-H PLASTICS, INC.
10212 Manchester • St. Louis, Mo. 63122

KLITE® LIGHTING PANELS

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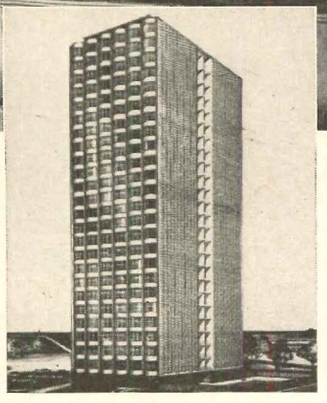
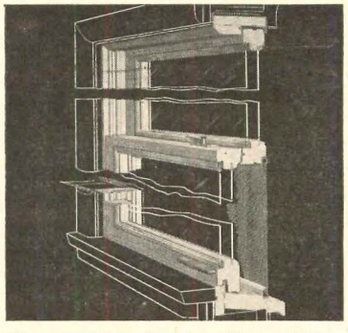
Architects: Rasche, Schroeder, Spransy and Associates



Pella Double-Hung Windows put wood's warmth to work in high-rise construction



The PELLA Double-Hung Window is different! It has spring-loaded vinyl sash slides that are tough, resilient, insulate against heat or cold, and never need painting. They are the reason both sash can be pivoted. Slides are held snugly against the sash by a concealed 2⅝" continuous spring weather strip which compresses to allow sash to pivot. Full 1¾" thick sash stiles are factory painted where they come into contact with these special sash slides . . . need no further finishing. Windows won't stick when painted.

These new PELLA Wood Double-Hung Windows are equally at home in high-rise buildings and residences. They are designed with pivoting sash that permits them to be washed and painted from the inside. Sash also can be removed from the inside.

There's a choice of a half screen or a full length screen that swings out during washing. Both are removable from inside. Traditional styling is accomplished with snap-in, snap-out wood muntin bars in horizontal, rectangular and diamond arrangements.

Other features include a rigid steel frame at the head for strength and a combination of stainless steel and woven pile weather stripping at the head, jambs, check rail and sill for additional weather tightness. Dual glazing panels or insulating glass add to year 'round comfort conditioning. Mail card for more facts today!

PELLA

ROLSCREEN COMPANY • PELLA, IOWA

PELLA MAKES QUALITY WOOD WINDOWS, WOOD FOLDING DOORS AND PARTITIONS, WOOD SLIDING GLASS DOORS AND ROLSCREENS.

Pella®

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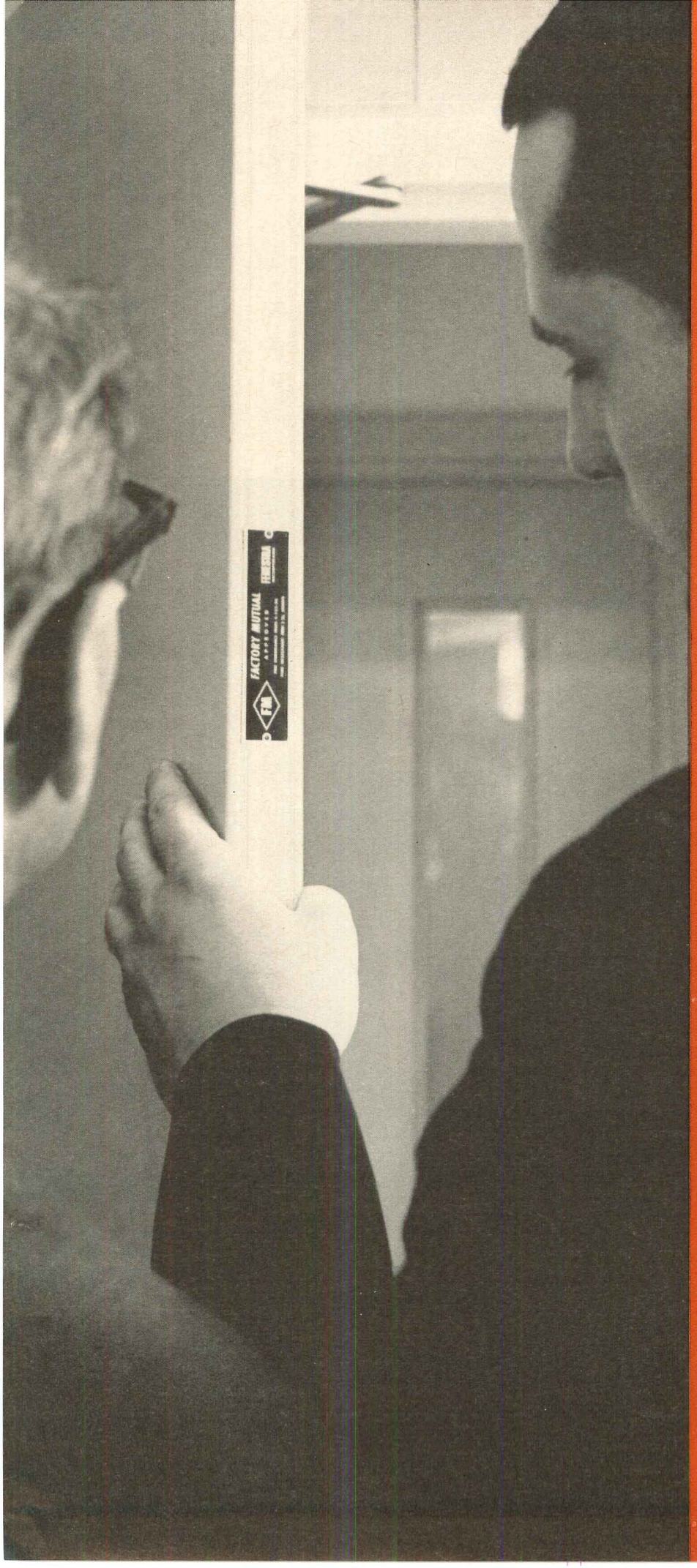
For more data, circle 106 on Inquiry Card ➔

FOAMGLAS® ROOF INSULATION
the only umbrella guaranteed leakproof for 20 years

Few umbrellas (and even fewer roof insulations) stay moistureproof for 20 years. FOAMGLAS Roof Insulation does—and its insulating value stays constant. We guarantee it in writing. The reason—0.0 permeability rating. Next time you hear an insulation's moistureproof, ask for its permeability rating. If it isn't 0.0, the material isn't moistureproof.

Practical, quickly-installed FOAMGLAS BOARD in 2′ x 4′ units is now available in thicknesses of 1½″ 1¾″ and 2″ to give exactly the insulation protection needed. Write for details and a copy of the 20-year guarantee. Pittsburgh Corning Corporation, Department PA-54, One Gateway Center, Pittsburgh, Pa. 15222.

PITTSBURGH® CORNING



"We have approved Fire-Rated Doors for you–at Stock Door Prices."

Fenestra doors on the job are evidence that the architect and contractor are thinking for the client. Along with the best-built hollow-metal doors, you get Factory Mutual labeled fire protection up to 1½ hours. Your local distributor has the complete line, plus the facilities and know-how to modify doors and frames, and fabricate sidelights and transoms to meet most job conditions locally, without delivery delays. Distributor inquiries invited. Write Fenestra, Inc., 4040 West 20th Street, Erie, Pa. 16512.

FENESTRA
DOOR PRODUCTS DIVISION

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flat plates

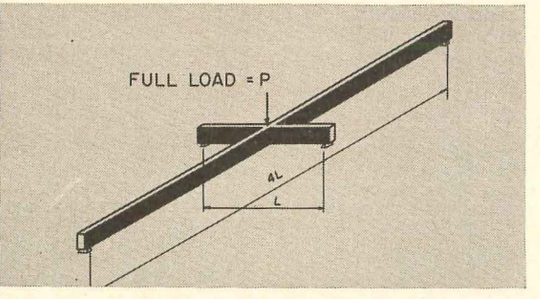
a.i.a. file: 4-a

Prepared as a service to architects by Portland Cement Association

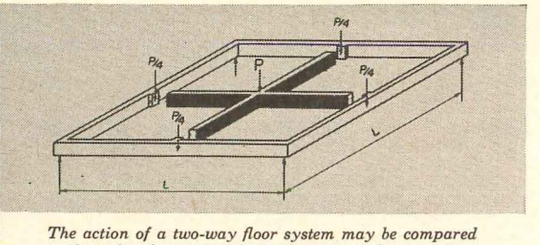
Clip along dotted line

Harbor Master's Building, Lake Pontchartrain, La. First Honor Award 1962
A.I.A. Gulf States Competition. Architects: Henry G. Grimball, A.I.A., H. M. Favrot, Jr., A.I.A., New Orleans. Photograph, Frank Lotz Miller.

Two-way floor systems are designed to carry loads in two directions. Whether a slab acts as a one-way or a two-way slab depends solely on the dimensions of the panel, as shown below:



The action of a one-way floor is typified by this framework which has a high ratio of long to short span.

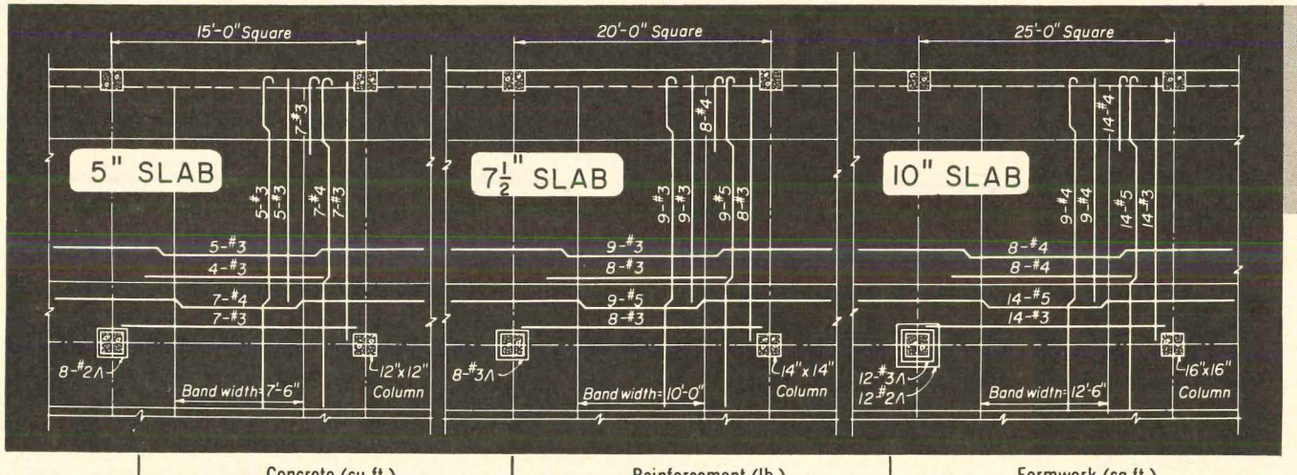


The action of a two-way floor system may be compared to that of a frame in which the ratio of long to short span is 2 to 1 or less.

Two-way flat plates are economical for medium to heavy loads on spans up to about 30 feet. They present a smooth undersurface as the photo shows. In the accompanying tables, material quantities for concrete, reinforcement and formwork are stated in units per square foot of panel with no allowance for waste or breakage.

Designs are based on a concrete strength of f'_c=3,000 psi; a steel stress of f_s=20,000 psi; and the use of A305 reinforcing bars. Write on your letterhead for further free information. (U.S. and Canada only.)

FLAT PLATES (50 PSF LIVE LOAD)

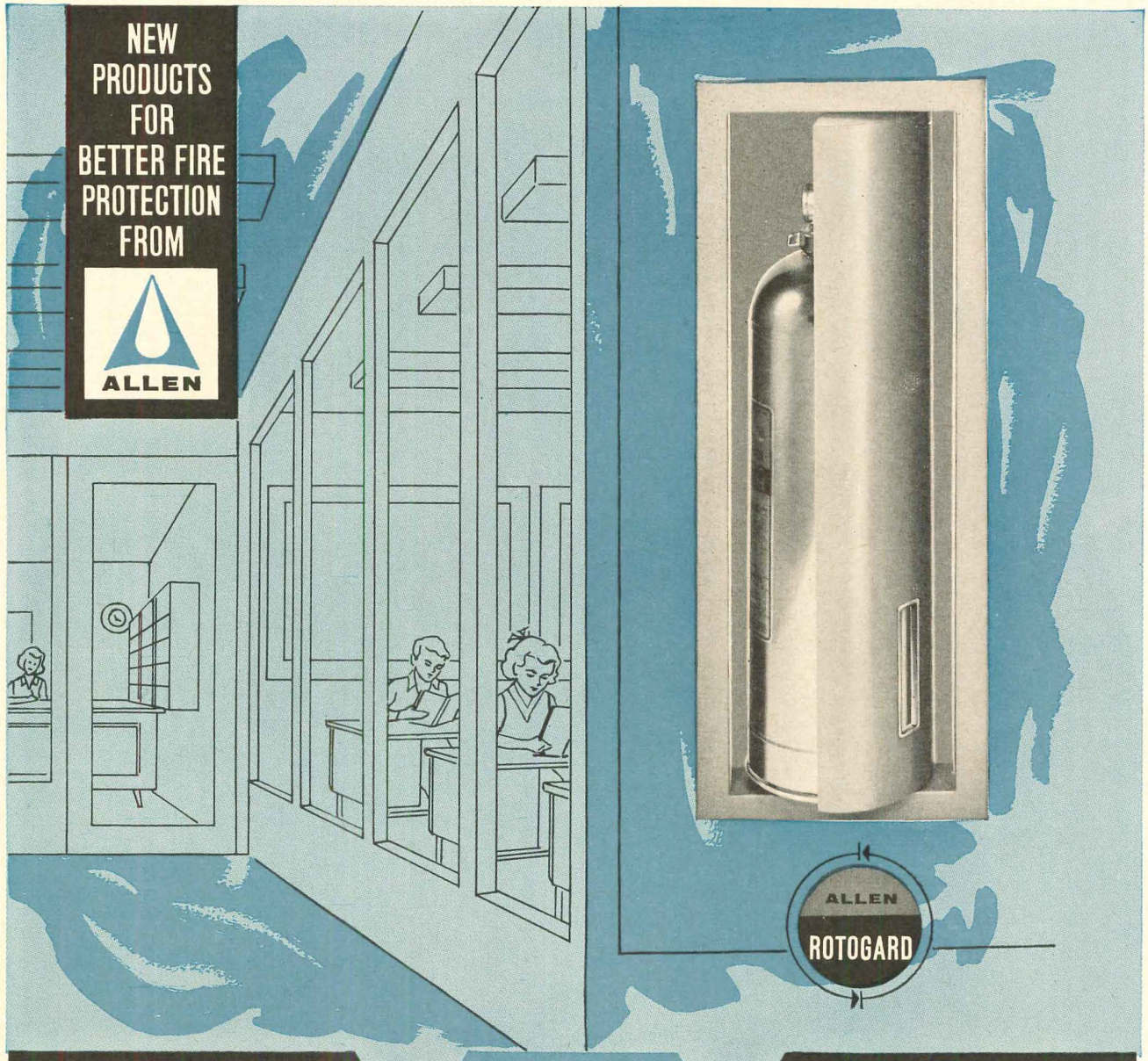


Item	Concrete (cu.ft.)						Reinforcement (lb.)						Formwork (sq.ft.)					
	15x15		20x20		25x25		15x15		20x20		25x25		15x15		20x20		25x25	
	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.	Total units	Units per sq.ft.
Slab	94	0.42	250	0.62	521	0.83	419	1.86	996	2.49	2045	3.27	225	1.00	400	1.00	625	1.00

PORTLAND CEMENT ASSOCIATION Dept. 9-8, 33 West Grand Ave., Chicago 10, Illinois *A national organization to improve and extend the uses of concrete*

NEW PRODUCTS FOR BETTER FIRE PROTECTION FROM

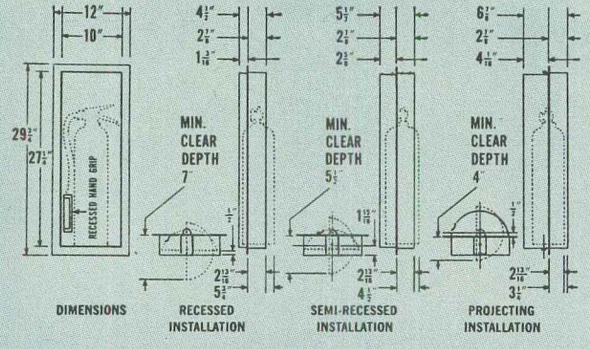
ALLEN



NEW REVOLVING EXTINGUISHER CABINET FROM ALLEN

FITS IN A MINIMUM OF SPACE

IS ADJUSTABLE ON JOB TO FIT 4", 5½" OR 7" ROUGH OPENINGS



Allen's new Rotogard cabinet accommodates 10 lb. ABC, soda and acid, pressurized and foam extinguishers. Revolving door opens with finger-tip pressure—provides fastest possible access. When closed, cabinet protects extinguisher which is hung on door, will not tip or fall out. Semi-cylinder pivot mounting eliminates need for box; three hole steel bracket permits door to be adjusted on job to fit 4", 5½" or 7" rough openings. Ask your Allen representative for complete details today, or write:

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

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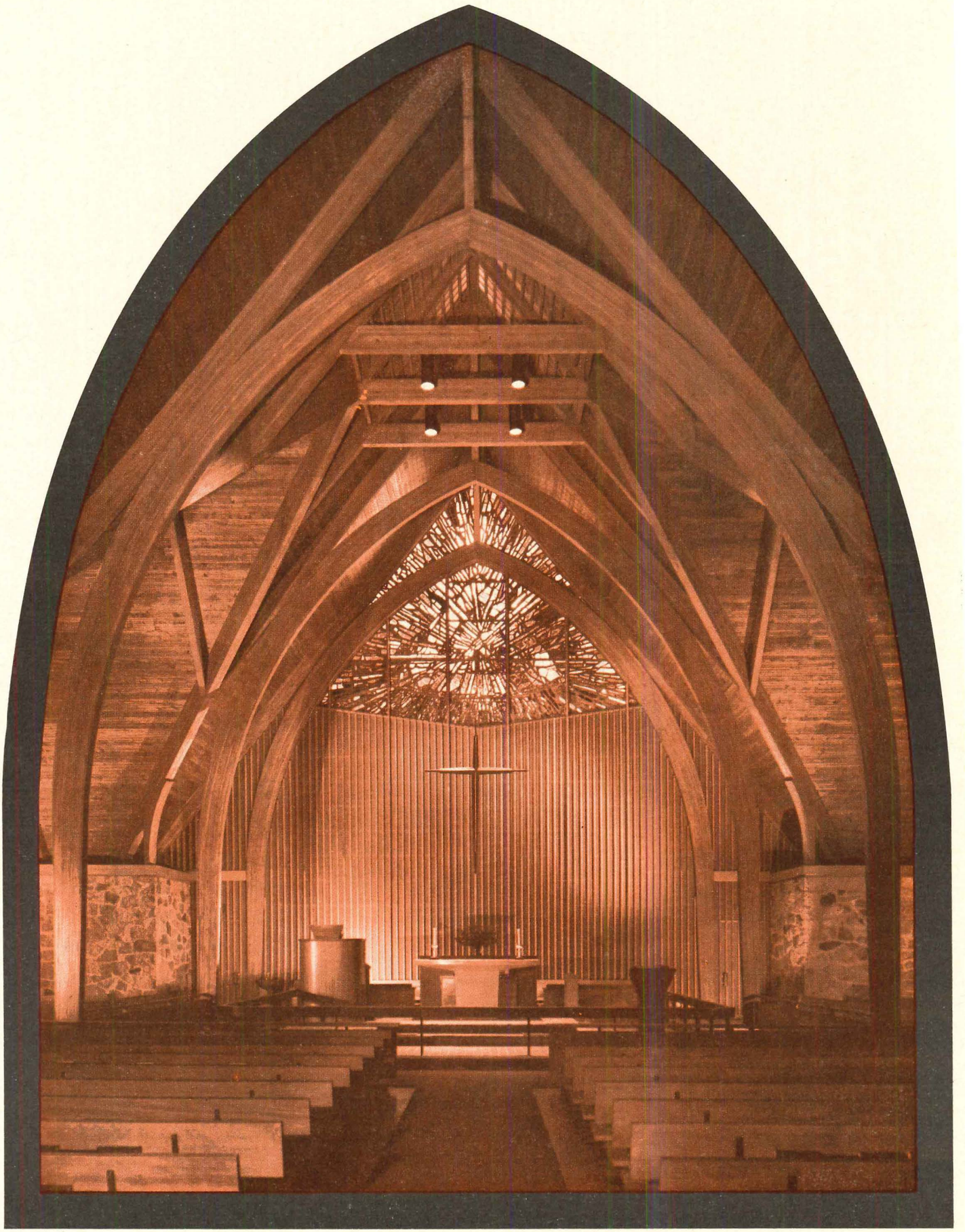
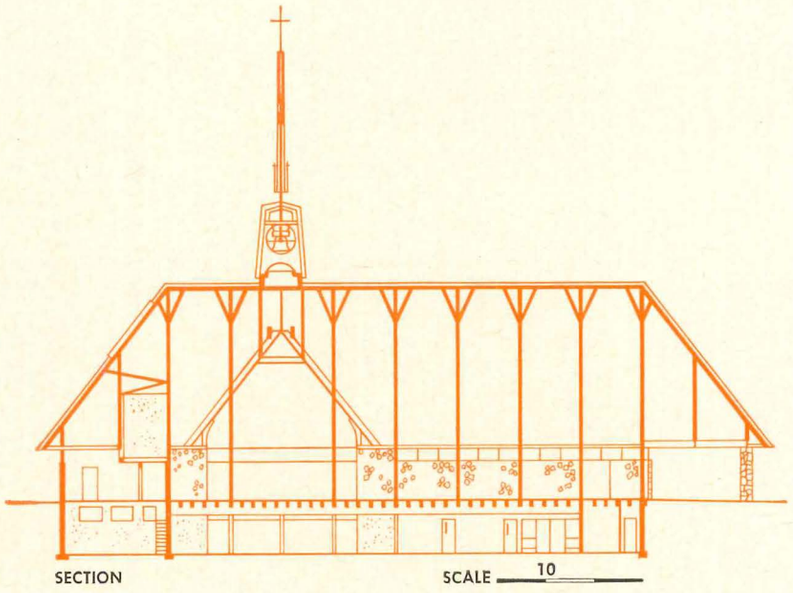
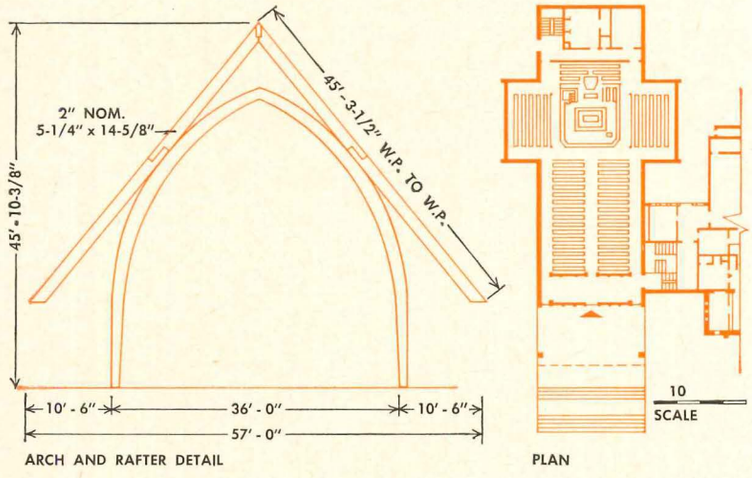


Architect / Pietro Belluschi, Anderson, Beckwith and Haible • Contractor / Rich Construction Company • Trinity Episcopal Church, Concord, Massachusetts





Rilco Laminated Wood . . . the span between imaginative design and economical construction

Pietro Belluschi had the difficult design problem of blending a new 400-seat addition with a 67-year-old rural New England Gothic design. Simple continuity in the church was essential. So was economy. For these reasons, he specified laminated wood beams, arches, solid sawn members and decking for the framing plan. And a 57-foot Rilco wood truss was used in the sacristy. Most of the Rilco structural members were pre-drilled to fit hardware provided. The job went fast. Labor costs were kept down with simple erection procedures. You can put the same advantages to work for you on your next job. See Sweet's Architectural Catalog File, 2bRi and AIA File 19-B-3, or write Weyerhaeuser Company, Box B-24, Tacoma, Washington.

Weyerhaeuser Company
Laminated Wood Products

AITC QUALITY INSPECTED

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N.C.A.R.B. ELIMINATES CITIZENSHIP REQUIREMENT AND CONTINUES STUDY OF FOREIGN EDUCATION

The citizen prerequisite clause was voted out of the regulations of the National Council of Architectural Registration Boards at its 43rd annual convention in St. Louis, June 12-13. The motion to delete the requirement for U.S. citizenship as a prerequisite for Council registration was carried by a vote of 32 to 10.

The adoption of this motion does not however prevent the 22 states which require citizenship for registration from continuing to do so. In calling for the N.C.A.R.B. to drop its "blanketing restriction," Worley K. Wong, F.A.I.A., San Francisco, who introduced the motion, stated that "it is not logical for N.C.A.R.B. to bar competent foreign-born architects from applying to those states not requiring citizenship" and further that "the competency of a foreign-born architect could be better judged by the individual boards of each state."

Mr. Wong remarked that "hardships have been created by those foreign-born architects who would be readily accepted by many states by virtue of their proven adequacy of training, experience and ability." Furthermore, while he felt "that it is folly to equate origin to ability and competence, the basic issue is not an emotional one, nor a patriotic issue, but one of practicality and of fairness to the individual."

The opponents of the resolution felt that the N.C.A.R.B. was a national council rather than a "world council" and that it would be extremely difficult to evaluate foreign education and training. A companion resolution was thus passed instructing the N.C.A.R.B. to study the method of evaluating foreign architectural programs. This resolution, introduced by Ralph O. Mott, Fort Smith, Arkansas, newly elected president of the Council, may possibly restrict the immediate implementation of the former change. In his report of the Foreign Education Committee, Chairman Theodore J. Pritchard, Moscow, Idaho, stated that his committee was preparing a list of foreign schools, comparing the training and degrees offered with those by American schools. A full report will be made at next year's convention.

In the elections, Ralph O. Mott was chosen to succeed Paul W. Drake, Summit, New Jersey, as president of N.C.A.R.B. C. J. Paderewski, San Diego, was elected first vice president and Earl L. Mathes, New Orleans, became second vice president. Elected to the post of secretary was John E. Ramsay, Salisbury, North Carolina, and to that of treasurer was George F. Schatz, Cincinnati.

Harry A. Rodman, Troy, New York, was named a new director. He will serve with the two re-elected directors: Howard T. Blanchard, Garden City, Kansas, and G. Stacey Bennett of Olympia, Washington. At the final meeting of N.C.A.R.B., it was announced that Charles A. Wood Jr., Ridgefield, New Jersey, will succeed James H. Sadler, Washington, D.C., as executive director. Mr. Sadler, who after five years of service in this capacity, has resigned in order to return to private practice. Richard V. Scacchetti will continue as administrative director.

Application Details

for No. 4033 SMOOTHEE ® door closer shown on opposite page
(See diagrams below)

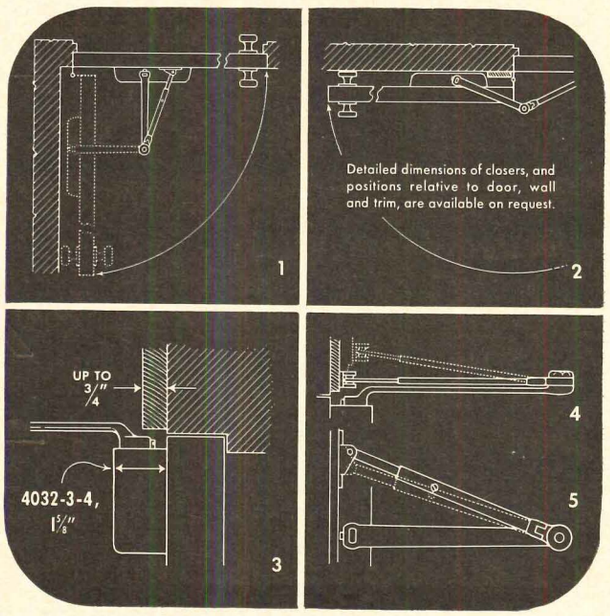
1 In corners a "Smoothee" takes less space than most doorknobs between door and wall

2 Degree of door opening possible depends mostly on mounting, type of trim and size of butt used

3 Arm of "Smoothee" is formed to avoid conflict with almost any trim

4 Joints in arm and shoe make it easy to vary height of shoe as needed for beveled trim

5 Power of closer at latch may be increased or decreased by simply reversing position of shoe



Comprehensive brochure on request—no obligation or see Sweet's '64, Section 19e/Lc

LCN

LCN CLOSERS, PRINCETON, ILLINOIS
A Division of Schlage Lock Company
Canada: LCN Closers of Canada, Ltd.,
P. O. Box 100, Port Credit, Ontario

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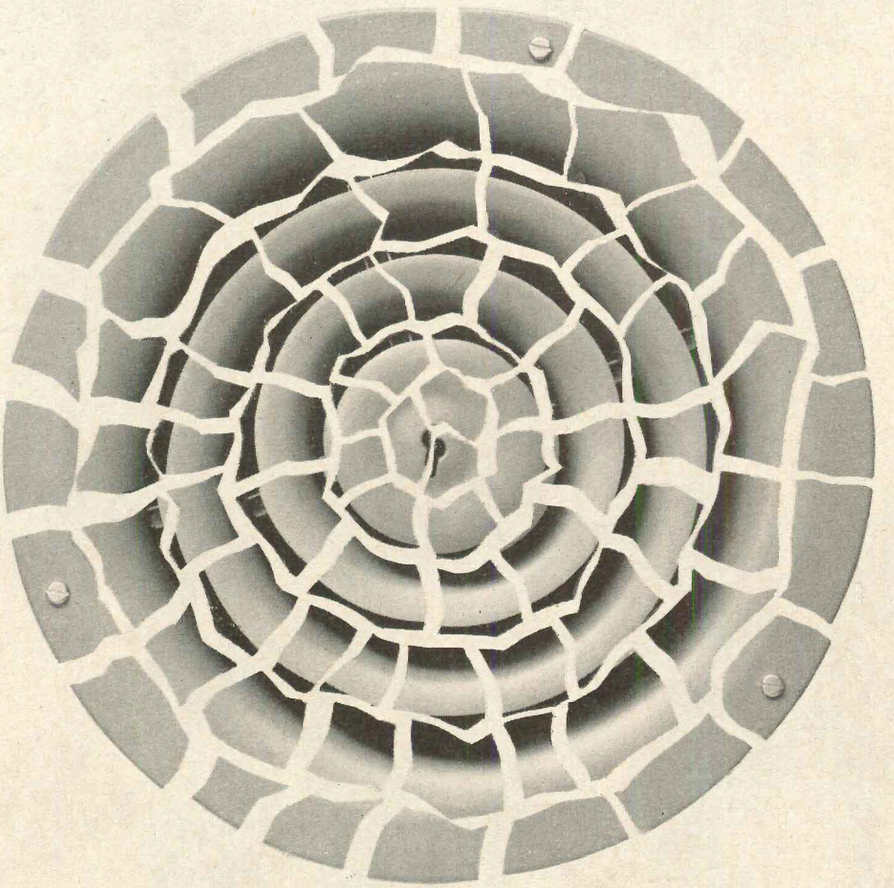
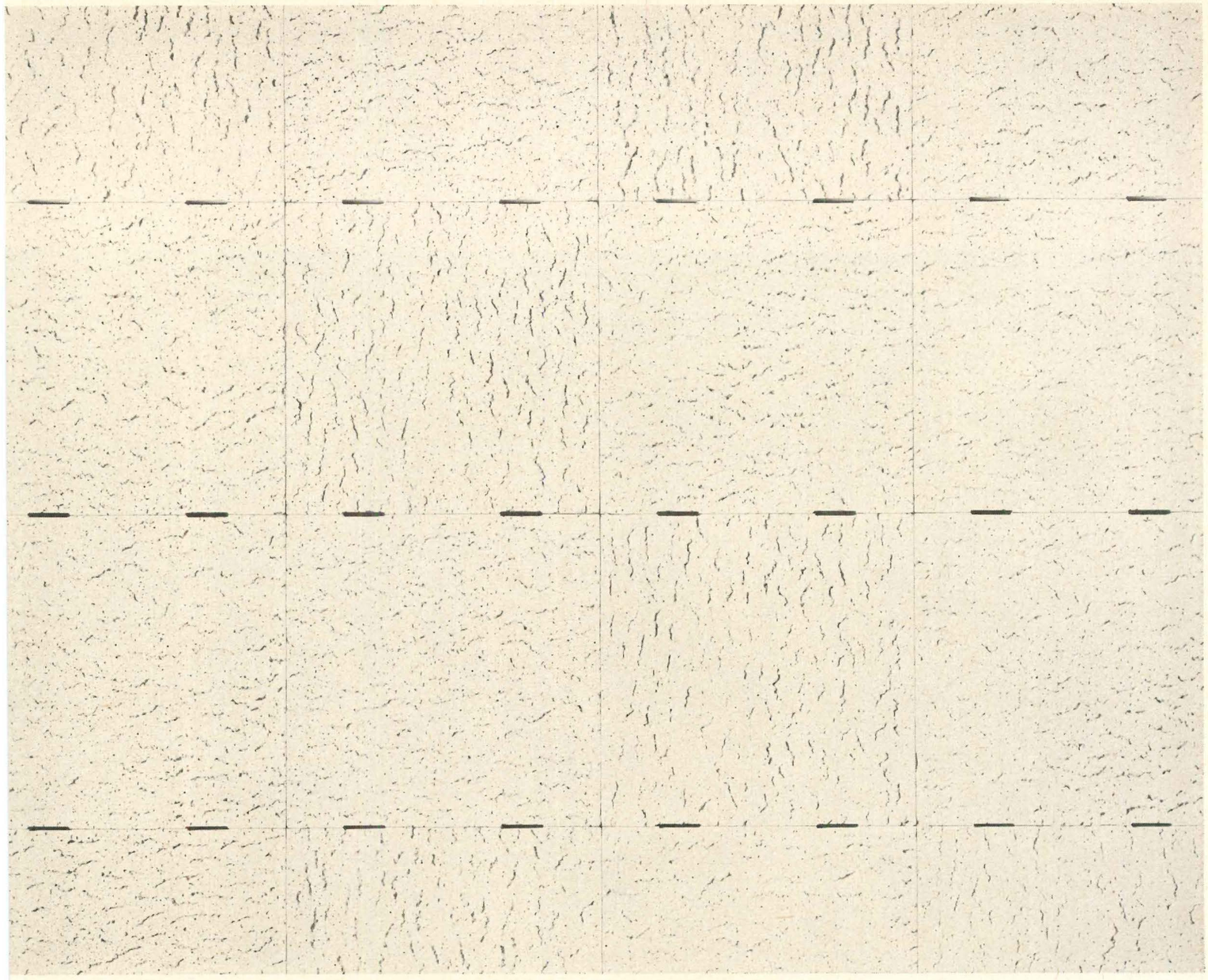
Modern Door Control by
LCN
SMOOTHEE® Door Closers
General Offices of Hyster Company
Portland, Oregon
Wolff & Zimmer, Architects
LCN CLOSERS, PRINCETON, ILLINOIS
Application Details on Opposite Page



Take a diffuser of the proper size for a given area…break it up into dozens of small segments…



then spread them uniformly over the entire area. —That's a Lo-Tone acoustical ventilating ceiling!

Jet slot openings in Lo-Tone acoustical ventilating ceilings are really quite similar to diffuser vents which you have been using for years. Biggest difference: instead of concentrating the delivered air, air is distributed uniformly over the area to be ventilated.

Lo-Tone tile and board make acoustical ventilating ceilings as desirable functionally as they are aesthetically. Also, they can generally save your client money—and make you more competitive—by minimizing the complicated ductwork of conventional air distribution systems.

The advantages of Lo-Tone ventilating tile and board over many other acoustical ventilating ceilings are just as major.

Some ventilating ceiling systems depend on tiny perforations in the ceiling tile to distribute air. But, while these perforations can move a volume of air, they cannot move an effective mass of air . . . at an effective velocity. The result is often poor room air entrainment and discomfort.

The jet orifice principle of Lo-Tone ventilating ceilings solves this problem by delivering the proper balance of air volume, air mass and velocity. Low static plenum pressures of .02 to .15 inches of water gauge deliver from .5 to 8.0 cubic feet of air per minute per square foot of ceiling . . . provide 3 to 30 air changes per hour . . . with no discomfort.

Slot velocities of nearly 1000 FPM are possible with an .06 plenum pressure. Most of the room air induction takes place well below the ceiling, reducing chance of dirt being deposited on the ceiling.

Mixing of primary and room air occurs above the occupied level (usually 72″ from floor) and produces optimum air movement in the occupied zone.

Each Lo-Tone jet is equipped with a concealed control spline which permits fast, easy, precise regulation of air flow from below the ceiling.

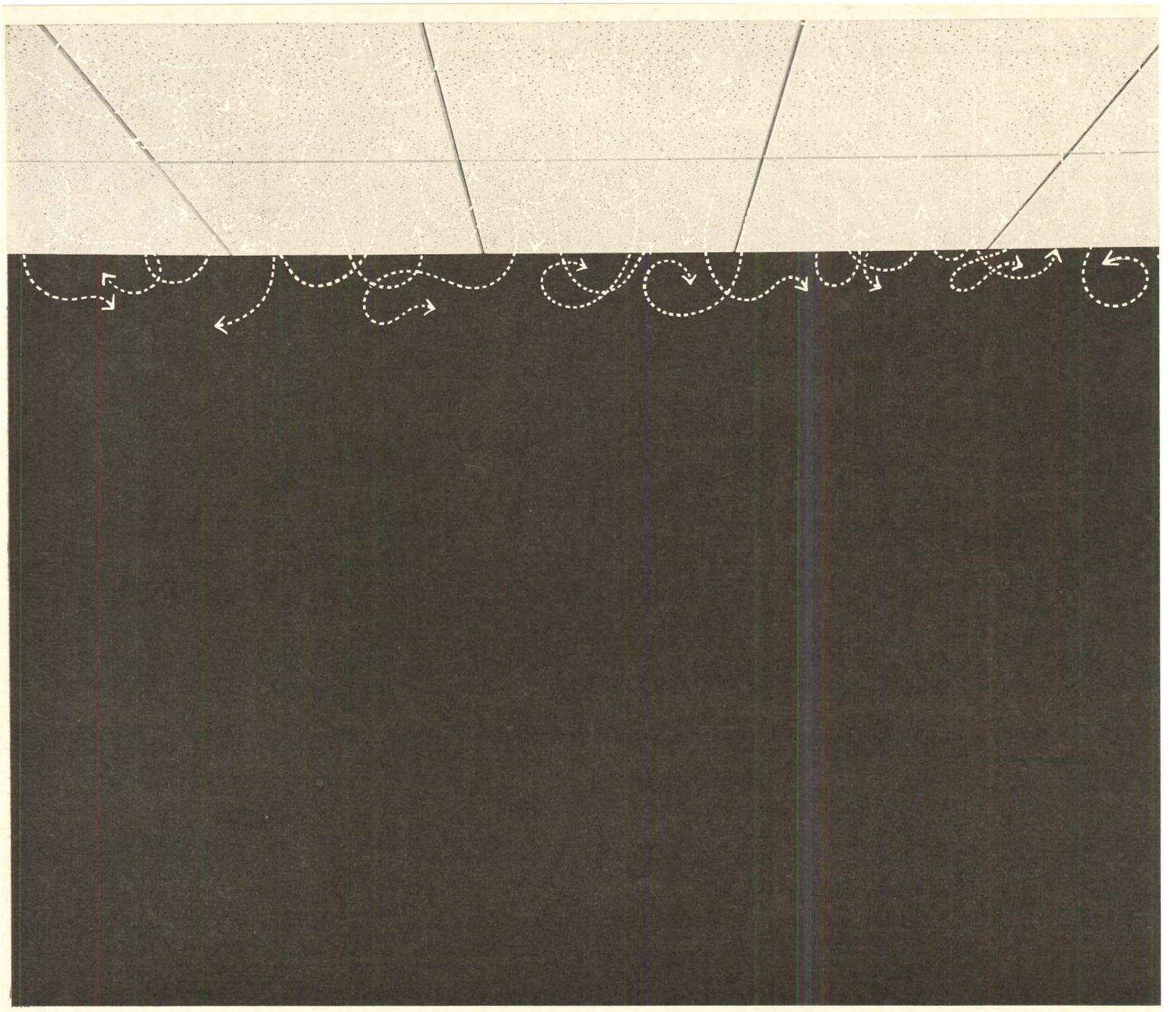
Get all the facts. Write today for your free copy of the helpful new 40 page booklet —"Lo-Tone Ventilating Ceiling Engineering Data." Our address is: Wood Conversion Co., St. Paul 1, Minnesota.

LO-TONE®

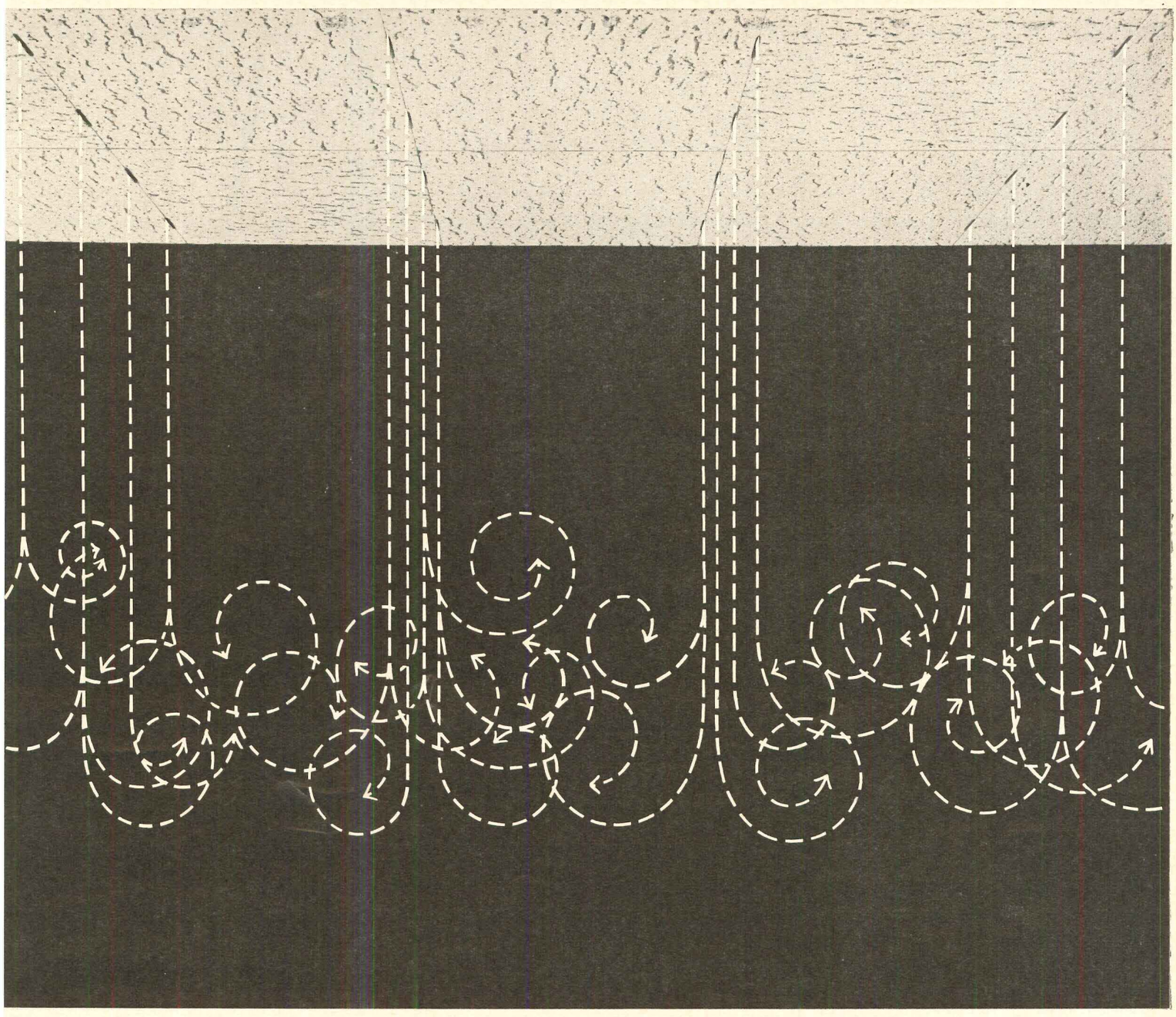
VENTILATING ACOUSTICAL CEILINGS*

*U.S. and foreign patents pending

For more data, circle 111 on Inquiry Card



All ventilating ceilings deliver air…



this one distributes it!

Arrows in the illustrations above point out one of the basic differences between Lo-Tone acoustical ventilating ceilings and most others. The system on the left delivers air through tiny perforations; the Lo-Tone ceiling distributes air by means of the jet principle . . . through specially designed slots.

As the illustrations indicate, tiny perforations cannot deliver an effective balance of air volume and mass for optimum air entrainment and distribution.

The adjustable jet orifice of Lo-Tone ventilating tile and ceiling board—featuring optional control splines which can be adjusted from below the ceiling—solves this problem.

Compared with systems based on perforations, alone, air jet slots in Lo-Tone ceilings allow higher static pressure differentials between plenum and the room below. This means delivery of sufficient air volume—with sufficient mass and velocity—to provide balance between air motion and entrainment required for human comfort.

At plenum static pressures of .02 to .15 inches water gauge, Lo-Tone ceilings deliver from .5 to 8.0 cubic feet of air per minute per square foot of ceiling with no discomfort.

At a plenum pressure of .06 the air velocity through the slots is almost 1000 FPM. Yet most room air induction takes place well below the ceiling, reducing chance of dirt being deposited on the ceiling.

Mixing of primary and room air occurs above the occupied level (generally 72″ from floor) and produces optimum air movement throughout the occupied zone.

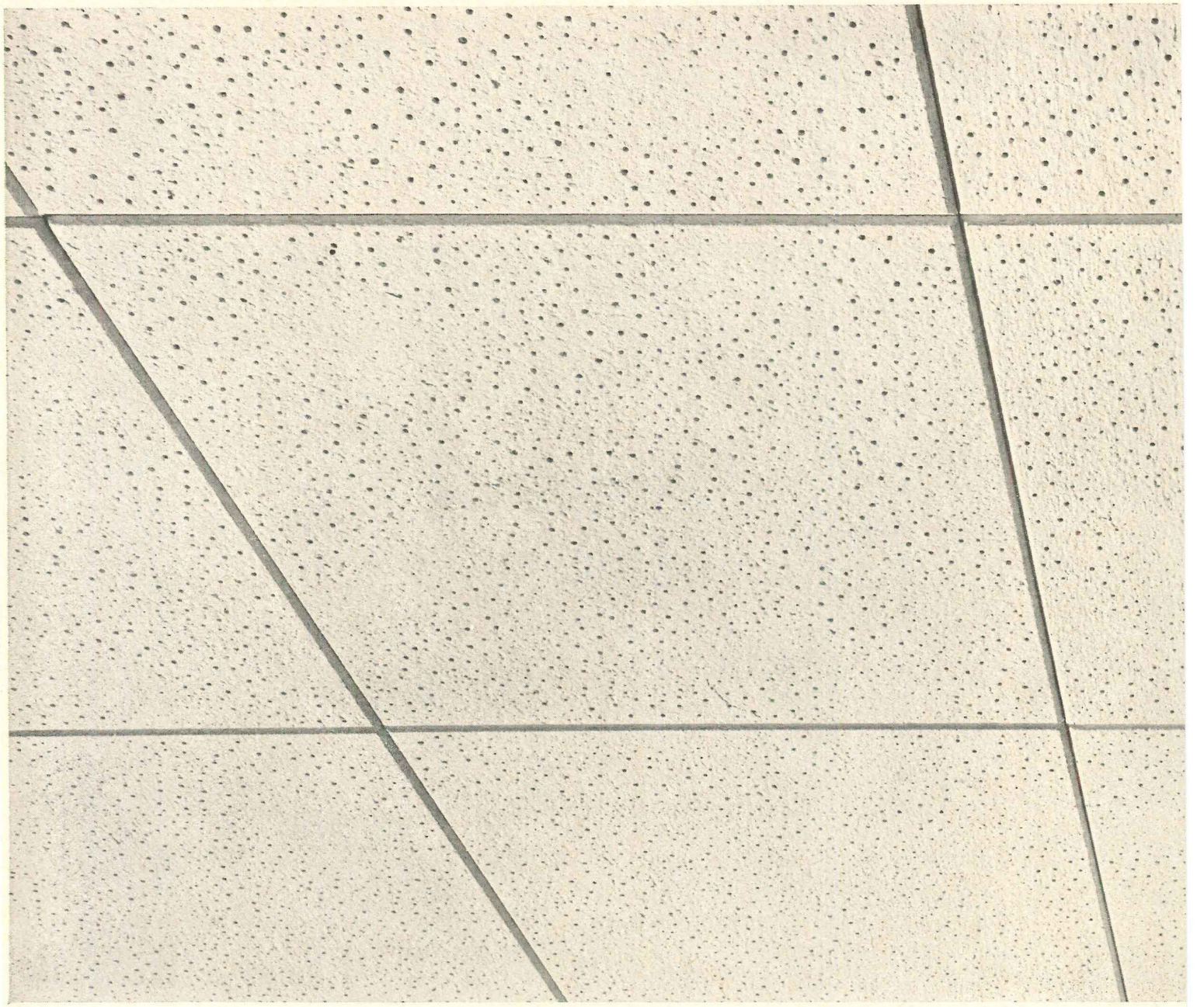
Get all the facts on Lo-Tone acoustical ventilating ceilings. Write today for your free copy of the helpful new 40 page booklet—"Lo-Tone Ventilating Ceiling Engineering Data." Our address is: Wood Conversion Company, First National Bank Building, St. Paul 1, Minnesota.

LO-TONE®

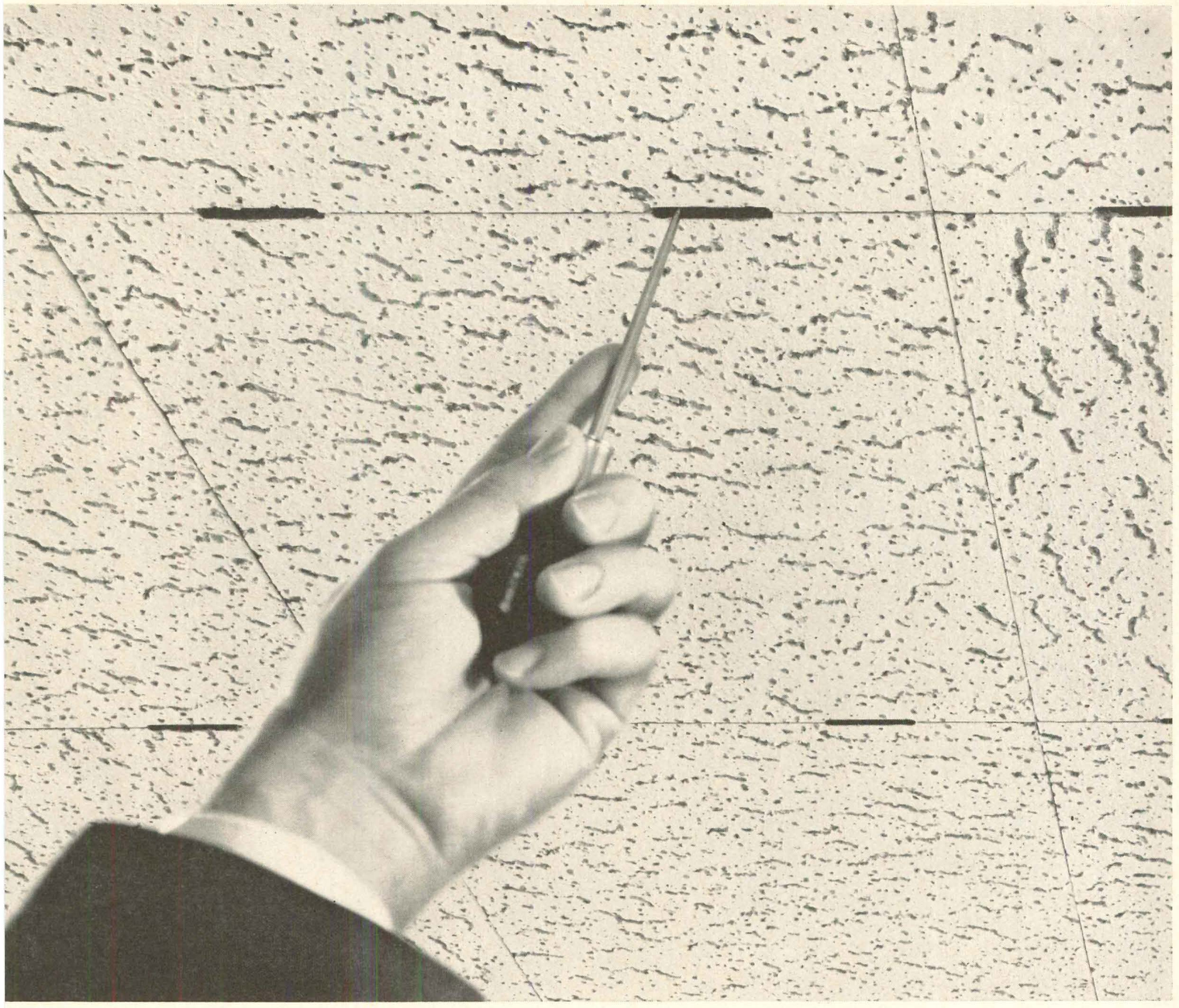
VENTILATING ACOUSTICAL CEILINGS*

*U.S. and Foreign Patents Pending

For more data, circle 111 on Inquiry Card



Some ventilating ceilings don't have built-in adjustability...



this one does!

Lo-Tone ventilating acoustical ceilings have jets you can adjust—jet orifices are equipped with air flow control splines as an integral part of the ceiling systems.

All you need to adjust air distribution is a small awl or pointed tool. And you do it from the room side—after the ceiling has been installed . . . any time after the tenant has moved in . . . or changed.

Air distribution can be modified as room requirements change without removing a single tile or ceiling board or altering the design.

If it's desirable to reduce the amount of air mixing in a specific area, you simply close, or partially close, the slots overhead.

The advantages of this flexibility are obvious for computer rooms or similar areas where a lot of air must be moved and occupant comfort must also be considered. But don't overlook the importance of precise comfort control in more common situations, such as offices, schools and public buildings.

The Lo-Tone adjustable jet combats all four major causes of discomfort originating from air distribution devices: drafts, temperature variations, stratification of air and noise. It provides optimum air mixing and distribution —something systems based on tiny perforations cannot effectively do.

Most of the room air induction takes place well below the ceiling. This reduces the possibility of dirt being deposited on the ceiling.

Mixing of primary and room air occurs above the occupied level (usually 72″ from floor).

Yet, even with its functional and aesthetic advantages, a Lo-Tone acoustical ventilating ceiling is installed in the same way as a regular acoustical ceiling. Available in Constellation or Fissura patterns, including Fire-Rated types.

Get all the facts on Lo-Tone acoustical ventilating ceilings. Write today for your free copy of the helpful new 40 page booklet — "Lo-Tone Ventilating Ceiling Engineering Data." Our address is: Wood Conversion Company, St. Paul 1, Minnesota.

LO-TONE®
VENTILATING ACOUSTICAL CEILINGS*

*U. S. and foreign patents pending

For more data, circle 111 on Inquiry Card

FLY'S EYE VIEW: LARGE AGGREGATE MARBLE CHIPS BLASTED ON EXCLUSIVE TROWELED MATRIX...ON SITE. Infinite color and natural beauty of large marble or granite chips gives free rein for imaginative surfacing of interior or exterior walls.

Marble-Lite is weatherproof, impervious and makes for a practically indestructible surface.

For details, specifications write to: Aggregate Surfacing Corporation of America, Wolf's Lane, Pelham, N. Y. or call 914 PE 8-2725.

RECENT MARBLE-LITE INSTALLATIONS ■ First National City Bank, Rye, N.Y. ■ Eggers & Higgins—IBM, Trenton, N. J. ■ Curtis & Davis—Constitution Plaza, Hartford, Conn. ■ Coca-Cola, World's Fair, Flushing, L. I. ■ Welton Beckett (Interior—Displayers, Inc.) ... and others.

MARBLE-LITE

For more data, circle 112 on Inquiry Card

ARCHITECTURAL RECORD SEPTEMBER 1964

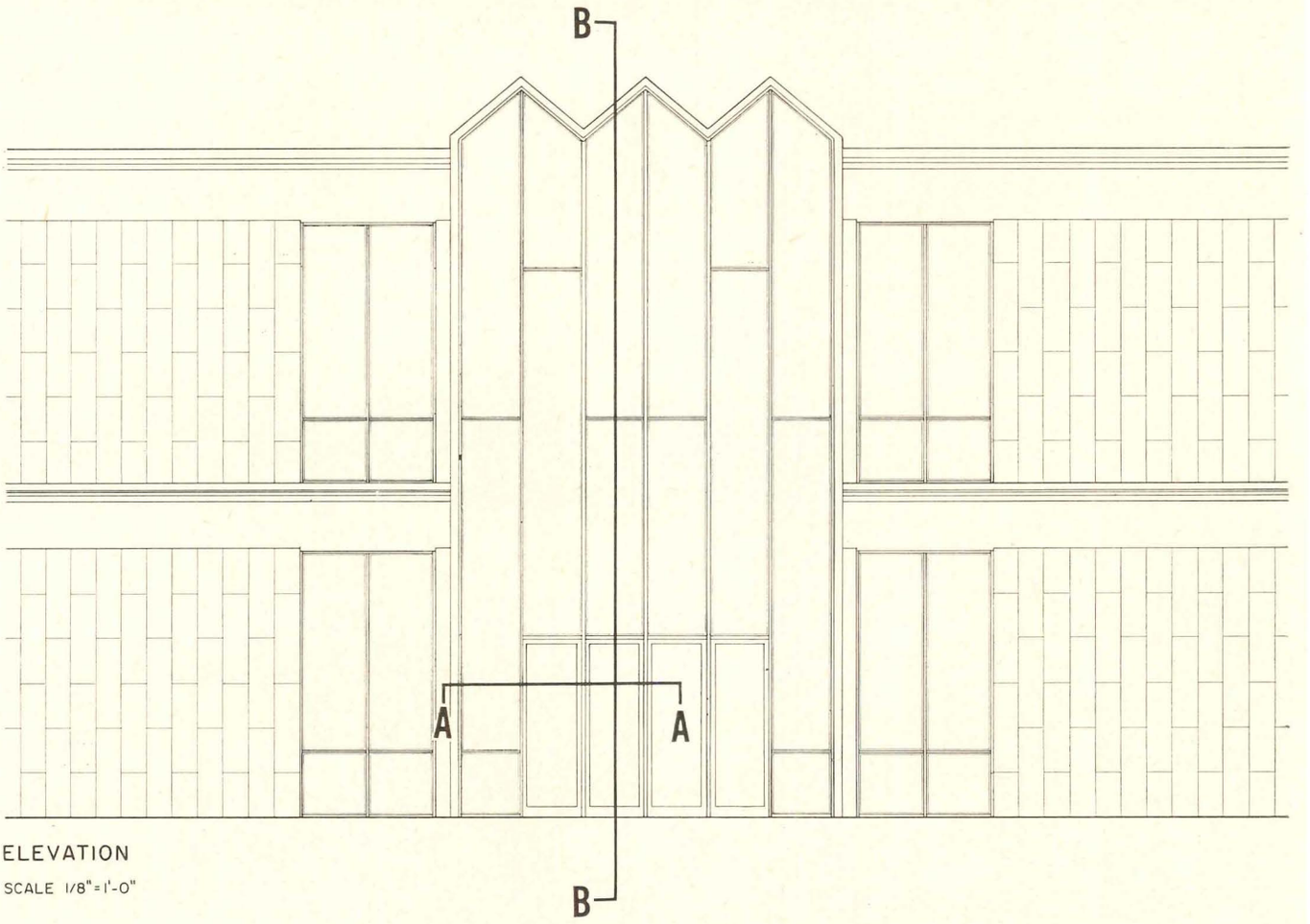
ARCHITECTURAL DETAILS

4. MINORU YAMASAKI

Fourth in a series of presentation details of significant architecture by master architects

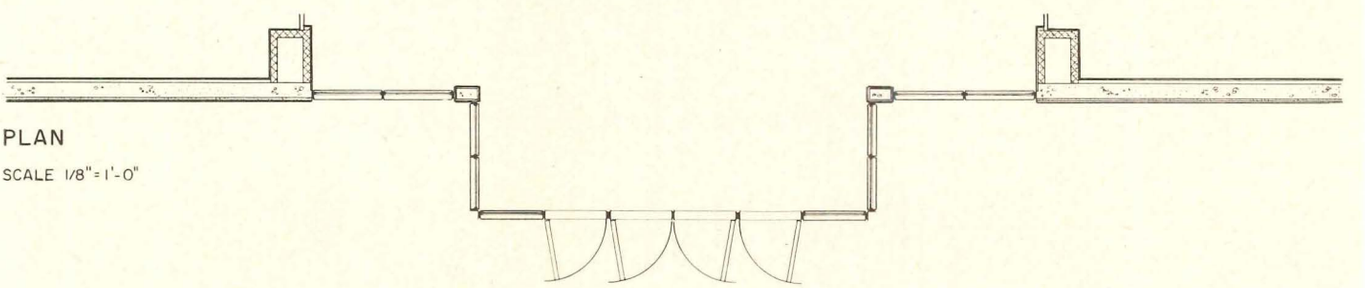
Each building is an experience to man; one dull, one wonderful. The more imaginative the concept, the more rewarding the experience. That experience can be further enhanced by the awareness of detail—of the thought and care given to it. The esthetic totality of any beautiful thing—such as a lovely plant—is in its concept, its structure or its tiniest detail. Thus, visual enjoyment of a building is more fully realized when—within the context of a sound, imaginative concept—great love and care are lavished upon appropriate details.

MINORU YAMASAKI



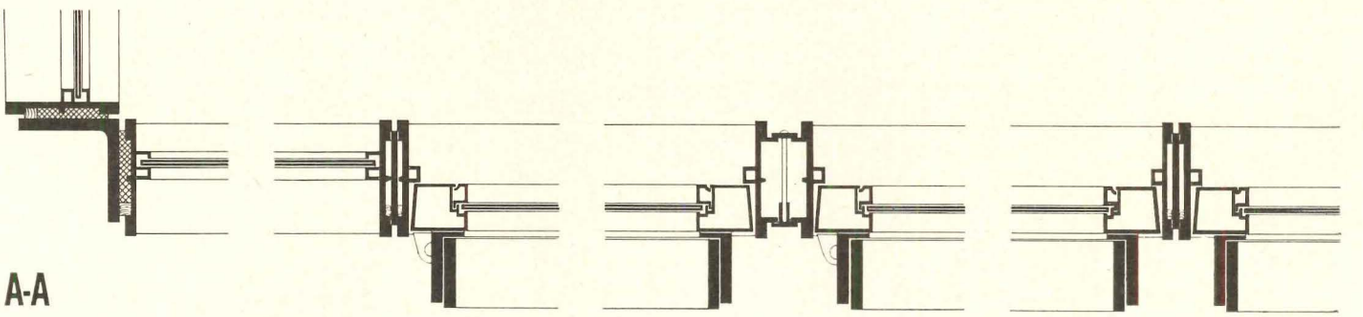
ELEVATION

SCALE 1/8"=1'-0"



PLAN

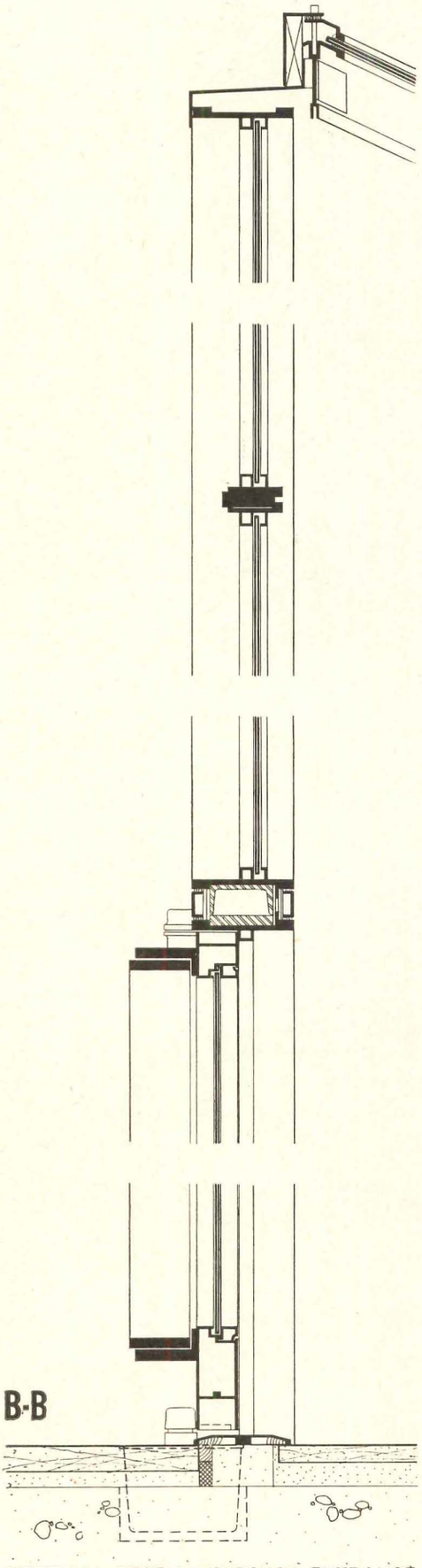
SCALE 1/8"=1'-0"



A-A

HORIZONTAL SECTION THROUGH ENTRANCE

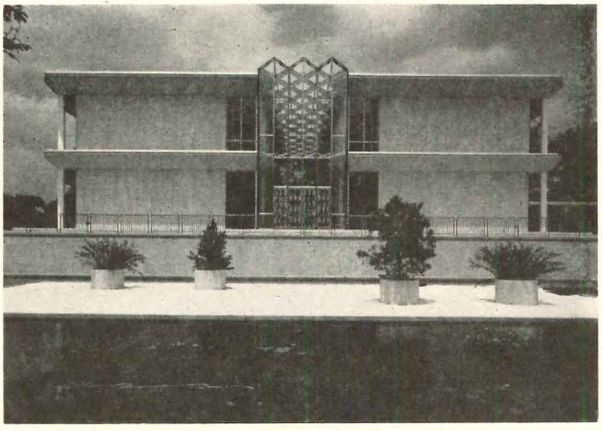
SCALE 1 1/2"-1'-0"

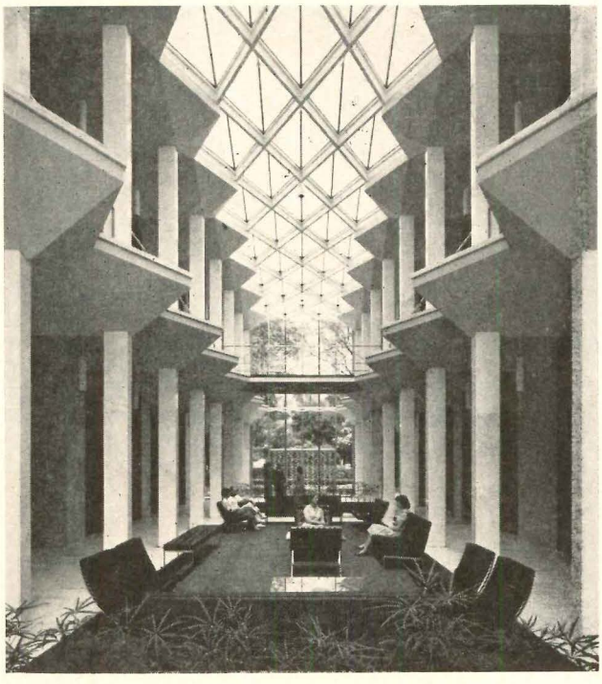


VERTICAL SECTION THROUGH ENTRANCE

SCALE 1 1/2"=1'-0"

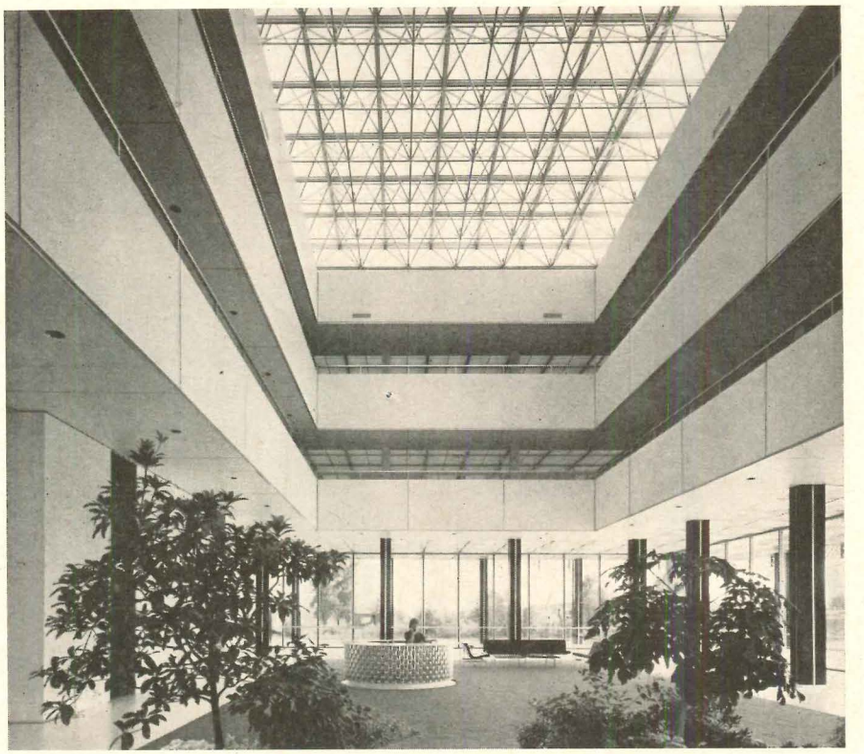
Balthazar photos





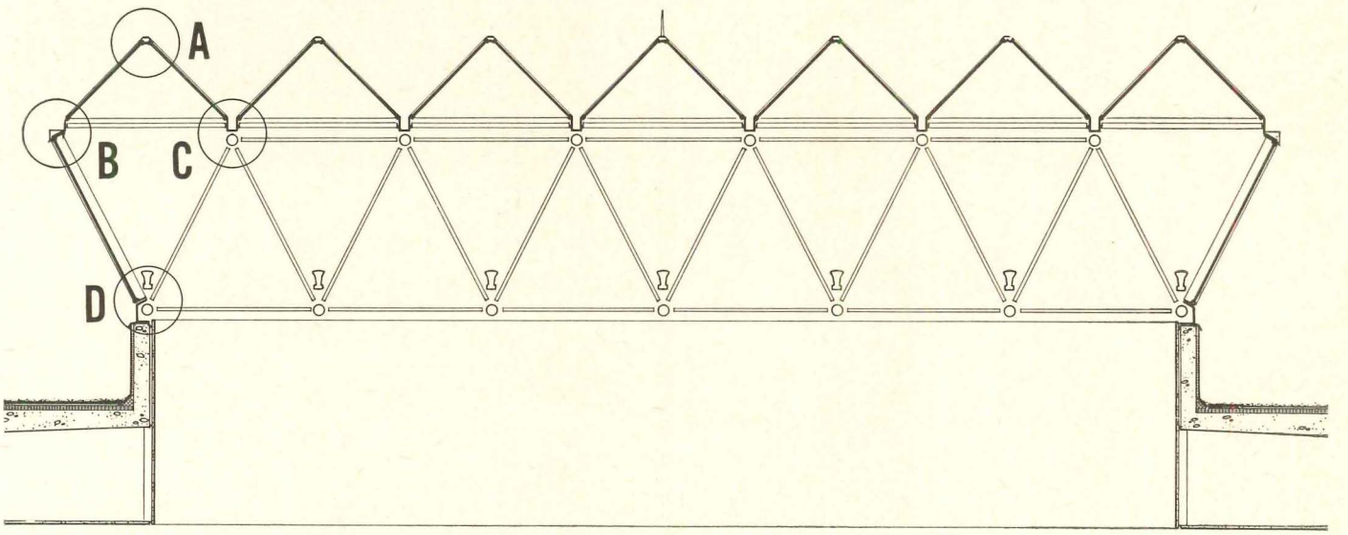
McGREGOR MEMORIAL COMMUNITY CONFERENCE CENTER WAYNE STATE UNIVERSITY DETROIT, 1958

Yamasaki: To enhance the importance of the Conference Building as both a center and a memorial, we felt it necessary to contrast it to the other campus buildings. Thus, we chose the folded concrete slab for interest of form and for silhouette against the sky. This form is reflected by the skylight which terminates in the quiet elegance of the glass and aluminum entrance wall



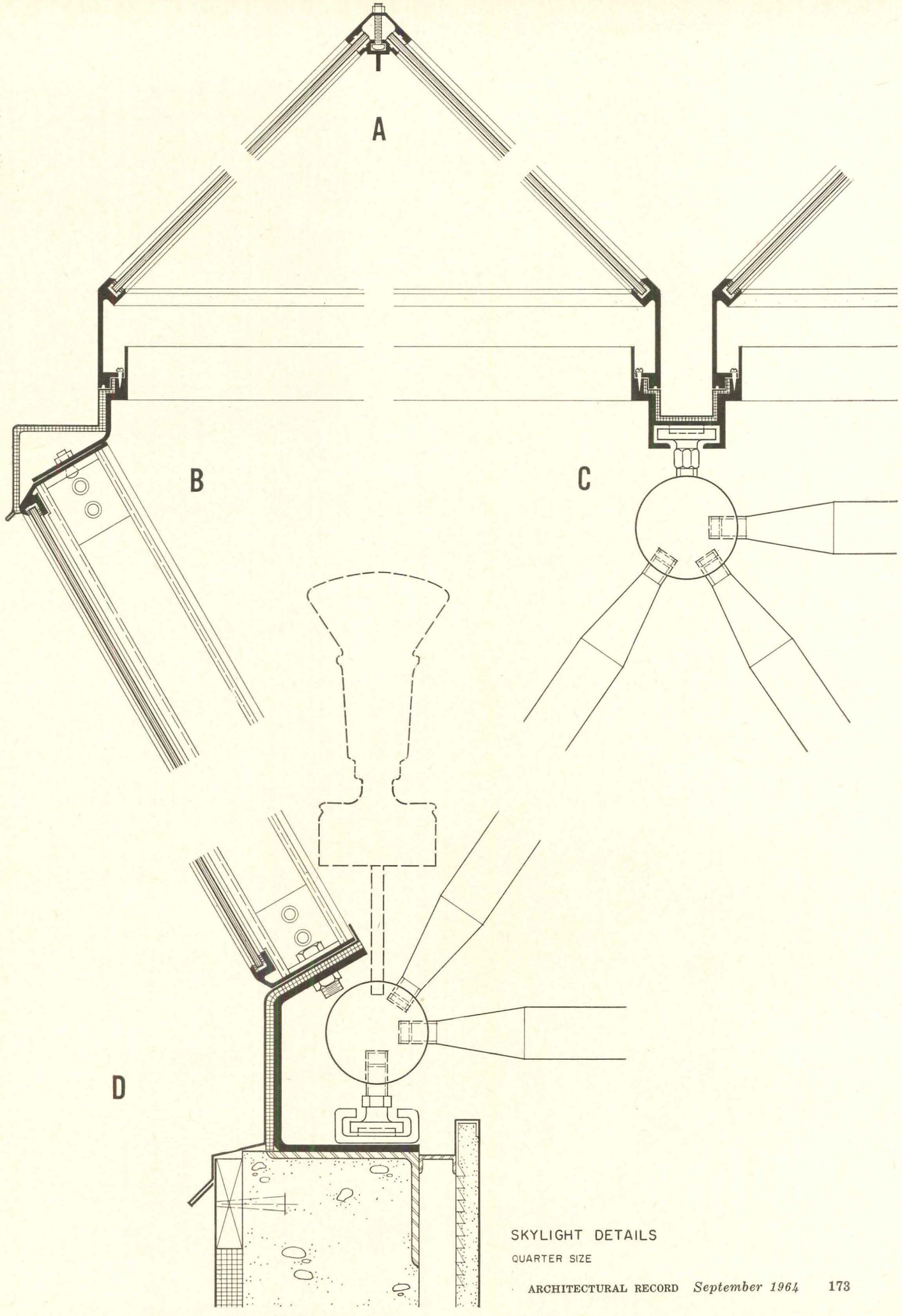
SKYLIGHT—
REGIONAL SALES OFFICE BUILDING
REYNOLDS METALS COMPANY
SOUTHFIELD, MICHIGAN, 1959

Yamasaki: The skylight crowning the open central core of this building gives a finish and silhouette to the exterior and floods the interior with daylight. Detailing the skylight posed several problems: structural support, expansion and contraction, and drainage. The solution is a space frame of bright aluminum rods and spheres, beautifully fabricated and finished. The frame supports a gutter system of extruded aluminum sections, which in turn hold the ¼-inch wire glass so that movement is possible without leakage. The entire structure was erected in five days; is lighted at night by 91 150-watt floods; is also shielded against lightning



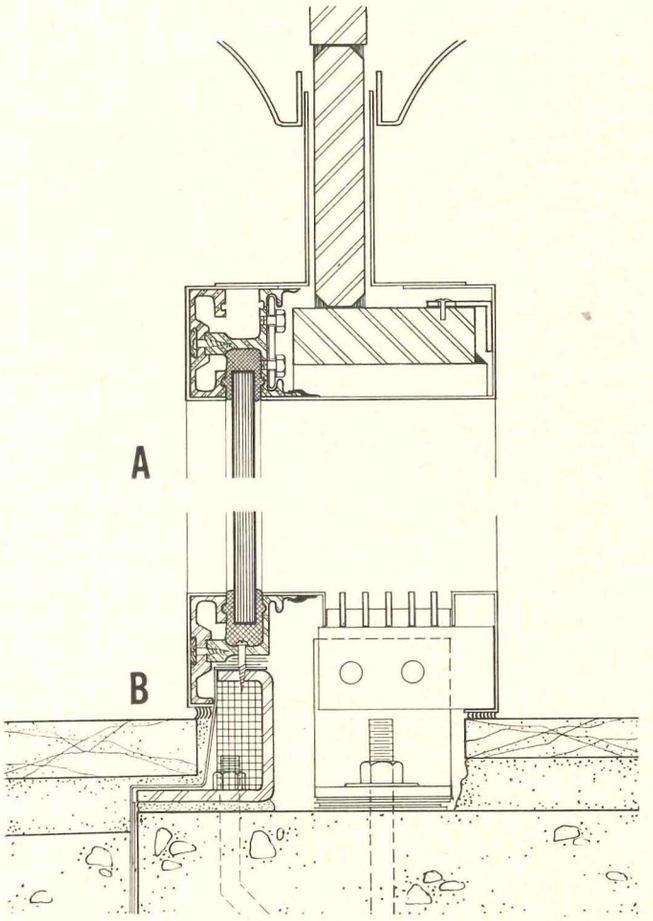
SECTION

SCALE 3/16"=1'-0"



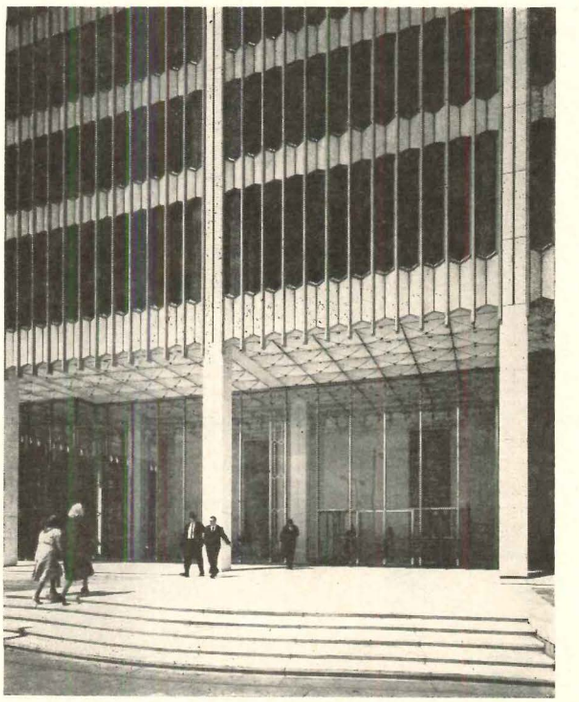
SKYLIGHT DETAILS

QUARTER SIZE



VERTICAL SECTION AT LOBBY WALL

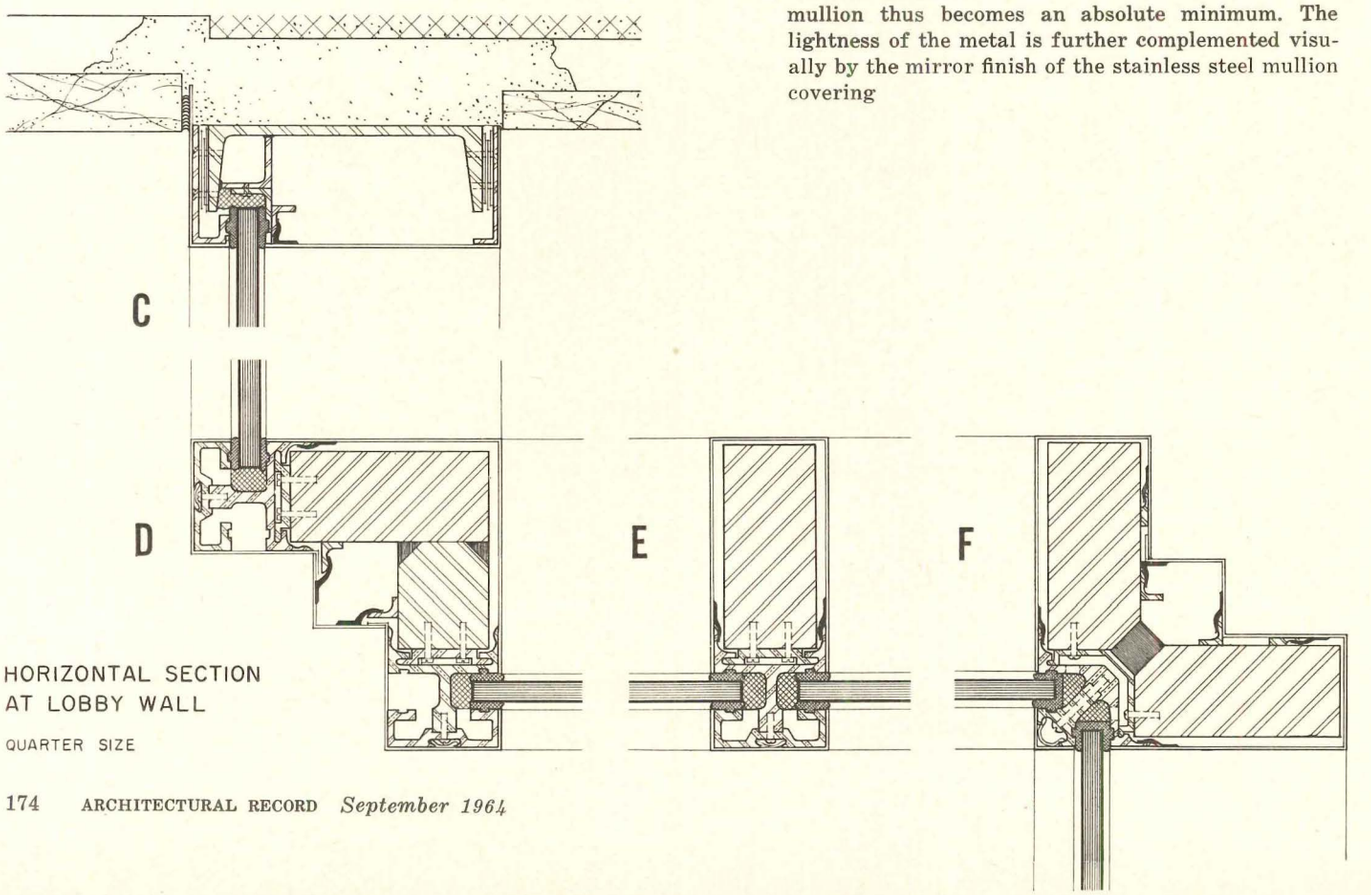
QUARTER SIZE



OFFICE BUILDING, MICHIGAN CONSOLIDATED GAS COMPANY DETROIT, 1963

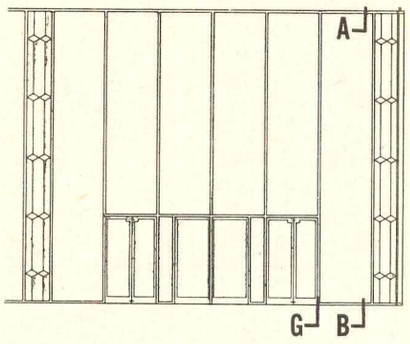
Minoru Yamasaki—Smith, Hinchman & Grylls Associated Architects and Engineers

Yamasaki: Because lightness was of paramount importance for the glass wall of the lobby, the mullions are passed through the floor and placed in tension by means of a simple spring attached to the underside of the structural slab. The cross sectional area of the mullion thus becomes an absolute minimum. The lightness of the metal is further complemented visually by the mirror finish of the stainless steel mullion covering



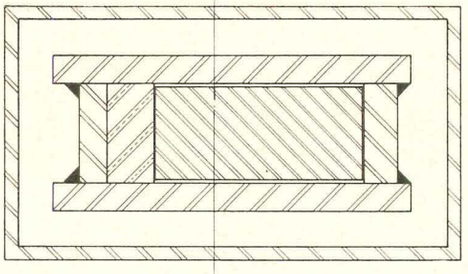
HORIZONTAL SECTION AT LOBBY WALL

QUARTER SIZE



KEY ELEVATION

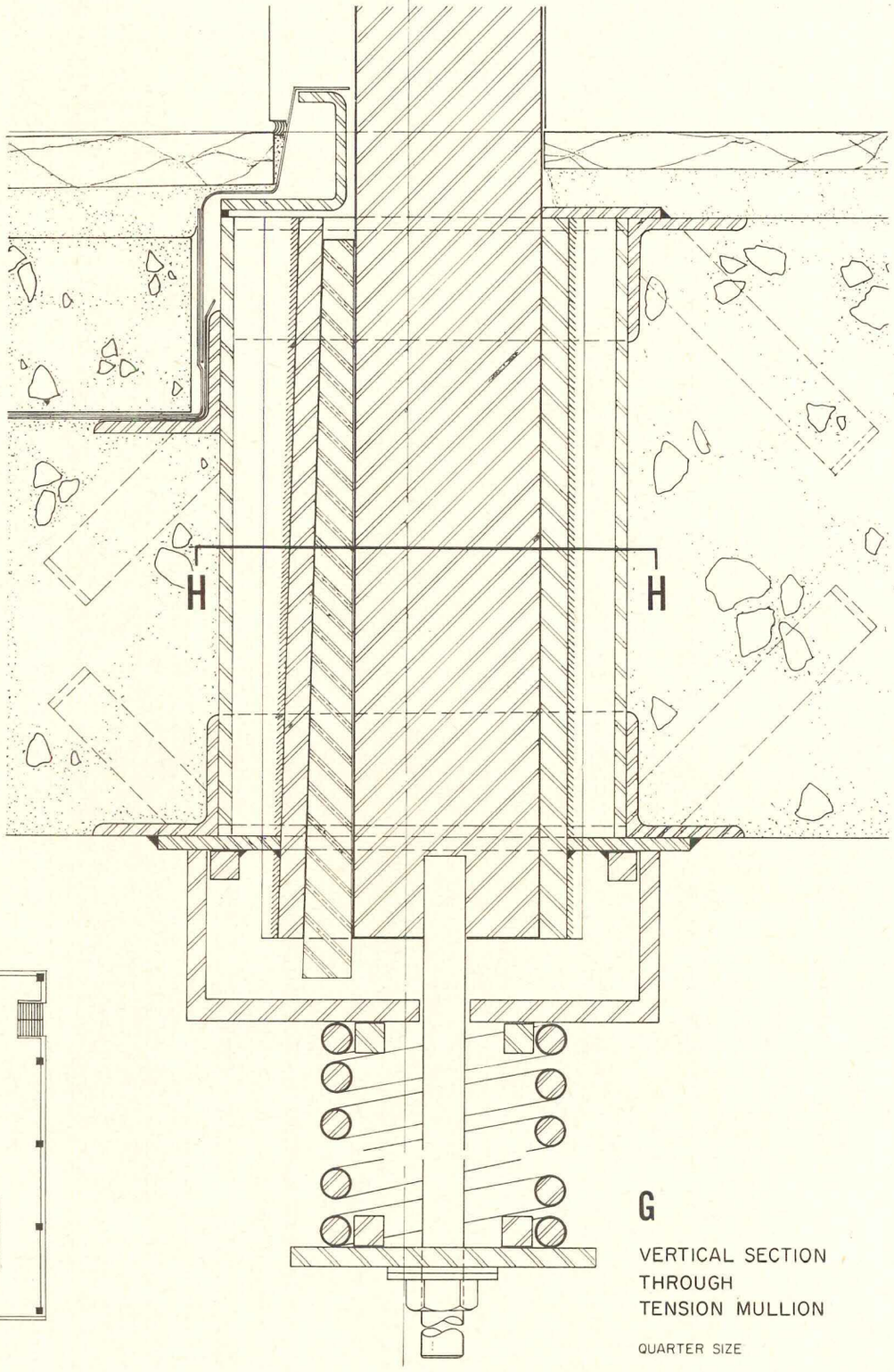
SCALE 1/16" = 1'-0"

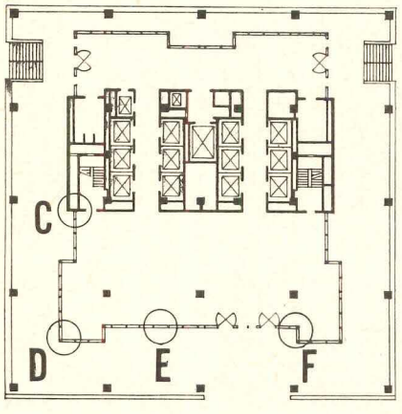


H-H

PLAN SECTION

QUARTER SIZE



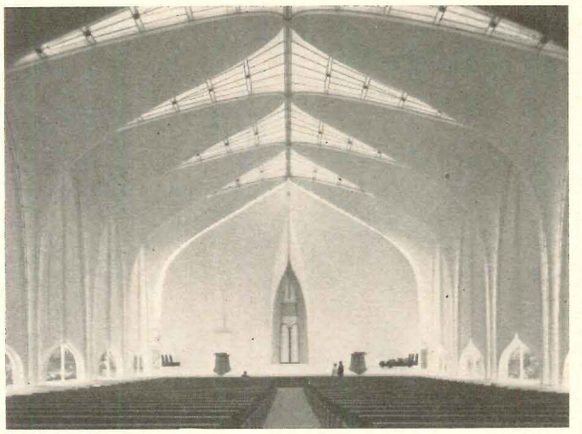


LOBBY LEVEL

G

VERTICAL SECTION
THROUGH
TENSION MULLION

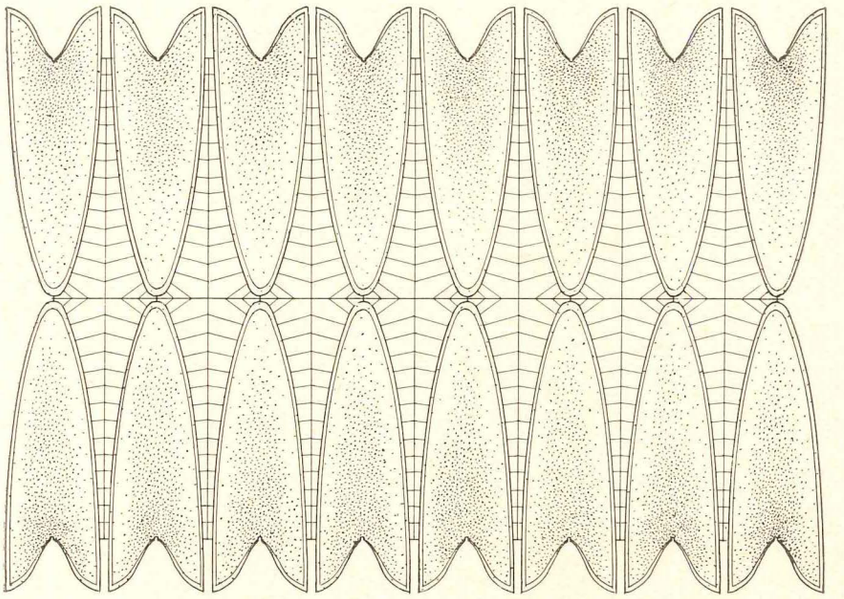
QUARTER SIZE



Heldrich-Blessing

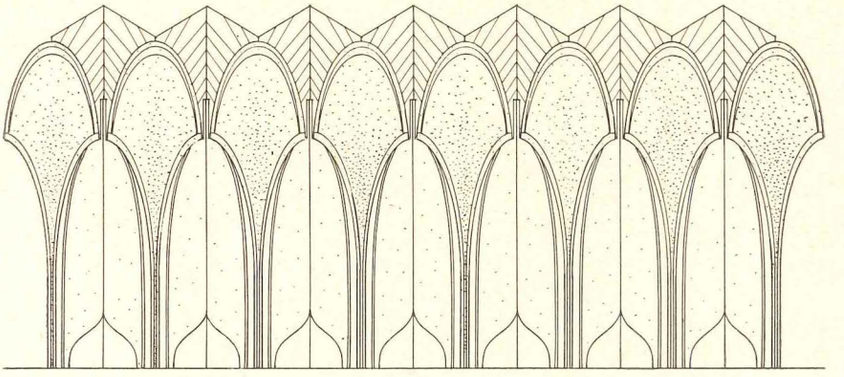
TEMPLE BUILDING
NORTH SHORE CONGREGATION ISRAEL
GLENCOE, ILLINOIS, 1964

Yamasaki: The sanctuary structure consists of 16 fan-vault shells, which are locked together at the outside walls and at the peak of the roof. The interstices are filled with skylights which are amber-colored, double-layered and contain artificial lighting. The precast exterior side wall panels are secured to the structure only at top and bottom; strips of translucent amber glass separate them from the fan-vault shells of the main structure. (For further information on this synagogue, refer to the feature story beginning on page 191)



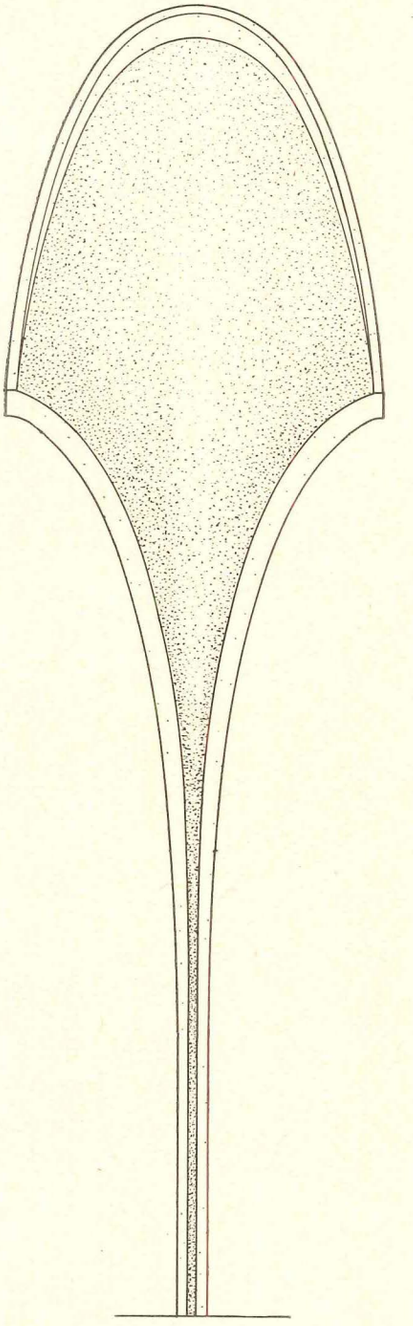
ROOF DIAGRAM

SCALE 1/32" = 1'-0"



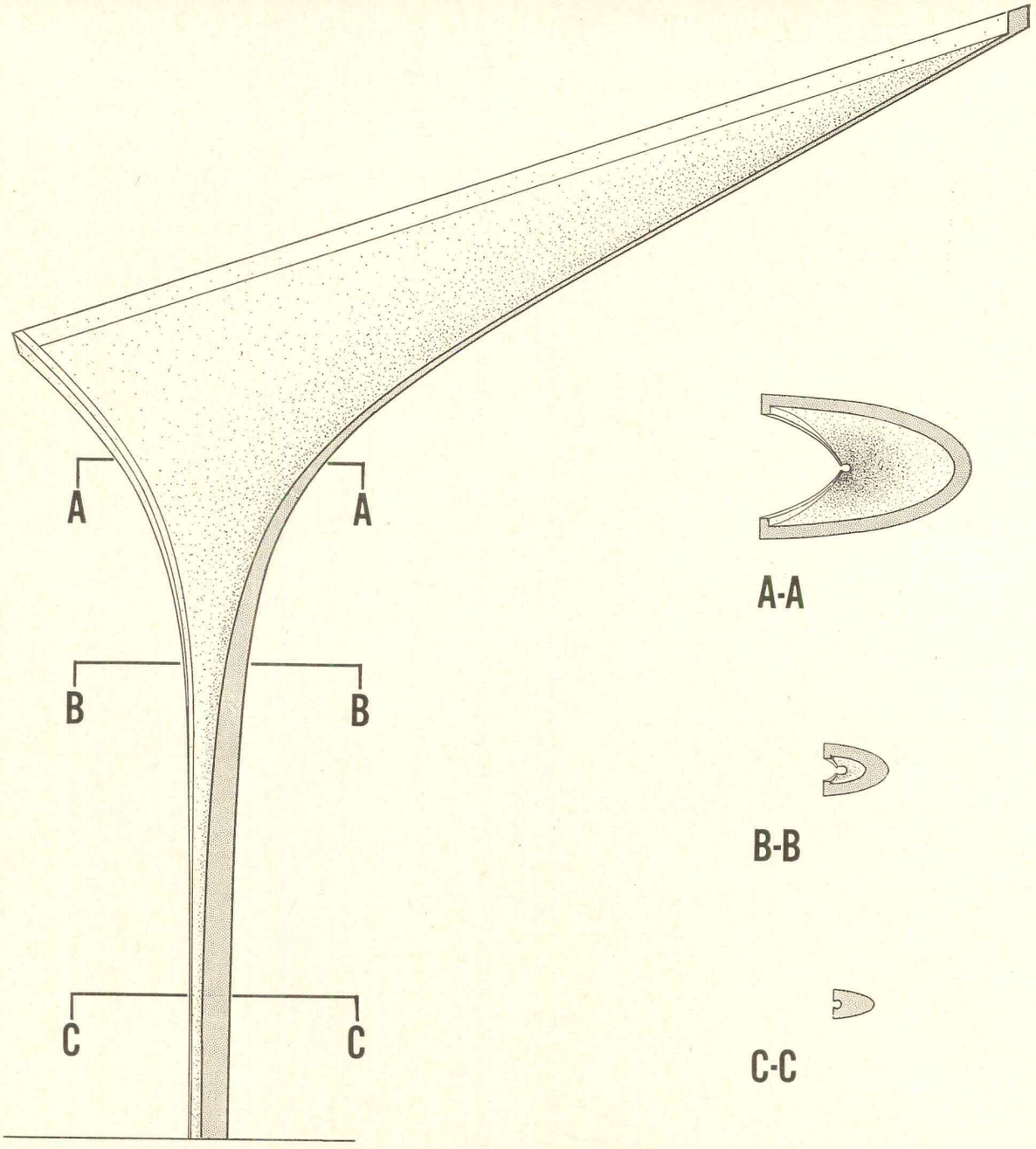
ELEVATION DIAGRAM

SCALE 1/32" = 1'-0"



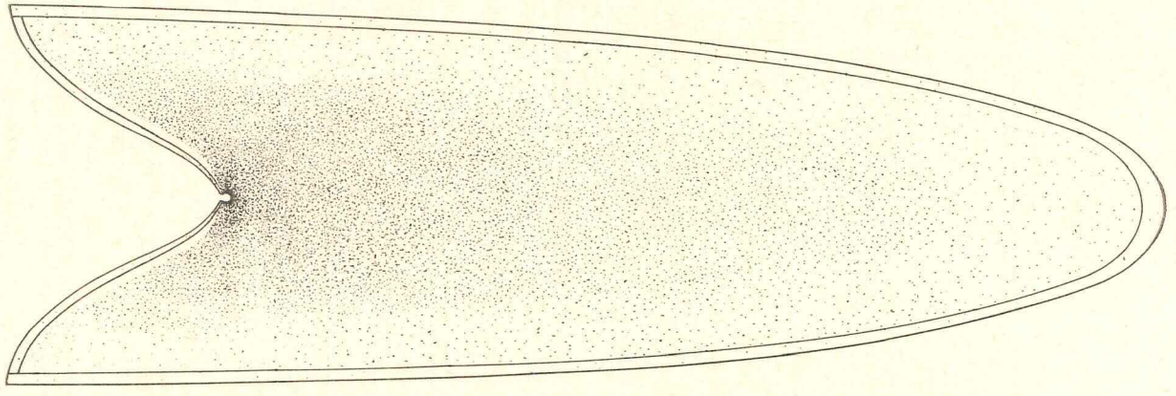
ELEVATION

SCALE 1/8" = 1'-0"



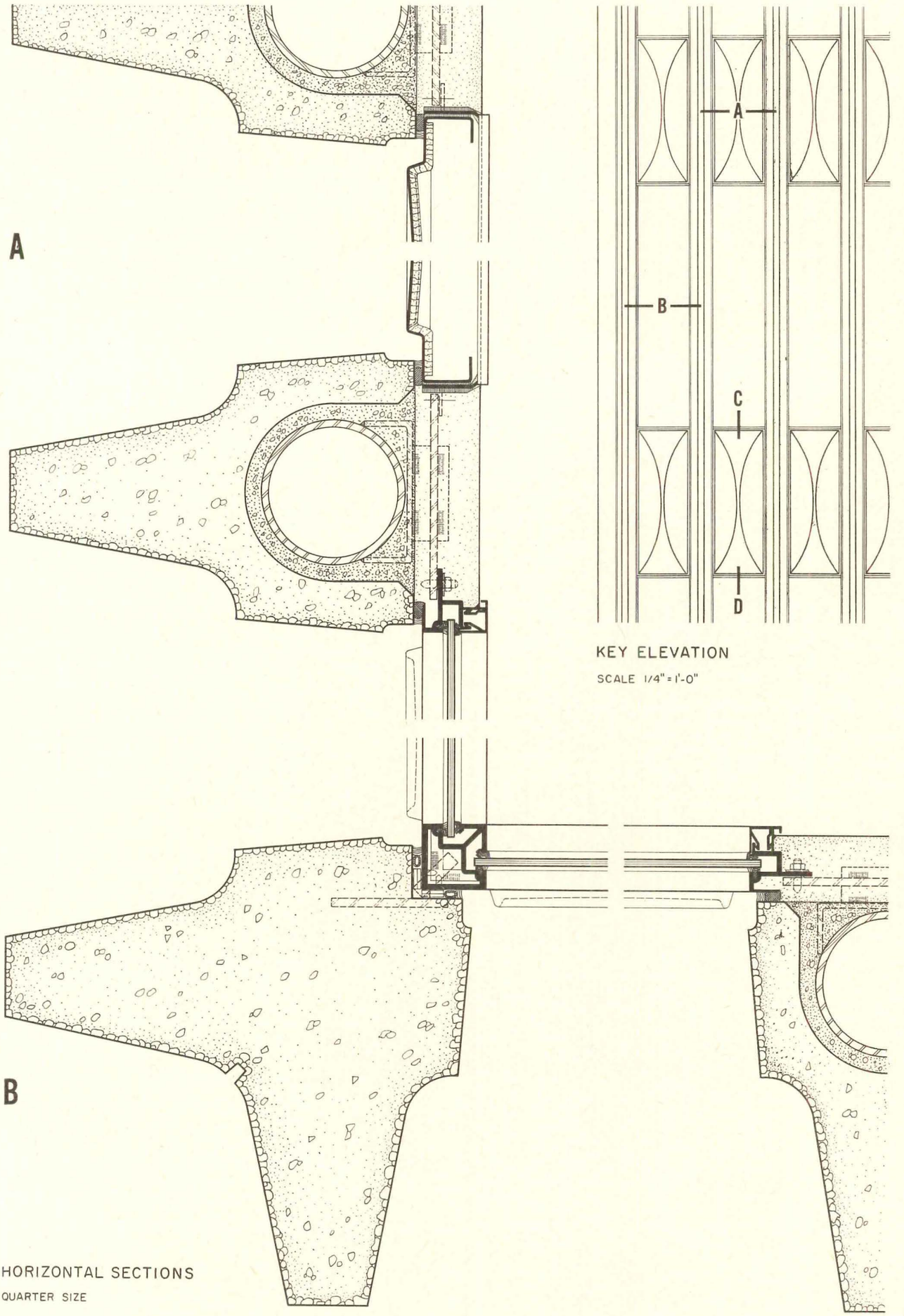
SECTION

SCALE 1/8" = 1'-0"



PLAN

SCALE 1/8" = 1'-0"

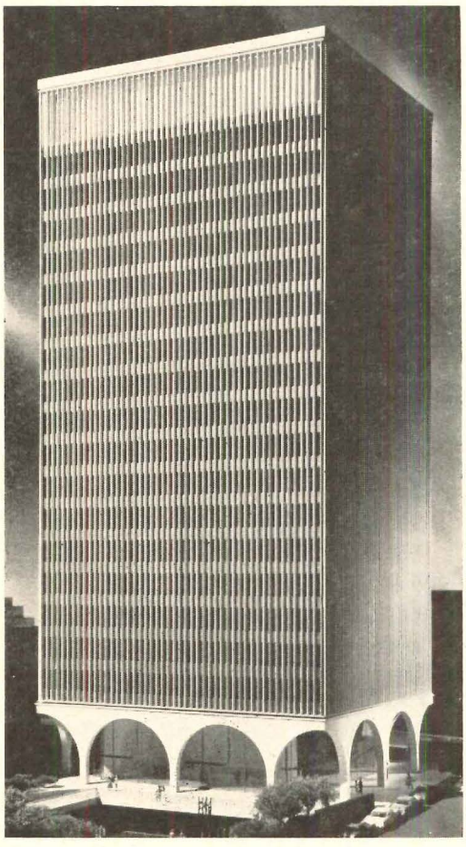


HORIZONTAL SECTIONS

QUARTER SIZE

KEY ELEVATION

SCALE 1/4" = 1'-0"



IBM OFFICE BUILDING
SEATTLE, WASHINGTON

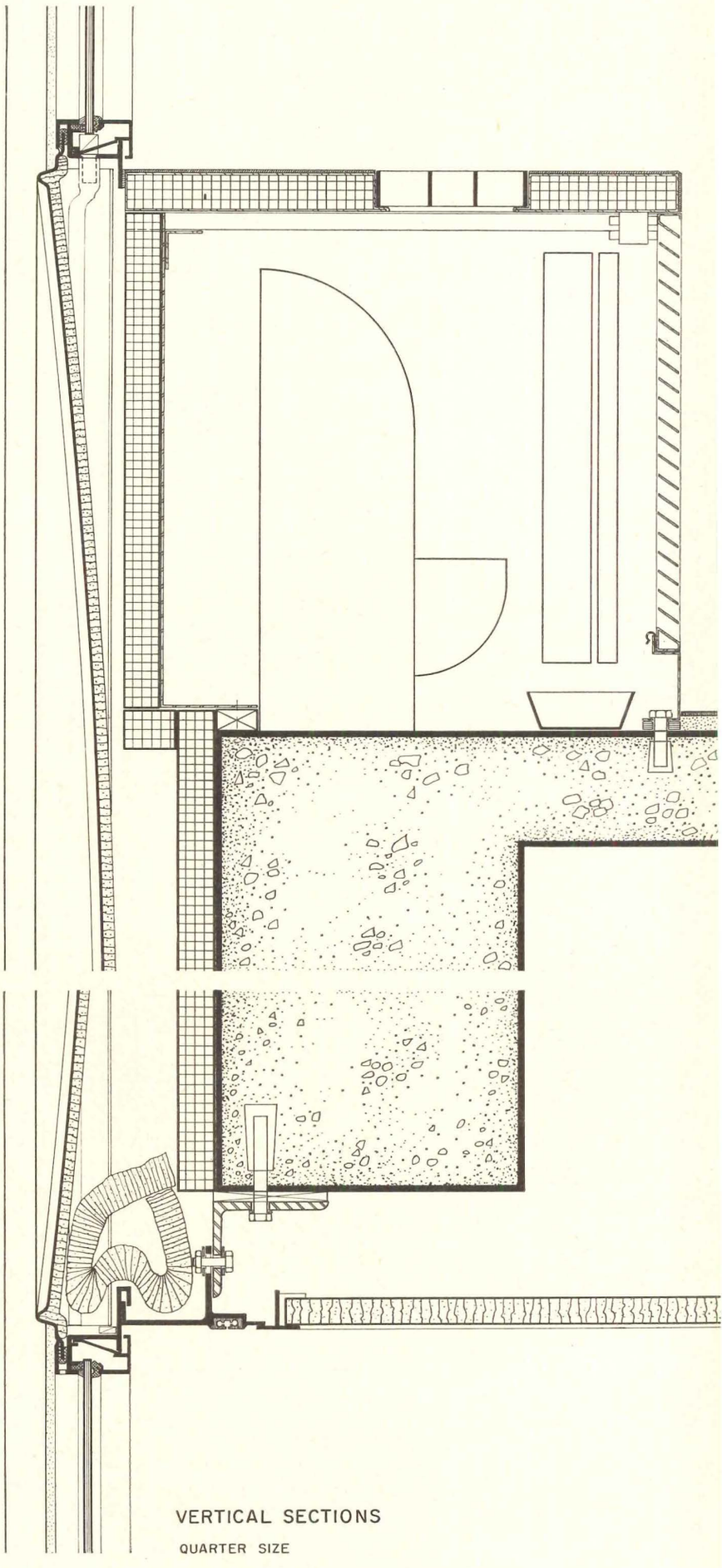
Estimated Completion: 1964

Naramore, Bain, Brady & Johanson

Minoru Yamasaki & Associates

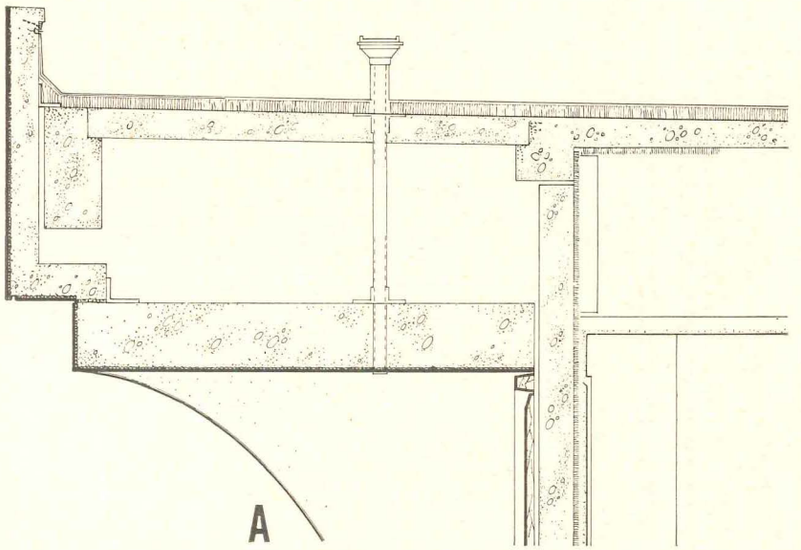
Associated Architects

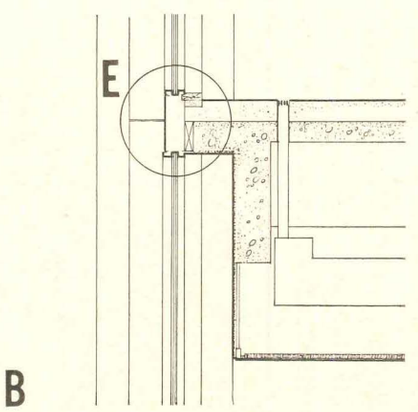
Yamasaki: The wall consists of high strength steel pipes—4½ inches in diameter—acting as bearing studs. The pipes are encased in aggregate-surfaced precast concrete elements. The gray glass is framed in bronze-colored, hard anodic coated aluminum; the material of the spandrels also. Of particular note is the manner in which the "corner is turned" so that the interior space makes a clean right angle

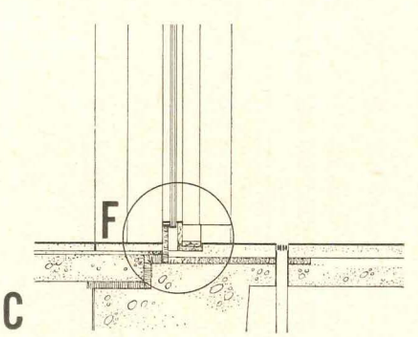


VERTICAL SECTIONS

QUARTER SIZE

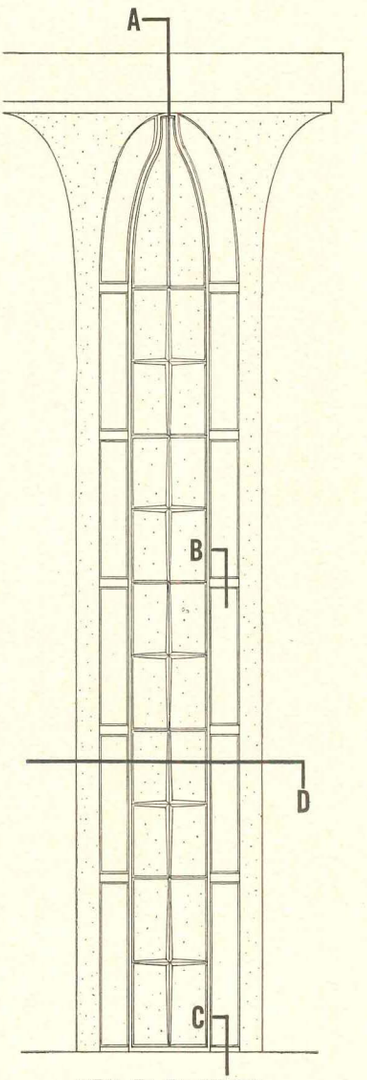






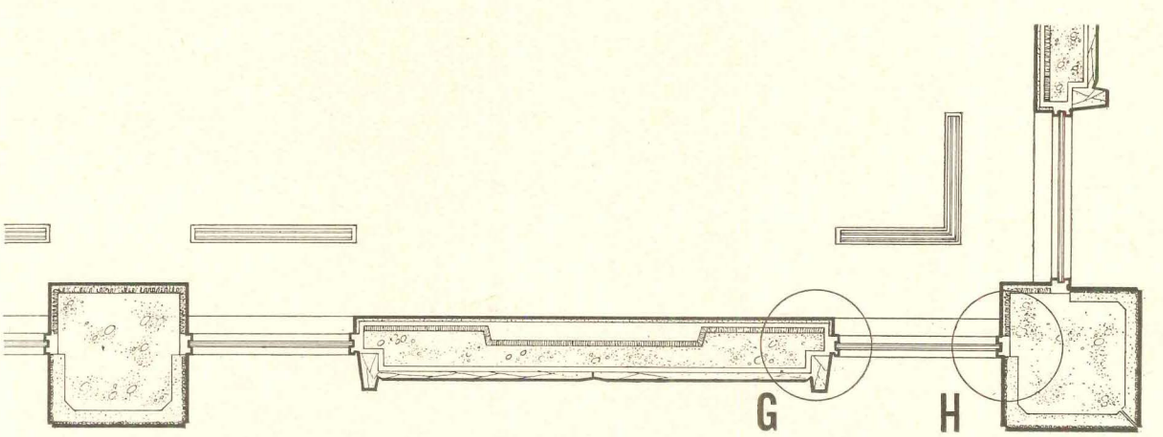
VERTICAL WALL SECTION

SCALE 3/8"=1'-0"



KEY ELEVATION

SCALE 1/16"=1'-0"



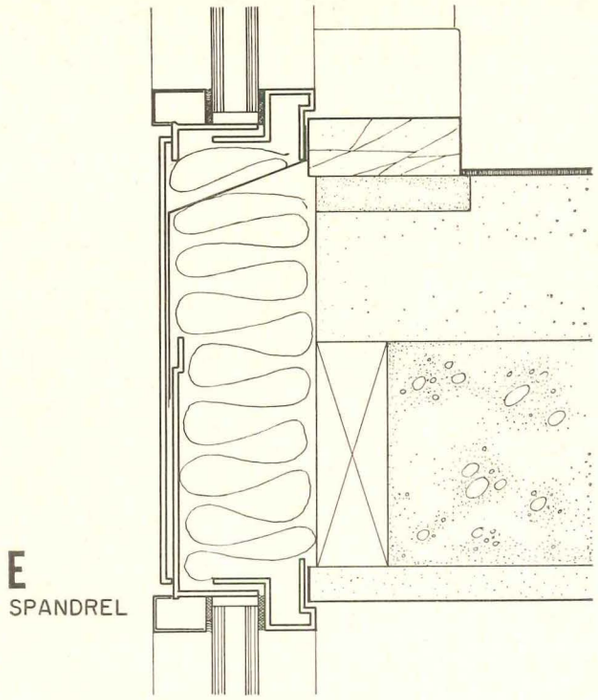
HORIZONTAL
WALL SECTION

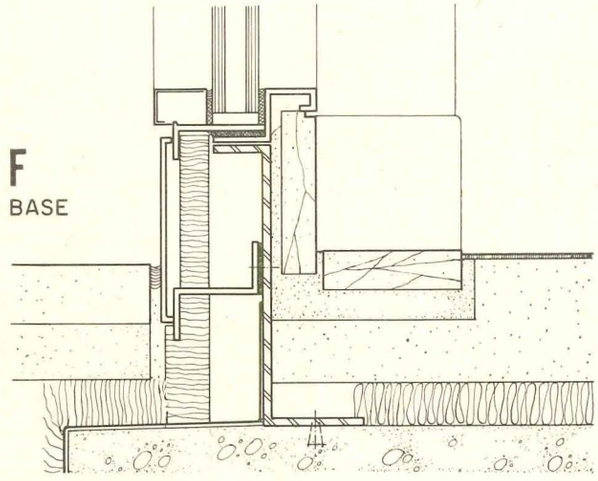
SCALE 3/8"=1'-0"

OFFICE BUILDING
NORTHWESTERN NATIONAL LIFE INSURANCE COMPANY
MINNEAPOLIS, MINNESOTA

Estimated Completion: 1964

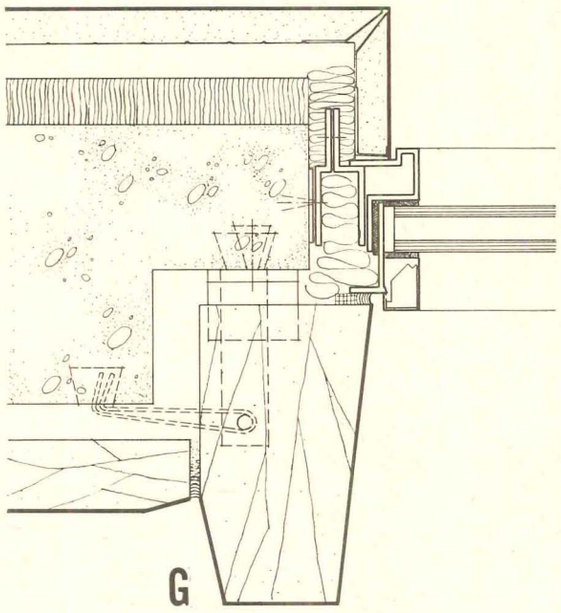
Yamasaki: The building perimeter is composed of 63 white quartz-faced columns, which culminate in flared capitals to form the arched openings that give the building its unique character. Within the arches—enclosing the building proper—are faceted verde antique marble panels, flanked by slender ribbons of gray glass framed in bronze-colored aluminum

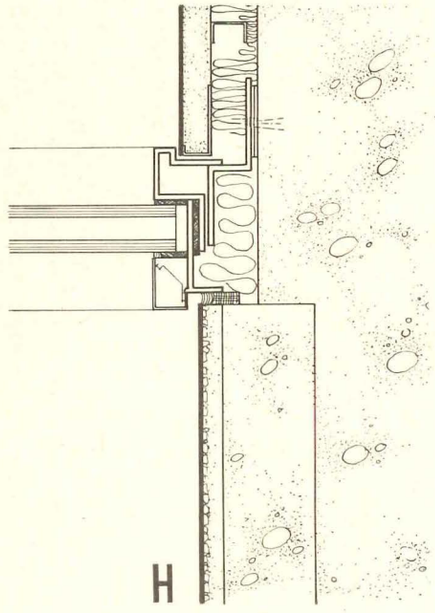


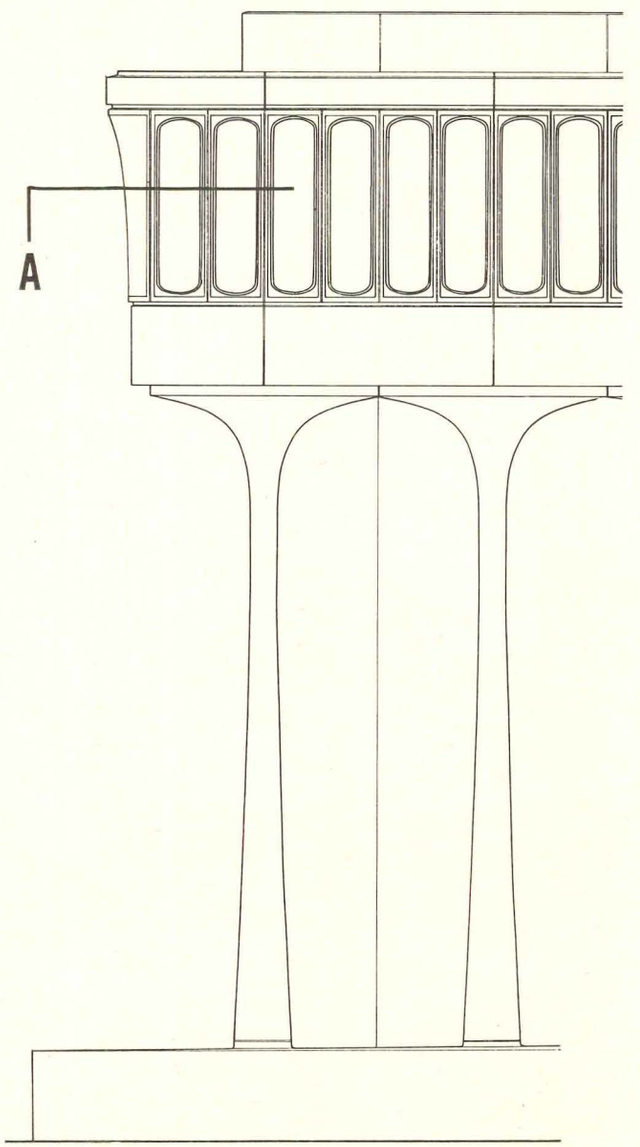


VERTICAL WALL SECTION DETAILS

QUARTER SIZE

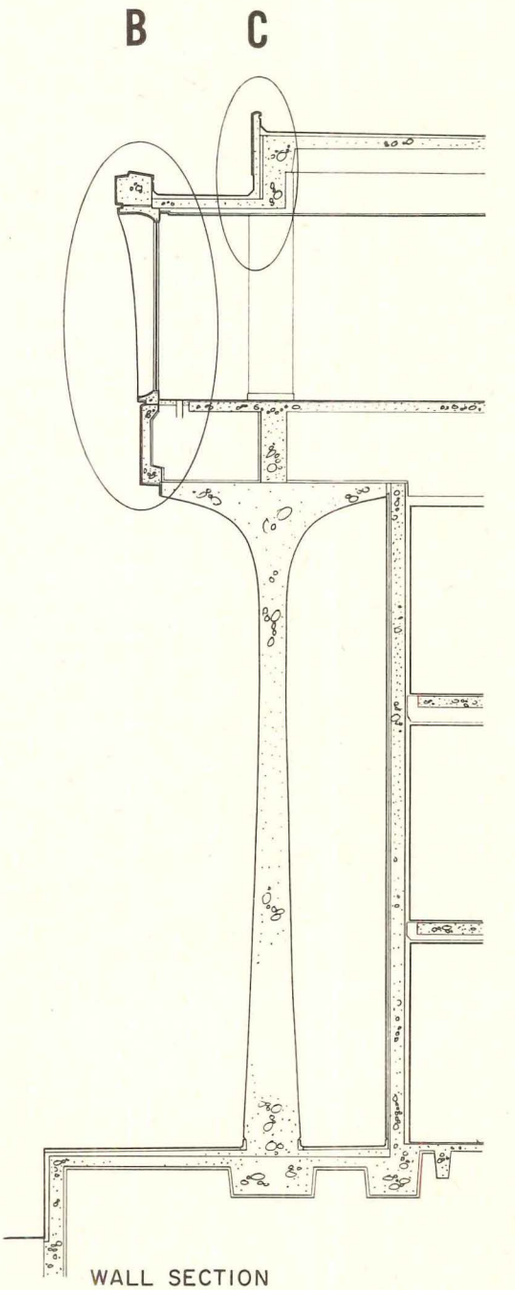






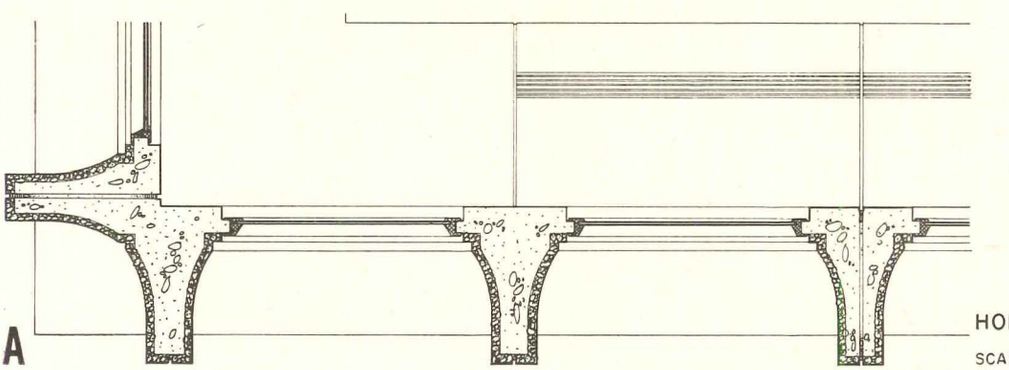
ELEVATION

SCALE 1/8"=1'-0"



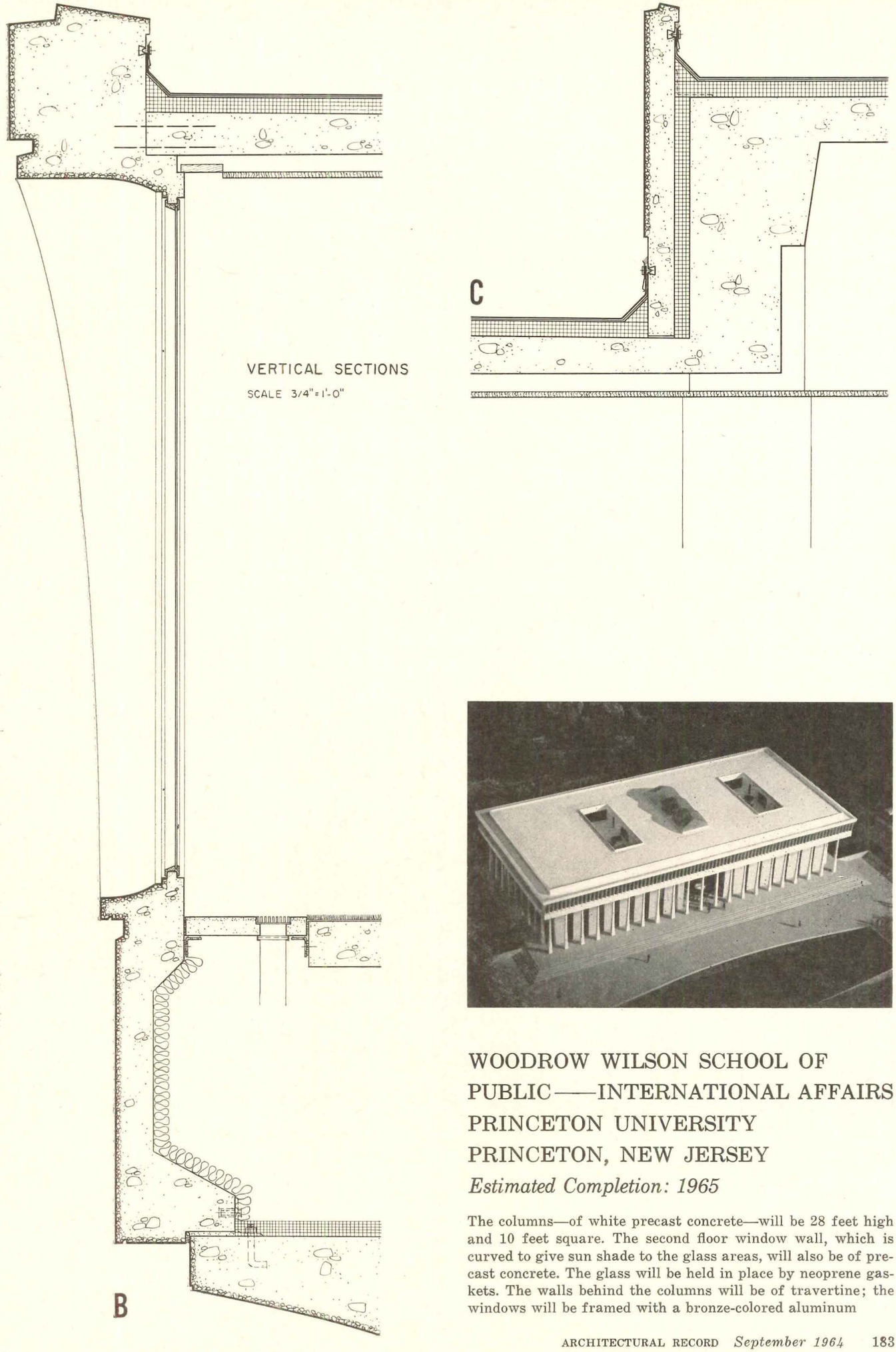
WALL SECTION

SCALE 1/8"=1'-0"



HORIZONTAL SECTION

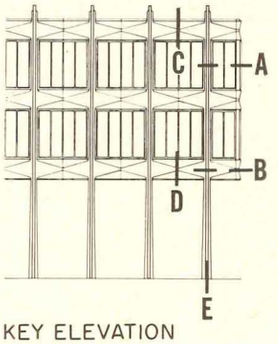
SCALE 3/4"=1'-0"



WOODROW WILSON SCHOOL OF PUBLIC——INTERNATIONAL AFFAIRS PRINCETON UNIVERSITY PRINCETON, NEW JERSEY

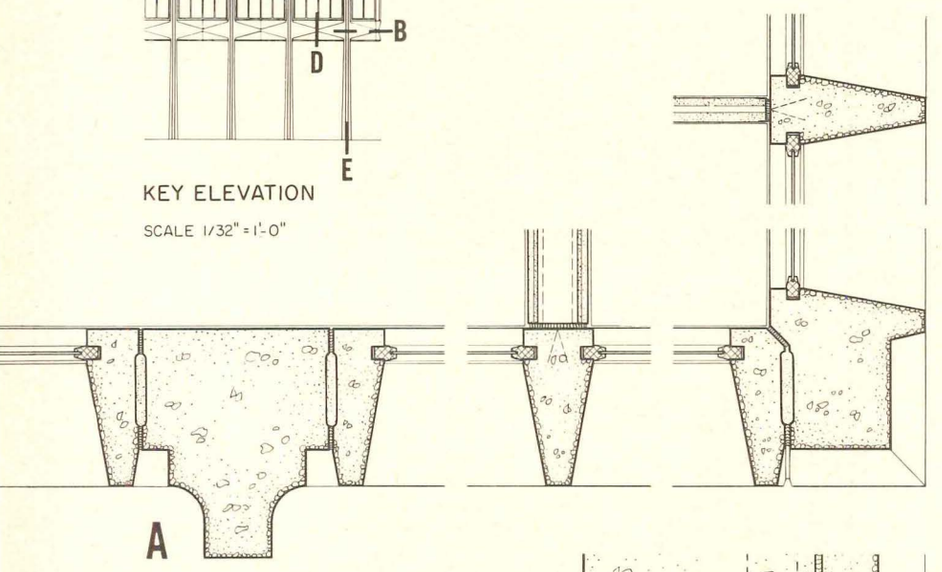
Estimated Completion: 1965

The columns—of white precast concrete—will be 28 feet high and 10 feet square. The second floor window wall, which is curved to give sun shade to the glass areas, will also be of precast concrete. The glass will be held in place by neoprene gaskets. The walls behind the columns will be of travertine; the windows will be framed with a bronze-colored aluminum



KEY ELEVATION

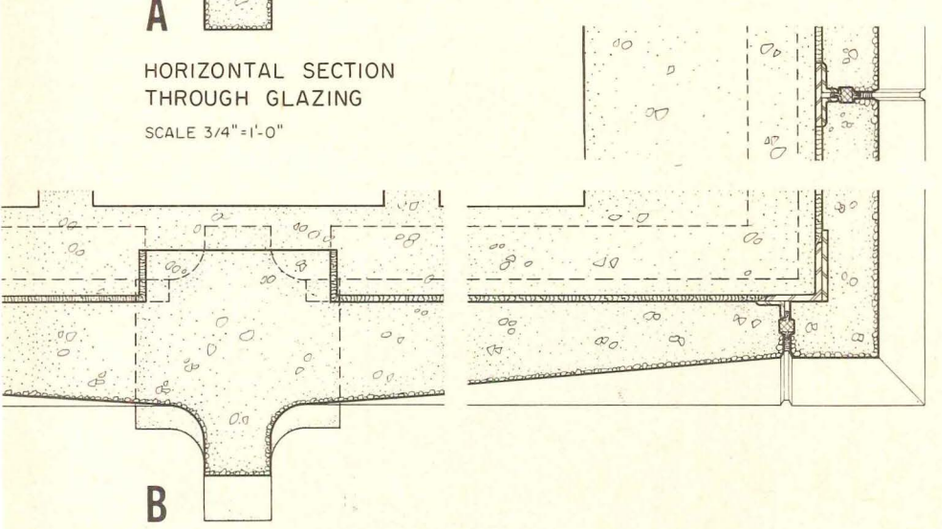
SCALE 1/32" = 1'-0"



A

HORIZONTAL SECTION
THROUGH GLAZING

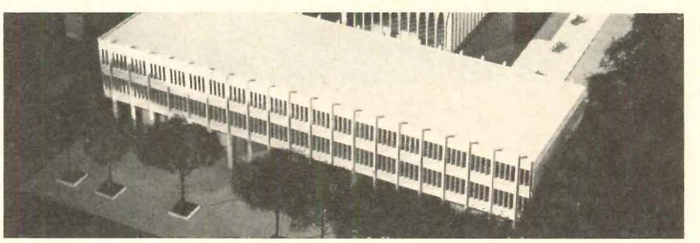
SCALE 3/4" = 1'-0"



B

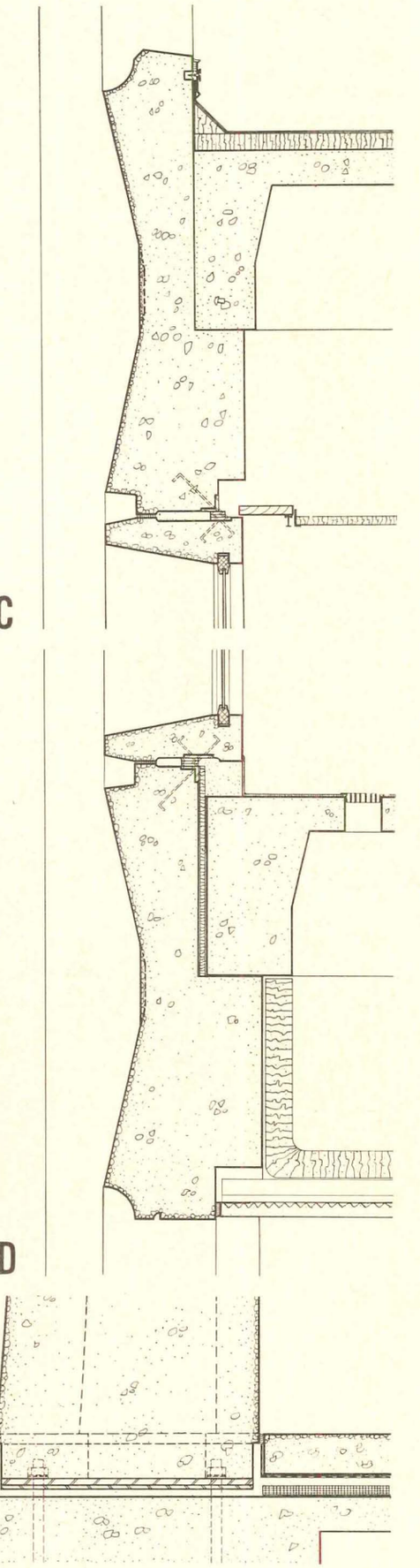
HORIZONTAL SECTION THROUGH SPANDREL

SCALE 3/4" = 1'-0"



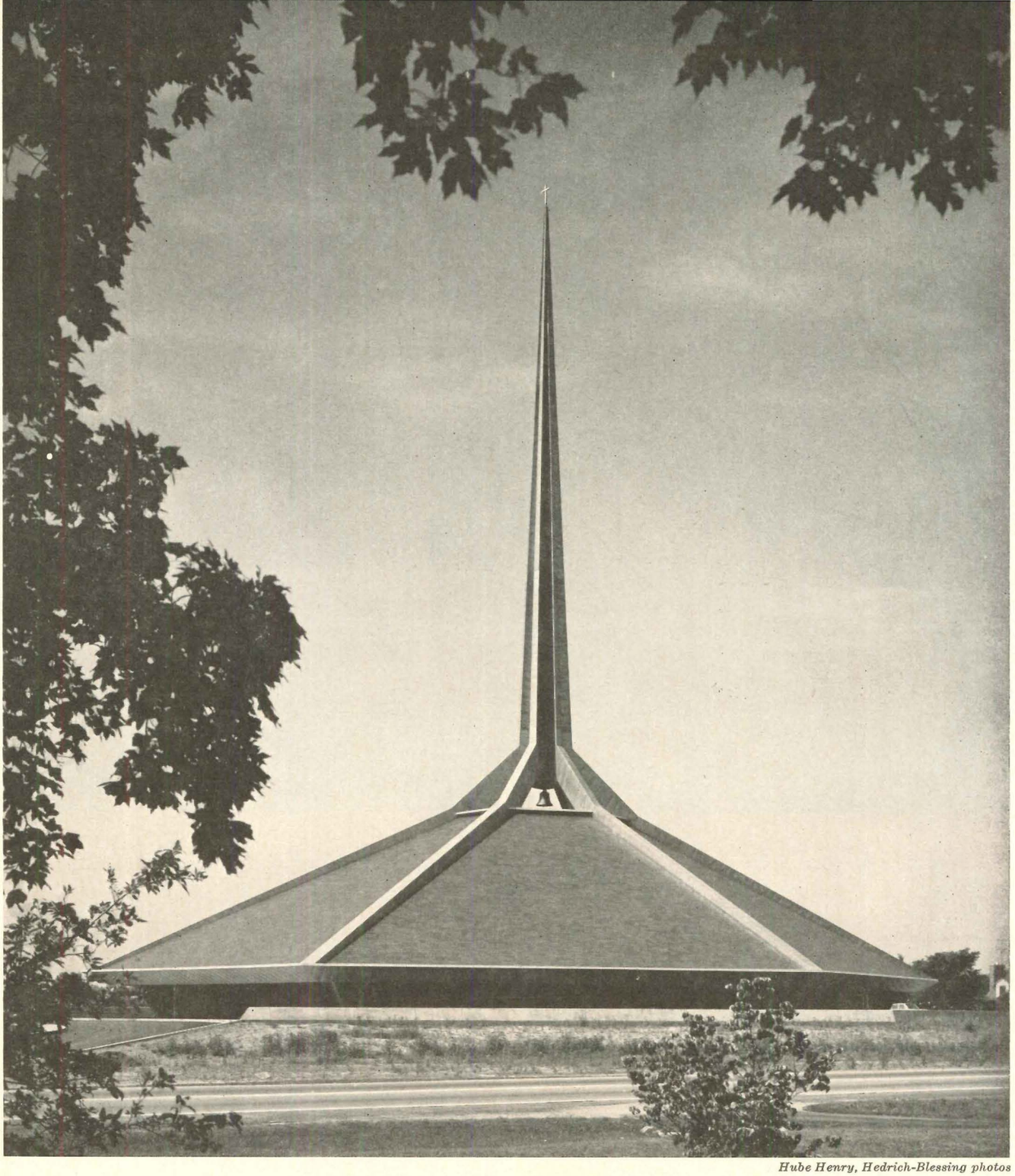
CLASSROOM BUILDING
WAYNE STATE UNIVERSITY
DETROIT, MICHIGAN, 1964

Yamasaki: This modular exterior wall consists of the assemblage of a series of concrete "trees," with precast concrete window frames fitted in place between them. The glass is held in place by neoprene gaskets, which allow for building movement



VERTICAL SECTION

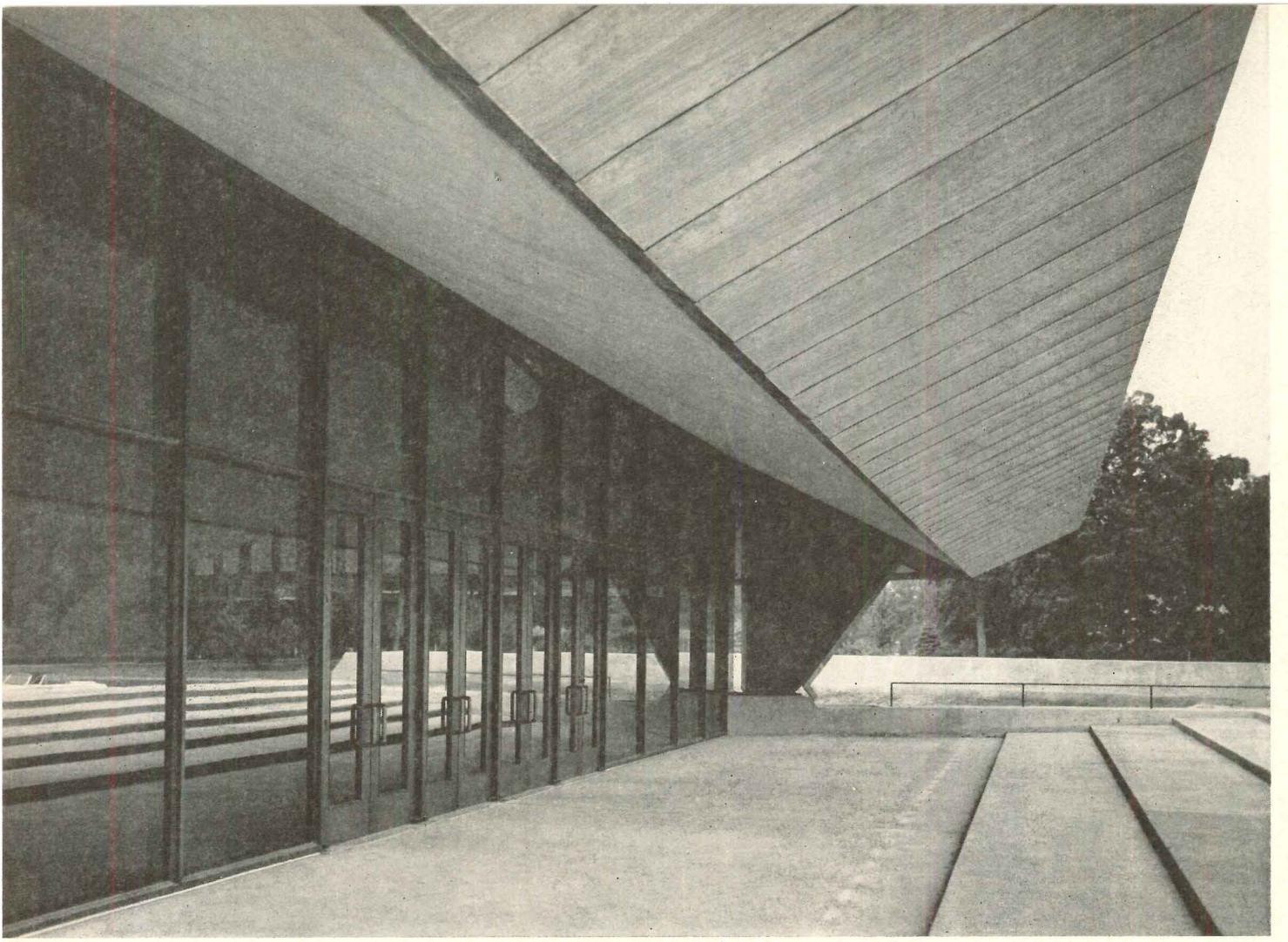
SCALE 3/4" = 1'-0"



Hube Henry, Hedrich-Blessing photos

SAARINEN'S CHURCH

The North Christian Church in Columbus, Indiana, designed in the years 1959 to 1961 and recently completed, is one of the architect's best



The concept of this small church is best set forth by Saarinen himself in this excerpt from "Eero Saarinen on His Work," edited by Aline B. Saarinen and published by the Yale University Press in 1962.

"Let me explain a little of my thinking about the problem of designing a new church for the Disciples of Christ in Columbus. I think we have to face first some of the problems of what has been happening in America today with the church and religion and architecture.

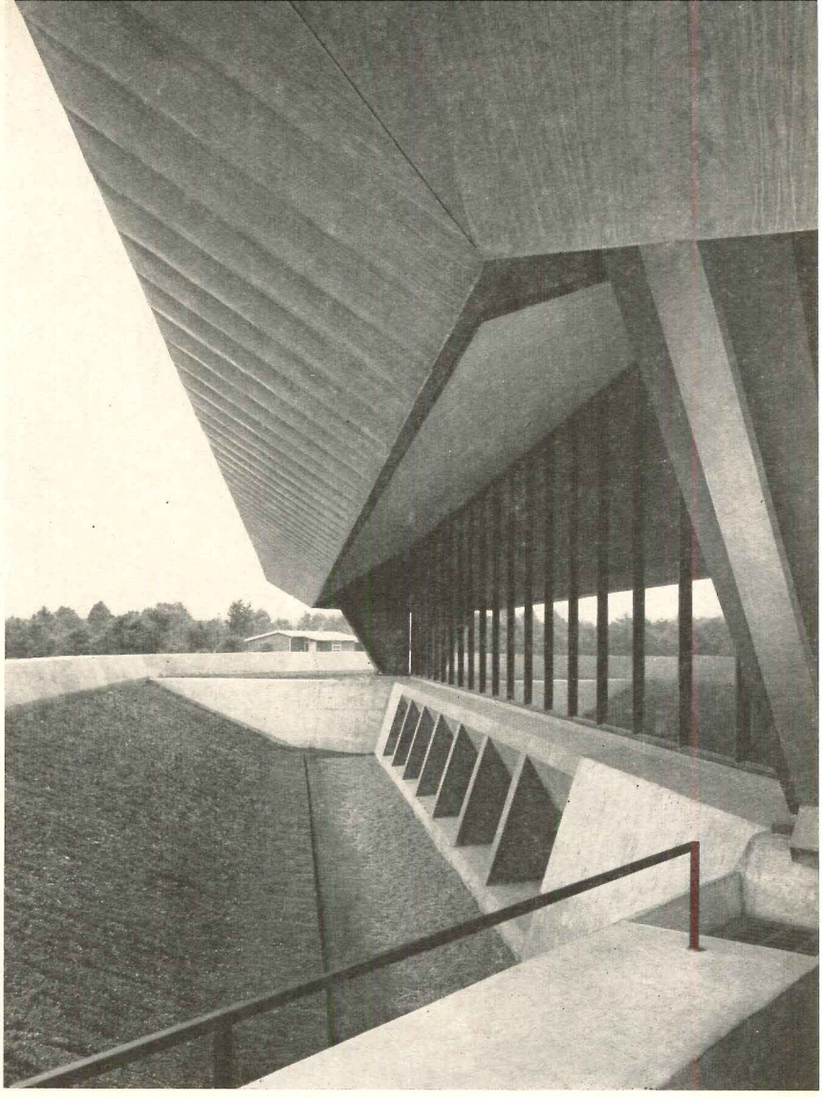
"In the 11th and 12th centuries, there was the cathedral and it was the significant thing. Maybe it had a cloister or a priory or some little low building off to the side, but the cathedral building itself dominated everything. Today, there are Sunday school rooms and good-fellowship rooms and kitchens and gymnasiums and square dancing rooms and so forth. All these have tended to sprout into separate buildings and to get bigger and bigger and more and more important and finally, the church itself has become an insignificant, almost forgotten little thing.

"So, in this church, I would like to put all that activity downstairs. Maybe underground, hidden away and put only the sanctuary above ground and make it the significant visual and architectural thing.

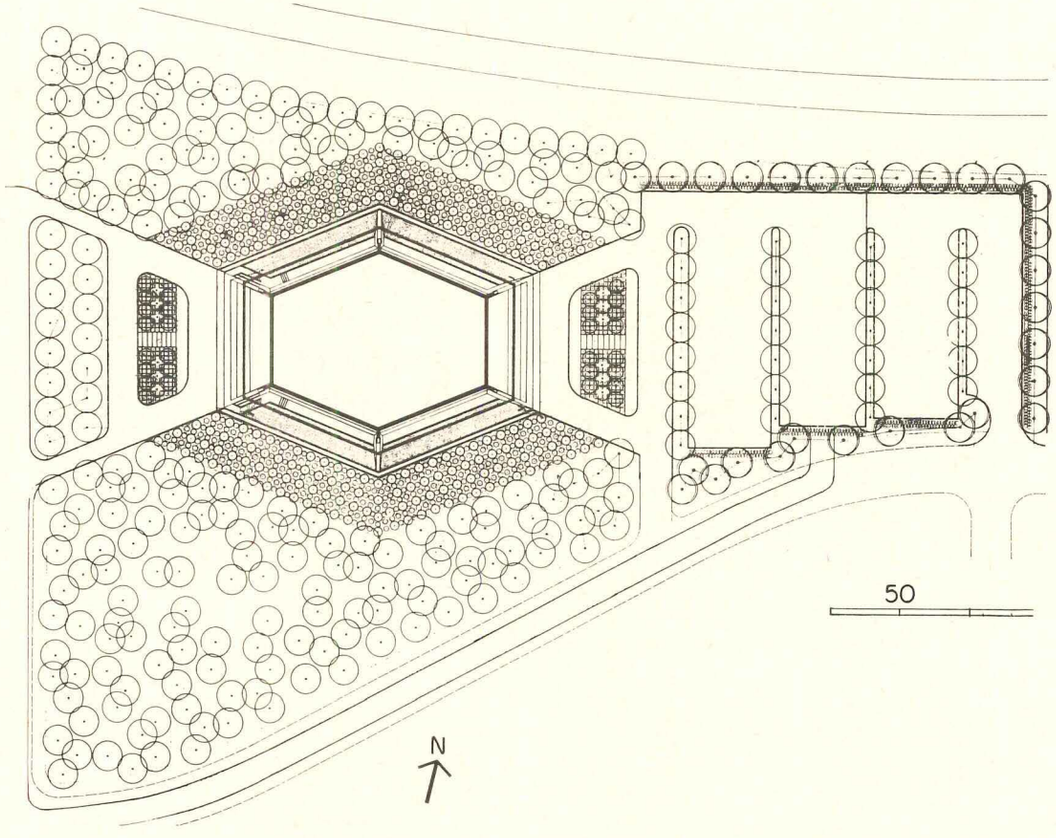
"Then, congregations and church building committees always want the architect to make everything on one level and easy, sort of inviting you to come in like a supermarket. But I don't think religion should be something easy. I think you should have to work for it and it should be a special thing. The architecture should express this. That is an absolutely marvelous experience at Borobudur and at Angkor Wat, when you keep climbing those steep steps and all the time are being subjected by the architecture to awareness of special and spiritual qualities. So I think this sanctury should be elevated and make you climb into it. There is another reason why this church must be elevated and that is the site. It is a flat site in a residential district. The church must be elevated so that it stands proudly above the parked cars and surrounding little ranch-type houses and can be seen. . . .

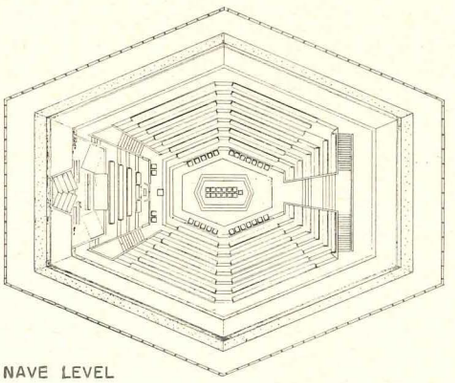
continued on page 190

North Christian Church, Columbus, Indiana
ARCHITECTS: *Eero Saarinen and Associates*
STRUCTURAL ENGINEER: *Henry A. Pfisterer*
MECHANICAL AND ELECTRICAL ENGINEERS:
vanZelm, Heywood & Shadford
DESIGNER OF LITURGICAL FITTINGS:
Alexander Girard, Architect
LANDSCAPE ARCHITECT: *Dan Kiley*
ACOUSTICAL ENGINEERS: *Bolt, Beranek & Newman, Inc.*
LIGHTING CONSULTANT: *Stanley McCandless*
FOOD SERVICE CONSULTANT: *Howard L. Post*
CONTRACTOR: *Repp & Mundt Construction Service*

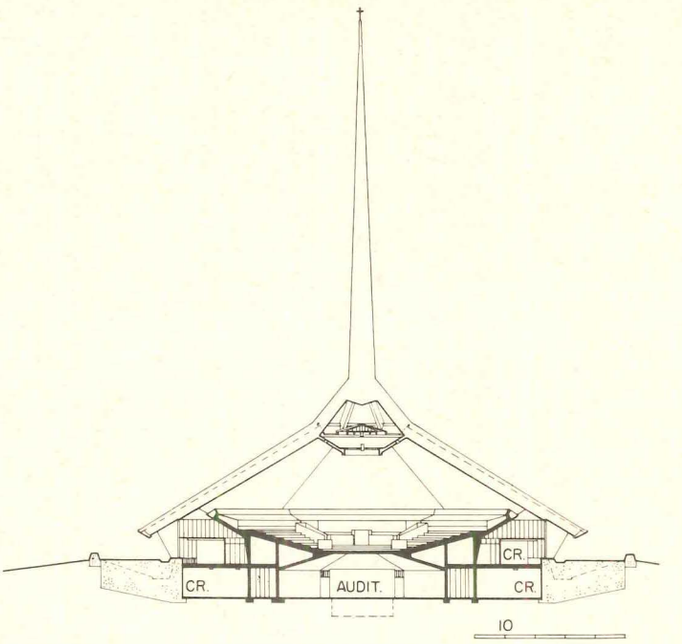


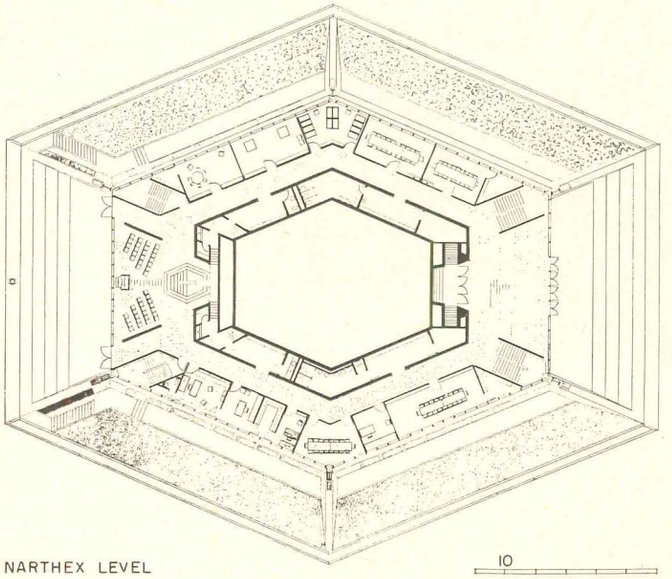
Left: Main entrance is shown in the photograph. *Right:* The windows at the base line in the depressed moat give light to the classrooms in the basement. The windows above the concrete base illuminate classrooms and meeting rooms at the narthex level. The roof fascia is covered with lead-coated copper. *Below:* The plot plan shows projected landscaping which will accent the church's hexagonal design



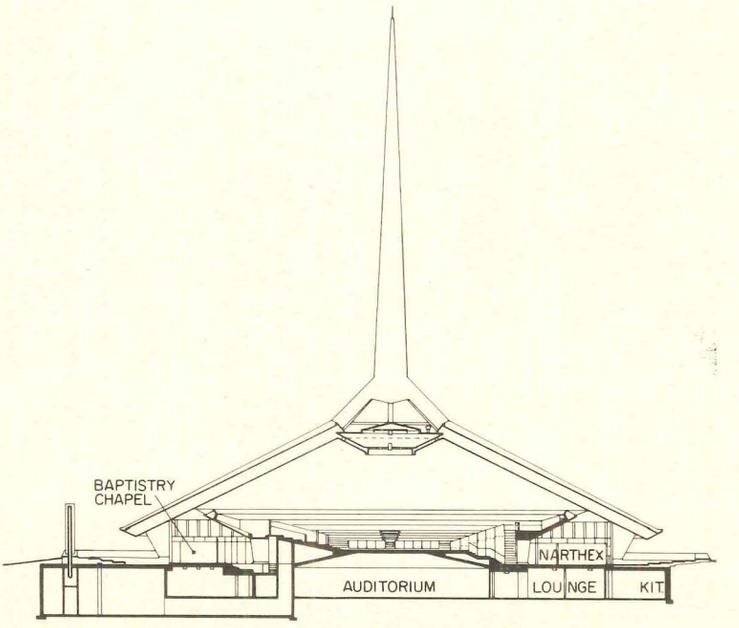


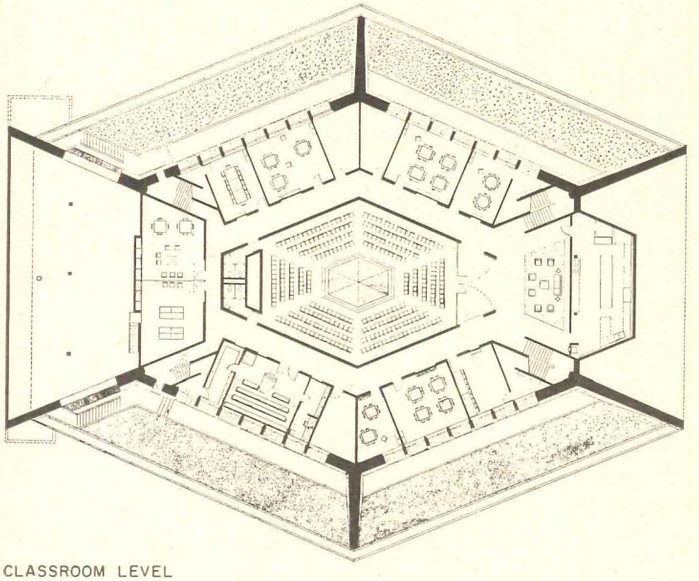
NAVE LEVEL





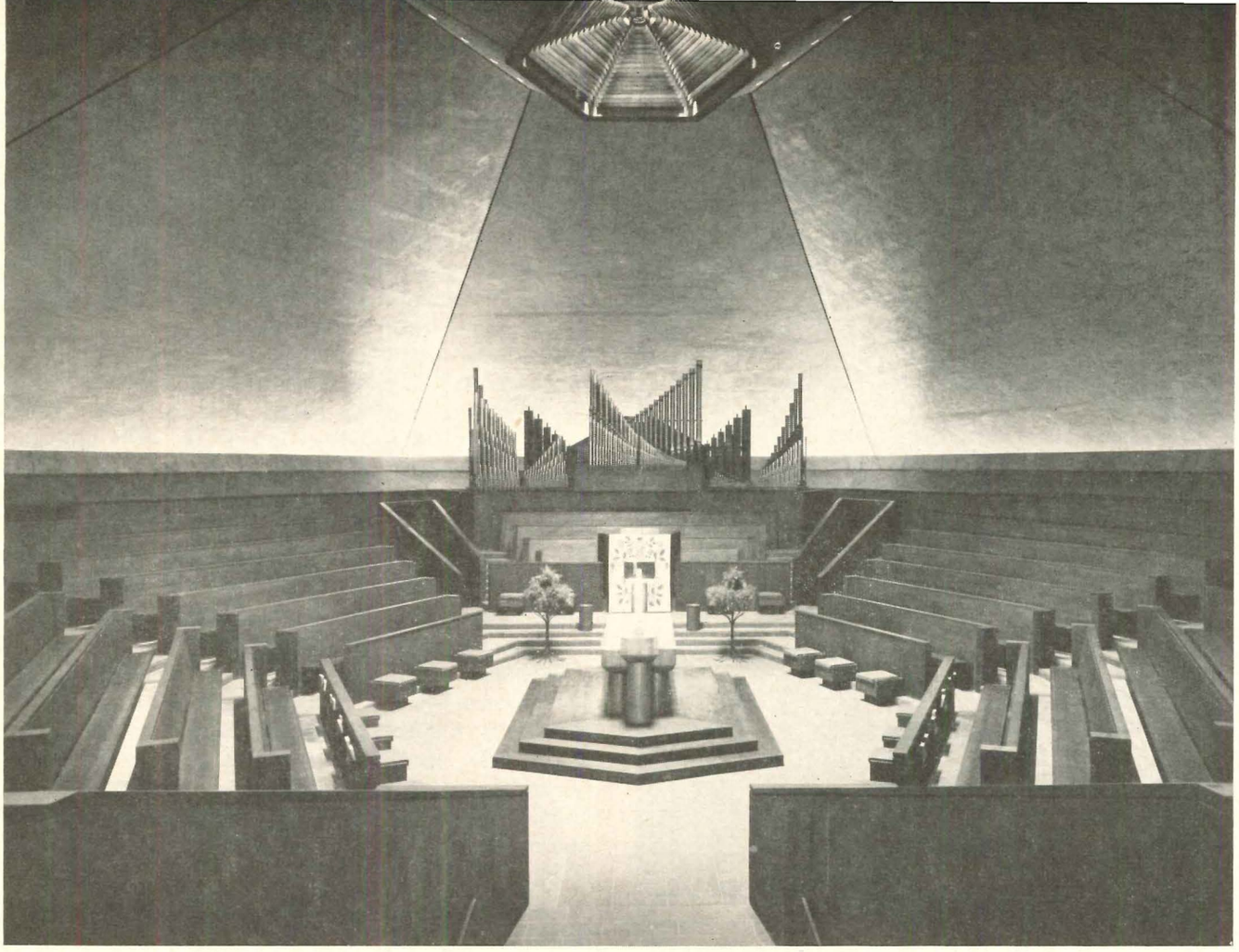
NARTHEX LEVEL





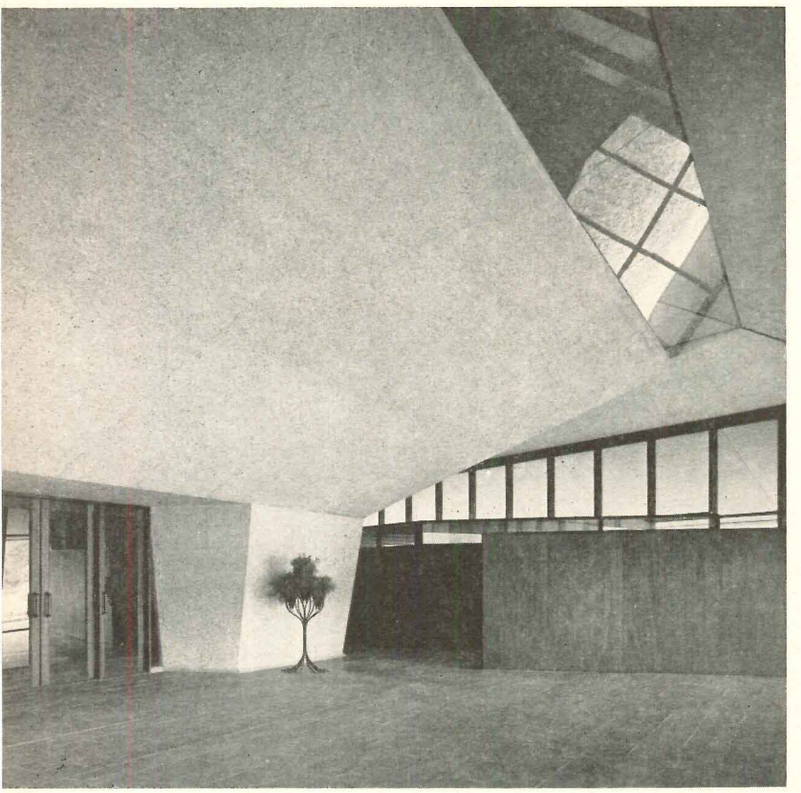
CLASSROOM LEVEL

Henry Pfisterer, structural engineer for the church, describes the concept simply as a "steel hat sitting over a concrete bowl." The hat consists of six rolled steel arch legs supported on six web plate steel arch bases set on tapering concrete foundations. The arch legs connect above the oculus to a 12¾-inch-in-diameter pipe column which is the center of the spire and to which gradually diminishing steel plates are attached. The six arch legs support five equally spaced rolled steel beams in each panel of the hexagon which in turn support the roof purlins and the slate covered roof. The portion of each arch leg visible above the slate roof surface consists of its wood cover, which is sheathed in copper, as are the steel plates of the spire. The wood covers indicate the lines of the structure but are not structural. The concrete bowl which is the nave floor utilizes a tube slab system as does the floor between the classrooms and narthex levels. The tubes follow the line of slope and are used for heating and ductwork. A portion of the plenum serving the tube system can be seen in the sections *(above)* between the auditorium ceiling and the nave floor. Air is discharged at outer rim of bowl beyond the last row of seats in the narthex



The nave ceiling is suspended plaster. Light source at seating perimeter provides either day or artificial lighting

Roof of the baptistry chapel is underside of nave bowl



Above: Doors within narthex open upon stairs which lead up to nave level, wood paneled screen to the right conceals stairs leading down to the classroom level. The glass panel in the ceiling admits daylight to the nave above. *Below:* Alexander Girard designed the fabric panel behind the pulpit shown in the sanctuary photograph. He was also responsible for the chalice, the nave flower stands and other fittings

"After the approach, there is the act of entering. There should be awareness of a changing environment, like a decompression chamber from the outside world into the church. Maybe you would go down and up again into the sanctuary. The light, of course, would begin to change, too.

"I guess another reason people go actively to church is so they can worship with a group of people of like mind. They will do this in the sanctuary and they should feel they are all in unity and harmony in a special and appropriate spiritual atmosphere. As I understand the Disciples of Christ, communion is a very important act and the congregation participates in it. The communion table should be the focal point. We can have the congregation sitting all around the communion table where every one feels equal and joined together. . . .

"Whatever way we solve that, the congregation should have the positive feeling of being within the church, in a special, enclosed spiritual world. I see it as a very simple interior with organ pipes an important element in the sanctuary design. The primary element to create the right spiritual atmosphere would, of course, be light. That is the crucial thing.

"Now, what form should this church take? If you think of the silhouette of a Christian church, you think first of the tower. Different periods handled the tower, or the spire or the steeple or whatever you want to call it, in different ways. So did we, at Minneapolis and the first Columbus church and M.I.T. and Concordia and so on.

"On this site, with this kind of central plan, I think I would like to make the church really all one form: all the tower. There would be the gradual building up of the sheltering, hovering planes becoming the spire. The spire would not be put on a box or come up from the sides of the roof, as we did at Stephens College. The whole thing, all the planes, would grow up organically into the spire.

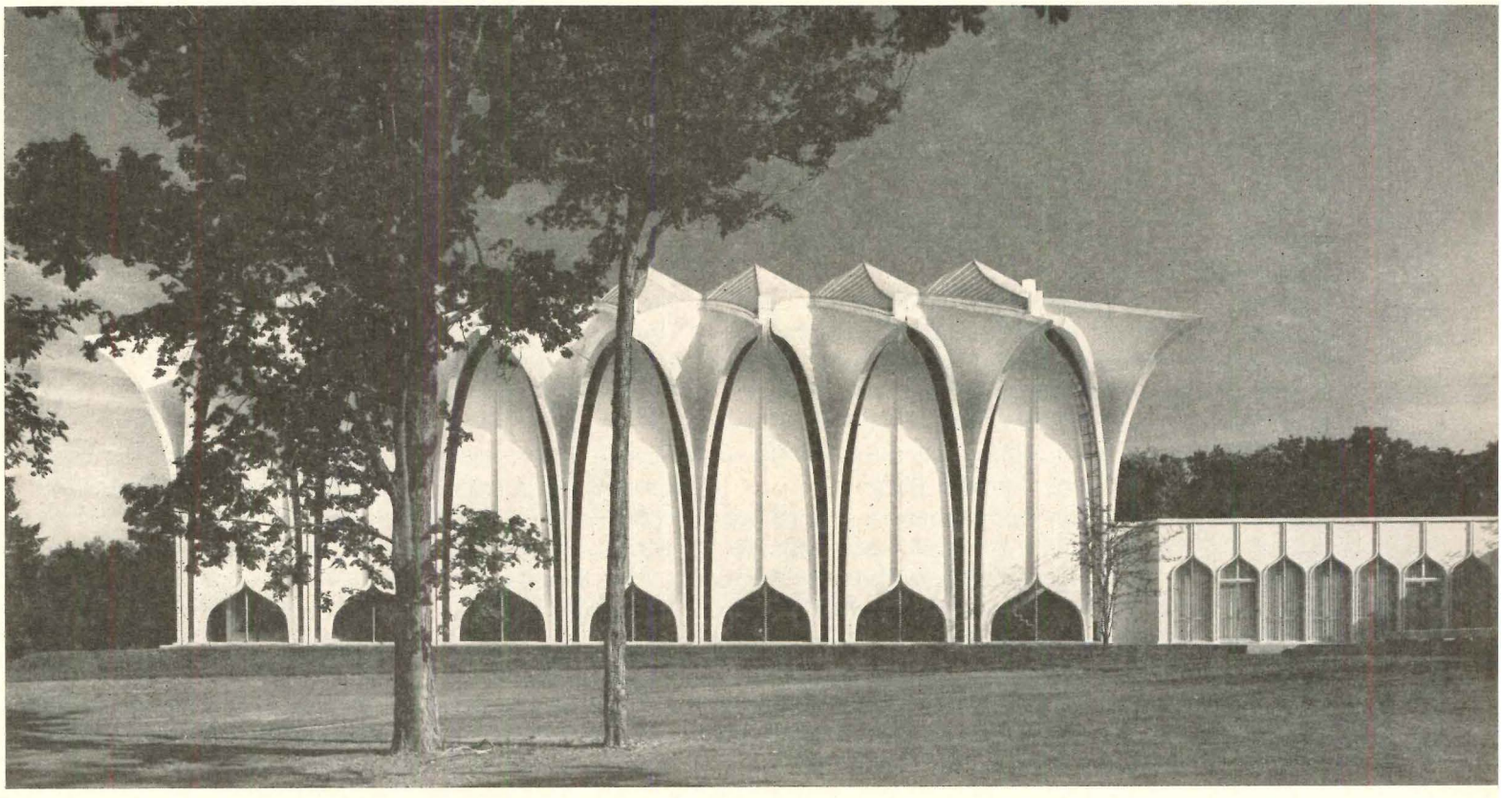
"It would be good as an exterior form, because the spire is a marvelous symbol or reaching upward to God and because it would proclaim this as a church in the silhouette of Columbus. It would also work well as an interior space. It would give a feeling of soaring space and a feeling of special enclosure. It would work well for the light. The primary light source would be an oculus in the spire. It could give intense light on the communion table. This light would lead you as you saw it from the narthex. It would also keep you from being distracted by the people across from you, but you would be aware of them. Then there could be a feeling of contracting light back in the seating area. And this spire form would work well structurally. The structure could be very simple and would clearly and logically express the form and character of the church."

Eero Saarinen (June 1960)

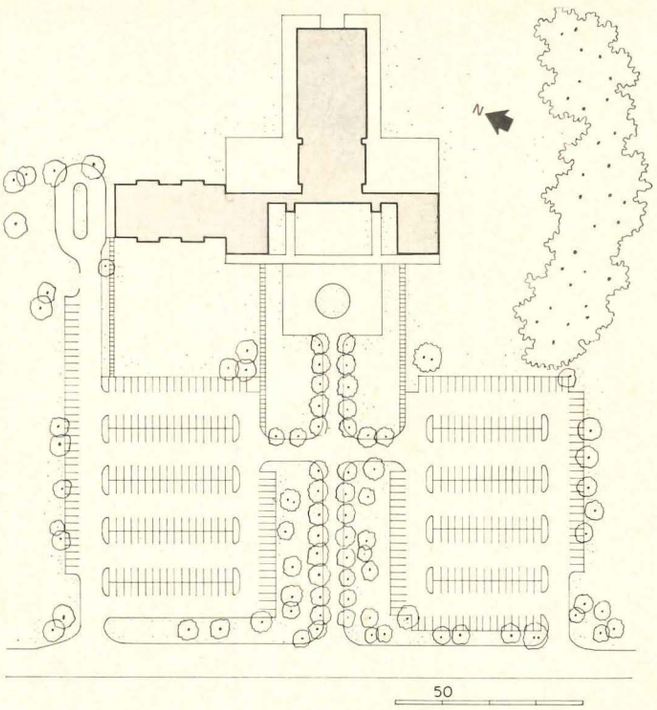
Hedrich-Blessing photos

A Synagogue by Yamasaki

The architect uses concrete, reinforced and precast, to evoke the structures of plant life for a $3,000,000 temple and school on the shores of Lake Michigan



New Temple and School Buildings for
North Shore Congregation Israel, Glencoe, Illinois
ARCHITECTS: *Minoru Yamasaki and Associates,*
Architects and Engineers
Henry J. Guthard, project director
Peter Turner, mechanical engineer
Alex Violassi, electrical engineer
RESIDENT ARCHITECTS: *Friedman, Alschuler & Sincere*
STRUCTURAL ENGINEERS:
Worthington, Skilling, Helle & Jackson
BEMA DESIGNER: *Lee DuSell*
LANDSCAPE ARCHITECT: *Lawrence Halprin*
ACOUSTICAL CONSULTANTS: *Bolt, Beranek & Newman, Inc.*
CONTRACTOR: *George A. Fuller Company*



In Yamasaki's introduction to the portfolio of his architectural details which begins on page 169 of this issue he states: "The esthetic totality of any beautiful thing . . . such as a lovely plant . . . is in its concept, its structure or its tiniest detail." The imaginative concept of his first synagogue causes one to speculate that the architect's response to the beauty of plants may have led him to studies in plant morphology which in turn have formed the basis of this design. His choice of plant forms in the first place is in harmony with his admission that the beautiful descriptions of nature in the synagogue's High Holy Service gave him an insight into the needs of the congregation. The hint that this temple might have been conceived in a botanic garden gains relevance as one admires its great sanctuary vaults, opening upward like segments of a Calla lily, and the walls shaped like palm fronds between the lily stems. The little ogival windows at the base line could be artichoke leaves.

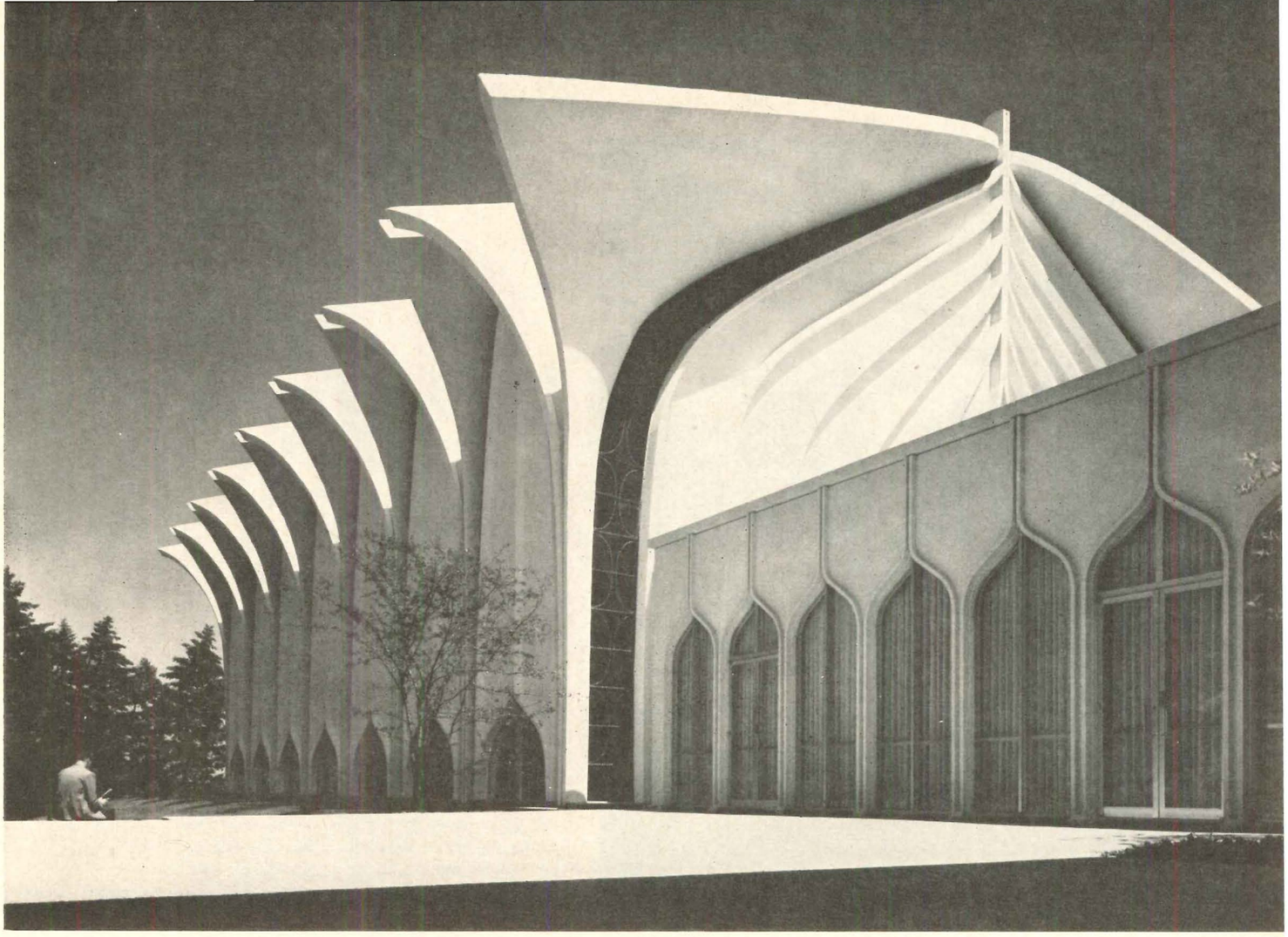
Yamasaki's masterful use of plant forms not only as generators of structure of this synagogue, but for certain details such as the Ark and the niche for the Moses tablets (see page 195) suggests the influence of Art Nouveau. One can compare the elegantly tapered and beautifully unfolding lily vaults with a long stemmed cup by Louis Comfort Tiffany.

Yamasaki's details for this structure are shown on pages 176 and 177. The columns, shell concrete roof vaults and both end panels of the sanctuary were constructed of poured-in-place reinforced concrete. Fiber glass forms were used for the columns and the vaults. The vertical side wall panels are of precast, non-prestressed reinforced concrete with a painted finish. These elements were cast away from the site in two pieces. A narrow band of amber glass surrounds each side wall panel to distinguish it from column and vault and to help define its non-bearing character. Each wall panel is tied to the structure at three points.

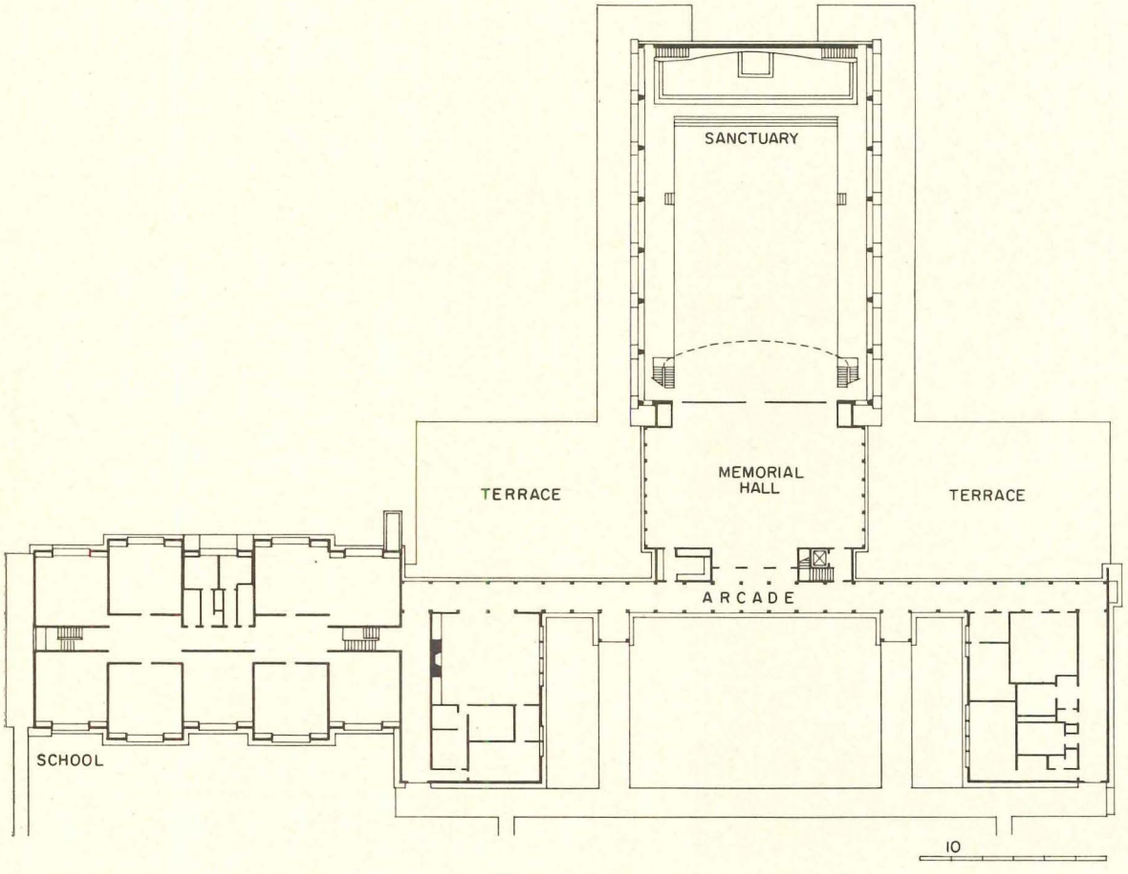
The typical synagogue plan has the sanctuary and auditorium on axis with a lobby in between. The overflow attendance at special religious services moves into the auditorium. Yamasaki disapproves of this basic *parti* and has expressed his view as follows: "The usual solution for the expansion seating of a synagogue on the High Holy Days is to combine the sanctuary with an auditorium and open the space between the two. This solution is an undesirable one from many standpoints. It makes for an esthetic hodge-podge to combine a spiritual space with a functional one. It poses severe acoustical problems when the two are used separately and simultaneously and it creates circulation hardships. The expansion for this sanctuary is provided through two means. The main sanctuary area is made larger by having platforms on either side of the main seating which tie in with the bema platform at the front. The additional space provided by these platforms on the sides gives a sense of spaciousness to the sanctuary. The lobby is larger than needed for circulation and, as the memorial hall, provides expansion space and makes it suitable for other functions. By this means the main sanctuary which normally seats 800 can be expanded to 1,800."

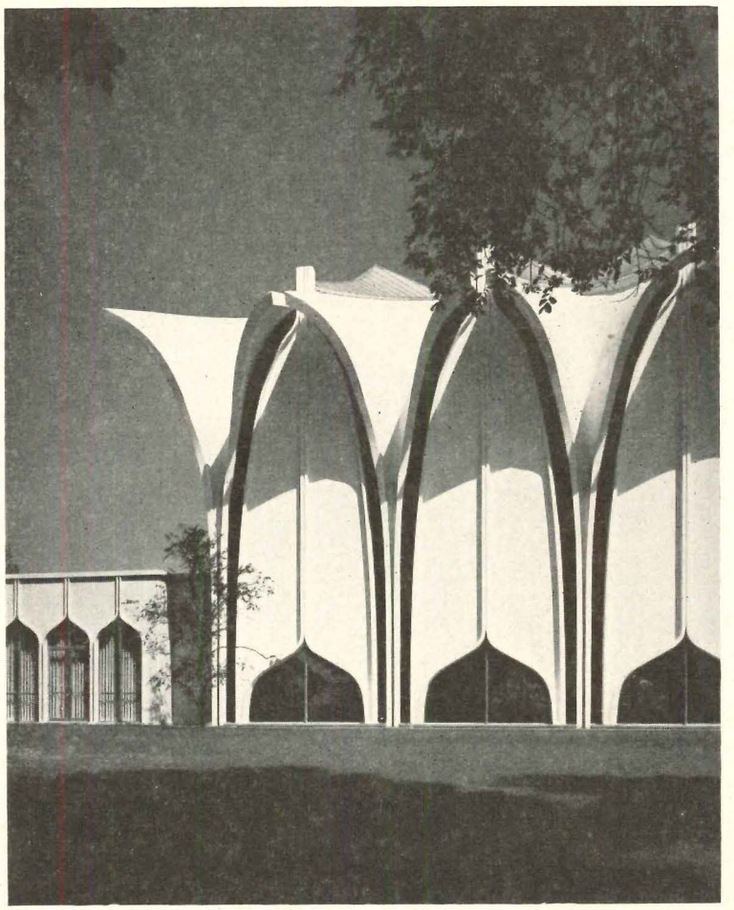
One assumes that had the program called for a real auditorium, Yamasaki would have handled it as a separate element placed elsewhere, provided the budget allowed.

Current value of the complete structure including site, buildings and equipment is $3,000,000. The sanctuary and memorial hall are air-conditioned.



View from north terrace toward memorial hall and sanctuary



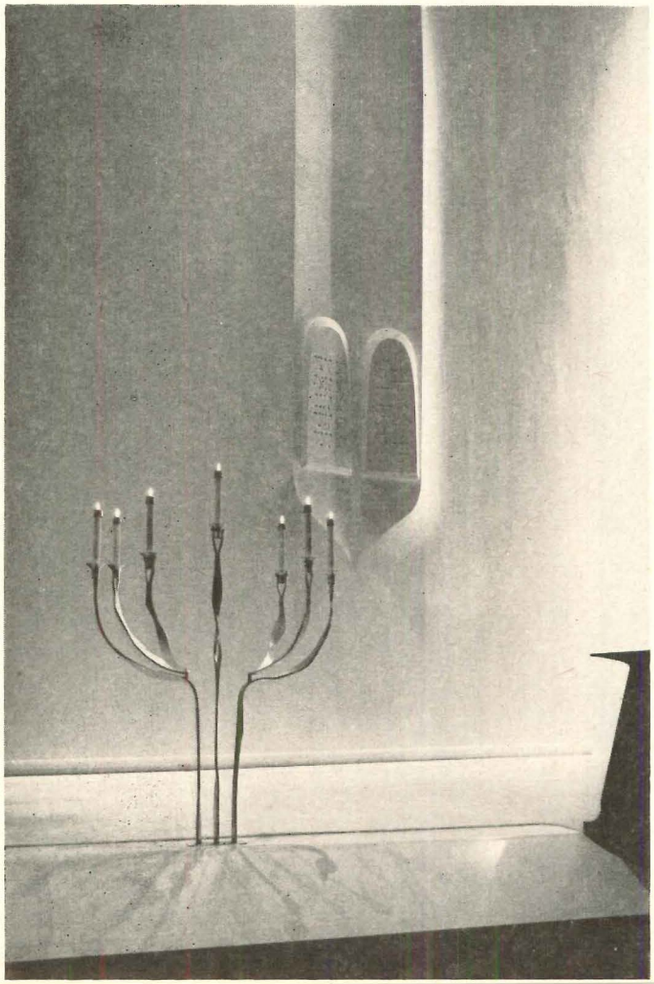


The sanctuary is 50 feet high, 80 feet wide and 126 feet long, and is enclosed by eight pairs of reinforced concrete fan vault shells weighing more than 90 tons per pair. End walls are of poured-in-place concrete and weigh 150 tons each. The side walls, seen in the photograph *(left)* were precast in pairs and weigh 30 tons per pair

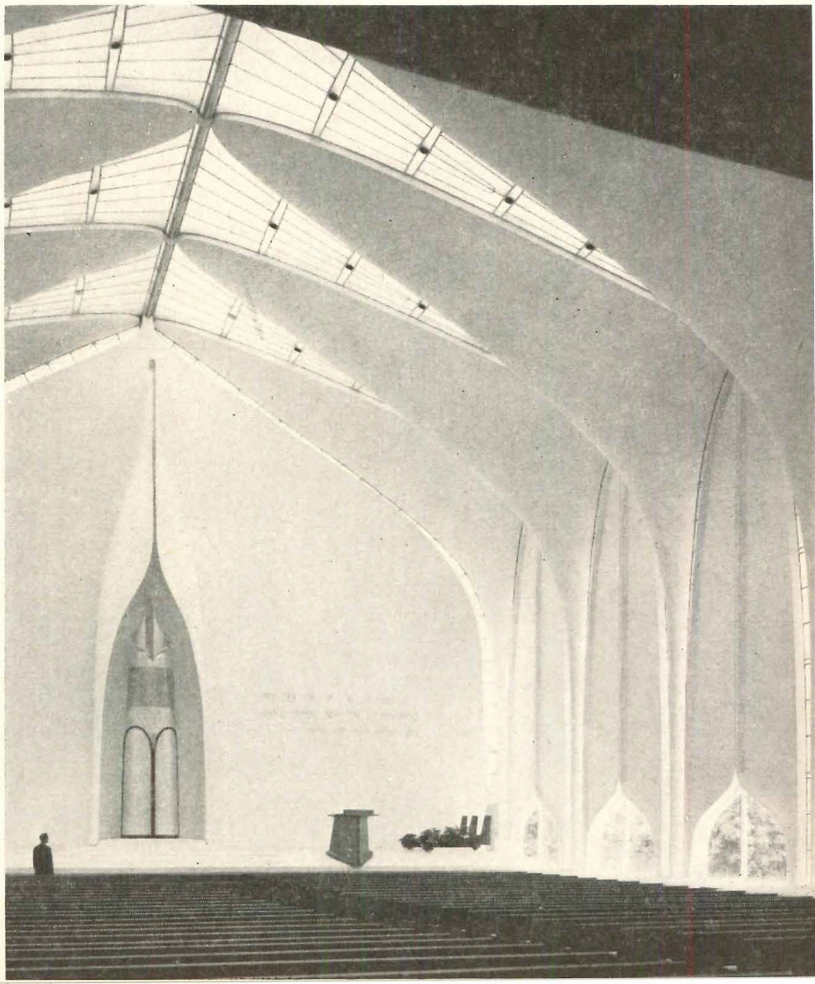
The skylights are equipped with interior amber glass bottom diffusers to reduce sun glare. The top exterior surfaces are glazed with opal glass. For nighttime lighting a combination system of dimmer-controlled incandescent and fluorescent lighting has been installed within the skylight construction between the inner and outer panes of glass. Lighting accents are provided by leaded glass panels in the end and side walls

View toward rear of sanctuary. Folding wall at rear opens into memorial hall

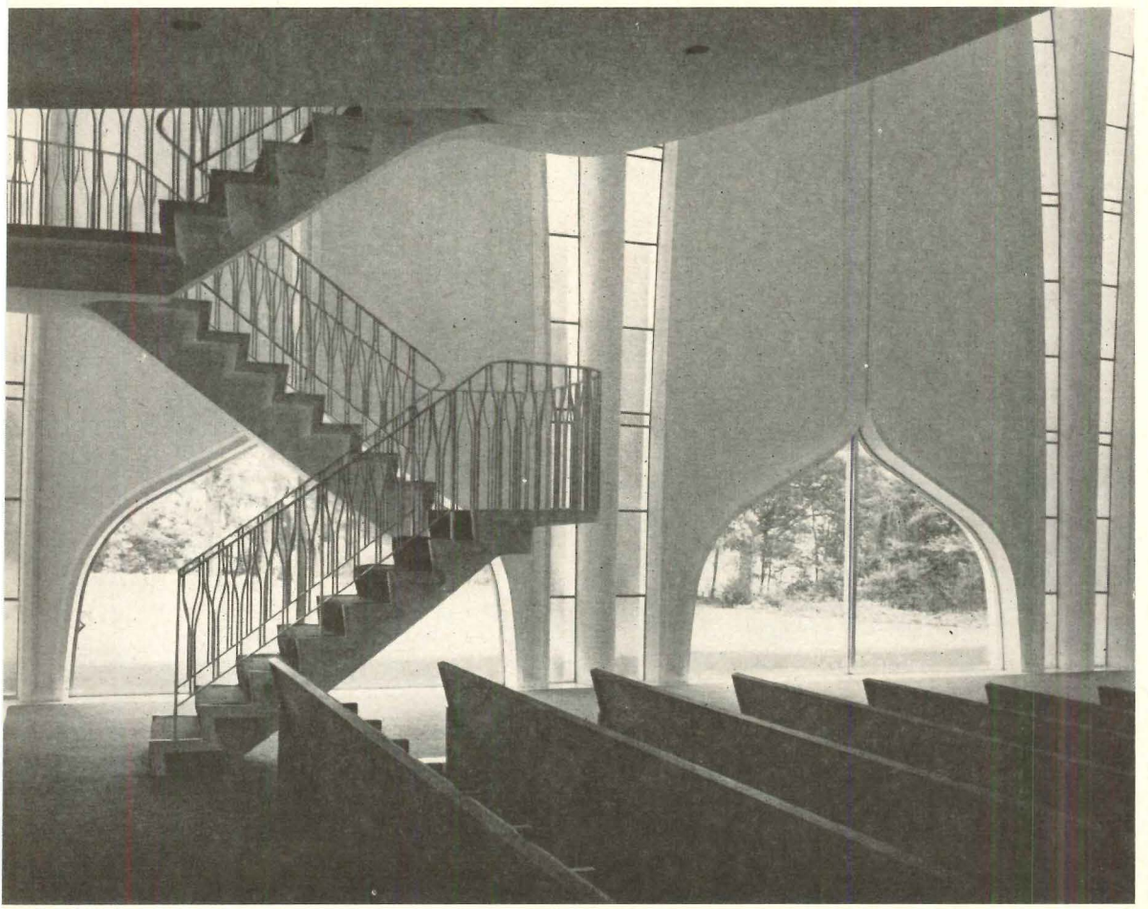
Bema details. The Ten Commandments are carved in marble



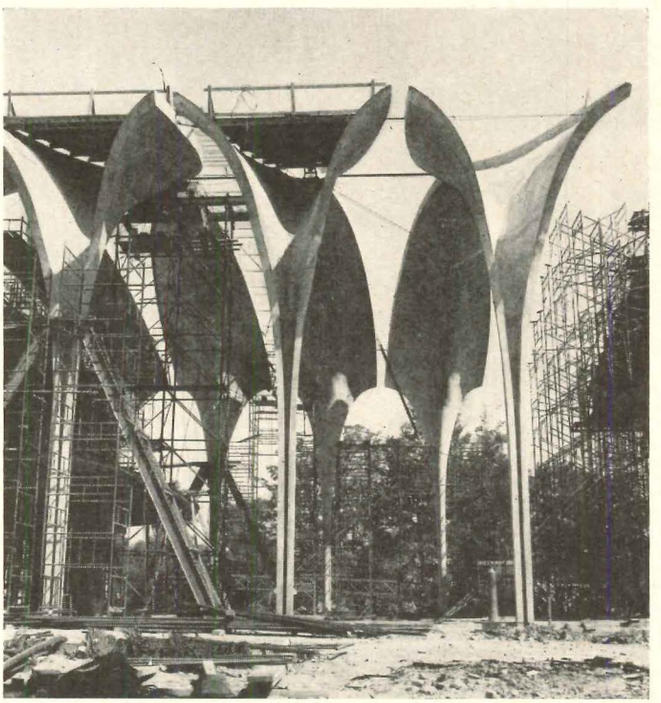
Lecturn and Ark like the synagogue itself suggest the spirit of Art Nouveau



Balthazar photos



Above: Stair to choir loft. The surrounding platform at window sill height is for expanded seating on the High Holy Days. *Below:* Construction photo showing fan vault shells before side walls and skylights were added. Shells are locked together at the outside walls and roof peak



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

6. THE ROLE OF REGIONAL POLICY

In the last issue we proposed, analyzed, discussed the urgent importance of any active urban-regional development policy. This is based on genuine New Towns, to meet humanely and imaginatively the realities of population growth and of central-thinning-out; of metropolitan in-migration and out-to-suburbs migration; of the leisure epoch; of the new freedom and the new bondage of the automobile. And, reciprocally and synchronously, the creation or recreation of fresh in-city communities. In this article, we explore questions and opportunities in Regional Policy, both with respect to New Towns, which are the most urgent and conspicuous in the regional tapestry, and to the fabric itself.

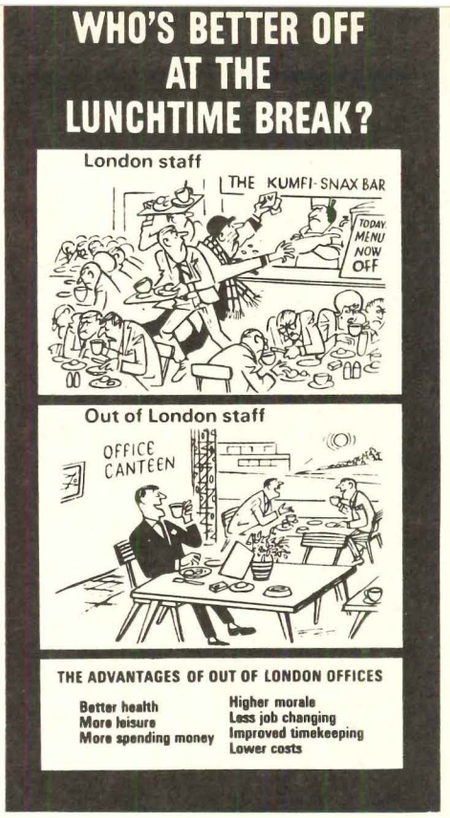
We consider Regional Policy and its implementation in two different senses: Local Metropolitan-Regional Policy, and form and execution; and National Regional Population Distribution Policy. By the former, we mean the analysis and coordination of urgent problems which arise in any region, and which are constantly becoming more pressing with the surge of population and in-migration. Such common problems of all the portions of the region are: over-all land use, transportation and highways, water supply and distribution, parks and open spaces, drainage and flood control. How these are handled are matters of local-regional policy and administration. Of course, through New Towns crystallizations and the planned increase of existing ones, the cost of these vital elements is much less than in the presently prevailing fringe-ification and scatteration.

By National Regional Population Policy we mean consideration of the possibility of not merely letting trend increases curve up as they will into ever-increasing megalopolitan areas, but of the debate and adoption of principles and measures of differential or channeled population increase to other areas, which could produce a more satisfactory physical, social and economic distribution of population as among different urban regions and the different *kinds* of living they could provide, than the simple extrapolation of trend. We will outline alternative kinds of regional composition that may be economically more efficient, and make possible a kind of living and of relationships to natural land that many will prefer. This is by no means just a theoretical suggestion, though there is no serious precedent for it lately in this country. But it has become policy in the last years and policy in course of execution in Holland, in England, in Israel. Perhaps, reversing Edmund Burke's famous dictum, we should call in the old world to redress the balance of the new!

Great metropolitan cities of metropolitan regions are here. No one can reverse that, whatever his personal Utopias. We *can* make the best of them, in such ways as suggested in the article on New Towns, AND we can and *must* do our best to dampen down their indefinite endlessly-agglomerating growth, through a National Urban Regional Policy.

Local Metropolitan-Regional Policy

Now as to local-regional policy and administrative requirements. There isn't the slightest doubt that perceptive people everywhere recognize the necessity of comprehensive metropolitan-regional surveys, research, coordinated study and action (including especially much closer coordination with and influence



PSYCHOLOGY OF METROPOLITAN INFINITE INCREASE VS. CREATIVE LIMITATION OF GROWTH: NEW YORK AND LONDON. London is convinced that growth beyond limit is unpleasant, uneconomic, should be countered. Note the official cartoon in favor of offices moving away from London. New York on the other hand, still afflicted by the unbridled urge to giantism, proposes a convention hall for 80,000 on two blocks right in the center of town! Neither the news announcement in the New York Times nor the editorial even refers to problems of congestion, traffic, increases of tension

over the runaway highway engineers). But, pragmatically, they simply have not yet made themselves felt in effective action terms.

Although over 60 of our metropolitan areas already have some form of this setup, one may in the first place note that there are over 200 metropolitan areas. In most cases they are quite weak in authority. Some are fairly, and very few are very, influential and pervasive. There are the private-voluntary groups (e.g., Regional Plan Association of New York); the public body authorized by statute, with members from constituent communities but with no legal enforcement power or statutory financing (e.g., in the Chicago area, the very influential Northeastern Illinois Metropolitan Area Planning Commission); the public metropolitan body with specific powers for construction and operation such as the Port of New York Authority and the Bi-State Development Agency (Illinois and Missouri, for the St. Louis Metropolitan area). Then there is (rarely) the most thorough-going of all, Metropolitan Government, such as the Greater London Council[1]; Metropolitan Dade County in Florida, established five years ago (Miami being the chief city); the Toronto "Metro" government, now in its 10th year; and the Metropolitan Government of Nashville and Davidson County, Tennessee, in operation about 18 months. These latter are federated forms, with regional matters handled by the metro body with its own budget and power, and with the bulk or local powers in the control of the individual community.

This "specimen listing" is given here not because this is going to be a detailed treatise on metropolitan-planning or government, but to indicate how widely and variously the need has been felt and action varying from mostly quite weak to decisive has been taken. Our hope is that this kind of indicative list will bring home sharply the one-ness of metropolitan wide problems, the urgency of the need, and the precedent and current phase of expansion of metropolitan planning and powers. There is no question in my mind that this will come, in its fullest version. It is inevitable. The burning question is: will it come *now,* or will it come after much more metropolitan spoilage has taken place, much more new land prodigally and fragmentarily used up, the results of metropolitan anarchy much more irreversibly evident?

As far as studies and recommendations are concerned, most of these have gone a considerable distance. In some cases, such as the Baltimore and the Washington areas, New Town locations have been indicated in Regional Master Plans. In others, there is enough data at hand to facilitate choice of some sites. In the case of New York State, a feature of the proposed framework of Regions just announced by Governor Rockefeller includes illustrative locations and envelopic sizes of a number of New Town or expanded Town galaxies, indicative of the state's development policy. This New York State plan, which will be cited at various points in this article, is a MUST for readers. Based essentially on the epoch-making Clarence Stein and Henry Wright plan of 1926 for Governor Smith, and now intelligently carried forward, its aim is to provide a development framework for the next 60 years.[2]

Thus, we have arrived or can readily arrive at the specific locations of early towns, which in the last article we delineated in analytic terms, as well as their internal social, economic, physical composition and anatomy. We have also described a feasible initial set-up for creating them: a New Towns Com-

A Midtown Spectacular?

The idea for an $80 million, 80,000-seat convention hall in the Times Square area carried down to City Hall by Douglas Leigh, president of the Broadway Association, would—if it ever came to pass—answer a long-felt city need. All auditoriums existing or in prospect fall far short of adequacy in offering the combination of facilities required by large conventions.

Some years ago it was hoped that the new Coliseum at Columbus Circle might be the an-answer, but successful as it is for exhibition purposes, the final compromise plans made it disappointing on seating space. The Convention and Visitors Bureau feels the city "desperately" needs a new convention hall. All past records for the number of conventions held here will be broken this year, thanks in part to the World's Fair.

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CONVENTION HALL URGED ON 43D ST.

2-Block Project Would Be Just West of Times Sq.

By GLENN FOWLER

The Broadway Association proposed yesterday the creation of a giant convention hall on 43d Street, just west of Times Square.

The suggestion was made to Deputy Mayor Edward F. Cavanagh Jr. at City Hall by Douglas Leigh, president of the businessmen's group and head of an outdoor advertising concern that operates many of the spectacular display signs that have made the Great White Way world famous.

Exhibit City, as the project would be called, would cost $80 million and would cover the two blocks bounded by Seventh and Eighth Avenues and by 41st and 43d Streets It would necessitate demolition of 10-motion-picture houses, the Dixie Hotel, a 24-story office building and both sides of what has been called New York's worst honky-tonk block—the stretch of 42d Street that contains the movie houses (most of them open until 4 A.M.), several frankfurter and pizza stands, amusement arcades and bookstores specializing in sex publications.

Mr. Leigh said that financing had not yet been arranged — "but we find it not a major problem."

Mr. Cavanagh, however, sounded a more cautious note. He thought it would be "a gift from heaven" for the city, provided that no public funds were required and that there was no need for condemnation of land by the city.

"At this point," he said, "I cannot say the city is in f[illegible] or disfavor.

The cost of [illegible] was put

mission, and individual Development Corporations whose form and personnel would somewhat resemble the quite successful special Authorities here and to some extent the British New Town Corporations. The New York State plan speaks of the use of municipal corporations to assist in the development of new communities. While there is no doubt that a substantial number of "early" New Towns in our sense can thus in any case be created, the maximum advantage will accrue if at the earliest moment the Metropolitan body can set out a complete plan (as New York State has now just started to do), can closely link these locational and quantitative determinations of population with the other urgent physical and transport-communications decisions and gain the maximum value from this simultaneous coordinated decision-making and process. That is why it is so late in the day and so very urgent to move a thoroughgoing Metropolitan setup into action NOW.

This issue is receiving a great deal of many-paged high-level attention. For example, the Advisory Committee on Inter-Governmental Relations, a permanent bipartisan committee set up by Congress, composed of distinguished and practical members from local, state and Federal government and legislatures, after analyzing the inadequacies of the approach of metropolitan authorities or districts with specialized piecemeal jurisdiction, has advocated what it considers a first move: the Metropolitan Service Corporation. This proposed Metropolitan Service Corporation would perform area-wide services and have jurisdiction over sewage disposal and water supply, transportation, housing, parks, flood control, etc.: all the area-wide elements that the localities simply cannot cope with. Its Board of Directors would be those who hold local office in cities and counties of the metropolitan area; i.e., members with direct responsibility to the people[3] . . . Readers, if you never do anything else as a result of going through this series, go after this objective: lay your eloquence, your prestige, your devotion on the line to achieve this NOW.

Now, this is our very immediate and pressing job, and a great one it is to do it right. But it is not by itself enough, not by itself *nearly* enough, to fulfill national need, and above all national potential.

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[1] Recently broadened in area and in strength of control, as the result of long study and the recommendations of a Royal Commission. This significant step, showing both the need and the accumulated confidence in an area which had had previous experience with metropolitan government, is well described and dissected in a pamphlet "The World's Greatest Metropolis: Planning and Government in Greater London" by William A. Robson, published 1963 by Institute of Local Government, University of Pittsburgh

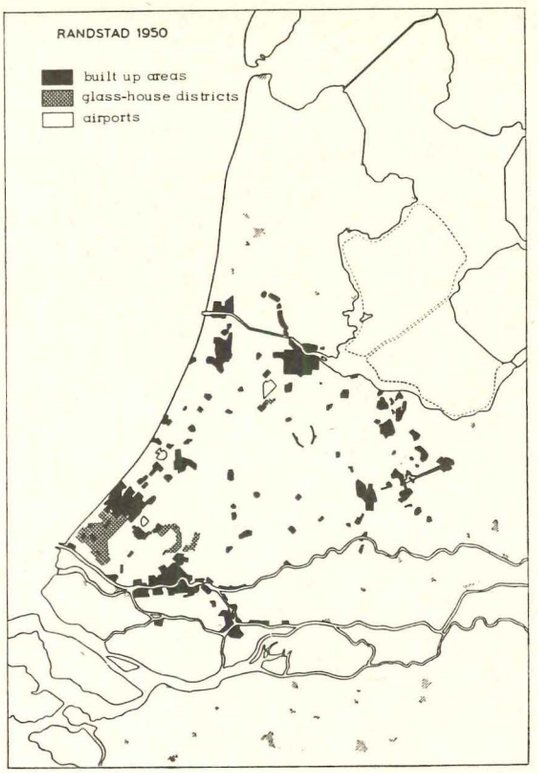
[2] Actually, the original plan, and this extrapolation of it, have an incisive organic character related closely to topography; to river, lake and soil resources; involve afforestation and other essential natural utilization aspects. In short, it is very broad-based. A serious analysis of it would take a full paper of its own. We are interested in the urban-regional aspects

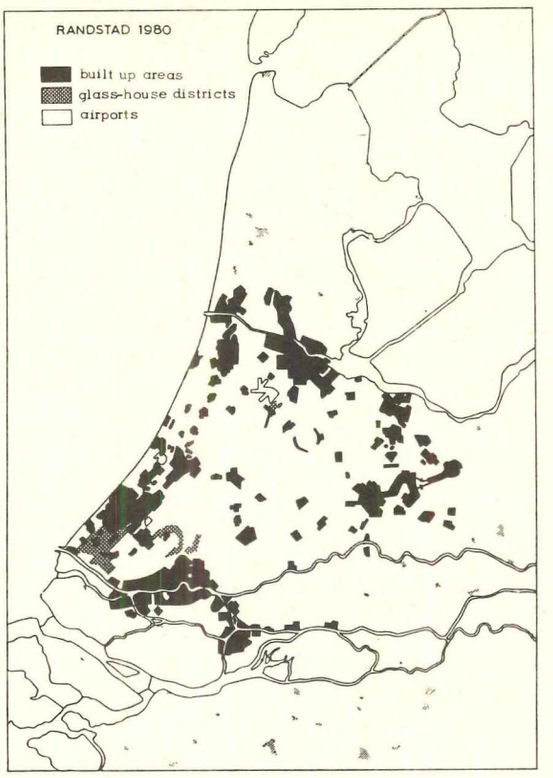
[3] An interesting and worrisome current illustration of the metropolitan action-dilemma and current unpreparedness for it comes from reports of a recent meeting in the St. Louis area called by the Bi-State Development Agency, attended by members of 14 local government and planning bodies. As reported in the St. Louis Post-Dispatch of June 19, an agreement was reached to form a highly tentative regional coordinating committee. "The agreement . . . represents a kind of shotgun marriage, the coercive element being the threat of a withdrawal of Federal funds for urban highway projects next year. The Federal Highway Act of 1962 specifies that the Bureau of Roads will not approve any more projects in urban areas of more than 50,000 population after July 1, 1965, unless they are based on a continuing comprehensive metropolitan planning process."

The report goes on: "Richard Ives, deputy assistant commissioner for urban planning of the Urban Renewal Administration, also had a warning for the group . . . . [He said] that hereafter, funds will be available for smaller agencies only where their planning functions are coordinated with others in the metropolitan area.

"When some delegates questioned the Federal officials on how minimal the regional planning could be and still qualify for funds, Laurence K. Roose, St. Louis county supervisor, said he was concerned with the direction of the discussion.

" 'It seems to me the question before us is whether we establish a coordinating committee to meet all the needs of our community,' he said. 'I don't think it is a businesslike approach to regional planning to just find out the minimum things we must do to get this Federal road money. We ought to find out and define the areas in which regional planning coordination is in order.' "





National Urban Regional Policy

There are important alternatives to even the most intelligent and determined development of the major metropolitan areas. If there is one great characteristic of these United States, its genius, its ethos, it is PLURALISM. Let us capitalize on our competitive spirit, raise it to a new and compelling dimension. Let us in this vast country, with its vast spaces and initiative, create important alternatives to these outside metropolitan regions. They may well be better. Or, perhaps in this context there may be no absolute "better." But to say the least of it, many, many people's values would be better fulfilled. And, in our age of overflowing technology, we can, we must, we owe it to ourselves to consciously create these alternatives, and in the most effective possible way, give them a real chance. I believe that they will prove themselves out, that economically, socially, spiritually they can add important dimensions and advantages, economic and human.

There are several great alternatives to the major metropolitan regions. One sees three such:

—Development of middle-sized metropolitan regions.

—Development of promising "galaxies" of smaller cities.

—Development of almost-new areas.

Why these alternatives?

By National Urban Regional Policy, from a national point of view, we mean first a debate, then a consensus, and then (we hope) an implementation of new or guided distribution of population, industry-employment, recreation and highway network. Do we continue to accept unquestioningly the great and overwhelming increase in existing gargantuan regions, and try only or mainly by new towns in those regions and fresh in-city communities to make them work more rationally, humanely and verdantly; or should we also (i.e., not *instead,* but *also*) very positively seek to take some sizeable part of the increase,[1] and dispose of it in alternative ways, and place it in other Regions and "New Regions" (i.e., not totally new, of course, but not yet so gargantuanly developed and spread and fringed and inter-oozed)? Should we seek less developed and more potential regions, for a large part at least of growth and migration, in place of excessive further saturation of already-saturated regions? Should we go along with the fashion and act out the ever-increasingly continuous Megalopolis tendency of Boston-New York-Philadelphia-Baltimore-Washington, of the Los Angeles-San Diego stretch, and others? Or, should we embrace some valiant 20th-century equivalent or renewal of pioneering: urban-regional pioneering?

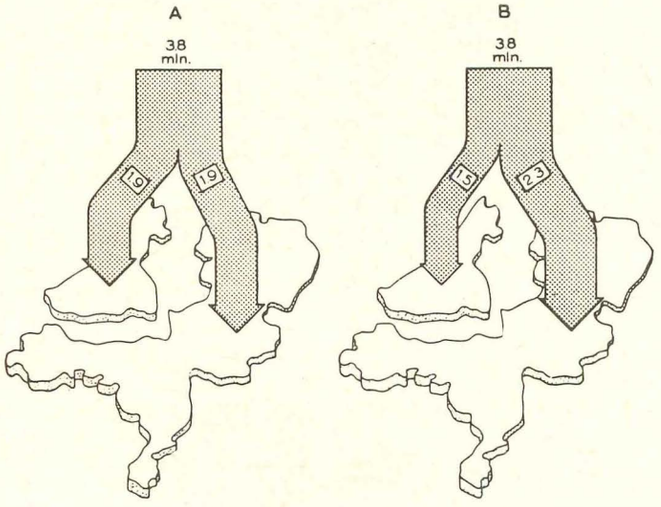
Some Examples Abroad

Bear in mind that on the 20th-century trail to such pioneering we have current guideposts in the British study and announcement of a new Southeast Region, Holland's policy of developing its under-developed east regions to minimize the lava flow into its present great cities and their environs, of Israel's new regions and some control of the population increase in its two already-major centers.

A brief run-down of these cases will give us a start in thinking things through.

In Holland, the west part of the country contains all its large cities, its potential Megalopolis—Amsterdam, Rotterdam, The Hague, Utrecht, Haarlem

Possibilities for distribution of the increase of population 1950 – 1980



A. following today's tendencies (without affecting them)
B. assuming balances migration 1950 – 1980

NETHERLANDS POLICY AND THE RANDSTAD. To prevent the oozing together into one megalopolis of its major cities Amsterdam, Haarlem, The Hague, Rotterdam and Utrecht, known as the Randstad. The great effort is to keep open rural land in the center, and open space greenbelts between cities. Since 1950 the Ministry of Economic Affairs has been aiding industrial development in other regions. "On these new centers will be concentrated improvement of communications, the provision of housing, the provision of social and cultural facilities. . . ." Also, subsidies for industrial development are given there. Note the expression of planning intentions, in the two prongs A and B. At left (A) is shown what would happen following today's tendencies. At right (B) the goal of policy is to divert 400,000 from the Randstad area to the "new areas"

—in a ring called the Randstad. Around a still fairly open and rural central area, and still separated from each other around this ring by green space, it was discerned some years ago that population was rapidly and concentratedly increasing, and the whole still-separated group was threatening to ooze together into one solid viscosity. Some four years ago, the Dutch started counter-measures and channeling-measures of development. They have been pushing the much less developed eastern regions by accelerated public resources development, subsidies to industries, etc., to divert in considerable measure what they consider the excessive Randstad growth. This is now active policy (plus development *outward* from the Randstad, not inward, for such growth as is minimally bound to take place).[2]

In England, we know, of course, of the notable New Towns effort, around London, Glasgow, and now Birmingham. The British, too, have concluded that an ever more decisive national Urban Regional Planning effort is necessary, to creatively divert a sizeable portion of metropolitan growth. This spring the Government announced what officials described as "the biggest planning project in the free world." They proposed a regional plan for the entire southeast, to meet a chunk of population explosion of the order of 3.5 million people. It involves three major new cities, new towns, expansion of towns, AND doubling the size of the greenbelt surrounding London "to prevent the capital from spreading endlessly into the countryside." [3]

Israel's case is of course rather special, but worth noting. Israeli policy for a number of years has been to hold down the growth of the two major cities, Tel Aviv and Haifa, and to channel growth into regional and sub-regional areas. The result has been a very substantial dampening of growth of these two cities as compared with metropolitan cities in other countries: this, in spite of enormous immigration. In both the really new region (the Negev) and older regions (such as the Lachiesh area) new urban, suburban and village configurations are being effectuated.

Thus, we have a series of adventurous and determined breakthroughs, all bearing on the same phenomenon and aim: some brake on the gargantuan present metropolitan increases, and creation of alternatives: in location, in differential advantages, in use of new potential.

New Elements for A New American Policy

Now as to our own U.S.A. What are some of the new emerging factors in 20th-century life that may well make the more intensive settlement of less developed

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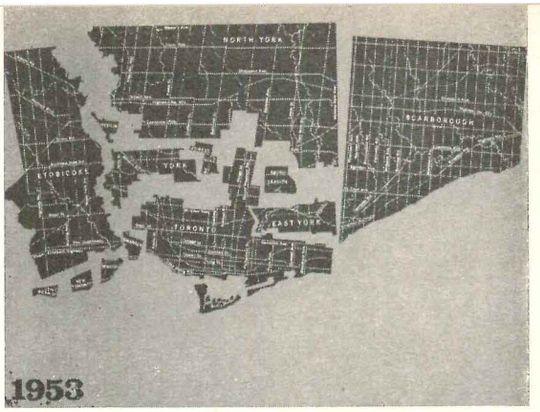
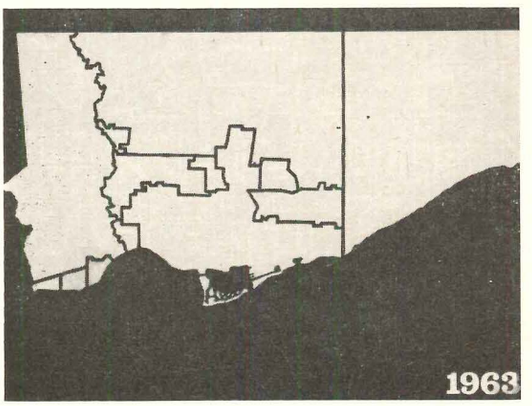
[1]I say only "some sizable part" for obvious reasons, and because in realistically appraising the situation and in shaping and scaling one's objectives, one must take into account the powerful psychological forces operating in this country. These are the embodiment of a fierce inertia of growth momentum, long after its initial causes and rationale have ceased to have any validity, in the form of the drive to and the prestige of giantism. One would, for example, think that New York City's Manhattan Island has enough and more than enough of prestige, overcrowding, tourists, traffic. But NO. Just recently, it has been responsibly proposed and urged that a convention-exhibition hall seating 80,000 be placed on 4 blocks right smack in the heart of Manhattan (Broadway and 42nd Street). Eighty thousand! The staid New York Times heartily approves in an editorial. Neither the proponent nor the newspaper has even mentioned the traffic and congestion effects

[2]This policy and its effectuation are described in a number of publications by the Dutch Government. I have made my resumé chiefly from a mimeographed publication by the Planning Department (Rijksdienst voor Nationale Plan), "Metropolitan Planning Problems in the Netherlands" by G. A. Wissink, September 1961

[3]Taken from account in the New York Times, March 20, 1964. This in turn is taken from a White Paper by the British Government, South-East England; which has also published their South-East Study as basic commitment to the principle "to moderate the dominance of London" by developing "centers of growth alternative to London."





TORONTO: FEDERATED METROPOLITAN GOVERNMENT. A pair of diagrams from the 10th anniversary publication of the Municipality of Metropolitan Toronto. They show symbolically and dramatically the fragmented 1953 situation, and the close coordination under the federated Metropolitan Government. *Across-page:* Population's precipitate rise in the area, 38 per cent in 10 years, to a total of 1,625,000. The explosive increase: as much as 192 per cent (i.e., almost three times the 1953 population) in the suburb of Scarboro, down to 3 per cent loss in Toronto. Major problems of transportation, water supply, sewage, land use are dealt with at the metropolitan level. Localities are in control of local problems

regions in our country worth a new, purposeful, determined look?

Recreation is one key factor. Automation, drastic decrease in the work week, increase in leisure time and mobility-range, scarcity of available open space, and the almost unbelievable projections of open-space need—all these compel an examination of this element as a newly emerging major factor in regional location. Consider a single (not extreme) instance. A study by a well-known consultant has led him to recommend that St. Louis County will within decades have a need for 31,000 additional acres for recreation, within an hour's drive of the major urban area. The land acquisition cost alone will reach something like $125,000,000. Such amounts will become, are, major items of cost for doing business in developed metropolitan areas; and as well, the access journey constantly lengthens. In a number of less developed regions, the cost would be a fraction. Indeed a new dimension in the equation.

Again, consider the costs of building. It has been previously noted that house costs are constantly rising, at an accelerated tempo, that in metropolitan areas the price of developed land has doubled, from 10 per cent to 20 per cent (of an increased total), and is still rising. In the relatively "new" region the speculative and related factors have in most cases not yet been seriously operating.

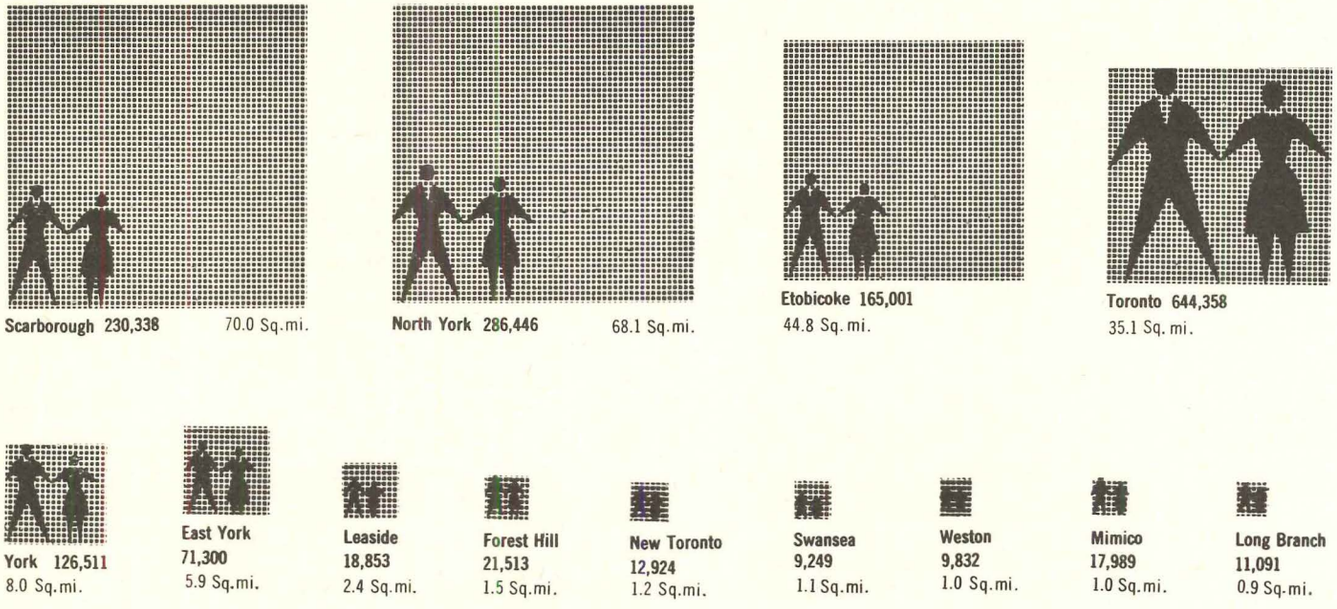
The opportunity to accentuate development of middle-size metropolitan areas and "new" urban regions and thus relieve some of the population and land pressures on the major metropolitan areas is made realistic by the communications developments of the last decades, which make industry—and especially certain types—all but independent of proximity to market or to raw material sources. The car, the truck, the plane, road networks and airports greatly narrow the distance factor; telephone, teletype, wave communication generally, operate further to obliterate it. However, consciously or unconsciously, the vast new interstate super-highway system does its very effective utmost to further accentuate concentration and congestion of cities and regions, to make the very minimum effort to activate less developed regions. How?

As previously noted, application of the cost-benefit ratio to a very short time-range means naturally that we increase the capacity and temporarily the over-the-road speed between and past the already congested centers, where demand is insatiable; and thus we also bind future highway expenditures to more of the same, *ad infinitum*. We must break loose from this compulsive tie. Public cost-benefit ratio must have a different time-orientation from that of private enterprise. These things, being public, should have a different set of governing equations. What we need is a great debate and a great awakening and re-orientation.

Recreation, and Re-Creation

There are three major types of opportunities available to absorb creatively and healthily a much larger share than hitherto of current and expected pressures of urbanization. Development of these is readily possible if we have the imagination and the determination, and it would in a happy way decelerate the megalopolitan ooze. This in itself would, of course, be a major accomplishment, but is in a sense a negative statement. On the positive side, our alternatives would produce a better tempo of living, a

Population and Areas



warmth and closeness of man to nature, in fact a realization of many of the suppressed potentials of our culture.

These are potentials and happy configurations which our 20th-century's multifarious technology and dawning spirit permit, because there we can start "nearer to the beginning." One is not so naive as to think we can start altogether from or near scratch. Hence, our immediate aim and emphasis have been on New Towns (and fresh in-city communities) to meet the undoubtedly inevitable further increases in our massive major agglomerations, and on metropolitan planning development, coordination, government. But even optimistically granted a maximum in New Town creation, all of our major metropolitan regions already have huge agglomerated core cities, so that half or at any rate a quite high percentage of metropolitan populations will continue to live in such areas, with their characteristic advantages and disadvantages.

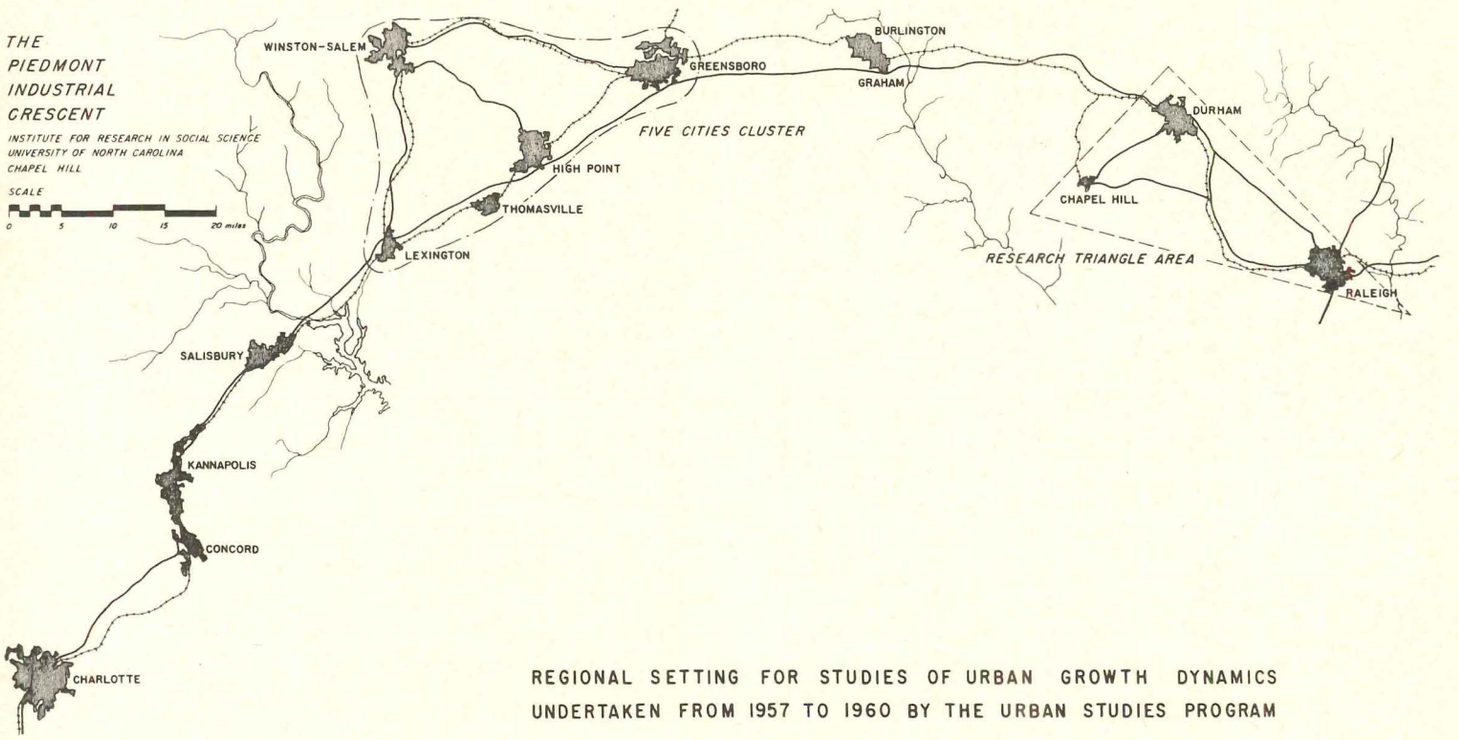
Before going specifically into these recommended alternative regions, I want to pause to consider more penetratingly the word *recreation* and what it implies, and why it is placed very high in our creative future as we here visualize it. Recreation is becoming, especially with the new leisure, an increasingly major factor in our lives, in our local and national government budgets, in our private budgets, and in our planning ahead, whatever our outlook or economic background. But the word itself, and the concept, have in an important sense degenerated. *Recreation* is a homogenized contraction of RE-CREATION. There are all kinds of positives in the urge and in the enhancing provision for recreation. But it is in most cases not re-creation. Recreation is pleasurable, healthy, brings out or develops important skills and qualities of sportsmanship and relationships. Its various synonyms are relaxation, sport, change, "refreshment of body or mind after toil" (dictionary). These one can achieve in major metropolitan areas, at increasing costs, increasing time effort of journey-to-recreation.

But RE-CREATION? A basic element in re-creation is our relation to land and the growth it sustains in animal life and plant life and food. Inhabitants of the great metropolitan areas forfeit these organic re-creative meaningful relationships. To them these are distant processes without essential or first-hand emotional meaning, except most meagerly by way of the zoo or occasionally the small private garden. It is necessary that the organic quality of process and growth be retained or regained as part of transmitted feeling and experience, by a much more substantial number of people, even by city people.

While in the case of outlying New Towns in major metropolitan areas, the people are physically closer to nature in something of this re-creative sense, it is mainly in what we have called New Regions that cities of moderate size, and adjacent active farm production, can be positively related and sufficiently close at hand to promote most fully this natural contact and emotional penetration.

The Three Alternatives

There have been indicated three types of alternatives to unlimited accretion and spread of the major metropolitan areas. Each offers a progressively sharper alternative and set of opportunities. Each progressively offers less of the fixed and barnacled



REGIONAL SETTING FOR STUDIES OF URBAN GROWTH DYNAMICS UNDERTAKEN FROM 1957 TO 1960 BY THE URBAN STUDIES PROGRAM

and already widely radiated areas of past development.

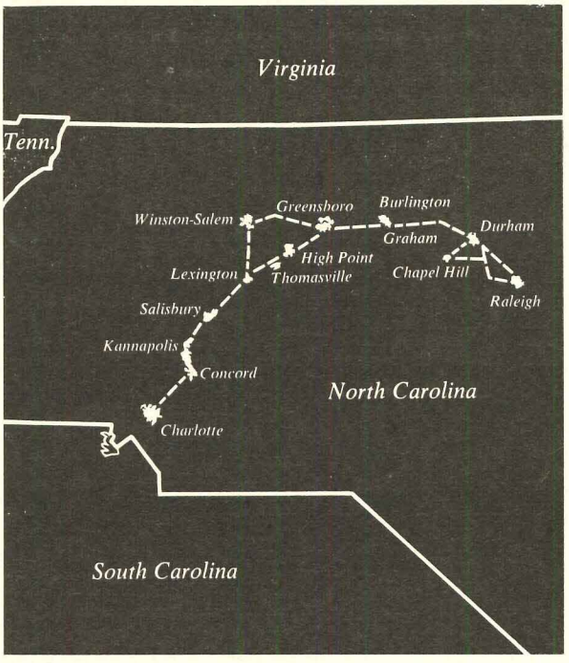
First, a number of the middle-sized metropolitan areas offer a *kind* of living that is comparable in style with the major ones, but with these differences. The tempo is less frenetic; there is less of the amorphous and anonymous character, more direct participation and contact; open space and nature are intimately closer. These require more in the kinds and degree of distinction available in cultural and entertainment opportunities, if these locales are to be counter-magnets to the gargantuan metropolises. *Their* increase in size will enable them to encourage and to support this higher level and variety. In short, with intentionally accentuated (but not unlimited) growth in terms of the metropolitan center itself and of New Towns or guided growth towns in their metropolitan orbits, we have here a more humane version of the major metropolitan area: the same *kind* of living, one might say, with the excesses mainly shorn away or, rather, never allowed to develop.

Such middle-sized center cities and their metropolitan areas will thus gain in quality and character by substantial planned growth, while great further growth adds nothing significant to major metropolitan areas, but simply accentuates already very serious problems.

There are numerous examples or candidates around the country. I will mention Syracuse, in the center of New York State, mainly because I am closely familiar with it. It is a core city of some 216,000 in a metropolitan area of some 500,000. Such an area can stand, and can benefit from planned (and limited) growth of intentionally very substantial induced proportions. The New York State Plan already referred to notes other than such potential centers.

A second type of urban region where growth should be encouraged, as alternative and competitor to the great metropolitan areas, consists of galaxies of small cities of special promise and perhaps of already special achievement: in manufacturing, education, research, abundant cheap power available or potential, scenic values. Such a one is the Piedmont Crescent in North Carolina, with a present total population of 1,500,000 in an area of some 6,000 square miles, with about 60 per cent of this population in a dozen cities, the largest of which is Charlotte, with 200,000. These are still-distinct, well-separated communities which could be very substantially increased, probably *should intentionally* be more than doubled by 1980. By sensitive planning and determined land-use control or public ownership, we could keep green and productive land between them, avoid the fringe-and-ooze-together of the already fringed-and-oozed viscous great metropolitan areas. Within this Piedmont Crescent, there are important specialized assets: Duke University in Durham, University of North Carolina in Chapel Hill, North Carolina State in Raleigh (the "Research Triangle"); another natural sub-area is the "Five Cities" area of which Winston-Salem, Greensboro, High Point are the best known.

A tremendous opportunity, if it is grasped in good time (NOW) and not allowed to repeat our other monumental carelessnesses and drifts into unmanageability. Note that this particular alternative, as well as the third type to be described, could have a distinctive and new competitive kind of pattern: no overwhelmingly predominant metropolitan center or focus, but a distribution of foci and "upper-



ONE REGIONAL ALTERNATIVE: THE PIEDMONT CRESCENT IN NORTH CAROLINA. One of the alternatives to endless metropolitan growth and megalopolis: the galaxy of cities. The Piedmont Crescent in North Carolina growth could well be encouraged, accentuated, to predefined limits, where space between and around will not be spoiled and despoiled by fringe and scatteration, what the British aptly call overspill. All the cities can grow to a healthy point, where the region becomes an interwoven rural-urban complex whose total distributed population and employment can afford in very large measure the cultural and entertainment resources of the major metropolitan area. Twentieth century means, to meet 20th-century problems. In the study map by the Institute for Research in Social Science, University of North Carolina, two associated sub-regions are distinguished: "Research Triangle Area" and "Five Cities Cluster"

level" or regional functions into a totality that Clarence Stein calls the Regional City. Stein has himself put this concept succinctly, and his statement is included here with no change.

A REGIONAL PATTERN FOR DISPERSAL

By Clarence S. Stein

THE REGIONAL CITY is proposed as basic pattern for building future cities, as well as for the redevelopment of the metropolis of today.

1. A REGIONAL CITY will be a constellation of moderate-sized communities, separated by great open areas but bound closely together by townless highways (i.e. throughways, turnpikes and parkways).

2. IT WILL BE PLANNED, DEVELOPED AND OPERATED AS A REGIONAL ENTITY.

3. WORKING PLACES WILL BE DISTRIBUTED in numerous towns and open places, so that there will be adequate and varied opportunities of employment convenient to all workers' homes.

4. THE OPEN AREAS BETWEEN TOWNS, while serving for spacious recreation, will be used mainly for farms, woods and grazing. Thus, much food may be produced as close to markets and consumers as is practical geographically and economically.

5. THE TOWNS IN A REGIONAL CITY WILL HAVE VARIED FUNCTIONS, CHARACTER, FORMS AND SIZES. Each will be large enough to support all the day-to-day activities and equipment of a contemporary American community. All towns will be small enough to foster local loyalty and pride, as well as closeness to countryside.

6. THE TOTAL POPULATION of a regional group of towns and farms will be adequate to utilize and support central facilities equivalent to those provided by a great metropolis of today. This includes the best of universities, hospitals, museums, libraries, laboratories, wholesale markets, business centers as well as auditorium, symphony hall, theaters and an equivalent of the "great white way."

7. THESE MAIN CENTRAL FACILITIES WILL BE IN VARIOUS TOWNS, each of which will serve one or at most a few related functions. Thus traffic loads will be limited and balanced and the deadening congestion of the obsolete metropolitan centers will be done away with.

8. THE TIME DISTANCE TO ALL ITS MAIN CENTERS from any part of a regional city will be less than that from vast outlying areas of a present-day sprawling metropolis to its congest-

ed multi-pupose center. This is possible because the greater part of the journey will be by townless highways, safely speeding through open country, with adequate terminal facilities in each town.

Another example, different but of this over-all character, is the well-located well-variegated triangle of Albany (the capital of New York State), Schenectady and Troy.[1]

There is a third type of alternative or "competitive" region for intentional accentuated development, where developed patterns and land use are still sufficiently "virgin" so that all our best mid-20th-century knowledge and technology and social understanding and thinking could be most fully brought to bear. The TVA region is a perhaps unfairly excellent example of this type, with its already well-developed regional-planned character, power resources, important industries and agriculture, natural and man-made recreation areas, its high level of social and extension services, its few small cities and towns of various sizes. Here is an area which, even in its present state of relative well-being, could gain much by very considerable planned increases in population and enterprise, New Towns, diverse and more excellent cultural resources. Perhaps this might be looked on as a special case of the second type of alternative, but it is here intended as an illustration of the still relatively "virgin" areas from the point of view of lesser degree of urban development, the still close relationship of urban settlements and productive rural land.[2] Certain portions of Appalachia have this potential at an even earlier point of development. Their own developed initiative and accomplishments as in the area served by the remarkable community-oriented regional Southern Illinois University give some promise that this may be another of this third type, potential alternative counter-magnet areas.

Of course, in this country there is rightly no mandatory or enforceable way to channel people into one area or region as compared to another, even if it is agreed that the results will be most desirable. But there are all sorts of very legitimate and almost daily occasions for powerfully influencing movements: such as the location policy of the super-highway system, of government manufacturing contracts and hence plants, of national and state governments' location of their regional offices, or research and educational contracts, of various types of subsidy and special programs.

[1]Note, by the way, the similarity of this area, in miniature, to the much bigger and more complex Randstad, Holland—or, at any rate until a few years ago. The oozing together and overlapping development may since have gone too far

[2]A sensitive and knowledgeable person to whom I mentioned the TVA Region in this context went even further. He felt that here is a modern-day yardstick function for TVA, yardstick in terms of humane living, a challenging successor to the power yardstick of 30 years ago, and an important complement of it

Summation: Urgency, Urgency, Urgency

What such proposals as these come to, in these last two articles, may be briefly summarized:

1. Urban development in major metropolitan areas by NEW TOWNS to take up increase and in-migration and central out-migration; and renewal of the central cities by reorganized in-city residential-working districts and communities, rather than by spectacular single projects and unreorganized land uses.

2. Emphasis on more intensive but limited development of areas as alternatives to the major metropolitan areas (middle-sized metropolitan areas, "galaxies" with special present and potential advantages, and the still semi-virgin areas). These would be made more desirable and competitive by enlarging existing communities and developing NEW TOWNS. These areas in varying degree have the enormous life-giving and re-creative advantage of intimate contact with rural cultivation, growth of the soil and raw nature. And the increase of population could support that enhancement of cultural and entertainment facilities that could make those areas more compatible with a sophisticated-leisure era, and more comparable with what is available in the major metropolitan areas.

It should be noted that such a program is not intended, nor expected, to *eliminate* growth of major metropolitan areas, but to *dampen* it to more viable proportions, and to provide those sizeable portions of the American people who undoubtedly prefer them or would prefer them, with alternative excellences and opportunities as compared with the standard major metropolitan complexes.

3. In whatever types and proportions of urban living and working concentrations exist or will be created, to work out and enact and operate large-scale regional coordination and governmental implementation, to effectuate optimum development of land-use and housing, transportation, drainage and flood-control, water supply and sewage disposal that can be done only on this wide scale and not in small local bites, leaving gladly to the localities the functions that they in reality can best do.

In these matters, the great problem is the absence of a common sense of urgency, a widespread lack of consciousness or lack of willingness to face up to the need for creative intentional change, creative command of the forces of change. It seems to me there is a similarity in state of mind and state of hidden urgency to what must have been the situation that faced our young country when it ultimately became overwhelmingly evident that the easy-going Articles of Confederaton had to be replaced by the directional path of the Constitution. Perhaps this sounds pretentious or mock-heroic. If it is, it isn't by much. These *are* great issues. The issues and dangers are intimate and extreme for the quality of our lives in this country.

RESTAURANTS

DINING PAVILIONS OVER WATER

Islandia Restaurant, Mission Bay Park, San Diego, California

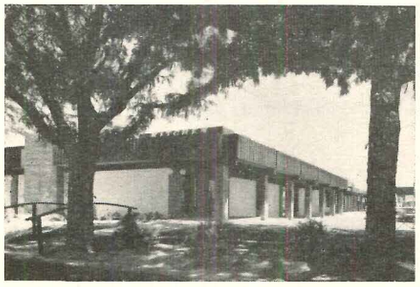
ARCHITECTS: *Frederick Liebhardt and Eugene Weston III*

Eugene Weston Jr., F.A.I.A., consulting architect

STRUCTURAL ENGINEERS: *John C. Kariotis & Associates*

LANDSCAPE ARCHITECTS: *Wimmer & Yamada*

CONTRACTOR: *Trepte Construction Company*

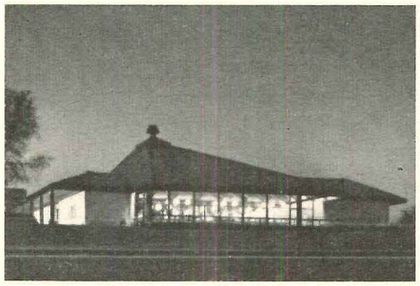


CASUAL ELEGANCE IN A SHOPPING CENTER

The Garden Kitchen, Greeley, Colorado

ARCHITECT: *Donald R. Roark*

CONTRACTOR: *Manion-Cropper Construction Company*



RESTAURANT ON A BUSY HIGHWAY

The Ground Cow, Penryn, California

ARCHITECTS: *Gerald M. McCue & Associates, Inc.*

E. Paul Kelly, job captain

STRUCTURAL ENGINEER: *Ralph G. Gray*

MECHANICAL ENGINEER: *Sanford Fox*

ELECTRICAL ENGINEER: *Scott Beamer*

CONTRACTOR: *Gavel and Flanders Construction Company*

RESTAURANT ON THE BEACH AT WAIKIKI

Outrigger Canoe Club, Honolulu, Hawaii

ASSOCIATED ARCHITECTS: *Vladimir Ossipoff & Associates*

Wimberly, Whisenand, Allison & Tong

LANDSCAPE ARCHITECT: *Katherine Thompson*

ELECTRICAL ENGINEERS: *Bennett and Shaw*

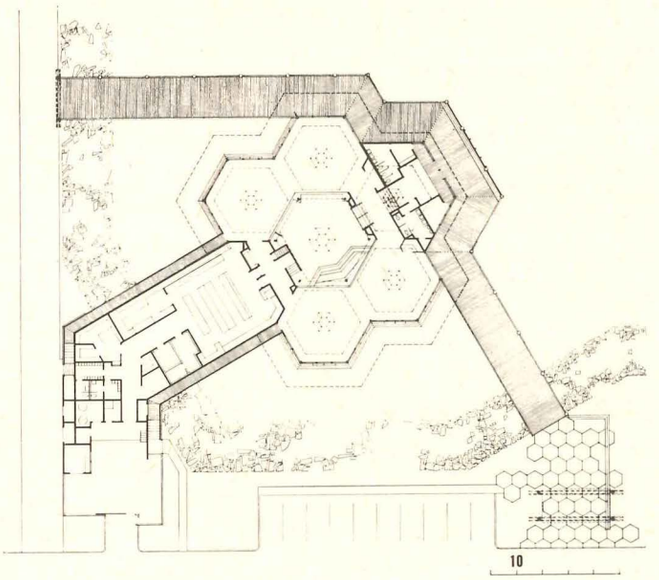
CONTRACTOR: *Pacific Construction Company*

SOUTH PACIFIC LONG HOUSE ON WATERFRONT PIER

Polynesia Restaurant, Pier 51, Seattle, Washington

ARCHITECT: *Raymond H. Peck*

CONTRACTOR: *Mulliken & Garrett*

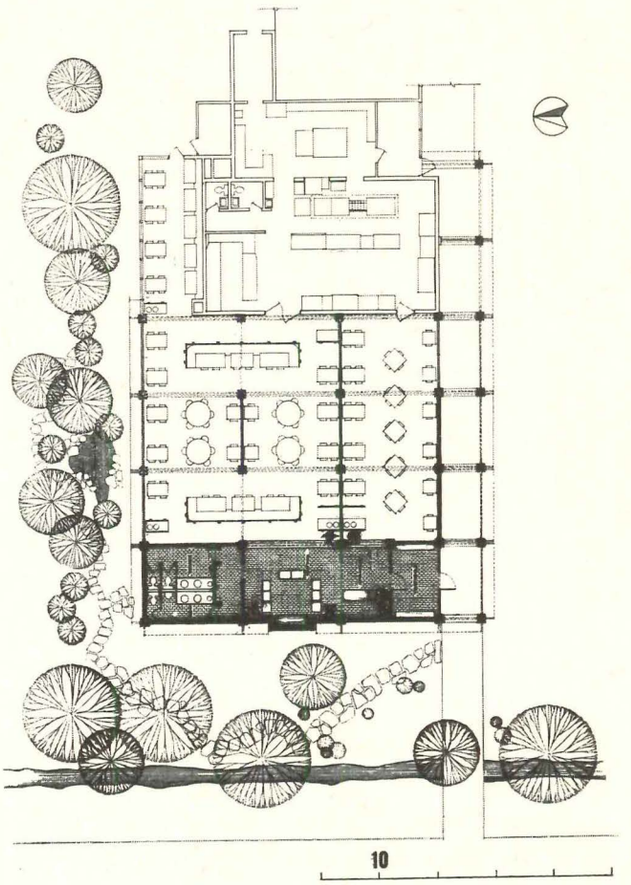


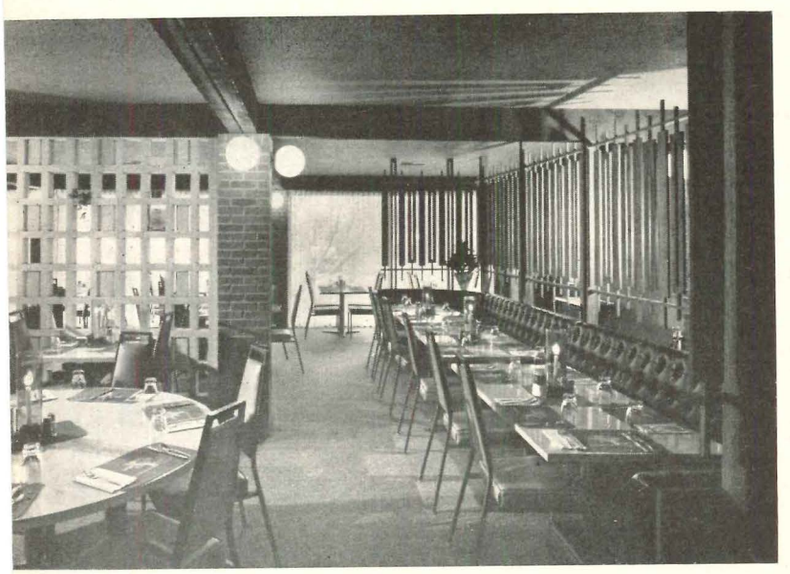
Julius Shulman

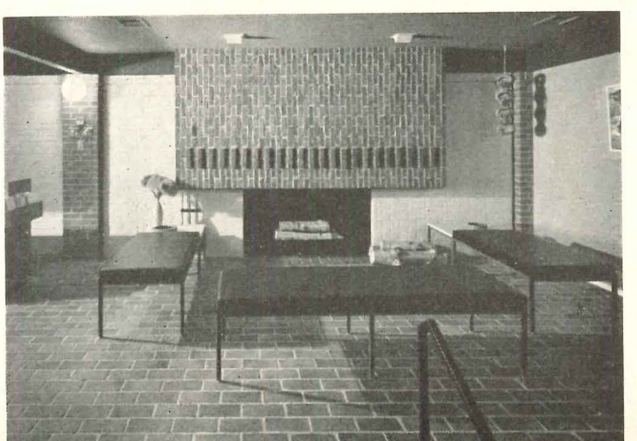
DINING PAVILION OVER WATER

Islandia Restaurant
Mission Bay Park, San Diego, California
ARCHITECTS: *Frederick Liebhardt and Eugene Weston III*
Eugene Weston Jr., F.A.I.A., Consulting Architect

In architectural form and character, this over-water building for the Islandia Restaurant intentionally relates to its waterfront location, but equally intentionally it identifies with no particular waterfront in any specific location or country. The restaurant, part of a hotel on one of the islands in the Mission Bay development on a vast mud-flat area north of San Diego, is at the end of a pier from which the restaurant's patrons get a fine view of the nearby Quivira Basin marina and the park surrounding it. Parking demands of the hotel and the marina literally pushed the restaurant out to its watery site, but the advantages of this were many. The over-water location in itself suggests a holiday mood: a gay and stimulating atmosphere was a program requirement. The physical separation of restaurant from hotel handsomely meets another requirement: that the restaurant be capable of functioning as an independent recreational attraction, inviting a clientele additional to the hotel's guests. The plan is a cluster of hexagons, the glass-walled outer areas for dining, the central hexagon a cocktail lounge. To take maximum advantage of the marine view several levels are introduced: the dining level is higher than the pier and deck, and the cocktail lounge is higher than the dining level. The dining areas, each defined by an unusual six-sided dome, provide a sense of intimacy regardless of the number of persons being served, and permit banquet as well as restaurant use. Dining areas seat 300; cocktail lounge, 70. Kitchen and service areas serve also as a connecting link with the "mainland." The structure is of wood frame on concrete piling and precast concrete girders; seismic loads are transferred to shore by concrete compression members under the pier. Materials used include redwood siding and shakes, solar glass, stucco, plaster, quarry tile and terrazzo.





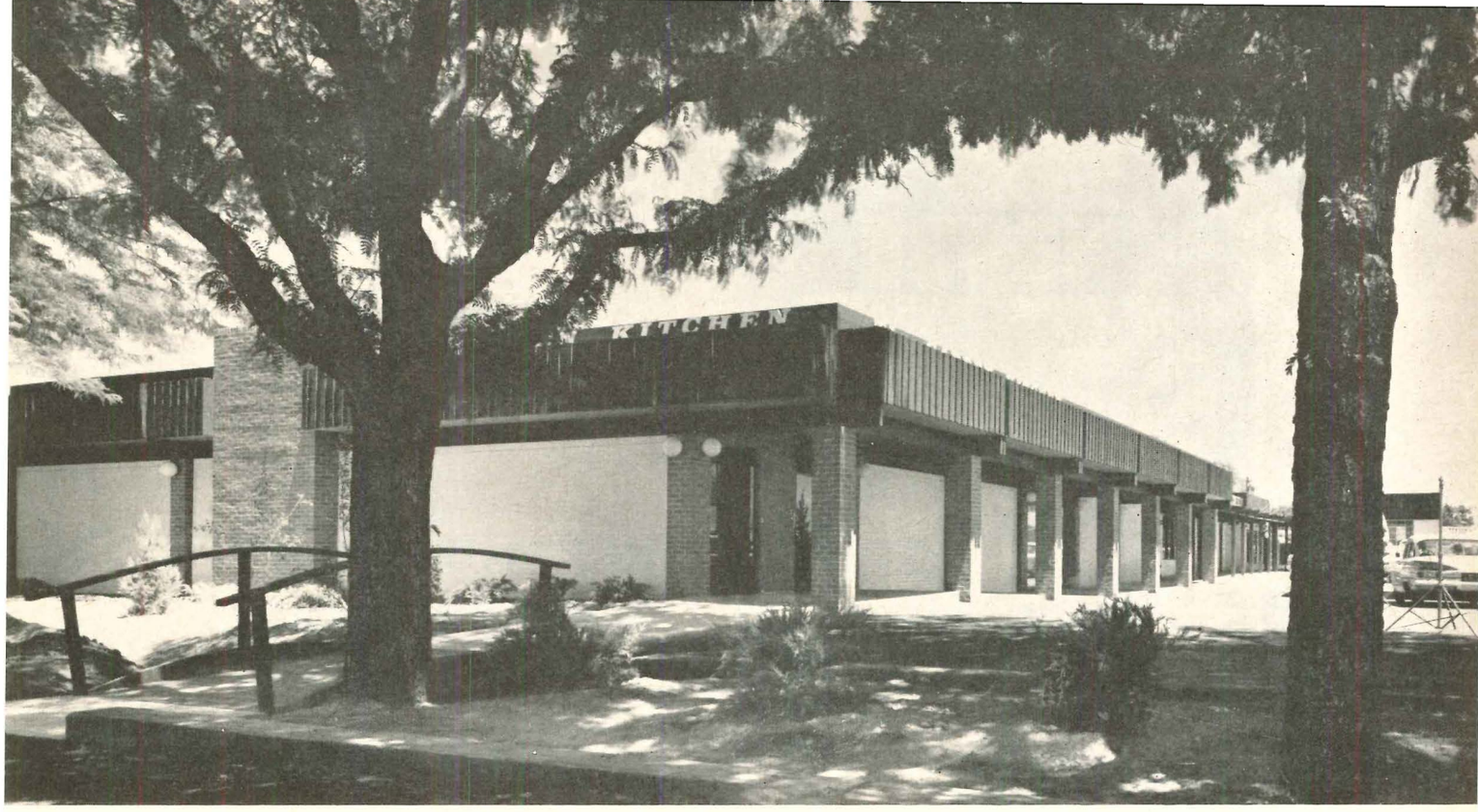


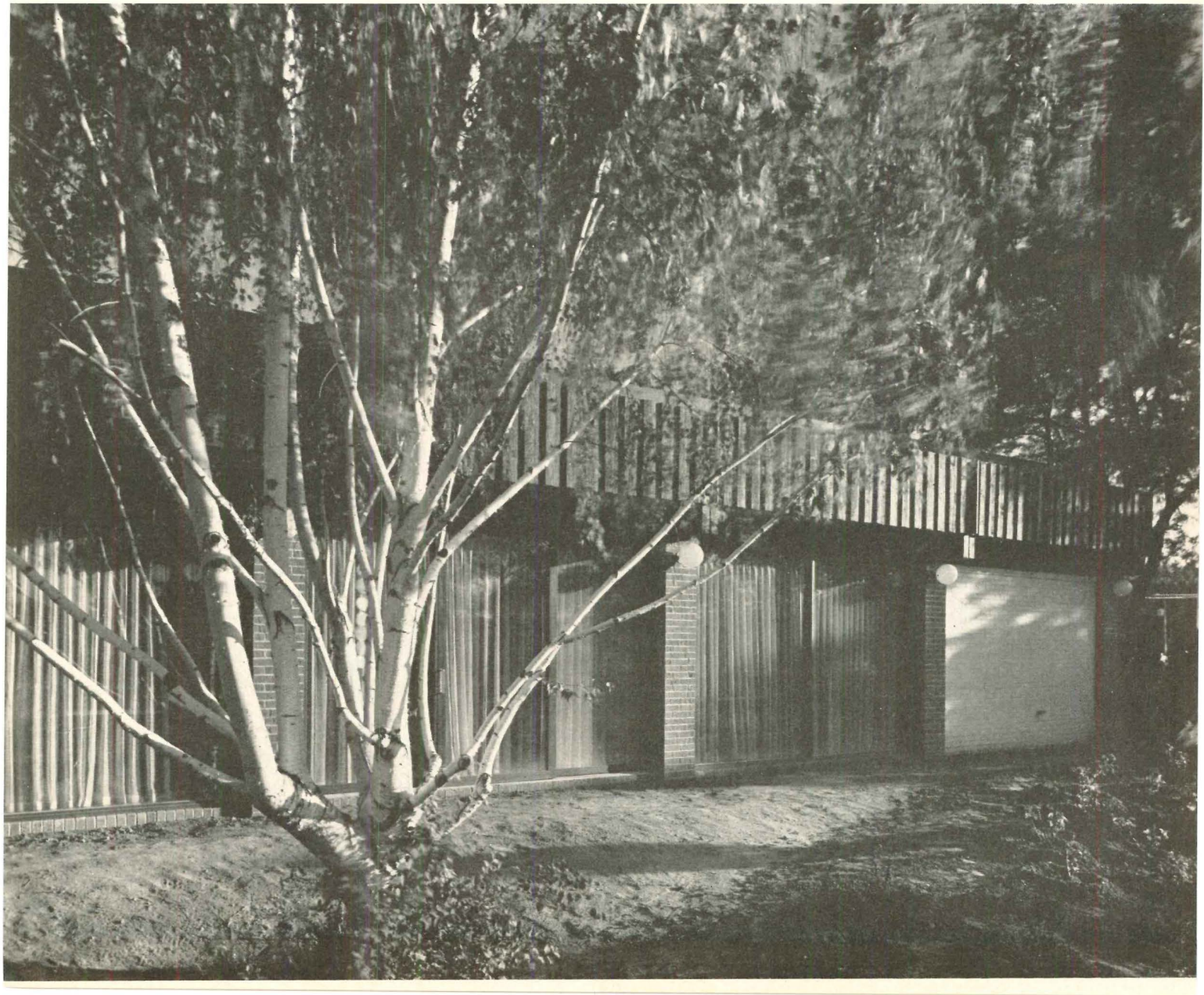
Winter Prather

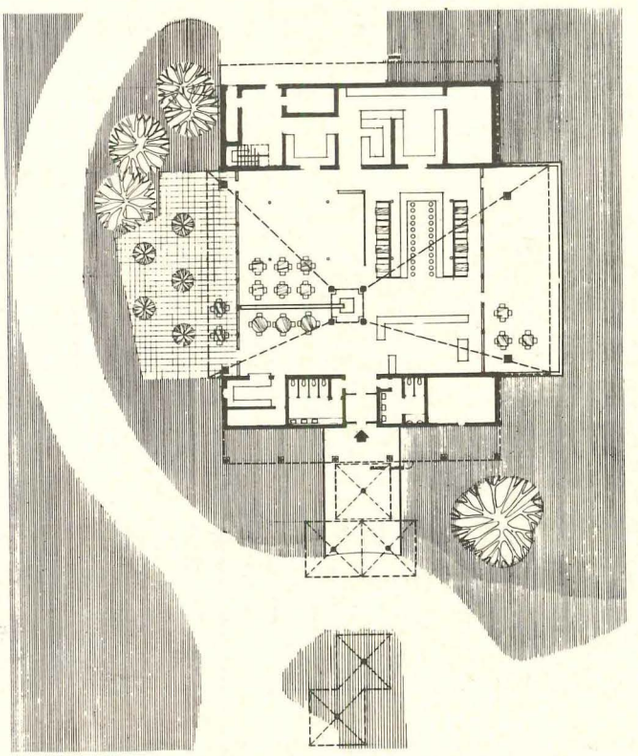
CASUAL ELEGANCE IN A SHOPPING CENTER

The Garden Kitchen Restaurant
Greeley, Colorado
ARCHITECT: *Donald R. Roark*

Additions to an existing restaurant in a shopping center in Greeley tripled the dining space to provide what is virtually a new building. The original restaurant (shown in shaded portion of plan) is now the kitchen; the new dining area seats 122, the coffee shop, 52. The location in a shopping center adjacent to a nursery was fortunate for both owner and architect: it assured a steady clientele for the owner, and it provided ready-grown landscaping of a high order for the architect. In integrating the new construction with the old, and in using the natural setting to its best advantage the architect achieved the mood of casual elegance which was a requirement. This he did with simple materials and a straightforward structure: independent brick piers, left their natural color, support rough sawn wood beams; walls are cavity brick painted white, or glass. The wide fascia which runs along the exposed side of the building is of resawn board and battens, painted. Inside, colors are olive, black and burnt orange. Floors are brick in the entrance lobby and carpeted in the dining areas.

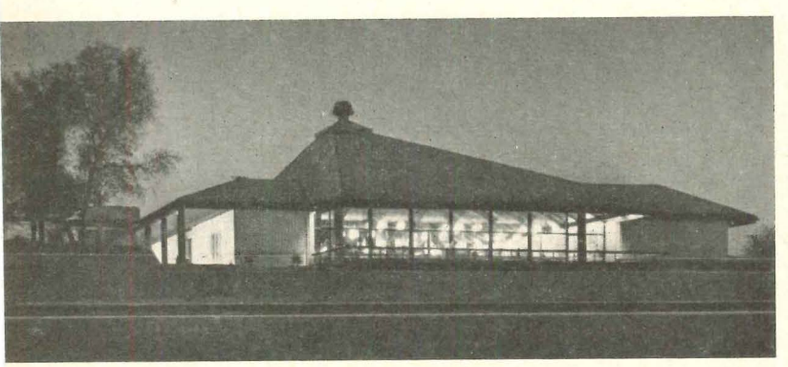

KITCHEN

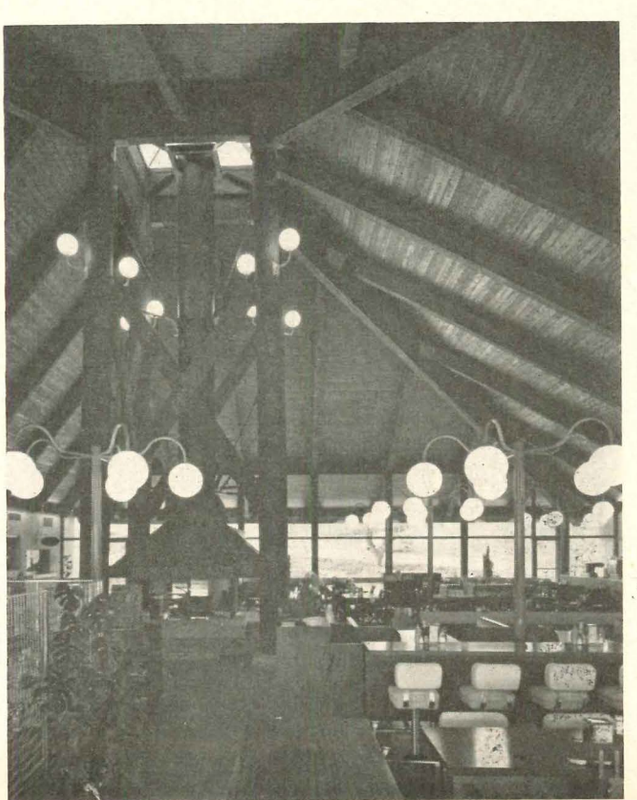




RESTAURANT ON A BUSY HIGHWAY

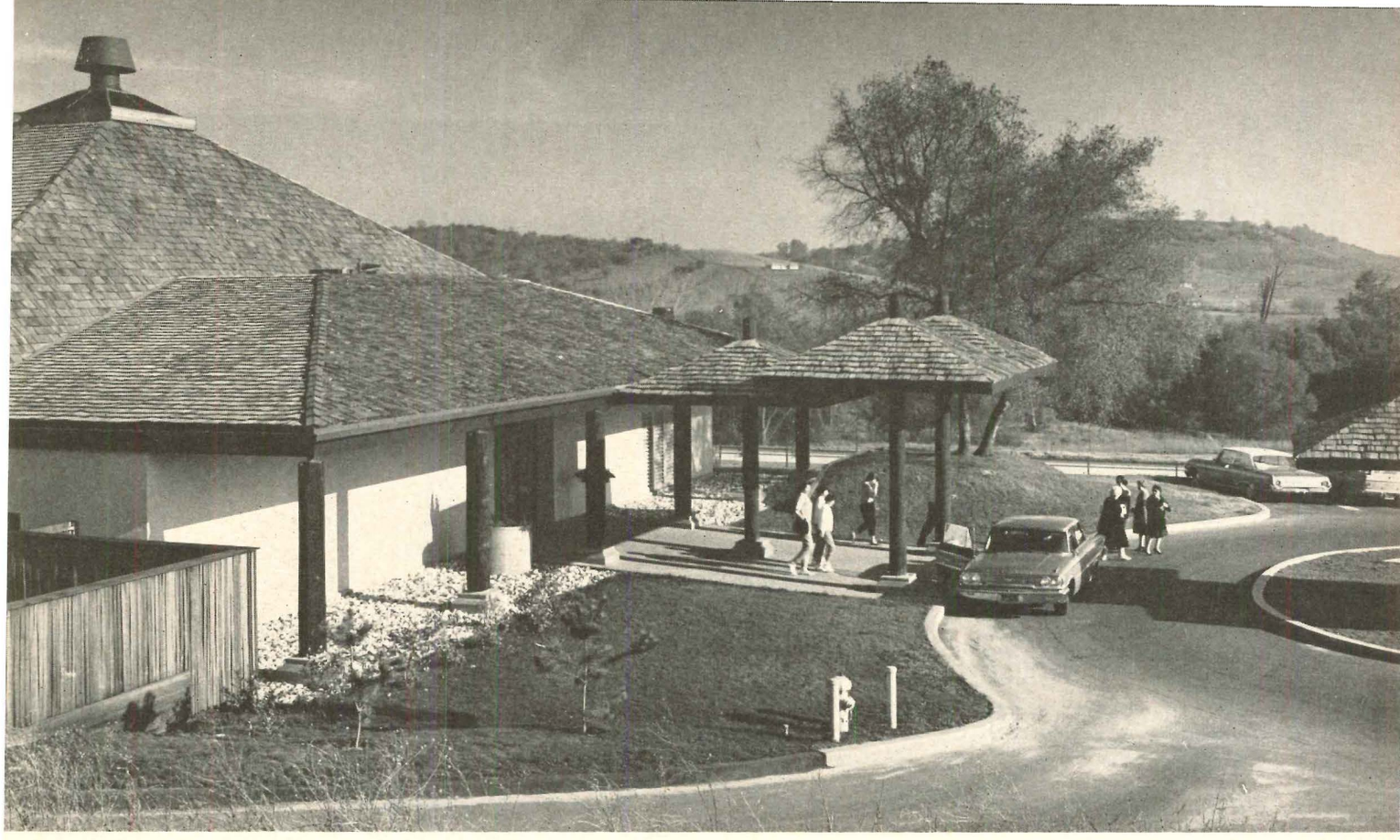
The Ground Cow
Highway 40, Penryn, California
ARCHITECTS: *Gerald M. McCue & Associates, Inc.*
E. Paul Kelly, job captain

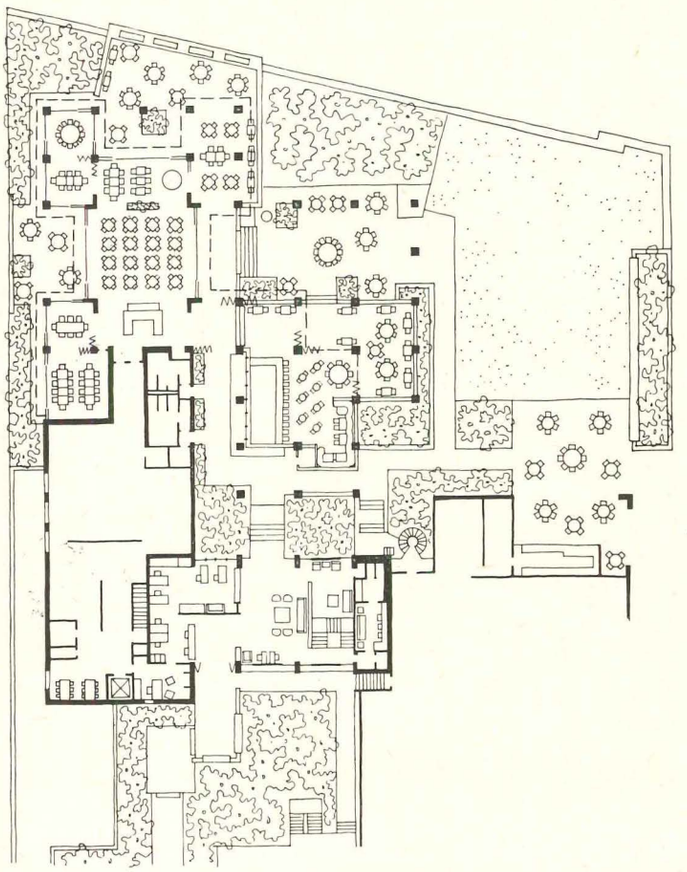


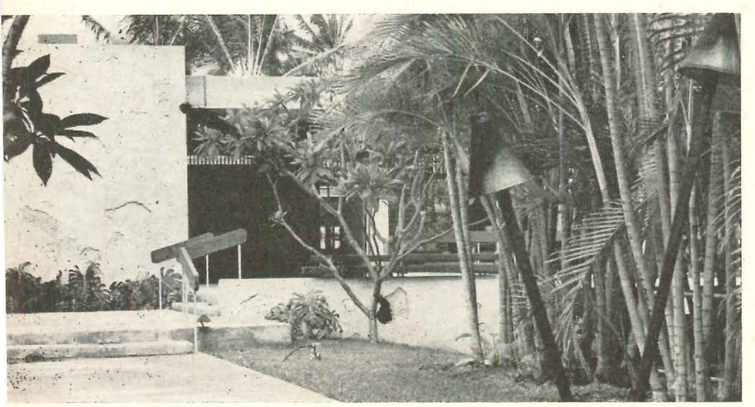


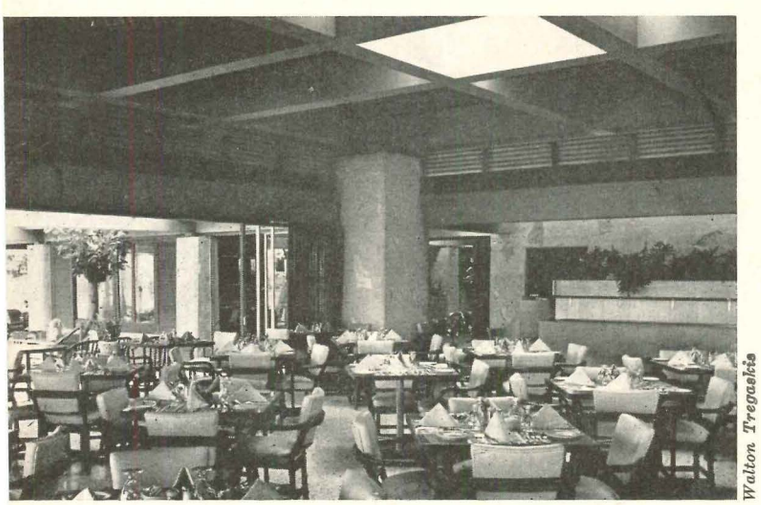
Karl Riek

Visible from busy highway 40 but removed from its bustling traffic, the Ground Cow is a quick-service restaurant which caters especially to families traveling to and from mountain and lake resort areas east of Penryn. Its location midway between the San Francisco Bay area and the Sierra Nevada makes it a natural stopping point on the 200-mile journey. The building's dominant roof form suggests shelter—from the dry heat of summer and the snow and cold of winter—and its woody character, reminiscent of mountain structures, invites a brief rest stop. The off-center peak of the roof is no gimmick: this solution divides the interior spaces in an uneven way, giving each its own character which contributes to the varied uses within the building. Within the almost square floor area four different ways of eating are provided: counter, booths, fountain (for self-service, using tables on the terrace) and dining room, plus a small gift shop. All spaces focus on the fireplace which vents through the roof peak. A skylight daylights the shaft, silhouetting the four posts which define the fireplace area. The covered porch overlooking the highway is also used by self-service diners, the movement below a dramatic sight from the restaurant's somewhat distant position. From the highway the building with its distinctive "umbrellas" leading from the parking area to the restaurant entrance is, in turn, an attractive landmark. The materials which make it so are simple and appropriate to its location: the frame is wood poles and laminated beams, the roof is covered with red cedar shakes, ceilings are exposed redwood sheathing. Exterior walls are concrete block, painted. Floors are tile.









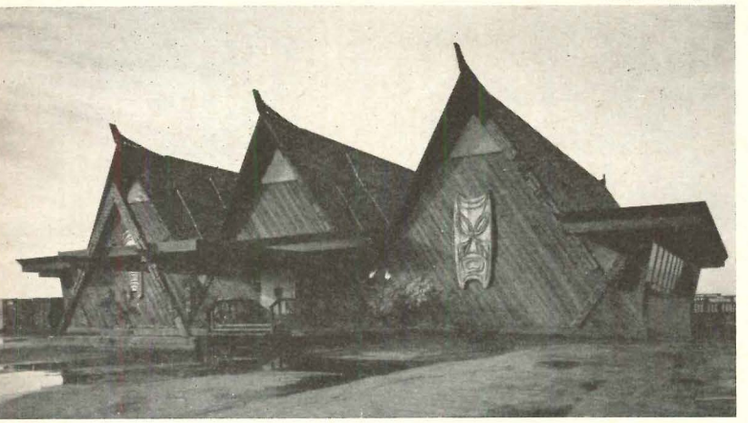
Walton Tregaskis

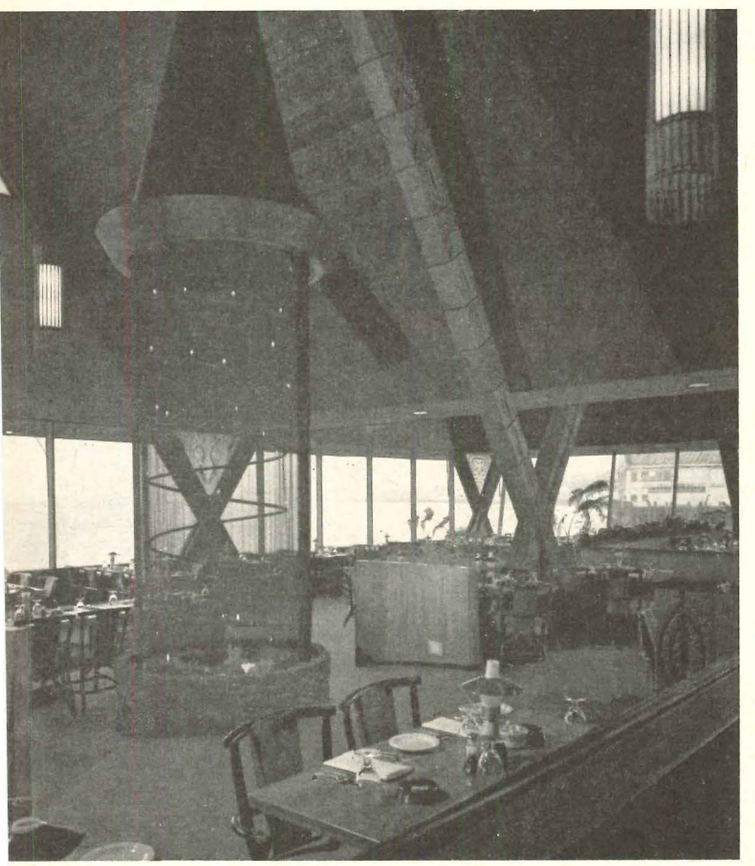
RESTAURANT ON THE BEACH AT WAIKIKI

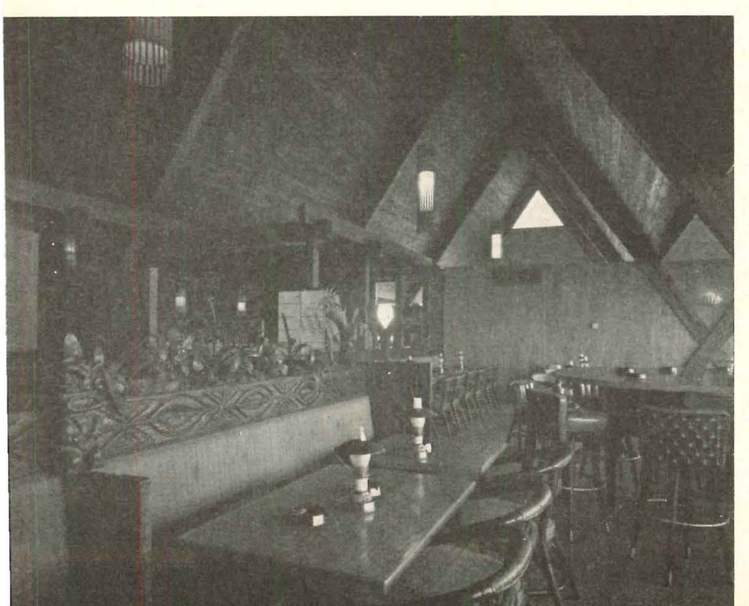
Outrigger Canoe Club
Waikiki, Honolulu, Hawaii
ASSOCIATED ARCHITECTS: *Vladimir Ossipoff & Associates*
Wimberly, Whisenand, Allison & Tong

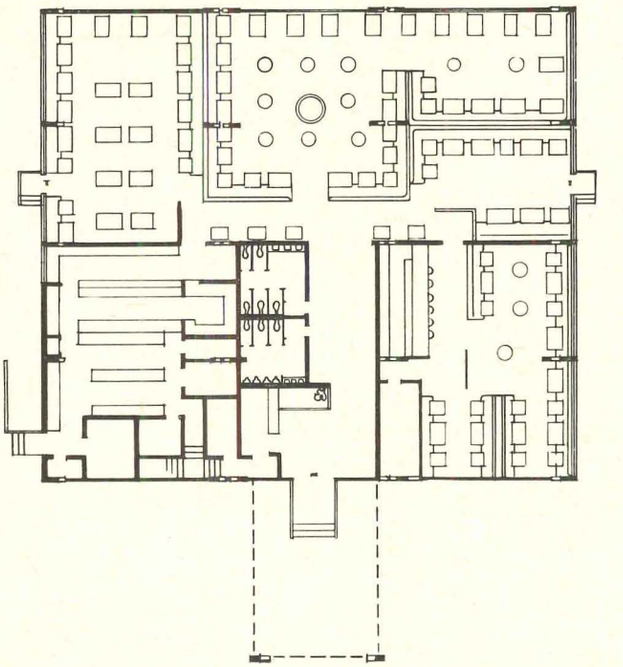
The new building for the Outrigger Canoe Club is located, as was the earlier one, directly on the beach at Waikiki, with its entrance from Kalakaua Avenue. (The old club building next to the Royal Hawaiian Hotel was sold last year and will become the site of a new hotel.) The main floor of the club building provides a variety of bar and dining facilities. The dining room, approached from the lobby or directly from the bar and the Hau Terrace, opens onto a dining terrace which juts out onto the beach, with a clear view out to the ocean and up and down the beach. The Hau Terrace, just off the centrally located bar, and the Snack Terrace which adjoins the volley ball courts, overlook a small private beach, a rarity in Hawaii where beaches are all public property. This one is possible because it is on club property. Open dining areas are for the most part shaded by pergolas formed by concrete columns and heavy wood beams. Wherever concrete is used in the building, large pieces of limestone are exposed and the surface is sandblasted. The lower floor of the building contains locker and shower rooms and other club facilities. A six-level garage has stalls for 200 cars. The site slopes down from the street to the beach with the lobby approximately at street level.

Hugh Stratford





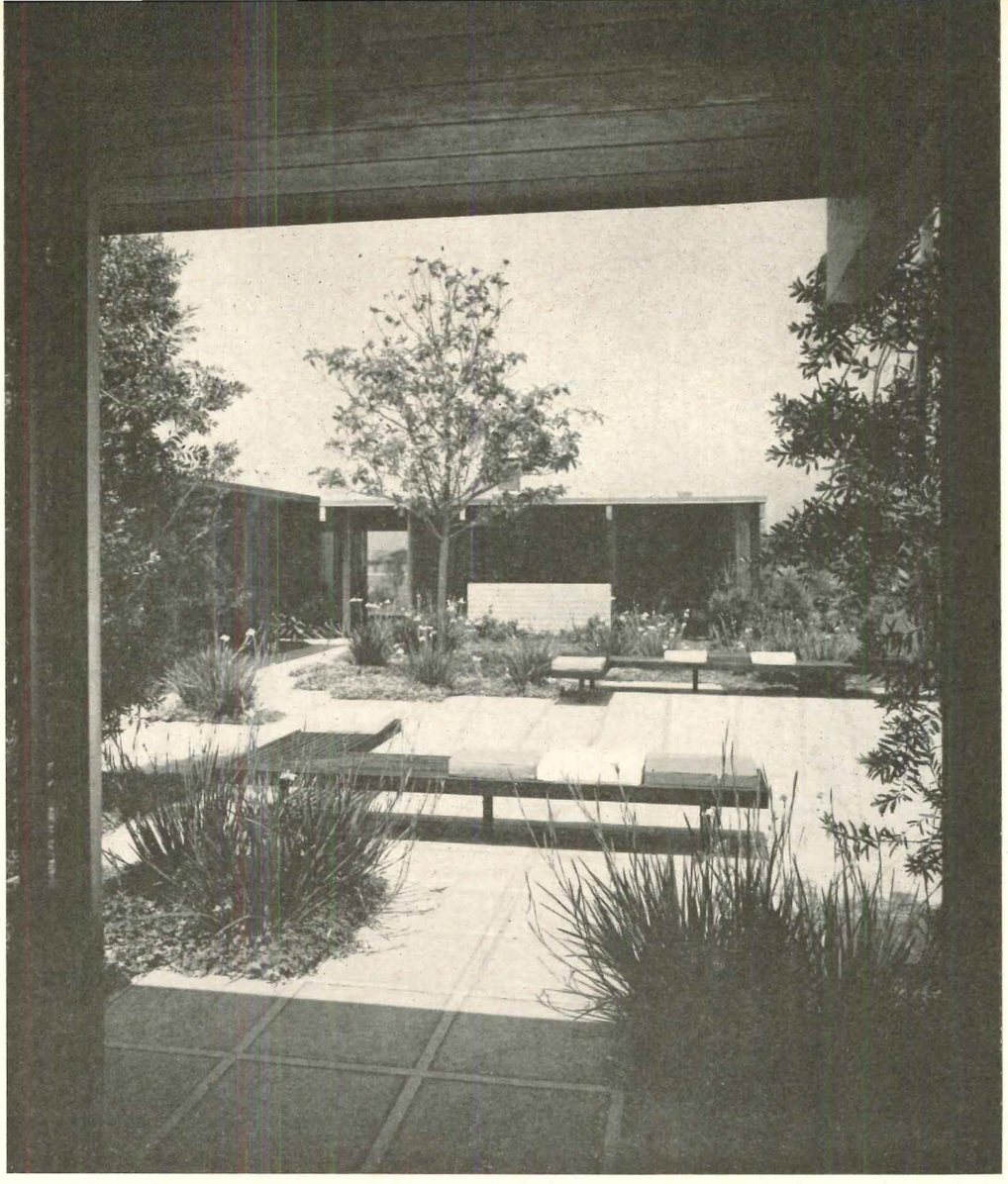




SOUTH PACIFIC LONG HOUSE ON WATERFRONT

Polynesia Restaurant
Pier 51, Seattle, Washington
ARCHITECT: *Raymond H. Peck*

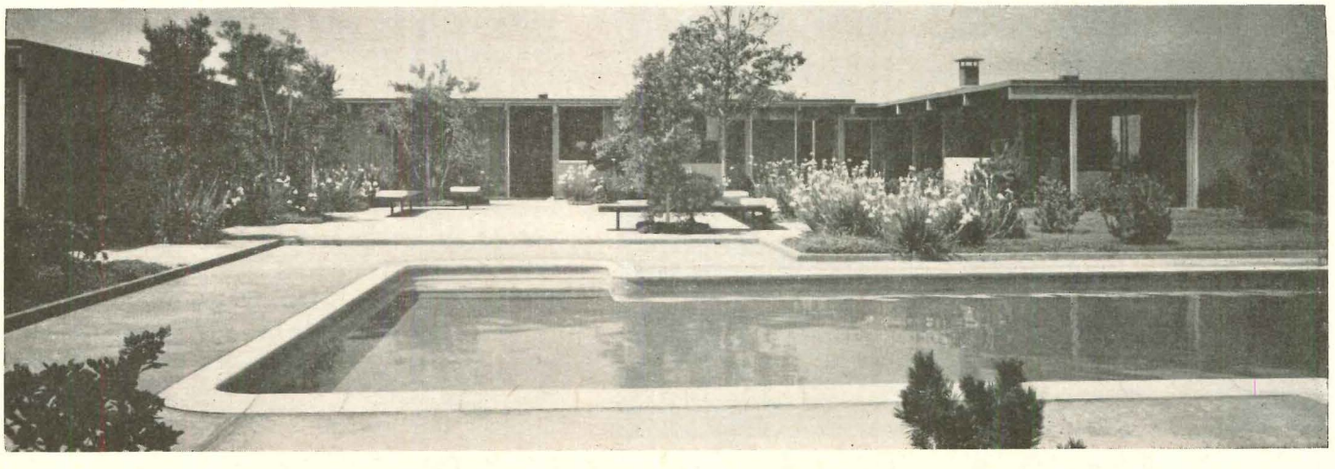
The Polynesia restaurant has a dramatic setting at the end of a 125-foot-wide pier which extends 800 feet from the Seattle waterfront into Puget Sound, and its unusual triple A-frame form—inspired by the Northwest Indians' "halau" or long house—accentuates the dramatic location. The structure is of heavy timber, with special precautions due to the building's location. The necessary sprinkler system is installed, however, so that only the sprinkler heads penetrate to the interior; supply lines are mounted on the outside and run 2 inches off the roof. Charcoal-colored asbestos shingles provide fire-resistant roofing. The red cedar siding, set on a slant to parallel one line of the A-frames, is stained dark brown. The two-level dining area looks out over the sound to a panoramic view of the Olympic Mountains. Most of the seating is built-in to resemble carved Polynesian benches. The cylindrical "fireplace" consists of a 1-inch copper tube, bent into a spiral and drilled for gas jets, surrounded by a mesh screen. The architect not only designed the building but the menus as well, and selected the costumes for waiters and waitresses, using tangerine, gold, black and seal brown—the same basic colors used elsewhere in the building.

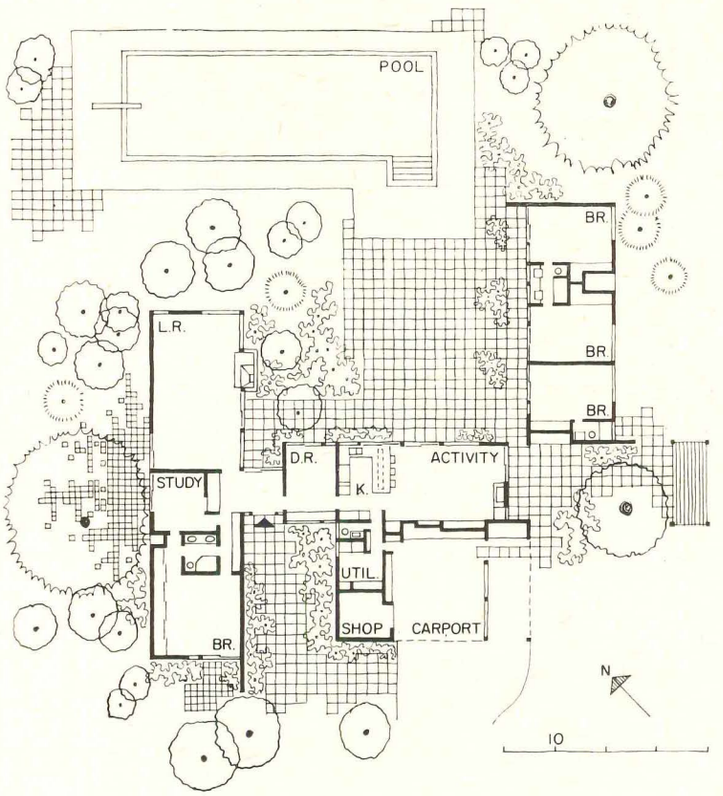


Douglas M. Simmonds photos

FAMILY HOME PLANNED IN THREE DISTINCT UNITS

Homer Delawie provides separated zones
for adults, children and family activities



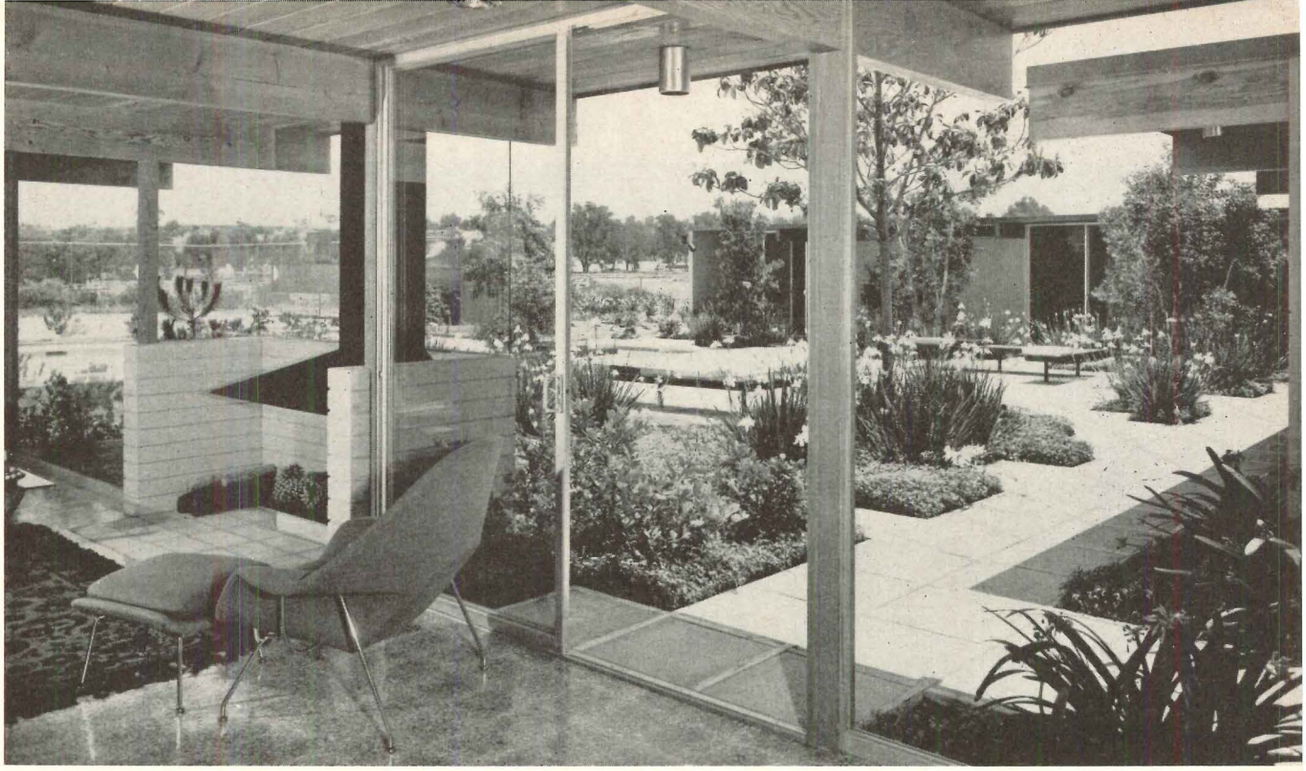


Residence for Dr. and Mrs. Myron H. Nichols
La Jolla, California
ARCHITECT: *Homer Delawie*
LANDSCAPE ARCHITECTS: *Wimmer & Yamada*

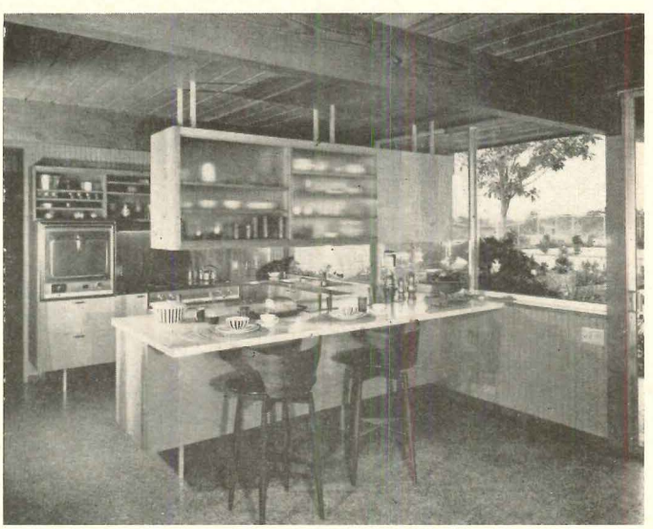
A level, two-acre site about half a mile from the ocean, was selected for this attractive family residence in La Jolla, California. The clients, an athletically active family consisting of a physicist, his wife and three children, ages 8, 12 and 16, wanted a house which would give scope for outdoor activities and for entertaining different age groups, while at the same time providing privacy and freedom for individual members of the family.

The solution divides the plan into three separate units around a large open patio adjoining a tennis court and swimming pool, which are directly accessible through sliding glass walls in many areas of the house. The children's wing, which is connected to the central family area only by a covered way, is designed to be used as a guest house when the children no longer need it. A glassed-in entrance area joins the family unit to the adult wing and also serves as a patio entrance for entertaining.

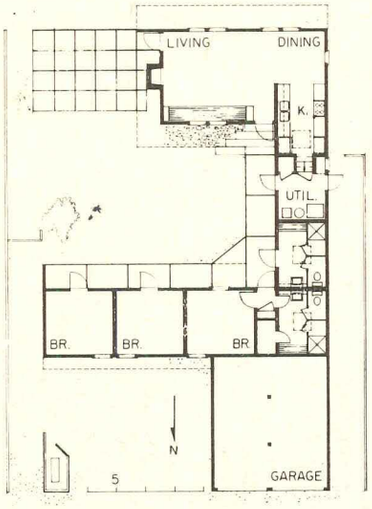
The house is of wood frame, post and beam construction on concrete slab which incorporates a hot water radiant heating system. Exterior and interior walls are textured Douglas fir plywood with some integral stucco walls to give variation. Floors are surfaced with vinyl cork and vinyl asbestos tile. The total floor area is 3,200 square feet, excluding the outdoor terrace and pool areas.



Douglas fir ceilings and beams are a dominant feature of the interior of the Nichols house as can be seen in the photos. The family room *(above)* has the minimum of furniture to keep open floor space for the children's activities. Such items as record players and television are housed in the decorative storage wall, which runs the whole length of the room. The kitchen *(below right)* which adjoins the formal dining room, has large windows overlooking the patio and the swimming pool to give easy supervision of children's play. All the rooms in the house are planned in relation to their own patio or garden area. The master bedroom *(below left)* opens on to a patio paved with redwood squares and protected by the overhang and an extension wall fin which helps define the terrace



THREE VACATION HOUSES BY WURSTER



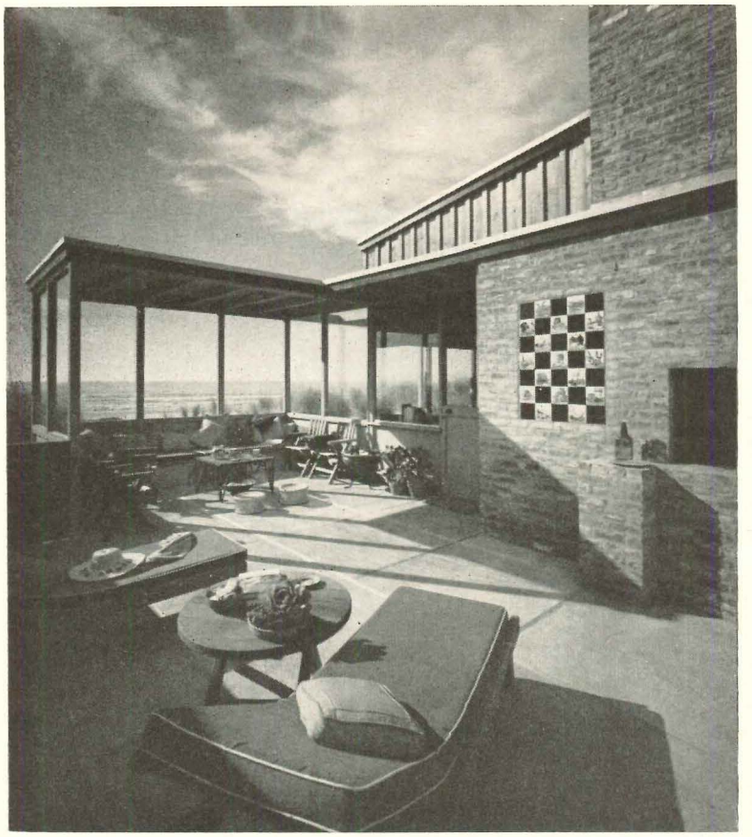
Beach House for Mr. and Mrs. William W. Wurster

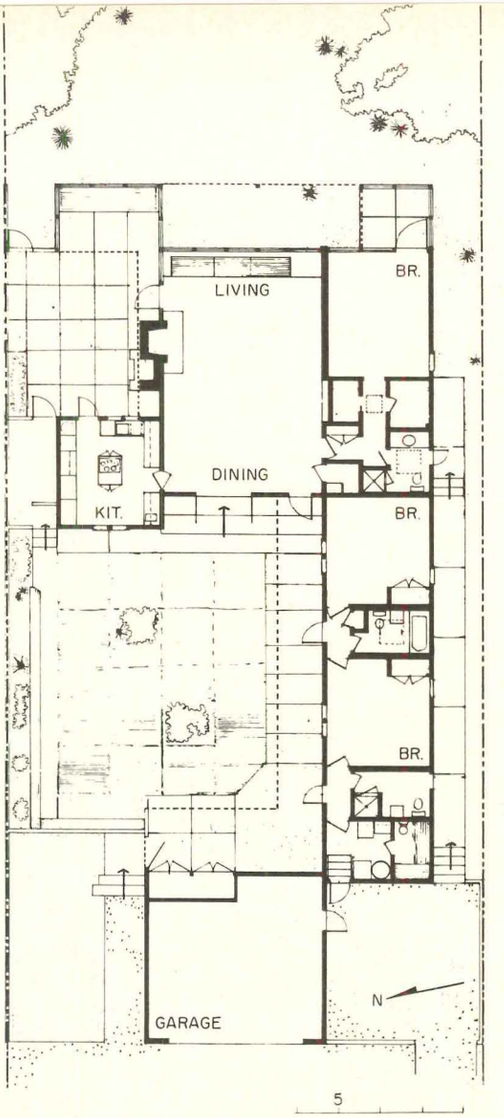
Morley Baer photos

Within the last five years, Wurster, Bernardi and Emmons have designed these three and five other vacation houses on a spit of land extending out from the main shore of Stinson Beach, Marin County, California. Because the exposure is the same for them all, the houses have in common the location of the courts, which are protected from the prevailing southwest wind so that outdoor living is comfortable.

The Wurster's own house was designed to give "a complete change of pace" for a very busy professional couple. The lounge and dining area overlooks the sea and opens on to a partly paved courtyard. A covered concrete walkway leading through a larger sanded court, past the utility room and two bathrooms gives access to the three bedrooms, which can accommodate eight people. The house has a Douglas fir frame and exterior walls of cedar shingles. The white painted gypsum board interior walls, bright blue furnishings and warm red concrete floors combine to give a light and cheerful effect inside the house. The approximate cost was $15,420.

Beach House for Mr. and Mrs. Stephen Chase





Credits for all three houses

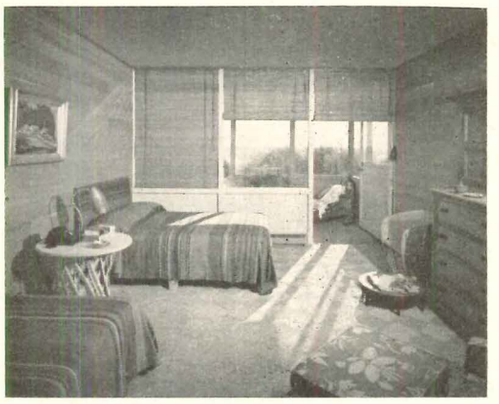
ARCHITECTS:
Wurster, Bernardi and Emmons

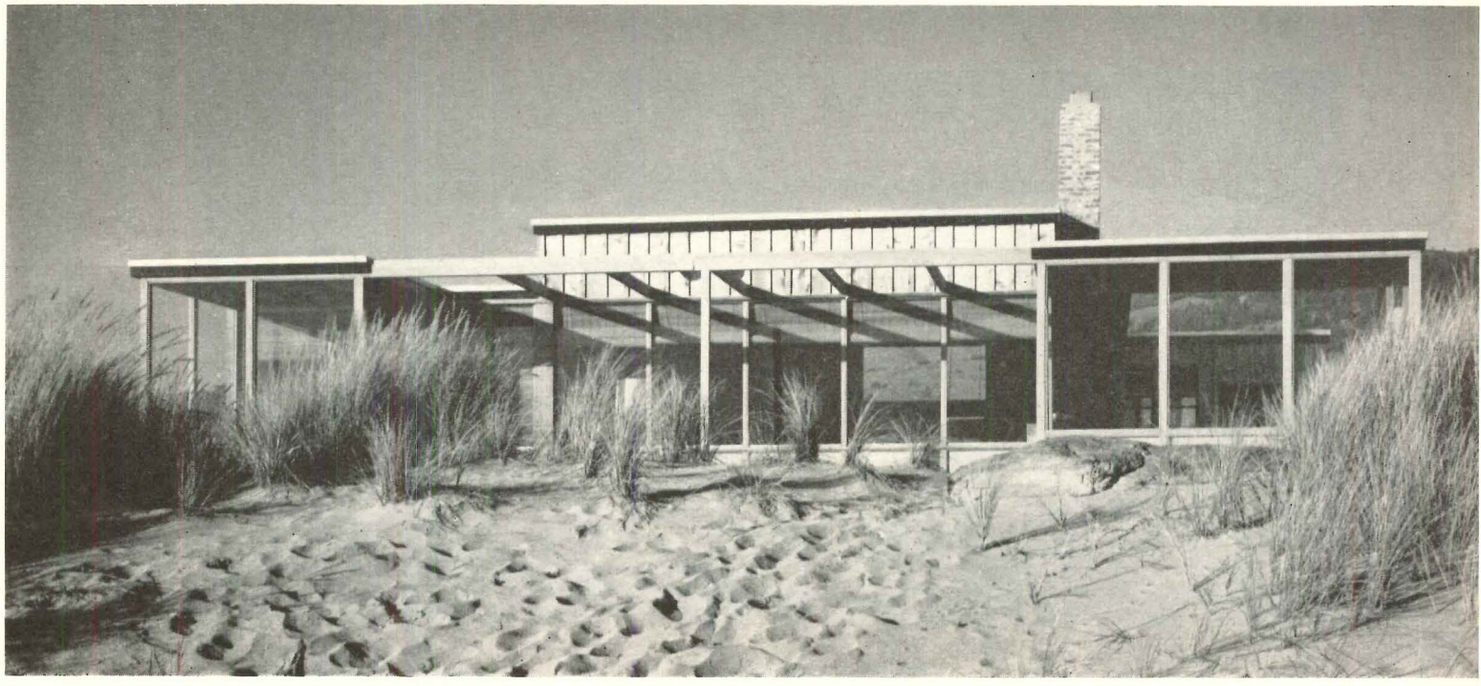
ENGINEERS:
Gilbert, Forsberg, Diekmann and Schmidt

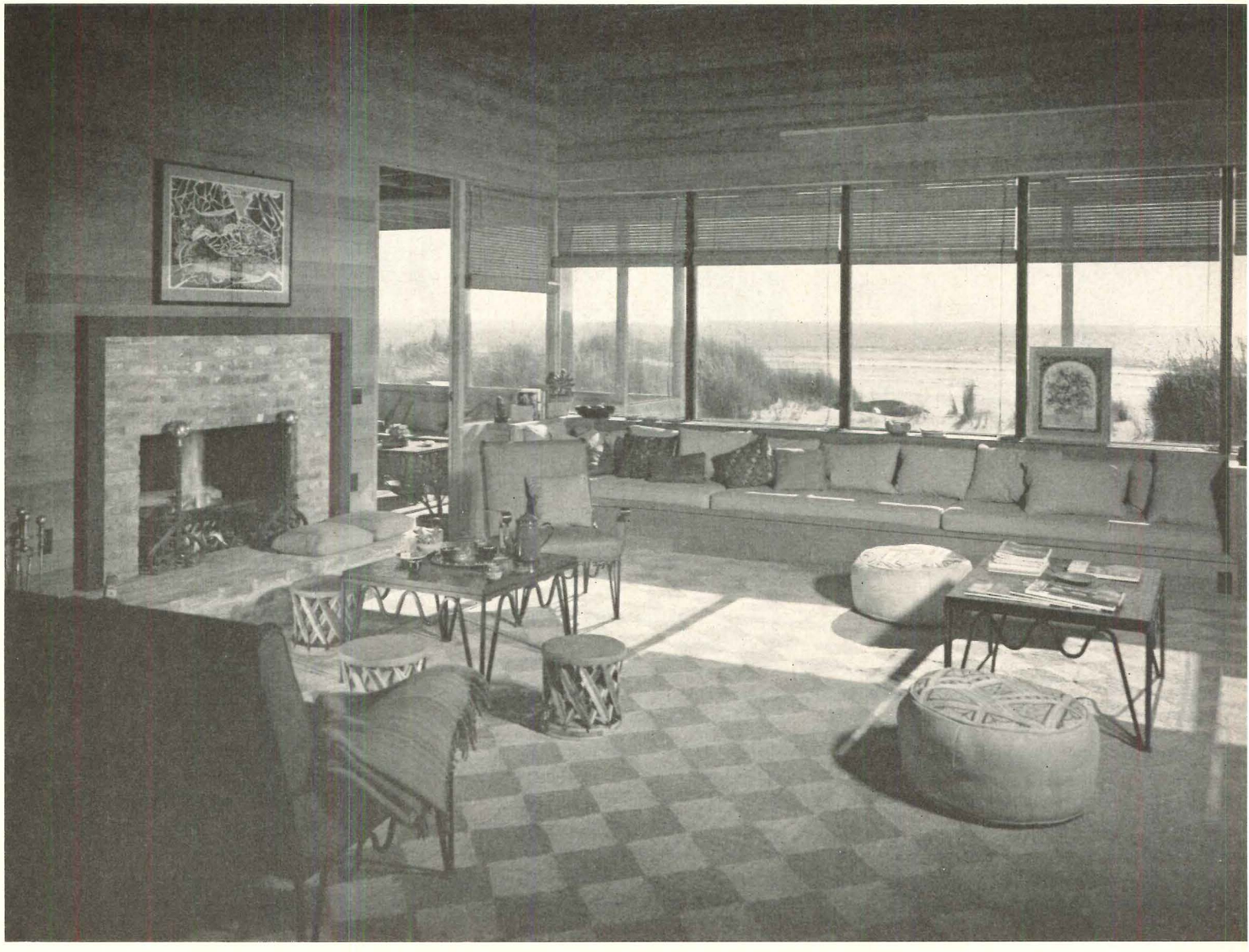
CONTRACTOR:
Thomas R. Tawns

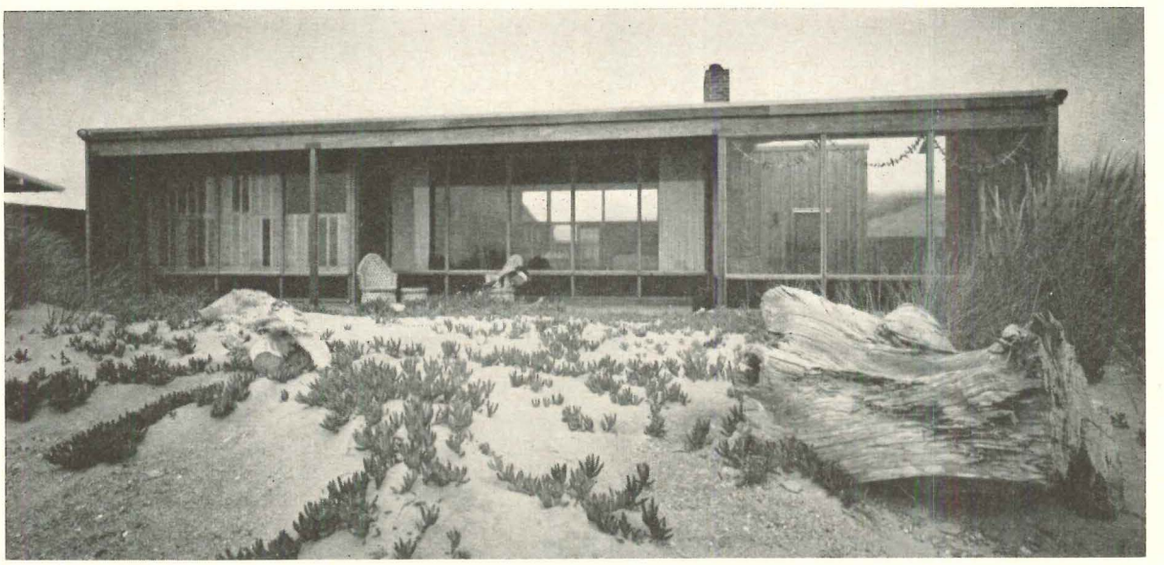
The clients, their two married daughters and their families required a comfortable and relatively spacious weekend house where housekeeping could be kept to a minimum. The solution is a well-ordered plan in which large outdoor living spaces and a covered outdoor passage between living and sleeping areas reduce the traffic inside the house and lessen the need for frequent cleaning. The construction is Douglas fir frame with cedar board-and-batten exterior walls and a tar and gravel built-up roof. The concrete slab floors are covered with rush matting for hard wear and easy cleaning. Horizontal redwood boards cover the interior walls of the living room and master bedroom. Other interior walls are painted gypsum board. The open fire is supplemented by electric heating units.

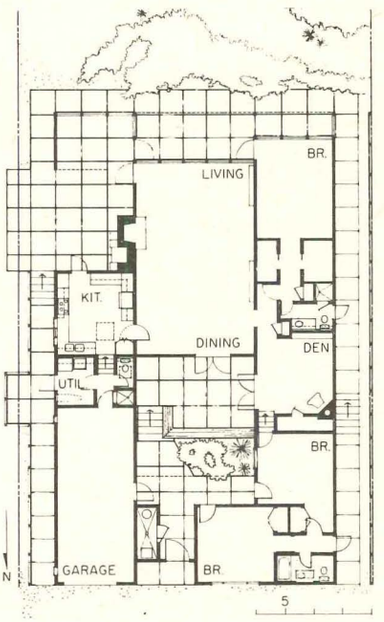
The north entrance court has a dockboard surface laid on the sand. The paved east court, which is accessible from the kitchen and living room is planned as an outdoor eating area with a brick barbecue. An additional bedroom is at present being added in the service yard area. Approximate cost was $43,650, excluding lot and landscaping.

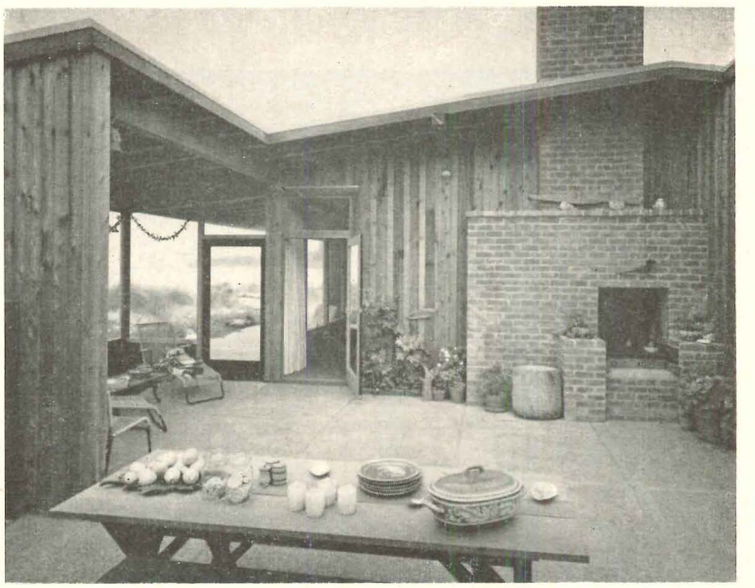












Beach House for Dr. and Mrs. Martin Debenham

The owners are a semi-retired couple who spend about half their time in this house and have furnished it with furniture from their former town house. Because this is more of a permanent residence, and the Debenhams entertain mainly among their own age group, the house is planned more formally than the other two, and has more expensive finishes and details.

The frame is Douglas fir, with cedar board-and-batten exterior walls. Vertical redwood boards are used on most of the interior walls; there is a terrazzo floor in the living room and card room. Both courts are paved, as is the large terrace on the ocean side. A hot water radiant under floor heating system is used.

The north court is comparatively small and is almost completely enclosed on all sides. It is on two levels with planting at the entrance on the lower level, and with a low redwood "sitting wall" provided at the upper level. The approximate cost of the house was $47,527.

WHERE THE SCHOOLHOUSE GOES FROM HERE

By Harold B. Gores, President, Educational Facilities Laboratories, Inc.

At Florida's Melbourne High School ("The Library," boasts the school letterhead, "Is Larger Than the Gymnasium"), nearly every student follows a tailor-made schedule. Instruction is by appointment.

At Cupertino, California's Dilworth Elementary School, 135 third- and fourth-graders are taught by four co-teachers in one "Big Room," a carpeted square which is big enough to hold four conventional classrooms—and would if it had interior walls. But it doesn't. "Walls," Principal Janet Goss told the planners, "are barriers."

These are not typical schools. The typical school is still an ice-cube tray where teachers with standard qualifications dispense standard information to standard numbers of students herded into classrooms of standard dimensions. But they are typical products of the educational upheaval that is turning the typical school upside down and inside out.

Barely a dozen years ago, no one had ever heard of the ungraded school, the teacher team, large-group lectures, small-group seminars, independent study, advanced standing, programed instruction or educational television. Audio-visual aids meant pulling down the blinds, setting up a projector (which the teacher worried about how to run), and rolling off a film (which was often badly made or irrelevant).

And since education is an innately conservative enterprise, it is not surprising that these innovations, which burst on the scene with such dizzying speed, are being absorbed rather more slowly. For every Melbourne or Dilworth, there are hundreds of schools that early adopted a "show me" attitude and don't yet realize they *have* been shown. Hundreds more, having early rallied round the banner of reform, are now pausing to evaluate the results of their drive toward self-betterment, and, where necessary, to regroup their forces.

We can expect, then, a period of consolidation while the advances made by lively school systems here and there spread and evolve. But we cannot expect a moratorium on educational change or its architectural consequences. The long inert body of education has been prodded into motion, and the schoolhouse is being carried along with it.

What will happen to the schoolhouse in the process is fairly evident from what is already happening: mostly, it will get out of the way. For if the educational axiom underlying the new instructional programs is that teaching should not interfere with learning, its architectural corollary is that buildings should not interfere with either.

The buildings that are emerging from the educational ferment of the past dozen years are characterized above all by responsiveness: responsiveness to the change that has become an educational constant, to the day-by-day and hour-by-hour demands of newly fluid teaching processes, and to the needs of the teacher and the child. As educators have moved toward more flexible arrangements of people and time, architects have moved toward more flexible arrangements of space. The "little boxes" school of school design is on the way out.

Wayland High School in Wayland, Massachusetts, one of the first schools to adopt a full-fledged team teaching program, was also among the first to smash the ubiquitous box, replacing it with a variety of spaces specifically designed for specific teaching purposes—large lecture halls, small seminar rooms, and spaces for independent study, as well as conventional classrooms. A less sophisticated version of flexibility through variety, usually found in the elementary schools, is the grouping of classrooms around a central "multi-purpose" space.

Then came the loft plan, the wide open space in which re-usable partitions can be rearranged to create new sub-spaces as the teaching program dictates. (The prototype, John Lyon Reid's Hillsdale High School, has been almost totally revamped in the nine years since it was built.)

This led to the notion that if a movable partition is good, an instantly movable partition is better. So now we have operable walls that multiply and divide space at will and at once, and provide as much acoustical opacity as the client wants and will pay for. At Covina, California, operable walls turn two classrooms into one lecture hall. In Chicago, they divided one classroom into two seminar rooms in the time it takes to change classes. In Boulder City, they convert an auditorium (potential utilization, 10 per cent) to three large-group teaching areas (potential utilization, nearly 100 per cent).

All of these architectural responses (clusters of

varied fixed spaces, the loft plan, the convertible space) are based on the assumption that special functions need special spaces. Changes in functions are accommodated by changing the spaces—over a relatively long period of time as with the loft plan, or quickly as with the spaces multiplied and divided by operable walls.

But another approach is emerging that assumes spaces are defined not by their size or shape but by what goes on in them. So we get generalized spaces made special by the equipment and activities assigned to various portions of them at various times. Depending on the immediate needs of the teaching program, Cupertino's big room can be one lecture hall, four classrooms, or several small-group spaces, plus a few "private" spaces where teachers or students can work on their own. The conversion is accomplished not by moving from room to room, or by moving walls between rooms, but by moving people, furniture and equipment within the same room.

New York City is planning a domed one-room schoolhouse for 200 pupils, with visual and acoustical privacy for various groups provided when and where —and if—the teachers want it. I. M. Pei has on the boards a demonstration school for New York University that provides zones of space out of which subspaces can be "snapped" according to the dictates of the program, hour-by-hour.

The trend away from fixed, specialized space and toward mutable, generalized space has had an impact not only on classrooms, but on auxiliary spaces—the gym, the auditorium, the cafeteria, above all the library.

And for reasons mostly practical—free movement in open spaces demands soft-pedaling for little feet; interior spaces in lofts and clusters, and year-round operation, demand air conditioning—but also related to the school's new discovery that what pleases the child and speeds his learning may be as important as what pleases the janitor and speeds his cleaning, we are beginning to see school architecture that provides not only commodity and firmness, but also delight. Carpet may have to be called acoustic floor covering; but it is there, and can be economically justified. Air conditioning may have to be called climate control; but it too is there. In Houston, the school board has just issued a dictum that all schools will be air conditioned—not just new schools, but *all* schools. And air conditioning is no longer won at the esthetic cost paid by the early compact windowless schools. There are now air-conditioned schools that look like schools instead of mausoleums.

Schoolhouse architecture has followed the school—and sometimes led it—in every battle of the educational revolution. As educational change spreads, so will the architectural innovations it has produced. The biggest job in the years immediately ahead will be extending and refining advances already made.

But this does not mean there are no new fields to conquer. For in many areas of education, and most notably in the city schools, new problems are producing new programs, and new architectural responses are being called for which will demand every bit of imagination and integrative skill (integrative in more senses than one) the architect can master.

In recent years the schools of the suburbs and the small cities have been the liveliest sector of American education, and have therefore required and received a higher level of performance from the architectural profession. In these demanding, yet manageable, communities, creative architects and educators working together have fashioned most of the schools that will key the design of schools to come.

Meanwhile, in the big cities, where school administrators are harried by the widest range of social, economic and urban problems, and where sheer numbers make communication difficult, school design has often been locked into "standards" and specifications so precise as to prevent both educational change and the practice of architecture. With few exceptions (Chicago is one), the rule has been that the larger the school district the less likely it is that invention will take place.

But this is going to change, and change fast. The big city schools will soon offer the greatest architectural challenge of all. Among the several reasons for this, two are immediately apparent:

1. **Integration.** Typical of our big cities, as presently constituted, is ethnic imbalance in housing—and therefore in schooling. Housing, being mostly private, cannot and does not yield quickly to either public desire or rearrangement by law. The schools, being public, can respond more quickly to the public consensus and are therefore the social agency first called upon to respond to the problem. Out of the pressure for integration will come new kinds of schools in our cities.

2. **Automation.** Secretary Wirtz tells us that it takes only 14 machines, tended by 14 men, to make 90 per cent of America's light bulbs. Two workers can assemble a thousand radios in a day—a job requiring 200 employes a few years ago. This year for the first time in all history, more than half of our labor force are employed to use their heads rather than their muscles. Work as we have known it is going out of style.

And in our cities, particularly in the Negro ghettos, are concentrated the people our economy has somehow failed to find a need for. When, for example, half of Harlem's youth, aged 16 to 24, are neither in school nor at work, you can, as someone has said, almost hear the ticking.

The cumbersome processes of government cannot respond as quickly as can the schools to situations as inflamed and complex as this. Schools can't do it alone, but they can be the leading edge. Therefore, when architects are henceforth commissioned to do a city school they should prepare themselves to design around a new set of specifications—specifications like the following:

1. We want a school for children ages 4 to 8. It will be called a primary school and it will be located near where the children live and will possibly be the last socially acceptable vestige of the neighborhood school. It should not look like a city school—a huge, masonry, maximum-security fortress afloat on a sea of blacktop. Instead it will be small-child scaled—more like New York City's new one-room schoolhouse than like any of the other city elementary schools we have known. This place of in-gathering of the tots where they live, and while they live there, may not be a product of the scorched-earth approach of bulldozing a site, but an indigenous school adapted with economy and function and child delight from an existing neighborhood. It may not even be a new building, but a converted store made bright and human by deft remodeling. The city-school architect who takes on such a commission, bottom-drawer blueprints in hand, is due for what the psychologists call reorientation.

2. We want a school for children ages 9 to 13. It's called a middle school because it's in the middle between the primary school and the high school. Encouraged by New Haven, Connecticut, which has reorganized its schools on a 4-4-4 basis, and the recommendations of the Allen report in a similar vein for New York City, we shall move to the next logical arrangement of schools—5-5-4-2: five years in the neighborhood primary unit, five years of the middle school, four years of high school and two years of community college, the latter leading to the acquisition of saleable skills and employment, or to transfer to a four-year college or university.

This will be a large school at every level above the primary unit, large enough to average out the pockets of ethnic imbalance that existing residential patterns may have imposed on smaller schools. The children of the middle school will already have learned to read, so they are here to read to learn. Great library-type spaces will be required because these children will frequently be pursuing knowledge independent of the pace of the class. The avid and the able will run through the curriculum at their own individual rates because this will be an individual-centered rather than a group-centered school. The library will be replete with all the carriers of information, not books alone. The architect receiving such a commission will find that previous experience in designing city schools will stand him in bad stead.

3. We want a high school. It will schedule children according to their needs, child by child as at Melbourne. Therefore the customary classroom box —32 by 24 by 9 feet, or whatever—will not be the major unit of space. Academic space will be at least 50 per cent library-type space with provision made for expansion of the library by absorbing the surrounding rooms someday. Science laboratories shall resemble those at Southern Illinois University—convertible from biology to chemistry to physics to classroom from semester to semester to match the students shifting patterns of subject elections. Because of the scarcity of land, forget the old formula for size of site like "20 acres plus an acre per 100 children." (We know a district where if this formula, much revered in simpler times, were applied, the student body would be wiped out.)

Give us space for physical education and games without consuming land we can't get, and find a way to park the faculty's cars without our having to acquire land we can't afford. The layering of outdoor space is already within our grasp just as from time immemorial we have storied indoor space. All it takes is a client who demands that it be done.

4. We want a community college. Its duty will be to prepare youth for jobs. Call it academic WPA if you want to but its clear mission is to prepare youth to join the American economy and therefore the American society. It will not be a bell-ringing, king-size high school where groups exchange boxes every hour on the hour. It will deal with jobs and culture—and in that order for, as has been said, man does not live by bread alone but he lives by bread at least. Its image should be of the city, and how one learns to prosper in it and contribute.

And while you are about it, design the college to provide apartments for the neighborhood and the faculty, or provide joint occupancy with some compatible commercial tenant whose rental will ease the cost of education and enhance the opportunity for graduates to get a job. Plan, too, that the community college be the capstone of an education park that will include a middle and high school.

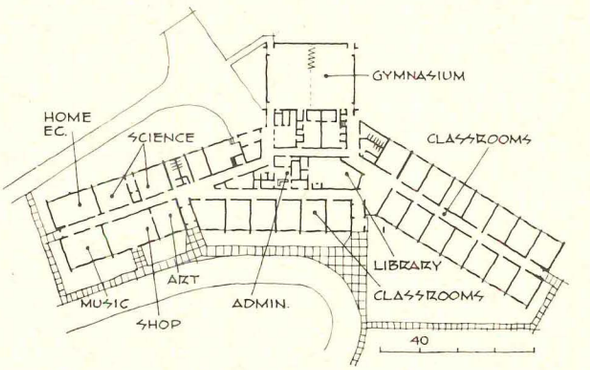
These may be the new prescription for cities. This is where the action is. And architects will soon be called upon to design schools that reshape and revitalize the central city, that make the urban cauldron habitable and humane and economically viable, and therefore tranquil.

In the olden days—say prior to 1954—a T-square and a touch of genius were enough. For the future, the school architect in the agonized cities must know how to melt the resources of city planning, urban renewal, federal anti-poverty programs, and educators' descriptions of what will happen in a school to a child.

I can think of no larger challenge confronting any profession than this—how to save our cities through the schoolhouse, how to restore a sense of belonging for all people, how to raise up the youth to be suitable heirs of a going society.

The suburbs, populated by people who have climbed the slippery slopes of our system, will take care of their schools. The rural schools, back where the creeks fork, are so close to the earth and the people that nothing much can happen to them—or indeed change them. It is to the city school that the best minds in architecture must address themselves if we are to create schools that enable our cities to continue to be good places for good people to live.

Oscoda Area Schools, Oscoda, Michigan
ARCHITECTS AND ENGINEERS: *Eberle M. Smith Associates, Inc.*
C. Wendell Smith, project coordinator
Lyndon Welch, structure
Lloyd Wright, architectural (High School)
Arthur Cook, architectural (Elementary School)
Gordon Lotts, mechanical
Harry Holm, electrical
Edith Pirtle, color and interiors
C. Wendell Smith, landscape
Lyn Eliot Graziani, design
CONTRACTORS: *Davison & Son Builders, Inc.*

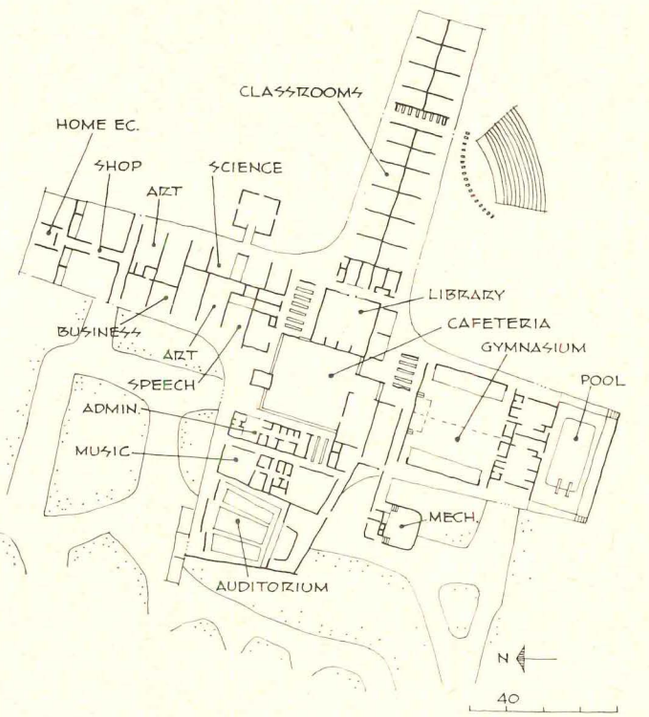


OSCODA MIDDLE SCHOOL

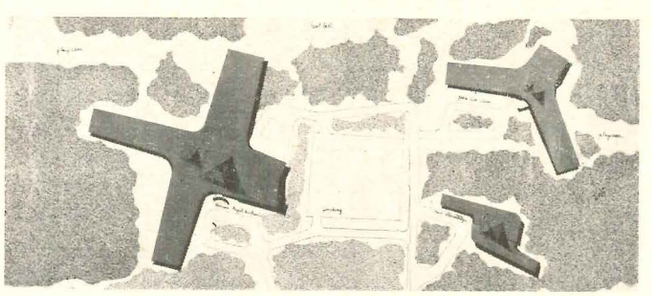
A NEW CAMPUS OF THREE SCHOOLS TO SERVE GRADES K-12

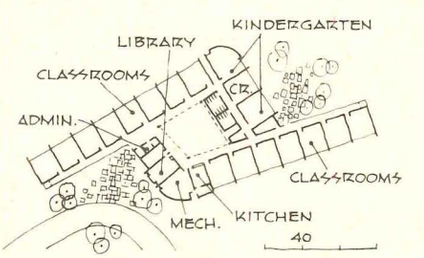
The Oscoda Area School District, facing a large increase in school population because of the development of nearby Wurthsmith Air Force Base, found itself, in effect, in need of a new system of schools for a new community. The site for the schools is an unusually beautiful, heavily wooded, 94-acre one on the AuSable River. Soil conditions precluded the construction of a two-story building; the school board also requested specifically that the schools be compact rather than dispersed, and that the designs be based on comparatively conventional program requirements.

The architects provided a campus arrangement of high school (completed), middle school (in drawing stage), and elementary school (under construction). Although the buildings are served by a single boiler house, they are effectively isolated from each other through orientation and by means of the intervening trees. Materials are similar for all buildings: steel frames; face brick; glass and aluminum sash set in concrete (some smooth, some rough and textured with stone). Because of the extreme climate of the area, the use of glass is much reduced and overhangs are provided for protection. The shapes of the buildings pretty much follow the interior space requirements, with some very effective results.

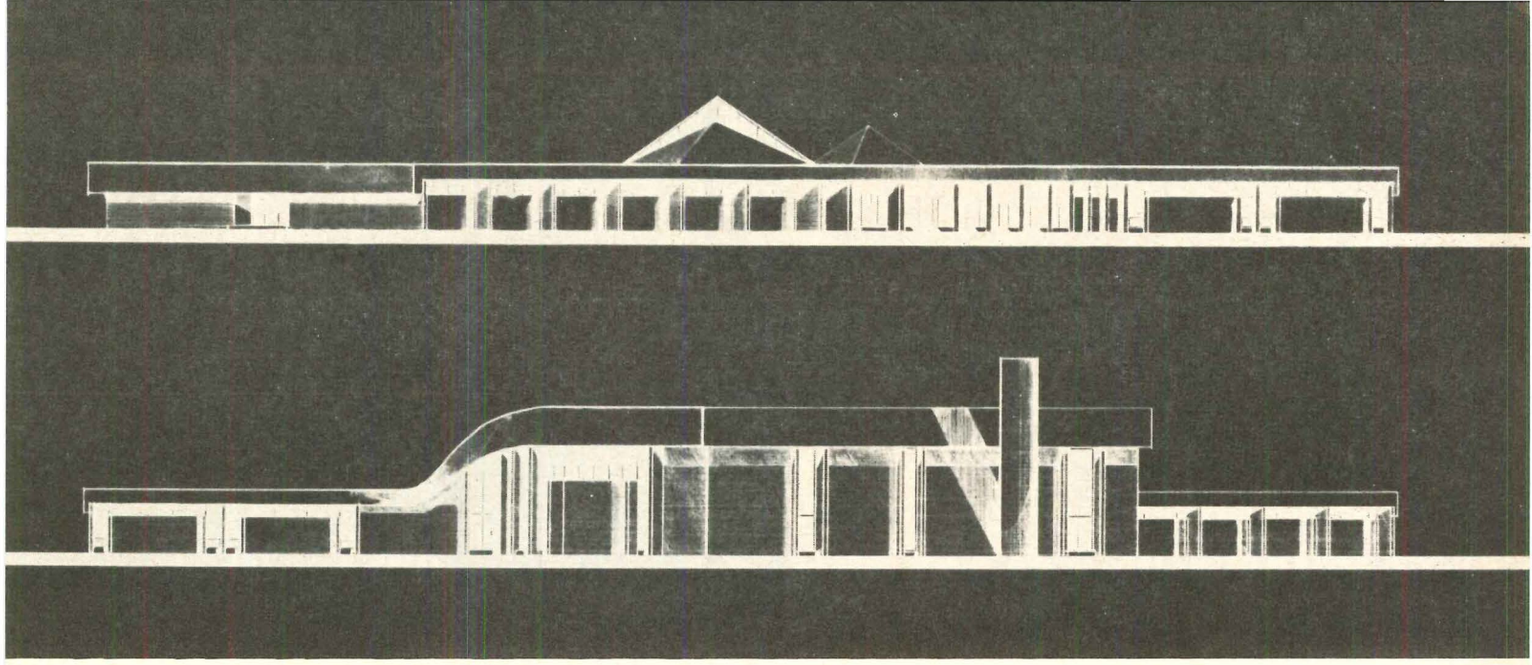


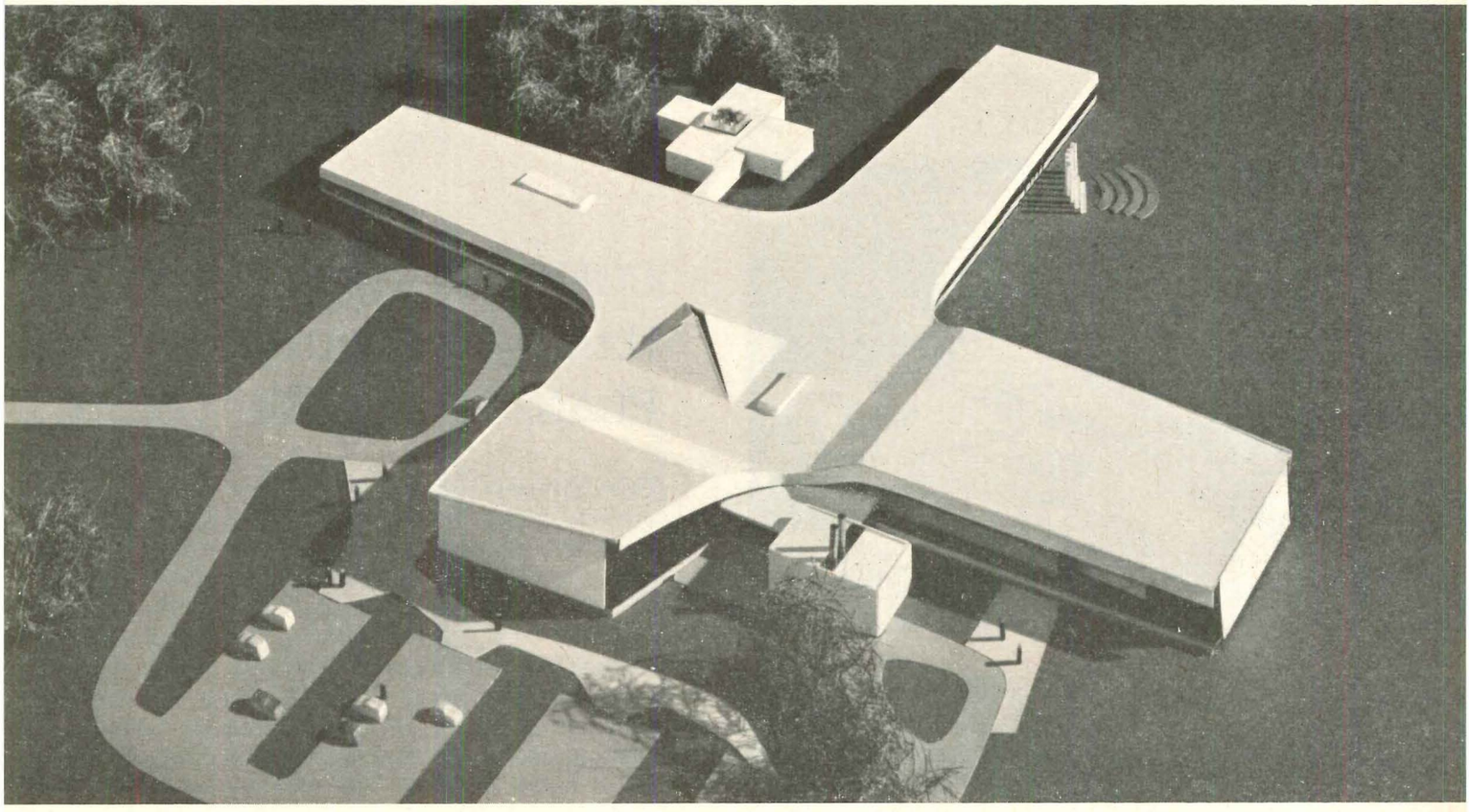
OSCODA HIGH SCHOOL



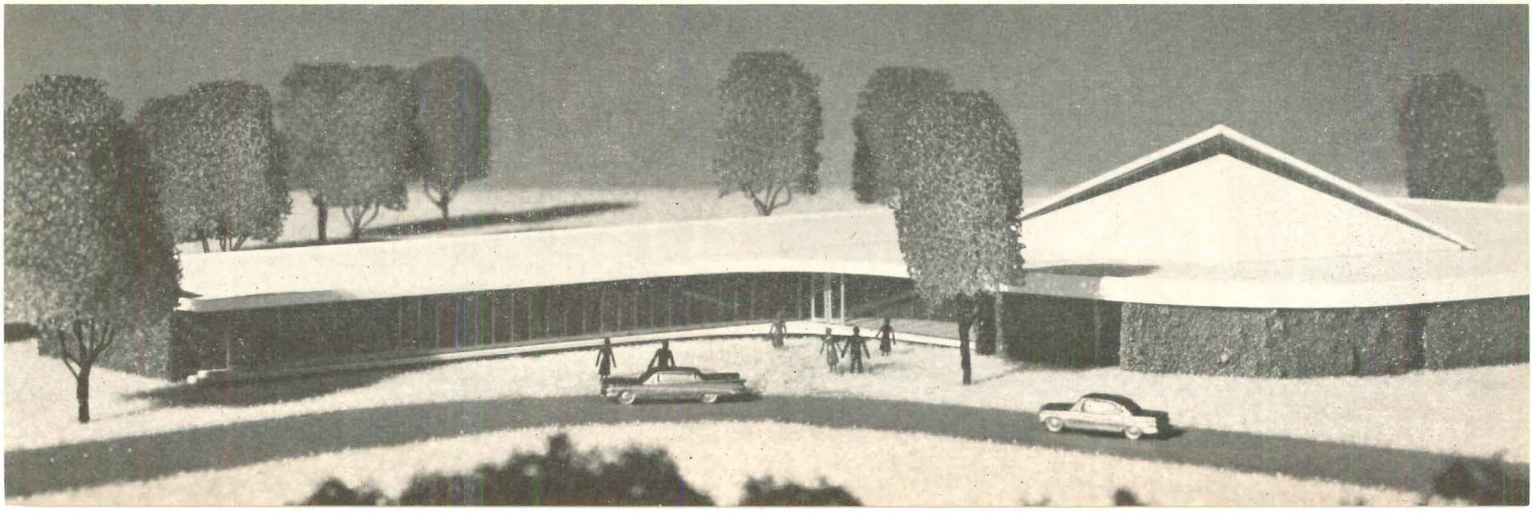


OSCODA ELEMENTARY SCHOOL

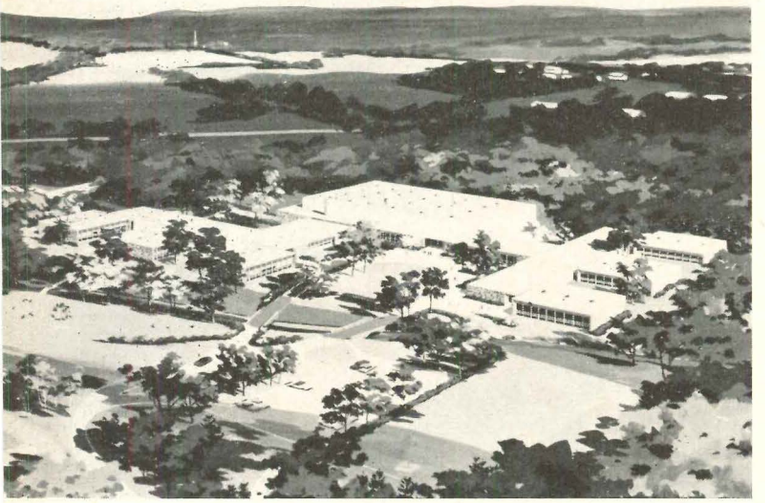


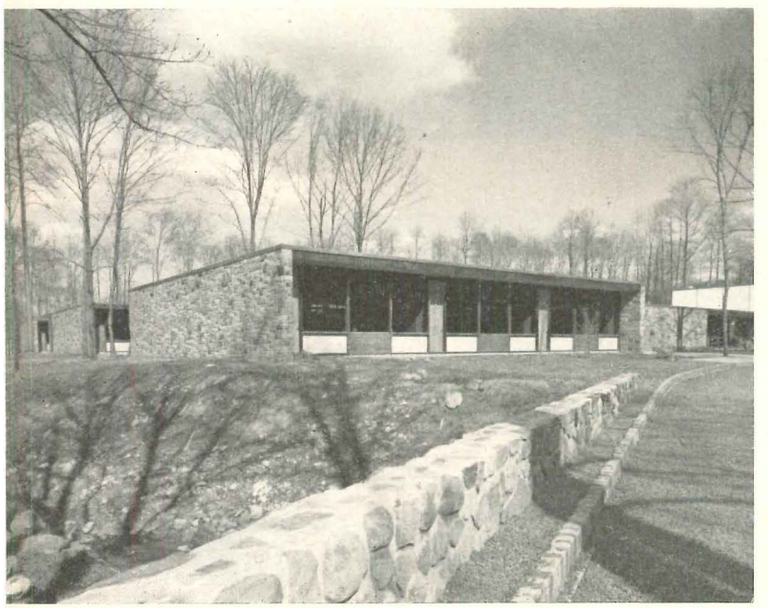


Lens-Art photos©



Short Hills Country Day School
Summit, New Jersey
ARCHITECTS: *Drake, Convery & Cueman*
MECHANICAL & ELECTRICAL CONSULTANT: *Ralph Visco*
STRUCTURAL CONSULTANT: *Gustav Gegauff*
LANDSCAPE ARCHITECT: *Ethelbert Furlong*





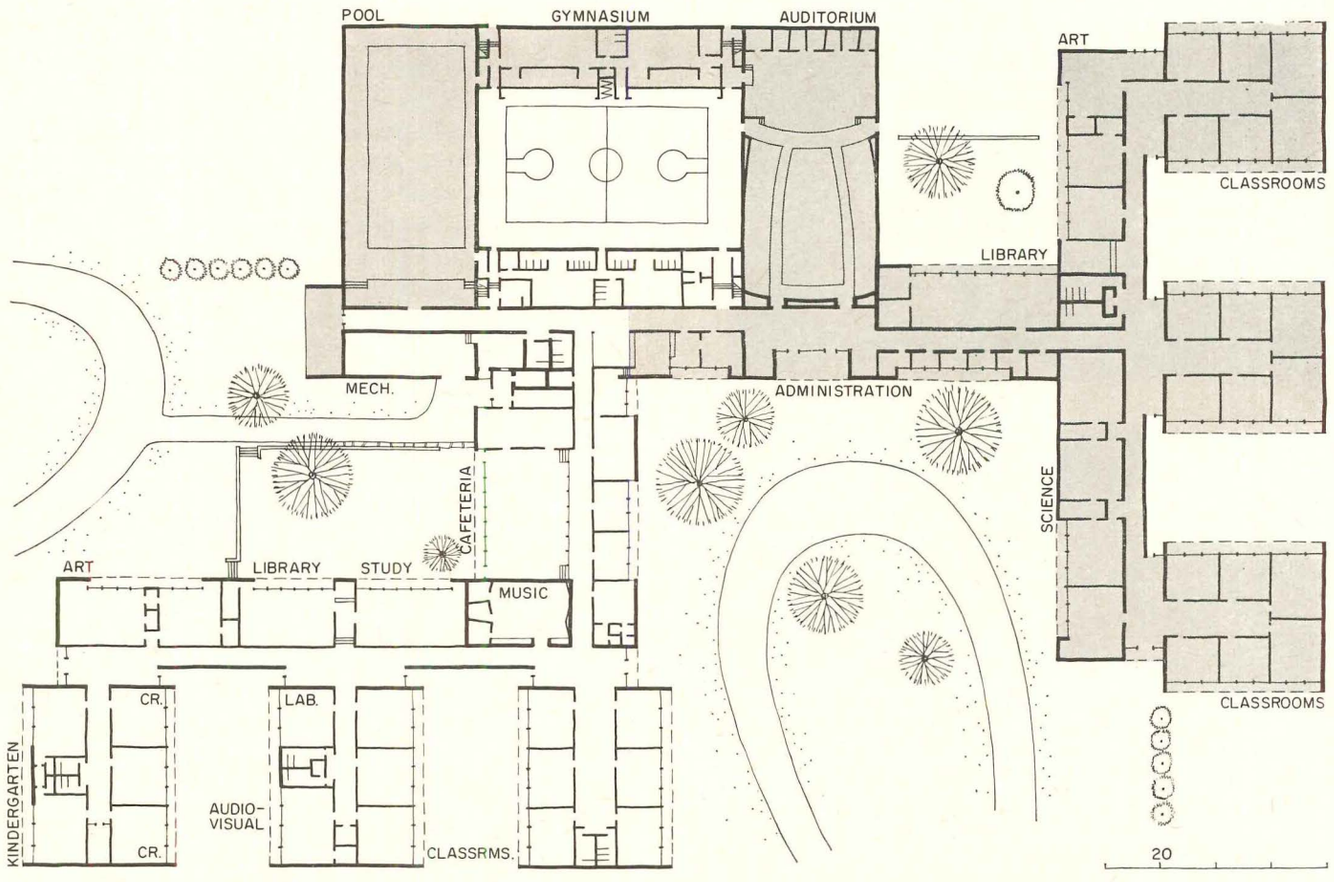
COUNTRY DAY SCHOOL HAS AN EXPANSIBLE PLAN OF LINKED UNITS

This extremely attractive private school is on a 40-acre site, which was once part of an estate with some heavy wooded areas, a stream and several abandoned ponds. In planning the new building, great care was taken to preserve the natural setting, and to achieve a design sympathetic with it. Construction was planned for two stages: a first unit for pre-kindergarten through grade 9; and facilities to be added later for grades 10-12. The first stage (shown in photos) also had to be designed to appear as a completed building during the intervening years. The final scheme is shown in the bird's-eye rendering at left.

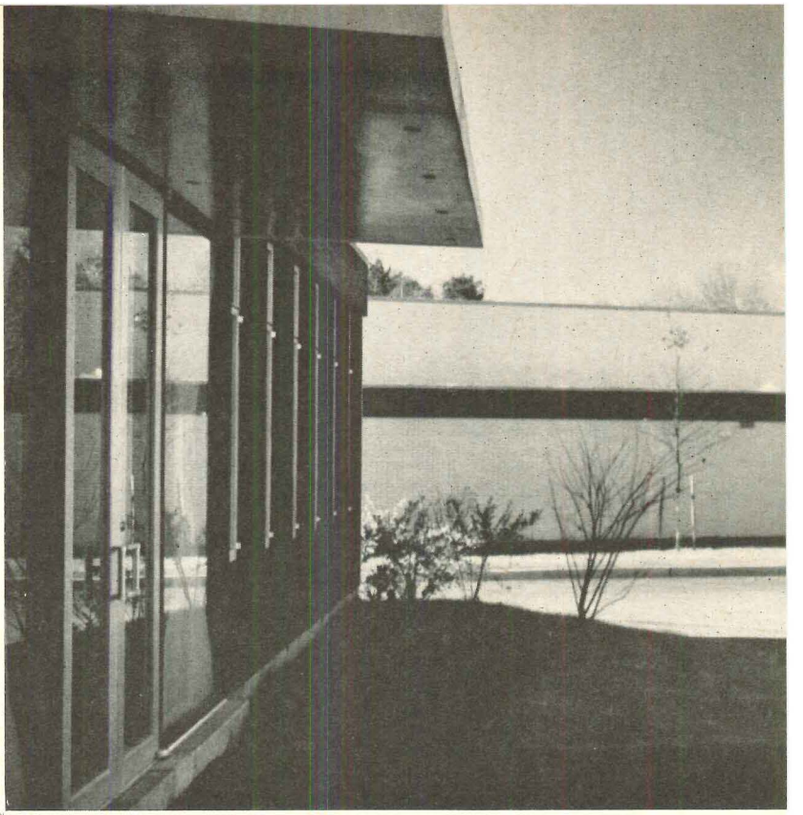
The pre-kindergarten through grade 9 section is divided into three "schools": lower, middle and upper. The plan, essentially, has three "fingers," each housing a school. These fingers have classrooms and toilet facilities only; all other functions such as art, music, shop, study hall, library, etc., are adjacent in the main stem of the building. The wings were developed to give a sense of separation between age groups, yet have all facilities under one roof for protection in inclement weather.

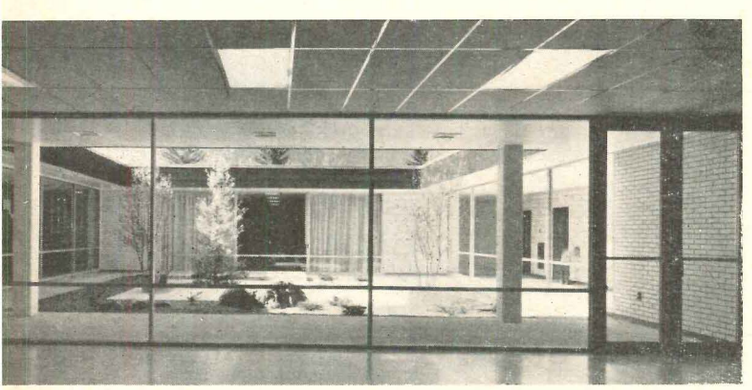
The materials of construction are simple: stucco on large areas, mahogany and glass wall panels, lead-coated copper roof edges and stone.

Frederick Rowe photos



Douglas G. Grafflin Elementary School
Chappaqua, New York
ARCHITECTS: *Sherwood, Mills and Smith*
STRUCTURAL ENGINEERS: *Werner Jensen & Korst*
MECHANICAL ENGINEERS: *Segner and Dalton*



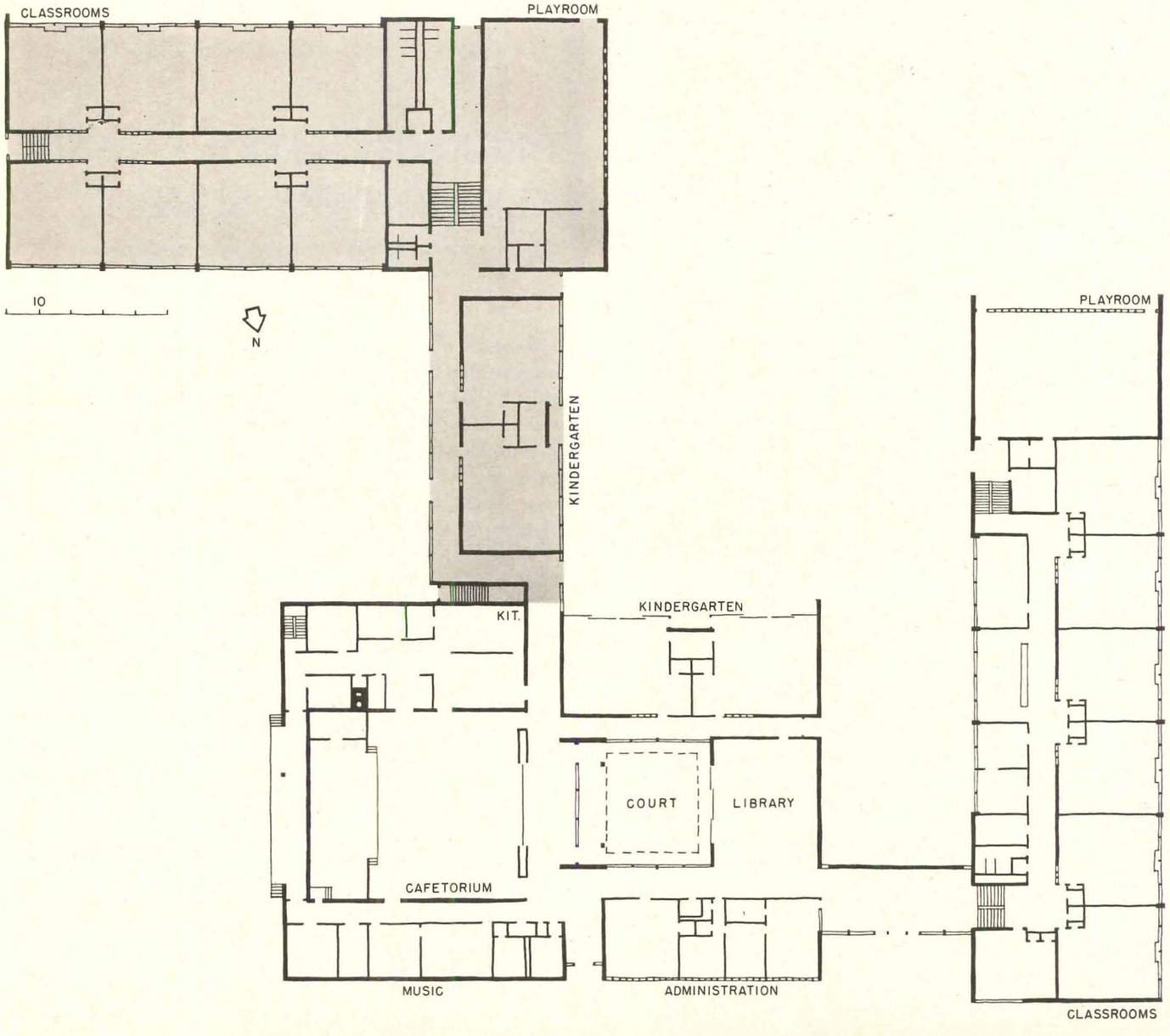


FOUR PAVILIONS PLANNED IN RELATION TO LARGE PLAY AREAS

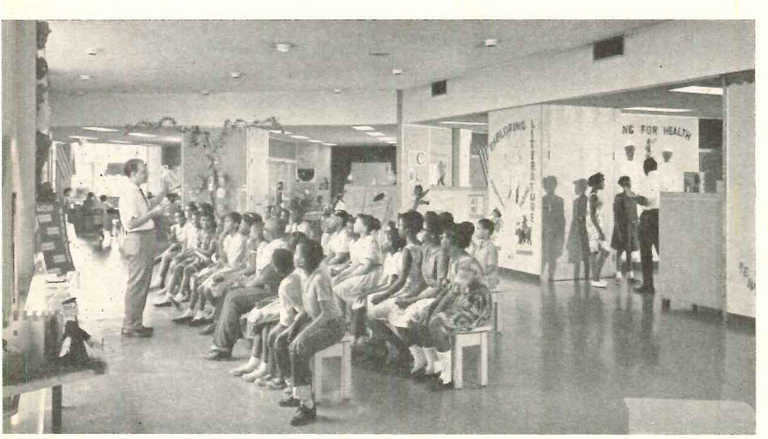
This elementary school was planned and built in two stages; the second stage, shaded on the plan, is now just reaching completion. The accommodation provided in the two stages includes 28 classrooms, library, auditorium-cafeteria combination, administration rooms, kindergarten, gymnasium and additional small spaces which can be adapted for various purposes. A small building to the left of the main entrance provides an air-conditioned executive office for the local Board of Education. The 12.3-acre site has been fully developed for play activities for each age group. Vehicles have been kept away from these areas to protect the children's safety. The program specified flexibility as an essential requirement "to provide for future developments in elementary education." This was achieved by "widening the corridor in the classroom wing to leave room for activities, exhibits, small conference and storage rooms."

Describing the appearance of the building, the architects said, "white glazed brick was selected, not only for its light reflecting qualities for inside use and durability, but also to give relief from the usual red brick, modern school building." To contrast with the white trim, dark stained wood was used for exterior trim and interior woodwork.

Louis Reens photos



James W. Johnson Elementary School
Chicago, Illinois
ASSOCIATED ARCHITECTS: *Caudill, Rowlett & Scott and McPherson-Swing & Associates*
ASSOCIATED ENGINEERS: *Caudill, Rowlett & Scott and E. R. Gritschke & Associates*
CONTRACTOR: *Telander Brothers*

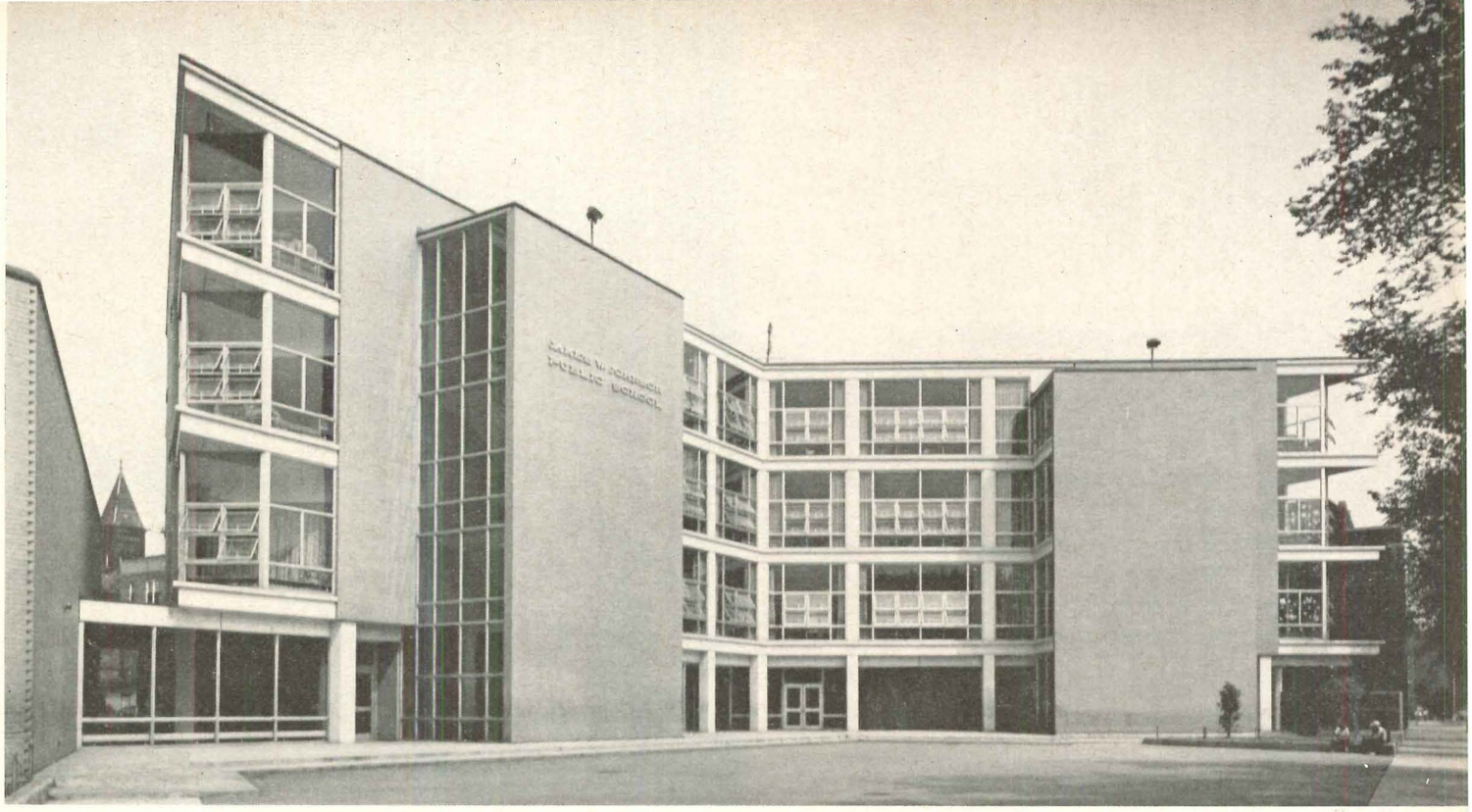


DECENTRALIZED URBAN ELEMENTARY SCHOOL FOR TEAM TEACHING

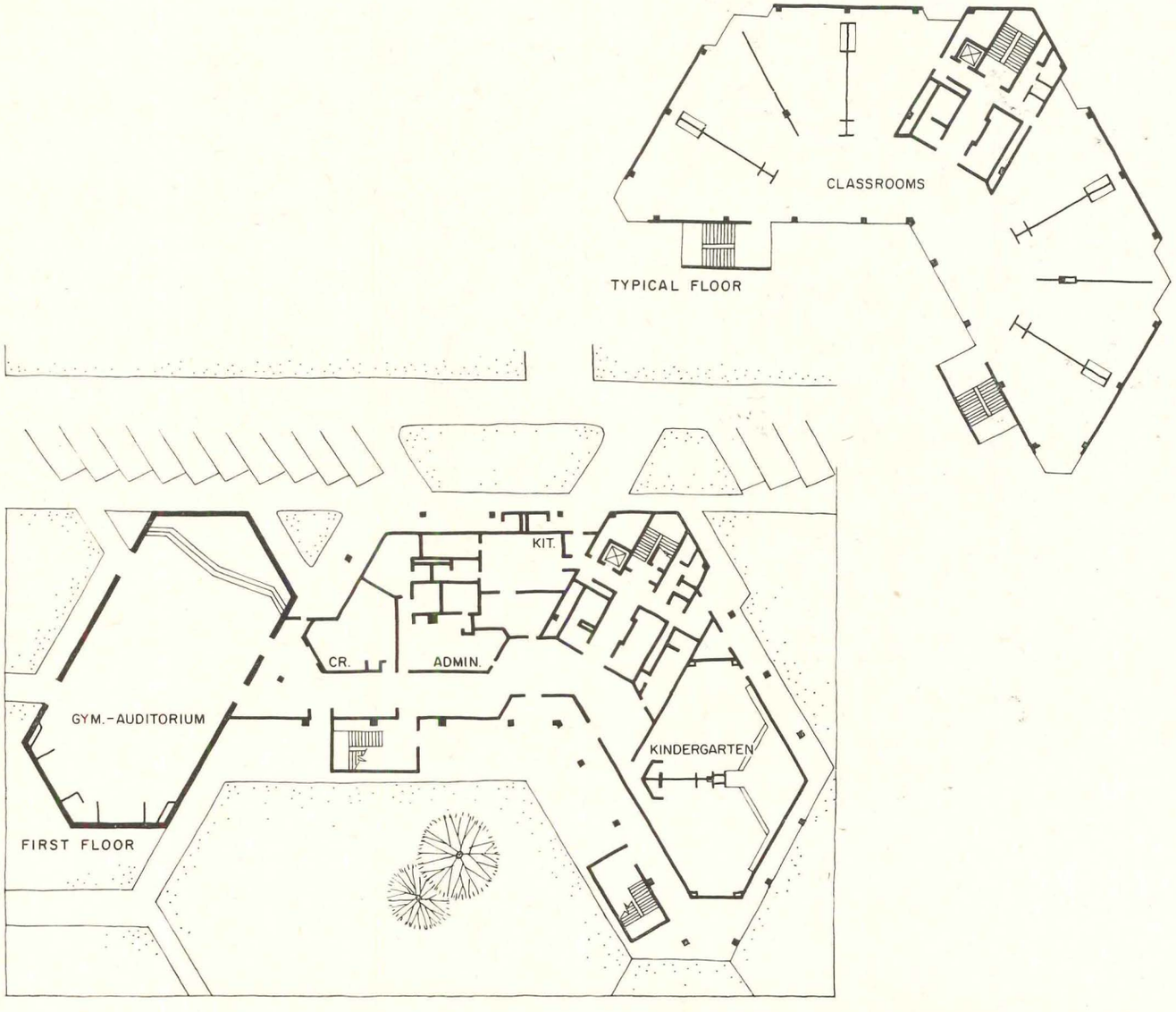
"No cells, no bells" sums up both program and planning in this new Chicago public school. The somewhat out-of-the ordinary, four-story scheme evolved from several explicit aims: to develop a small site in a highly populated area, and exploit a view toward a beautiful park; to subdivide a team teaching program into four decentralized sections; to permit a "phase-out" of the old type teaching without great disruptions; and to help cause a sociological betterment of the neighborhood.

Each of the three upper floors accommodates two grades in a highly compact arrangement which eliminates halls. Circulation is via a "commons" area in which students dine (food is brought to the floors in carts), study, and conduct large and small group activities. The plan shape and fenestration were carefully studied. The architects state, "although located in an undesirable area, here is a school with a directed, beautiful view. It turns its back not only on the slum-like area, but also to hot suns and cold winds."

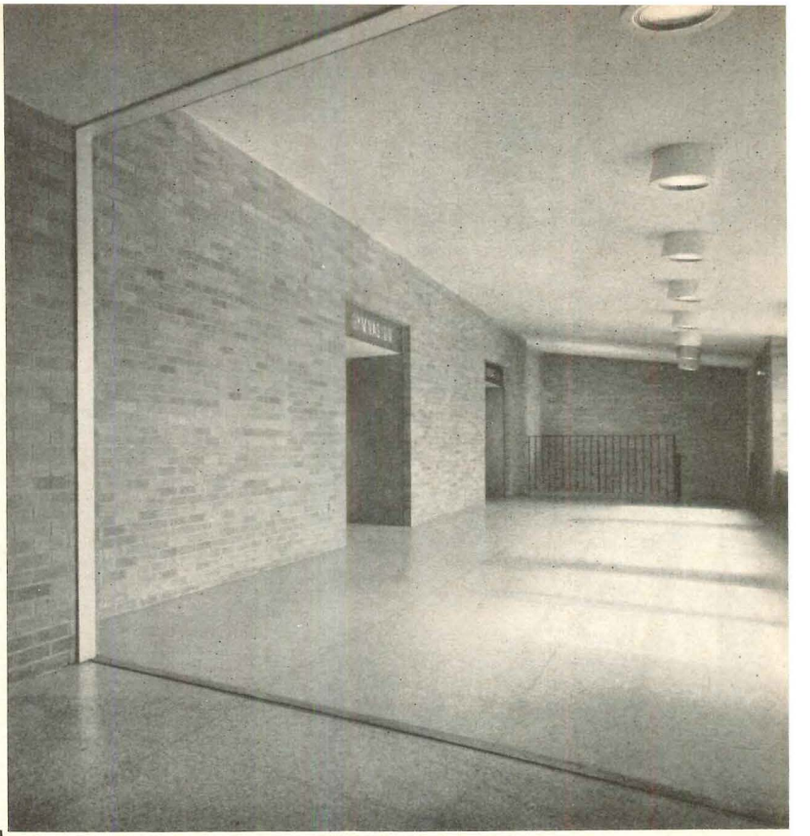
The structure, walls and floors are reinforced concrete, with exteriors of brick. Ceilings are acoustical tile and plaster; floors are resilient tile. All were chosen for maximum durability.

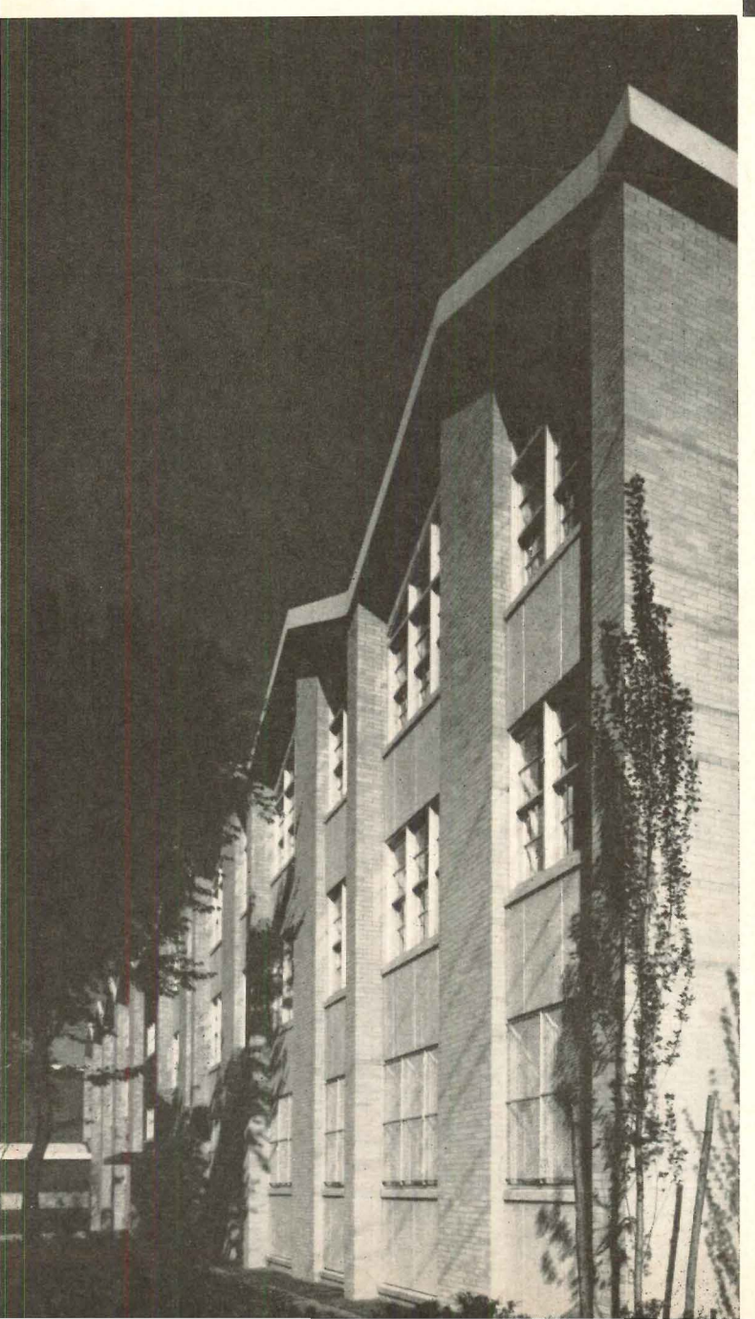


Frank Lotz Miller photos



Ocean Elementary School—P.S. 197
Queens, New York
ARCHITECTS AND ENGINEERS:
Katz, Waisman, Weber, Strauss
Joseph Blumenkranz, Consultant
Taina Waisman, Partner in Charge
ARTIST: *Jack Hastings*
STRUCTURAL ENGINEERS:
Fraioli, Blum, Yesselman
LANDSCAPE ARCHITECTS:
Robert Zion, Harold Breen

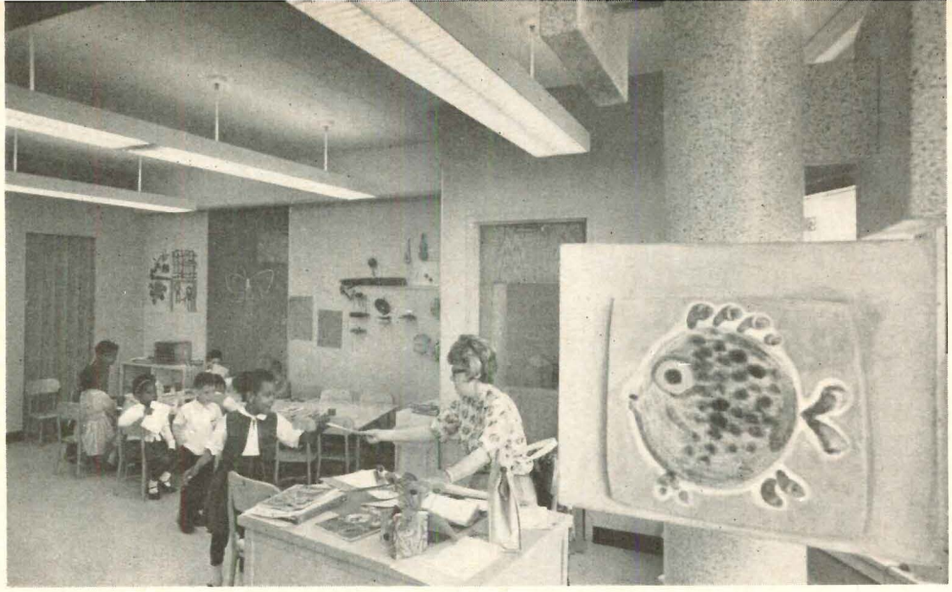


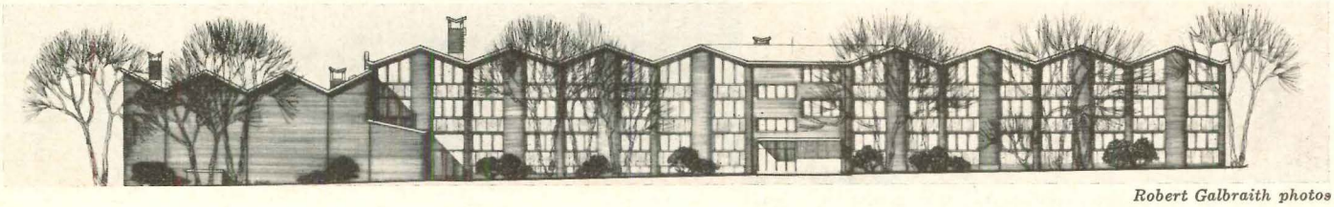


URBAN ELEMENTARY SCHOOL STRESSES A HAPPY ENVIRONMENT

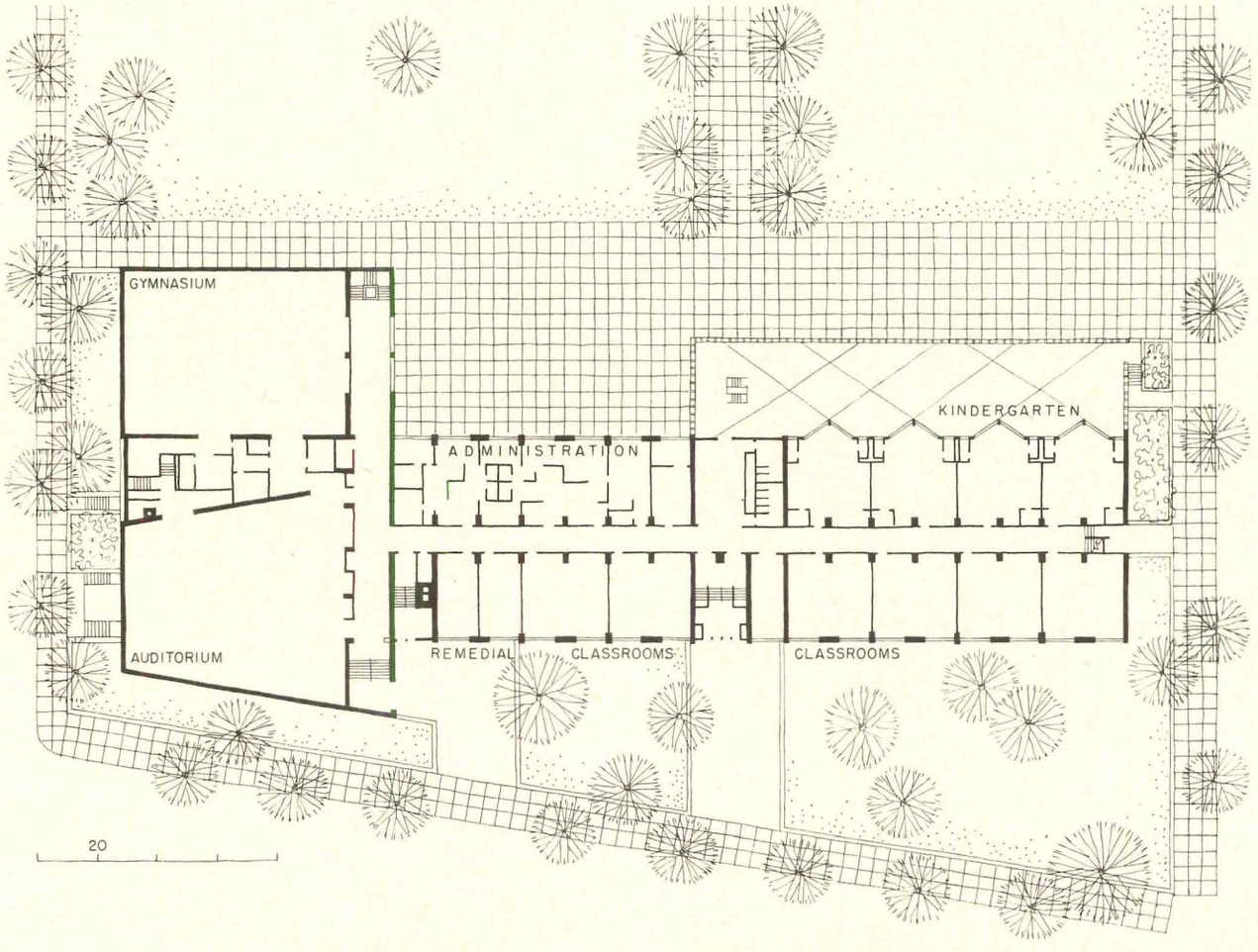
This extremely pleasant city school creates an unusually delightful environment for an area of very mixed population groups. In spite of its size (1,200 pupils), it manages a very good scale in its various elements for children in grades 1-6. The folded plate roof, and many of the classrooms—especially the kindergarten areas—developed as "small houses," play a big part in relating the building to the neighborhood and to the children. The land was predominantly lowland and marshland with swamp oaks and three blocks from the ocean. Landscaping, graphics, artwork and color also add much to the school's environment. There are several entrances to the school, each marked by colorful and amusing ceramic sculptures by Jack Hastings. He also created the totem pole structures in the kindergartens. In the auditorium and gym wing (planned to double for community use) a folded plate roof was planned to expose the view. Acoustical treatment in the auditorium includes a colorful wall of perforated glazed tiles, filled with glass fiber batts.

The architects state that "this happy school has contributed immensely to the inter-relationship of all its mixed population. It is a heart warming experience to see how buildings can help our democracy work."

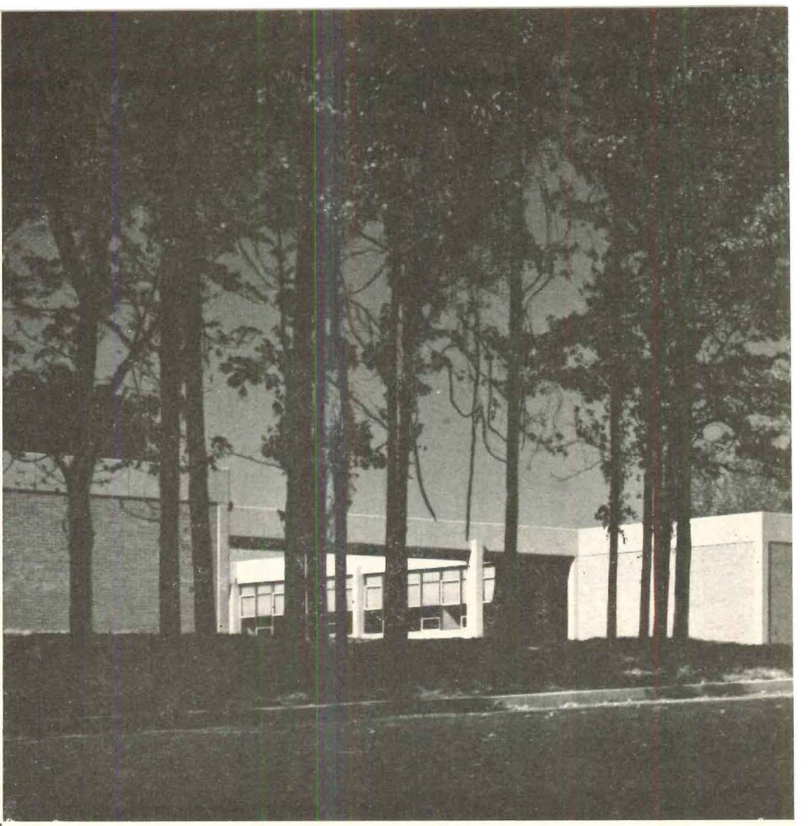


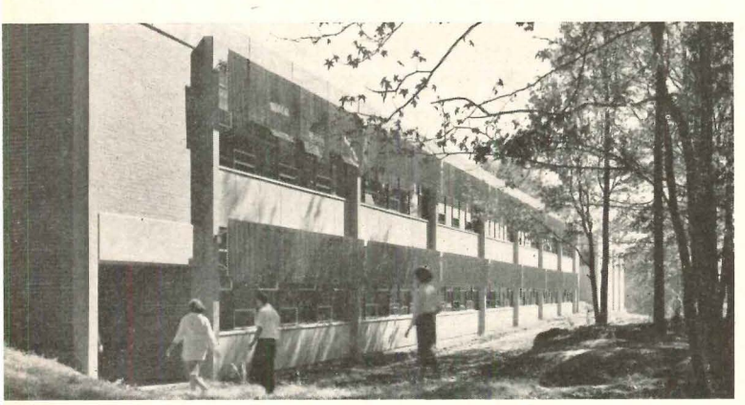


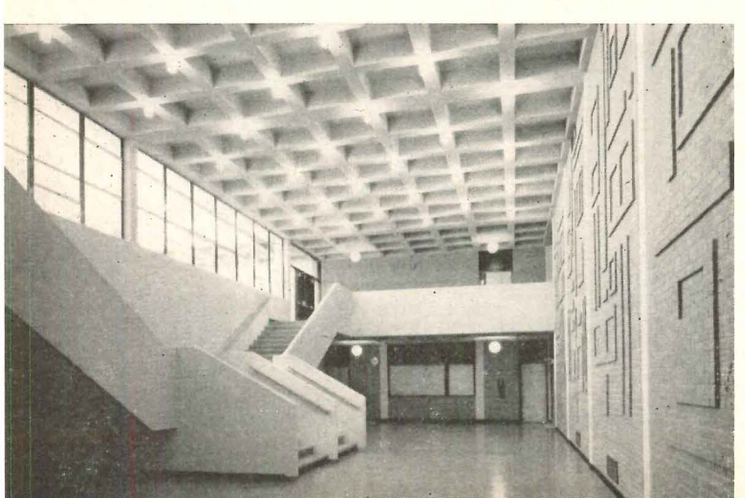
Robert Galbraith photos



Georgian Hills Junior High School
Memphis, Tennessee
ARCHITECTS: *Gassner/Nathan/Browne*
STRUCTURAL ENGINEER: *S. S. Kenworthy*
MECHANICAL ENGINEERS: *S. L. Burns & Associates*
CONTRACTOR (*first phase*): *John H. Moore*
CONTRACTOR (*gymnasium addition*): *W. F. Jameson*







COMPACT THREE LEVEL DESIGN ACHIEVED AT MODERATE COST

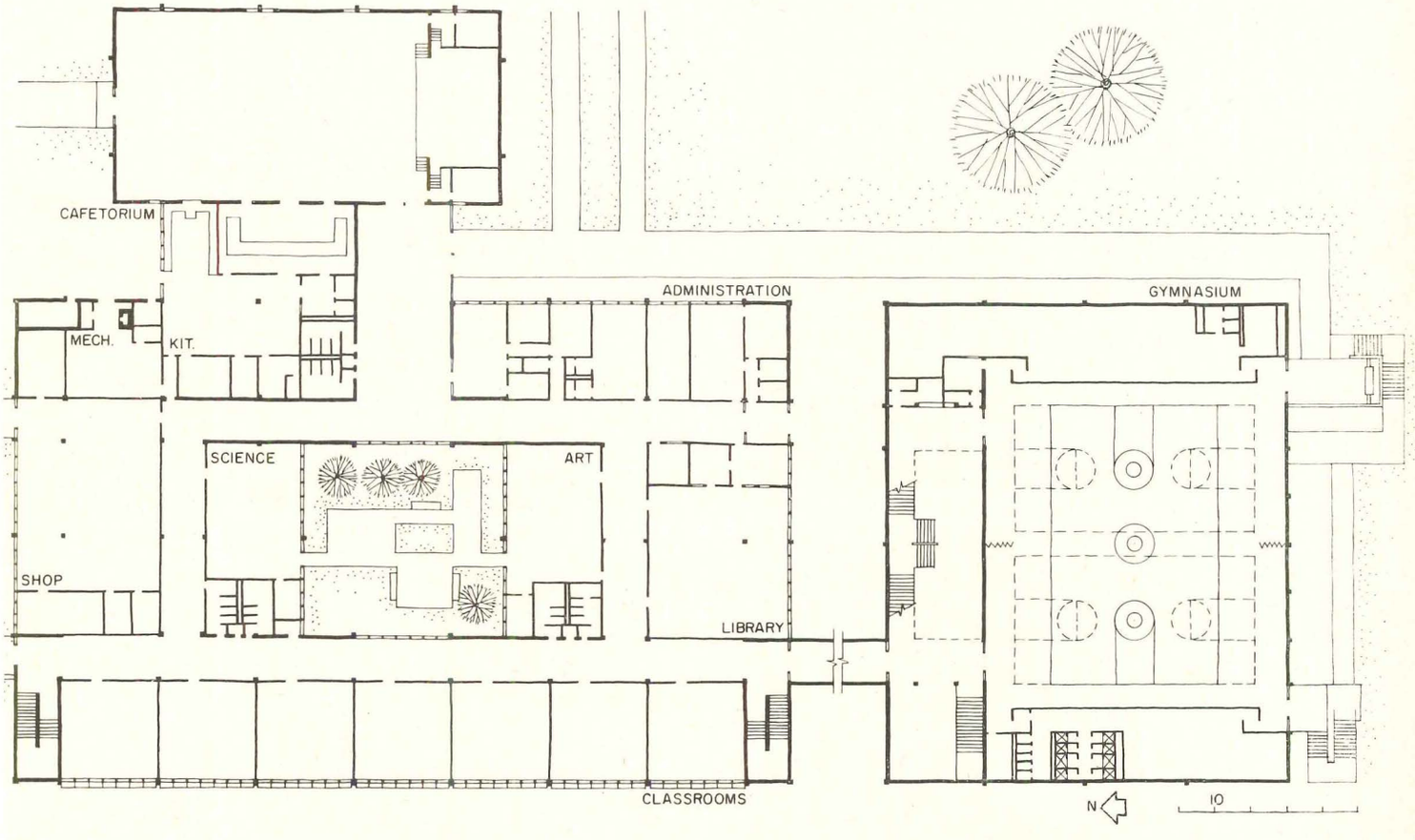
A steeply wooded 400- by 580-foot hillside site, dropping 40 feet from a flat crest at the northeast corner diagonally to the southwest corner, demanded a compact plan which made use of different levels.

Designed to accommodate grades 7 through 9, the school was planned and built in two stages. The first stage on the flat portion of the site is mainly on one level and provides 16 teacher stations, a shop, science and art rooms, cafetorium, kitchen, library, storage and administration rooms, with a lower floor containing classrooms and a home economics room tucked in underneath where the hill drops off to the west. Most of the classrooms thus face west and a system of translucent blue sun screens was devised to eliminate direct sun glare (*center left*). An interior court which lights the art and science rooms allows greater compactness in the plan.

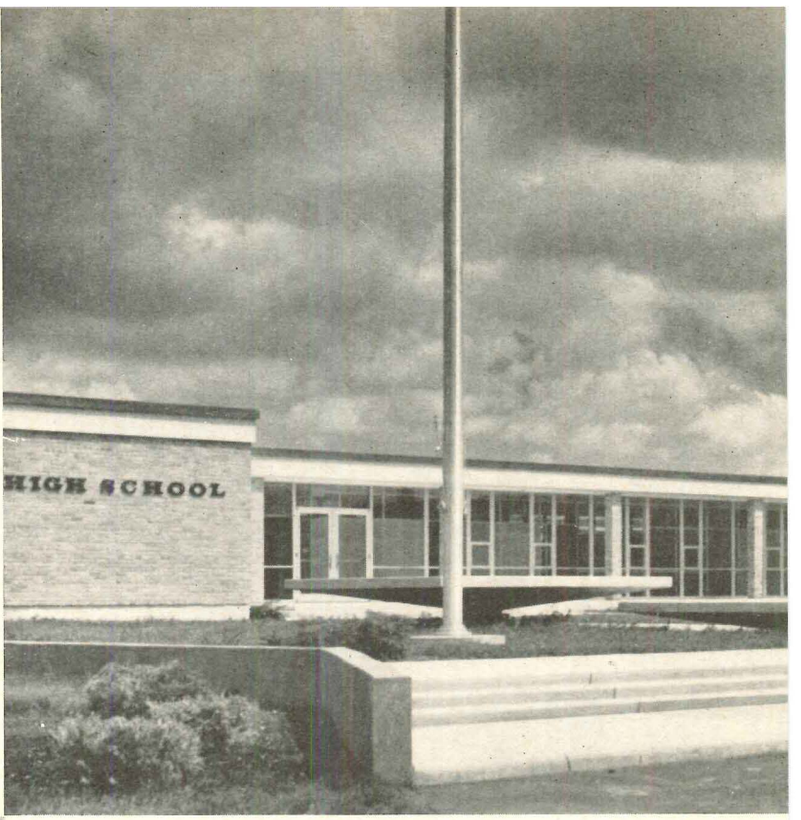
The second stage gymnasium block is approached through a two-story lobby (*bottom left*); the gymnasium is itself on the lower level, as shown in the plan (*right*). A third level underneath the gymnasium provides space for band, vocal and physical education. Uniformity in construction and materials contributed to the moderate cost of $10.45 per square foot, including parking areas and gym equipment.

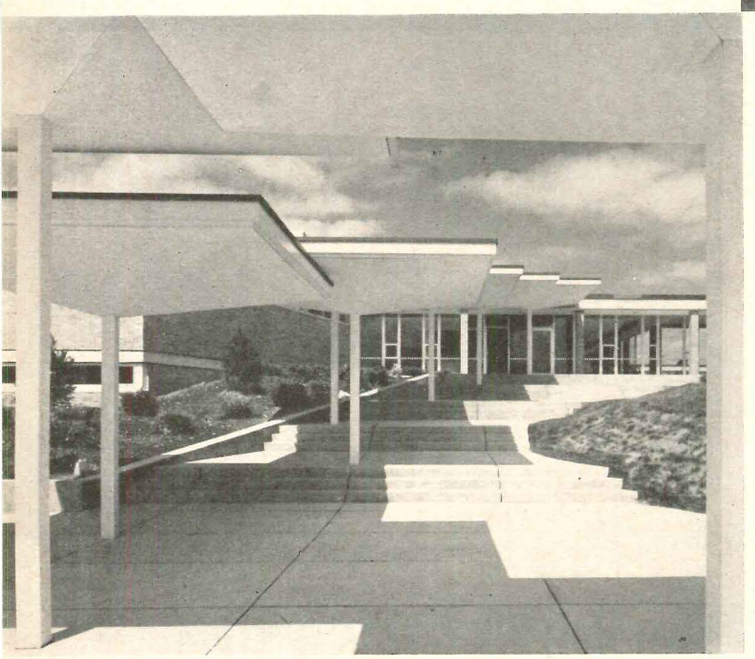
GEORGETOWN HILLS
JUNIOR HIGH SCHOOL

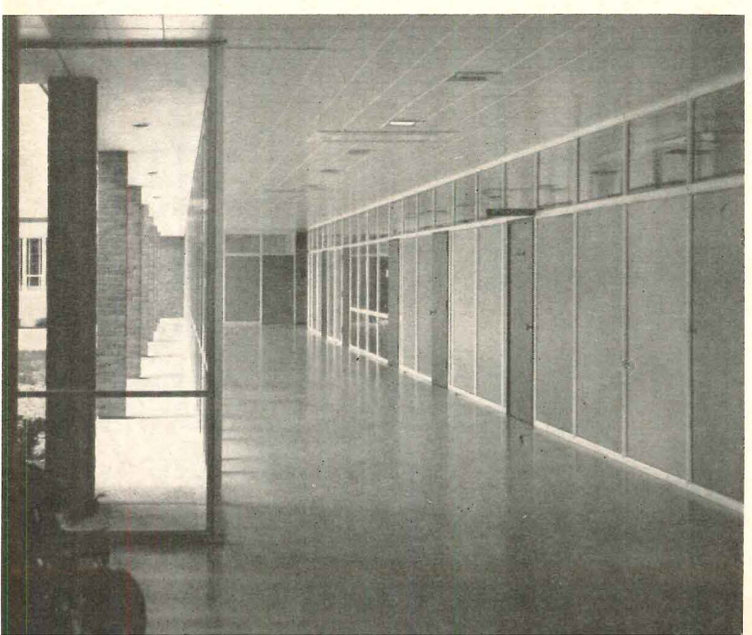
Art photos


CAFETORIUM
MECH.
KIT.
ADMINISTRATION
GYMNASIUM
SCIENCE
ART
SHOP
LIBRARY
CLASSROOMS
N
10

East Hills Junior High School
Bloomfield Hills, Michigan
ARCHITECTS:
Tarapata-MacMahon Associates, Inc.
CONSULTING SITE PLANNERS:
Johnson, Johnson & Roy, Inc.
LANDSCAPE ARCHITECTS: *Wilcox & Laird*







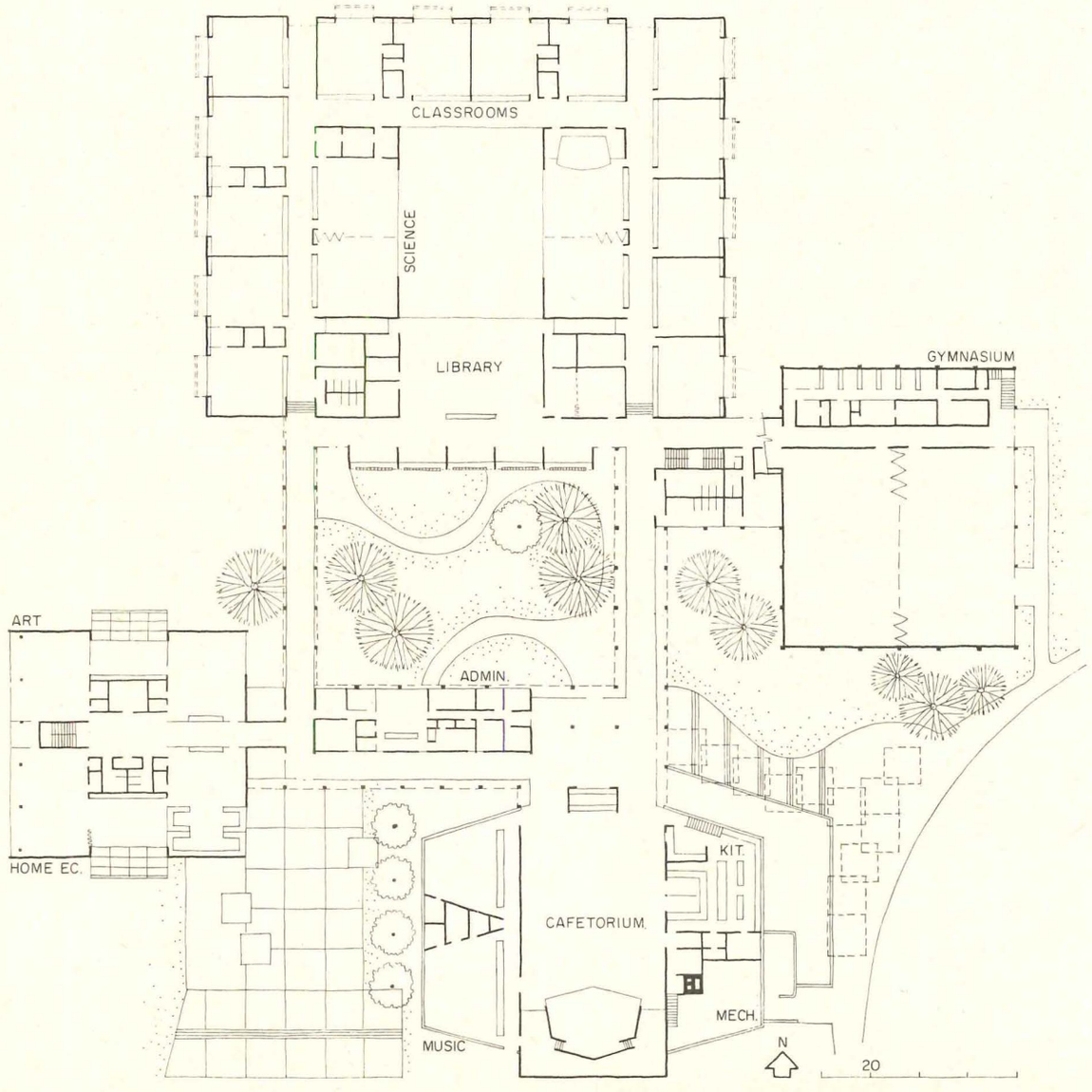
SUBURBAN CAMPUS-PLAN SCHOOL DESIGNED FOR FUTURE TEAM TEACHING

For this handsome junior high school, the client "requested that the plan be campus-like in character, but that, due to the severe winter conditions, it be linked together with enclosed passage ways. The school program in the future is expected to evolve gradually in the direction of greater emphasis on individual study, along with small group conferences and large group lectures, thus demanding considerable plan flexibility to accommodate these changes."

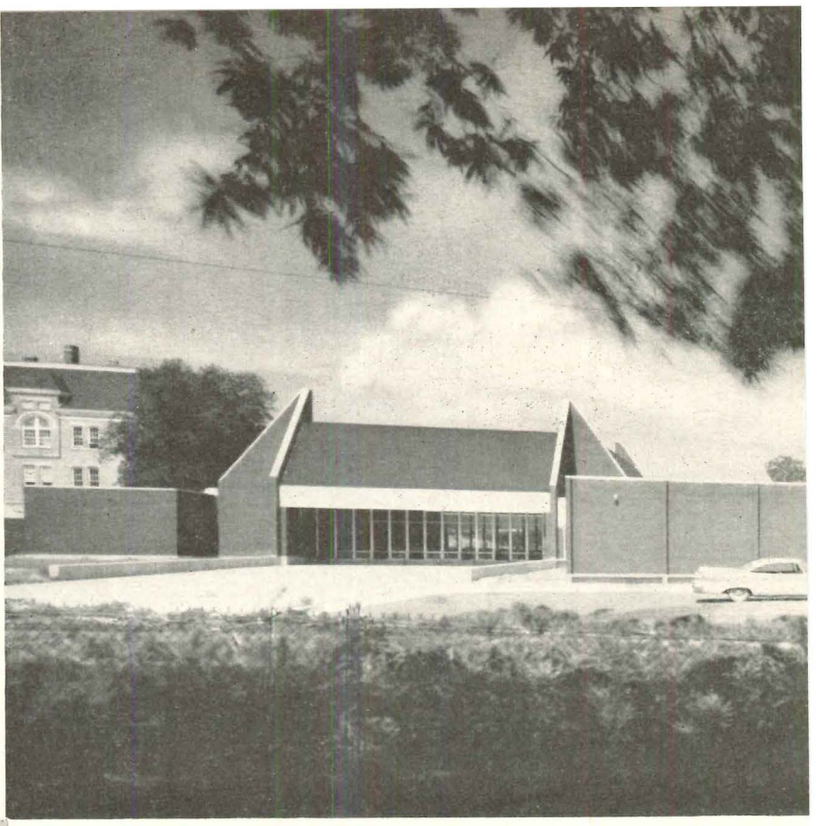
As developed, the school solves these problems well—and is suited for standard or team teaching programs. The four main elements of the school are grouped around a central court, with the quiet academic wing to the rear, the noisier allied arts unit to the west, and the gymnasium and cafetorium nearest the large parking area for ready public access. The centrally located library, conference rooms, and alcoves provide for the needs of individual study, while lecture rooms in each of the sciences and humanities wings provide for large group teaching.

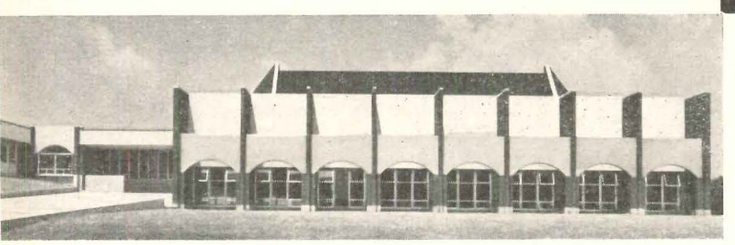
The construction is principally steel frame, with a unique space frame spanning the cafetorium. Exterior walls are of face brick, glass, aluminum sash and precast concrete slabs. Interiors are brick and lightweight concrete block.

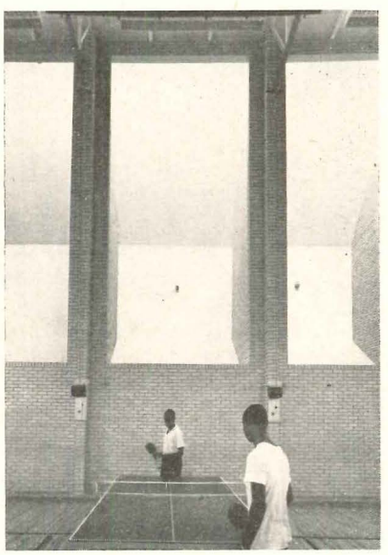
Balthazar photos



Booker Junior High School
Little Rock, Arkansas
ARCHITECTS: *Wittenberg, Delony & Davidson, Inc.*
STRUCTURAL ENGINEERS: *Engineering Consultants, Inc.*
MECHANICAL ENGINEERS: *C. E. Metrailer & Associates*
CONTRACTOR: *Collie, Inc.*



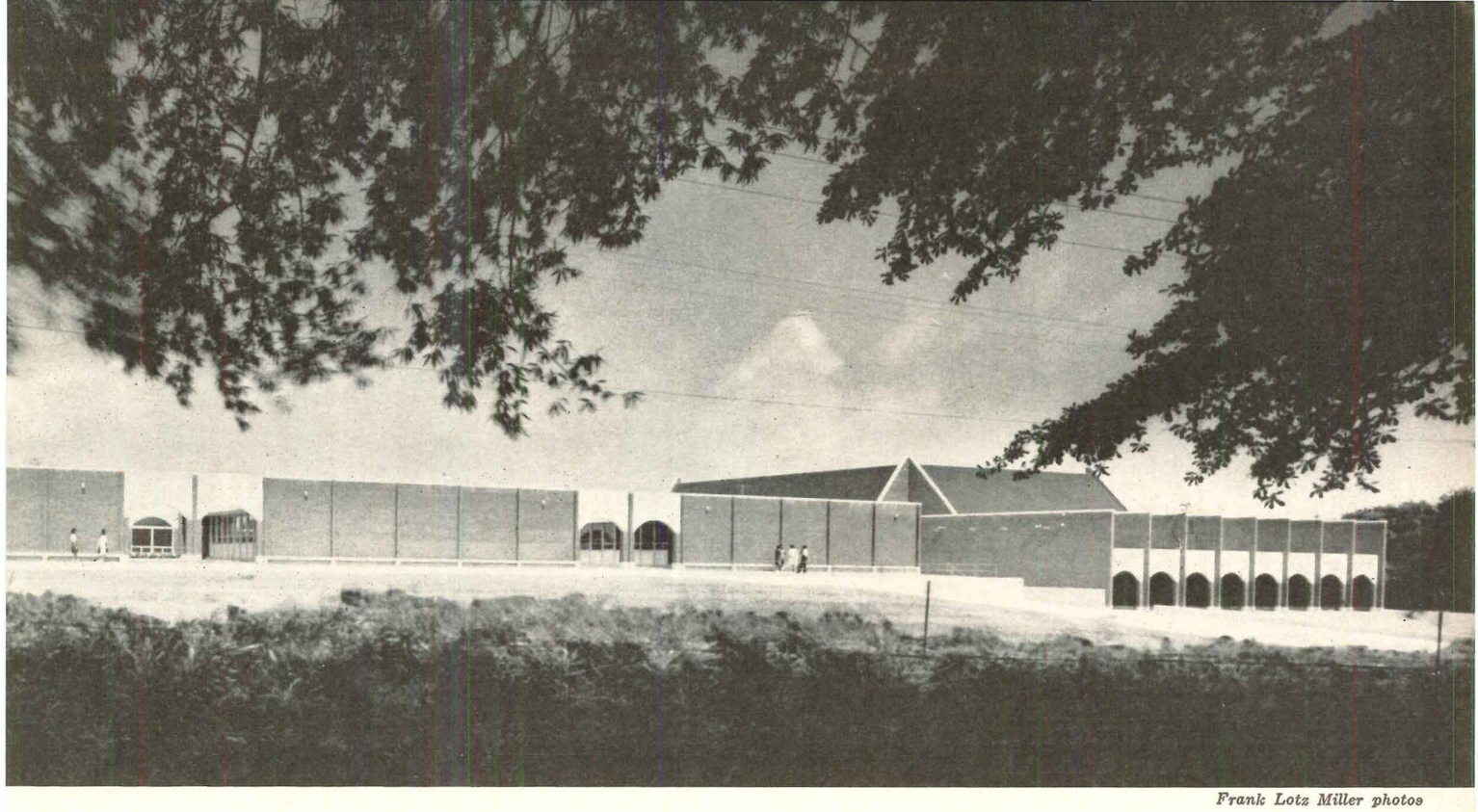




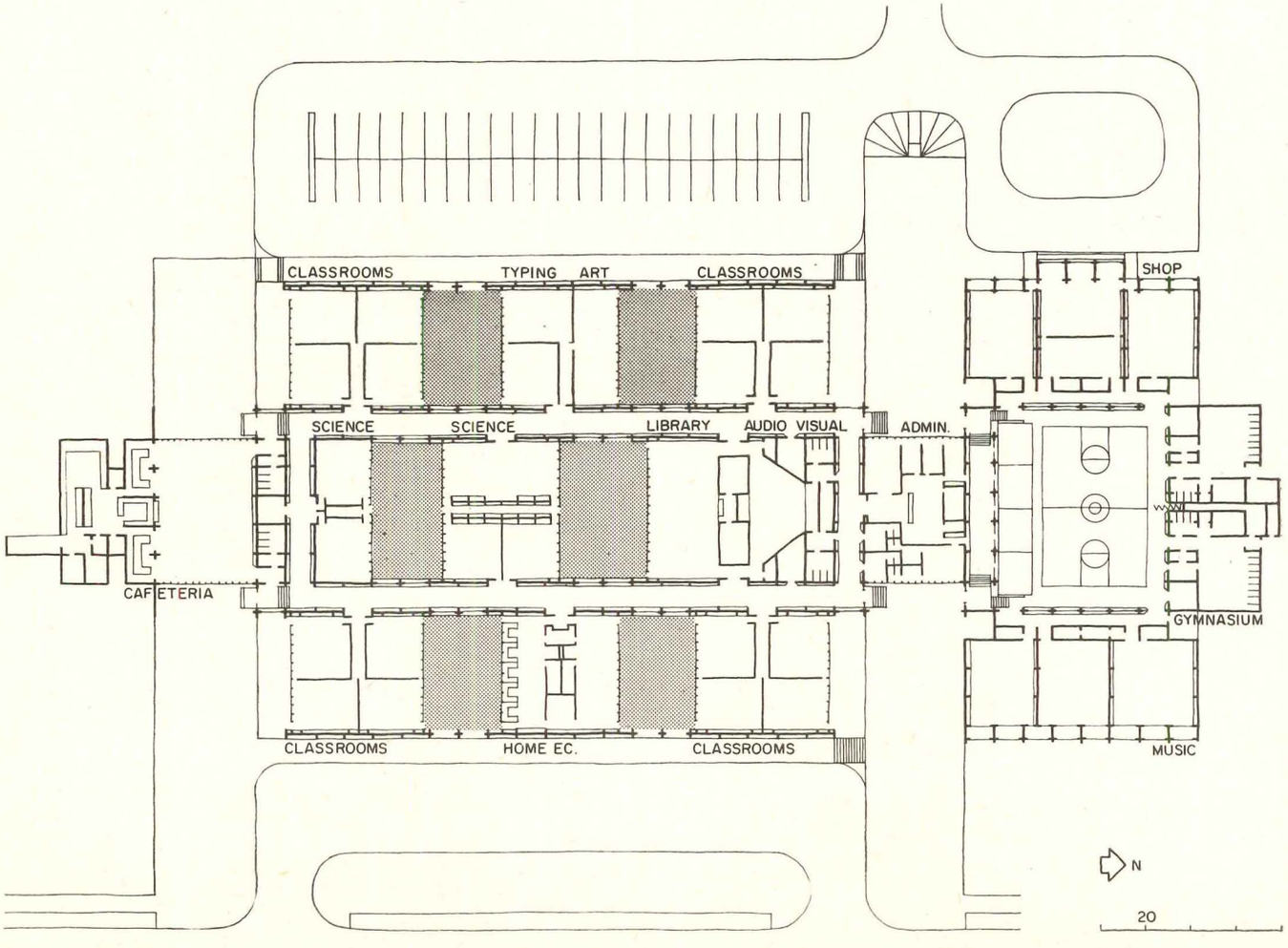
FLEXIBLE CLASSROOM CLUSTERS PROVIDE FOR FUTURE CHANGES

Uniquely functional roof peaks, arches, and a courtyard-dotted plan add to the pleasant, spirited design of this junior high school. The architects state that: "Of many program requirements, the primary influence shaping the nature of the academic teaching spaces, and their disposition, was the requirement of internal flexibility to accommodate future changes. Other influences were: a maximum area allowed by code within fixed fire walls; good cross ventilation, good orientation for light; and insulation from disturbances without the teaching space."

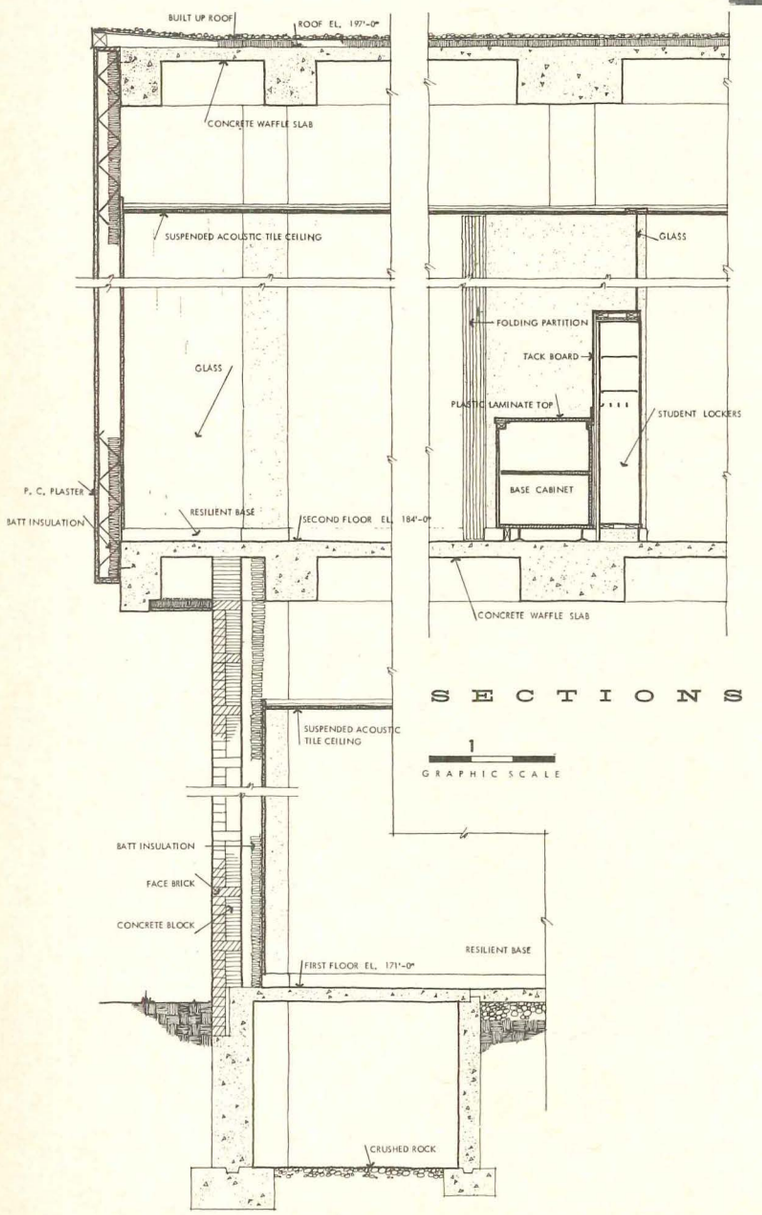
On a relatively small urban site, these items were all provided for by a checkerboard of clusters, each equal in area to four standard classrooms. Each unit is enclosed on the north and south by glass walls opening on courts, and on the east and west by structural walls containing storage, mechanical systems (including future air conditioning) and work counters. Each unit can be subdivided in any way desired by door-high partitions. The present school houses 750 students; expansion later to 1,000 can be done by adding a third locker corridor and three more clusters to the west. A sizeable resource center is provided, and a dramatic indirect daylighting system for gym and cafeteria.



Frank Lotz Miller photos



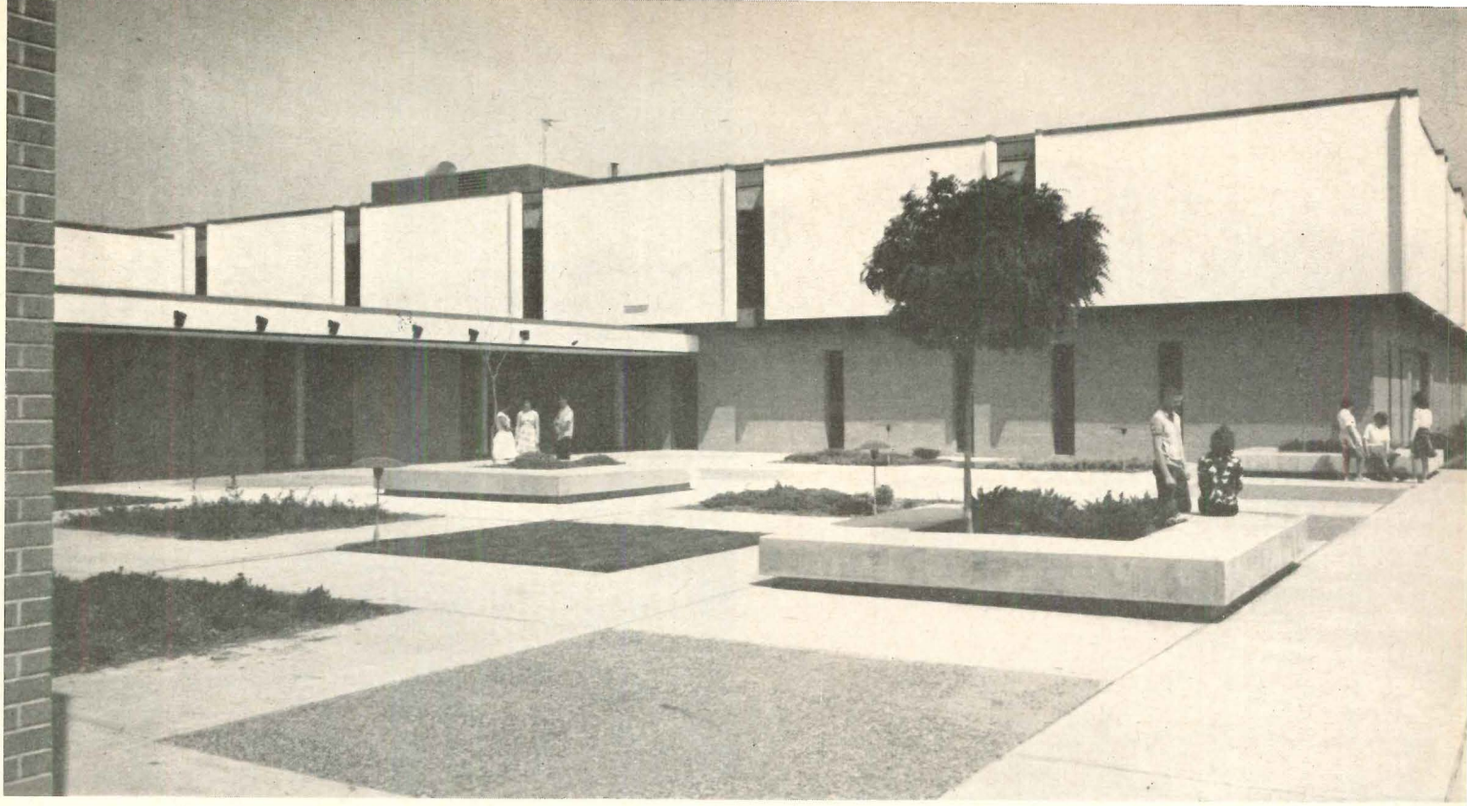
Maple Park Junior High School
North Kansas City, Missouri
ARCHITECTS: *Kivett & Myers*
MECHANICAL ENGINEER: *W. L. Cassell*
STRUCTURAL ENGINEER: *Bob D. Campbell*
CONTRACTORS: *Bob Eldridge Construction Company*



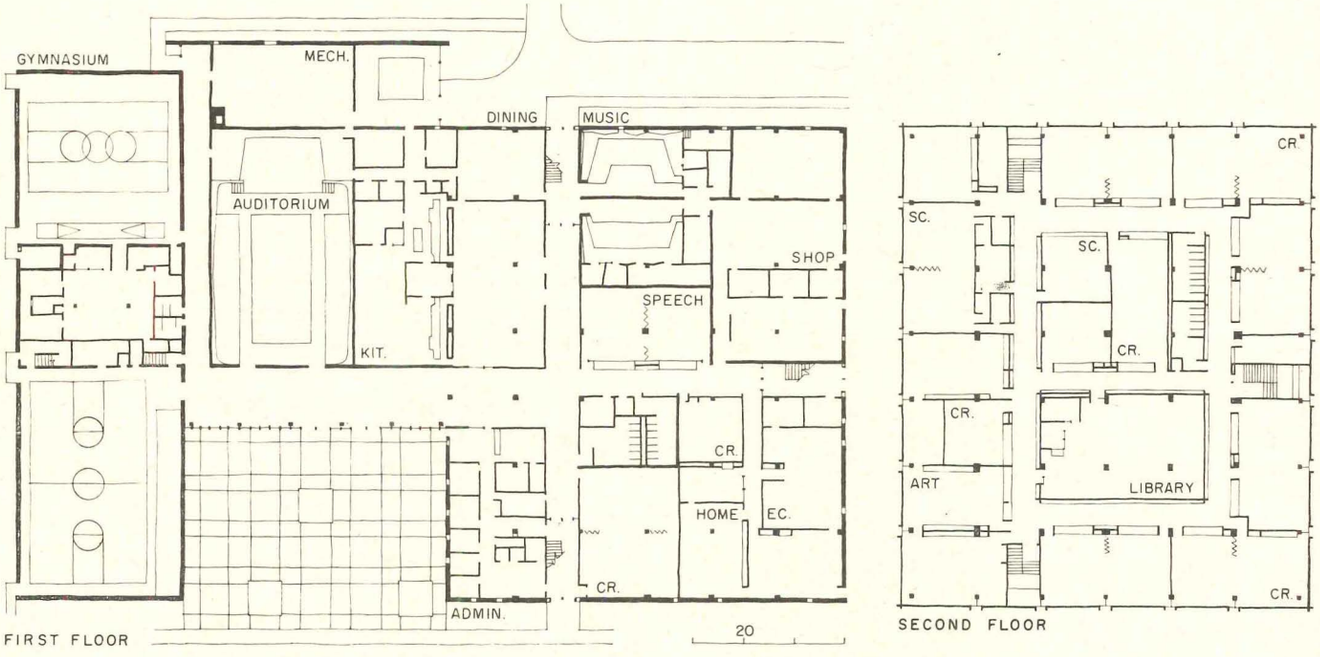
BUDGET DESIGN FOR A FLEXIBLE SCHOOL WITH AIR CONDITIONING

This trim school is unique in that it is the first air-conditioned school to be built in Missouri, and, at $12.23 per square foot (air conditioned), cost less than many conventional schools with the same facilities. As can be noted in the section, the building is of first quality construction throughout, with plaster partitions, full acoustical tile ceilings, glazed tile and terrazzo in all toilet and locker rooms, and a reinforced concrete structural system. The school is for grades 7 through 10, with a pupil capacity of 1,200. Total cost was $1,151,699 for 94,135 square feet, 1,365,043 cubic feet.

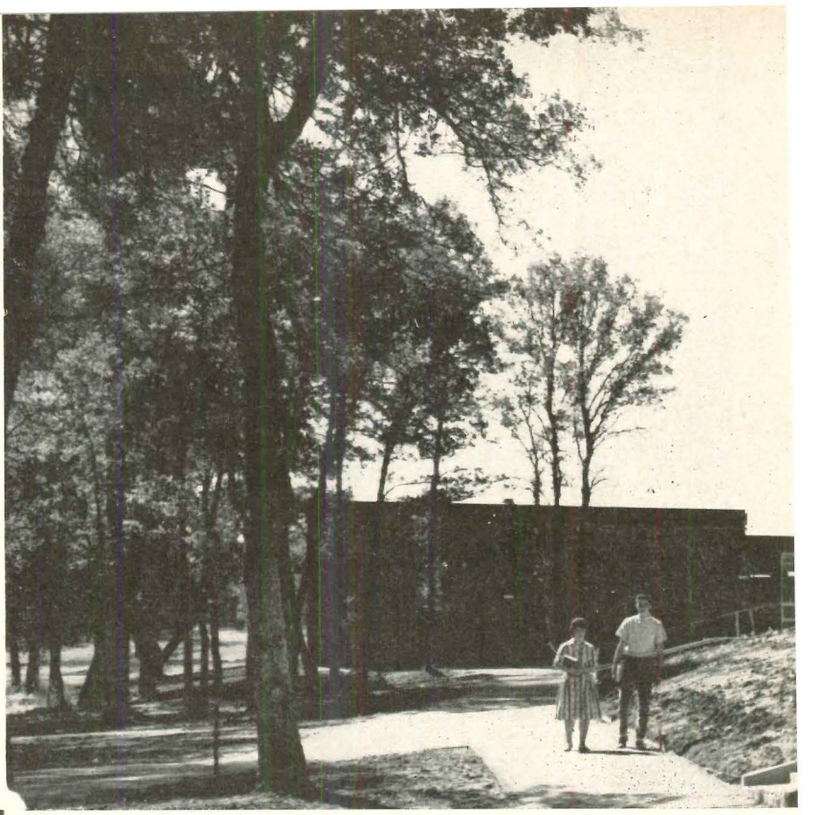
The architects state that costs were kept low by the following methods: (1) a compact building plan, which encloses a maximum space within a small wall area; (2) a minimum of glass area, to reduce the heat load—yet gives views to the outdoors; (3) utilization of the normal school heating and ventilating system for cooling by the addition of cooling coils in unit-ventilators, and the addition of compressor and cooling tower; (4) planning for team teaching in a way that all pupils are never concentrated in the "cooled" area at one time; (5) careful design control of all components and site.

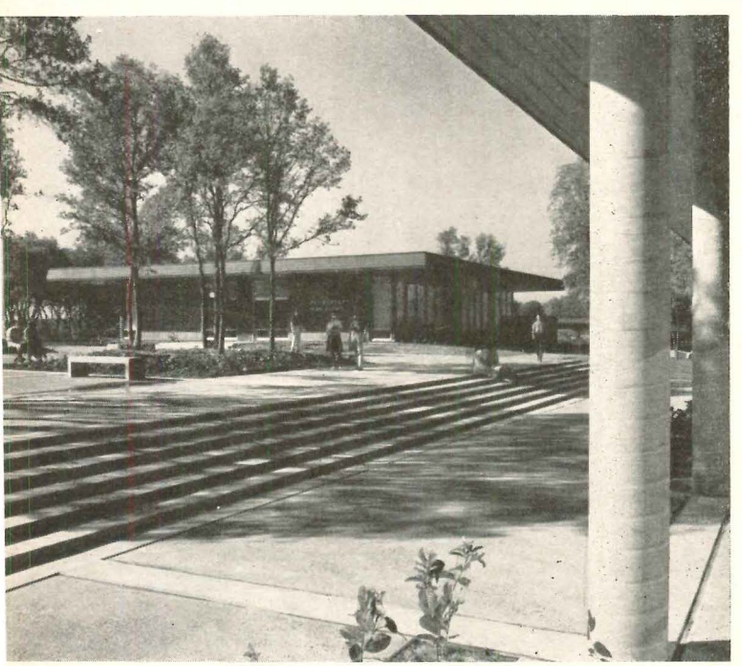


L. D. Jones photos



Ponderosa High School
Shingle Springs, California
ARCHITECTS: *Starks, Jozens & Nacht*
STRUCTURAL ENGINEER: *Walter Constant*
MECHANICAL ENGINEER: *Leonard Stecher*
ELECTRICAL ENGINEER: *Carl Koch*
CONTRACTOR: *Campbell Construction Company*

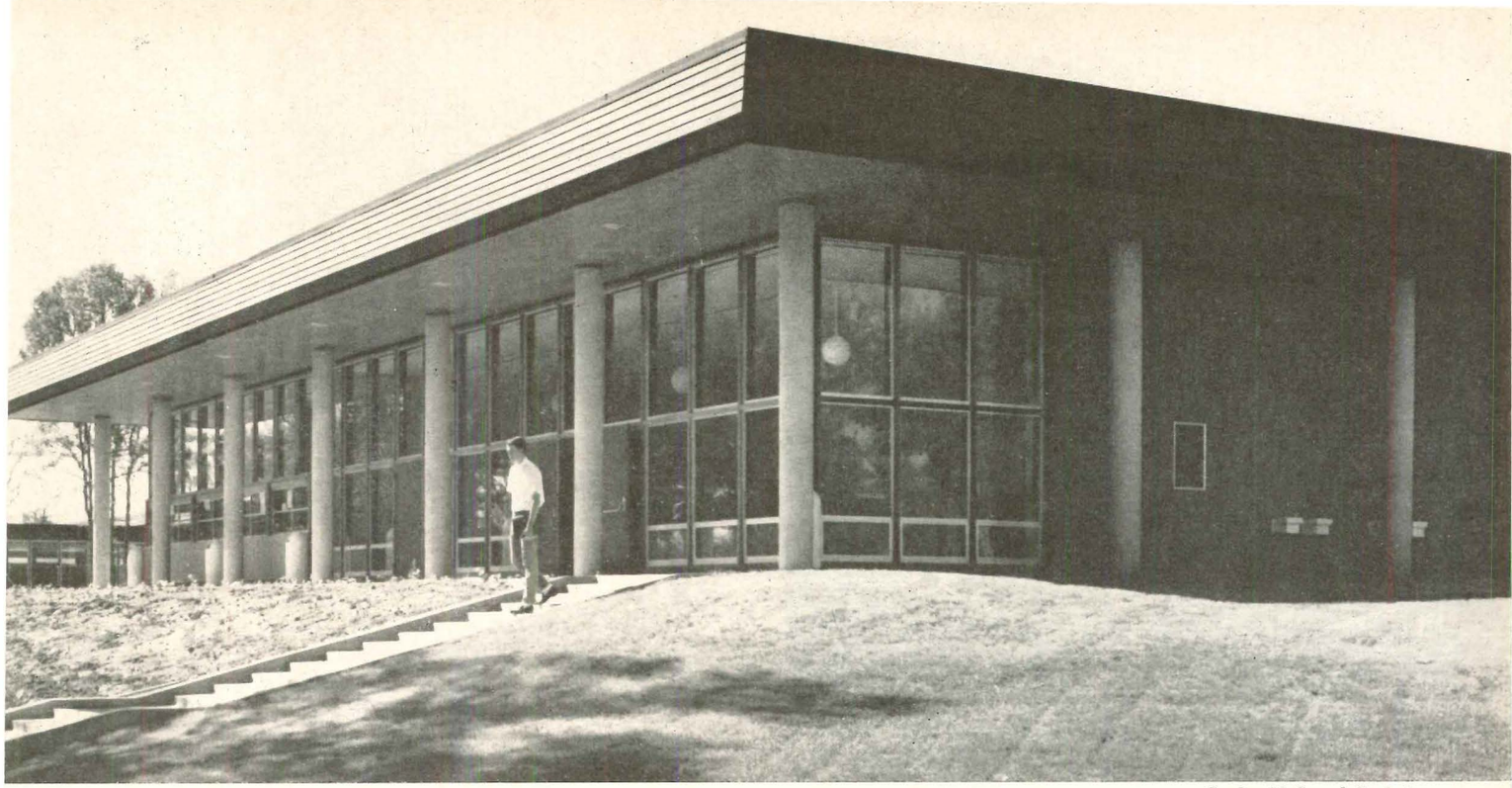




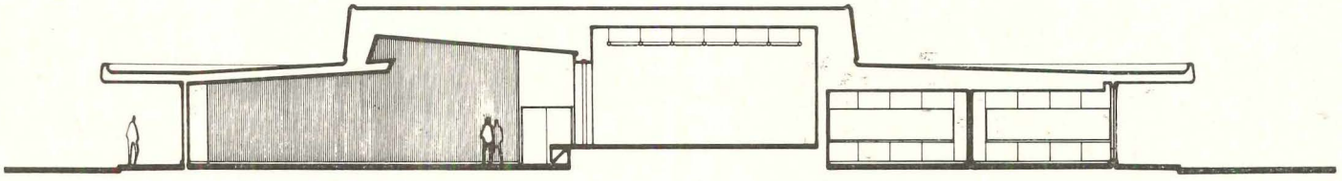
FLEXIBLE HIGH SCHOOL CAMPUS BLENDS WITH ROLLING WOODLAND SITE

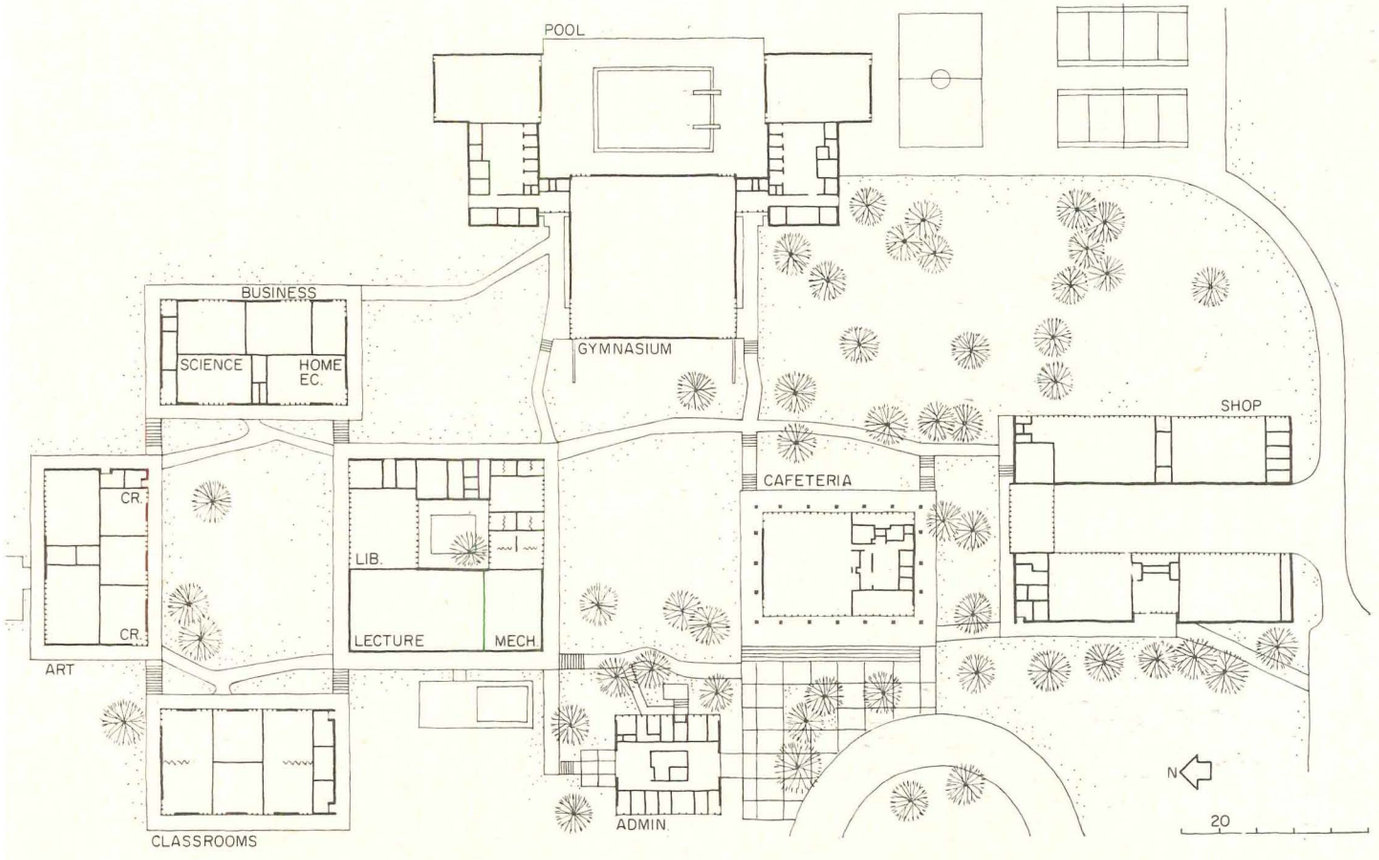
Ponderosa High School was developed to meet the needs of an expanding population in El Dorado County. The rolling woodland site influenced the placing of the buildings, which were sited on various levels in relation to the trees, and spaced so as to give interesting and informal play and circulation areas. The buildings are of stained redwood to harmonize with the natural colors of the site. The first phase, shown on the plan, accommodates 750 students and a second phase, at present in the design stage, will add a music room, business education facilities, and more classrooms on the west side of the site to bring the total complement to 1,500.

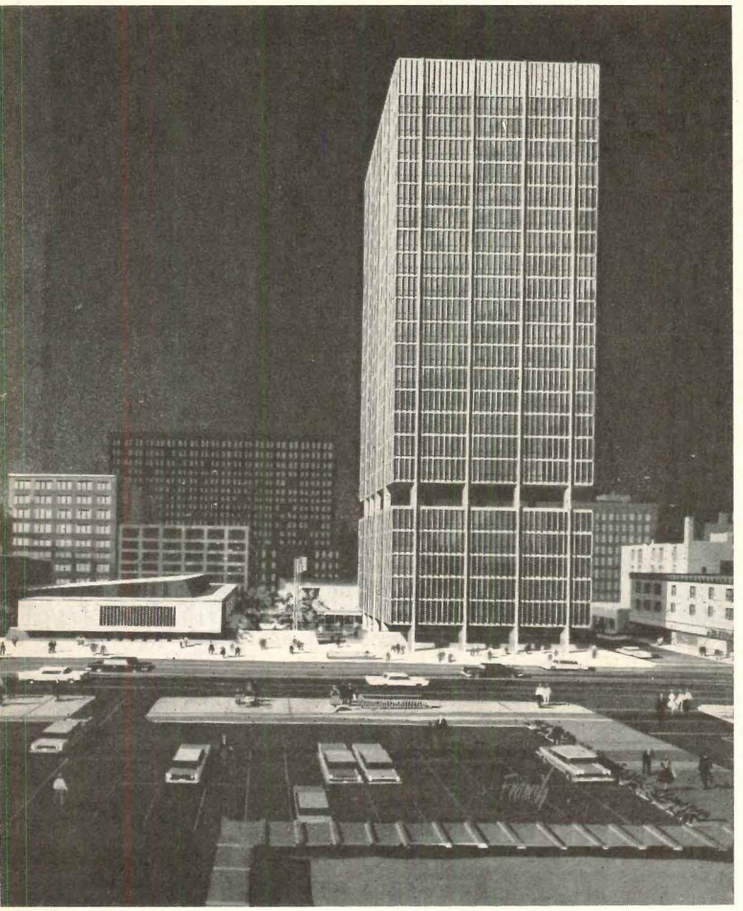
The plan of the buildings radiates from the instructional center which is placed at the geographical center of the campus and contains a theater, lecture and drama complex, a library, individual study areas, teacher preparation rooms, a center for teaching aids and flexible spaces for large and small group work. The classrooms are grouped to the west of this building, and the administrative center at the highest elevation, affords a view of the campus. The program required that provision should be made for the introduction of team teaching, and the classrooms have therefore been designed to give maximum flexibility.



Gordon McCampbell photos

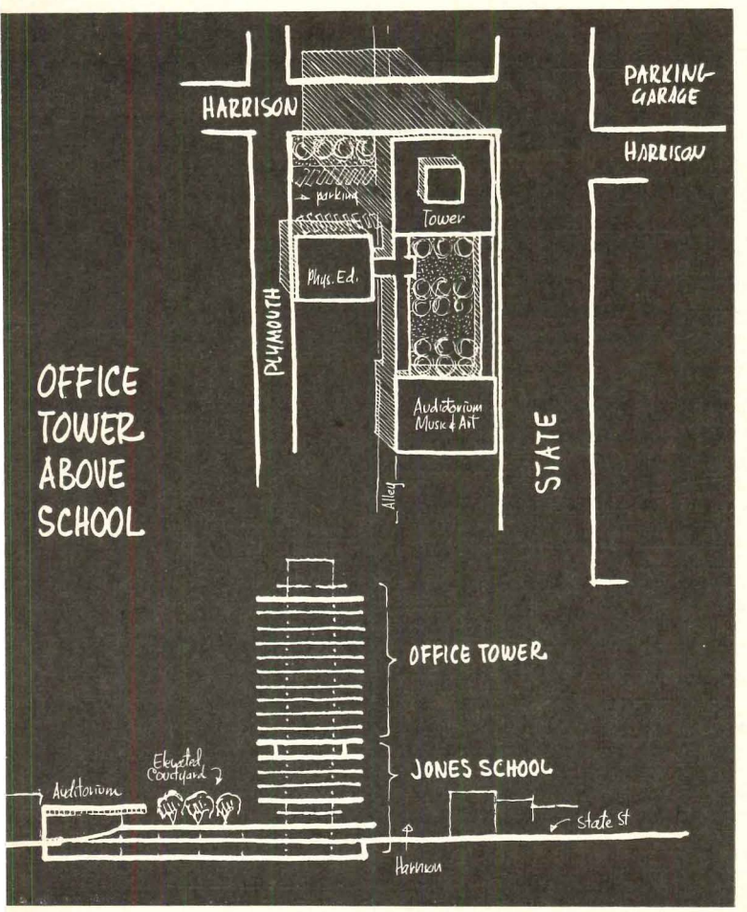






Jones Commercial High School
Chicago, Illinois
ARCHITECTS: *The Perkins & Will Partnership*

AN EXPANDABLE SCHOOL DESIGNED FOR OFFICE TOWER ADDITION



A concept for an urban school combined with office floors in a high rise building—long discussed for various communities—is now being considered in Chicago. In this case, a three-phase building program, designed by the Perkins & Will Partnership for the new Jones Commercial High School, has been approved by the Board of Education. The school will be built on a site at 600 South State Street in downtown Chicago. The total plot covers 1.2 acres with .8 acres fronting on South State Street. The present school building, just east of the new site, will be kept during construction with the following phases programed for the new $2,320,000 complex:

Phase I: A six floor classroom tower with a basement and roof-top fan room, and a separate building to house fine arts and cafeteria.

Phase II: The present old building will be torn down and replaced with a physical education building in about two years.

Phase III: For the future, an 18-floor addition to be added. The foundation of the original classroom building in the program is designed to accommodate this. A typical floor will have a fixed core in the middle, with column-free space on the outside to permit variety in partitioned spaces.

Architectural Engineering

Modernizing A Code

The proposed new plumbing section of the New York City Building Code, which is scheduled to be rewritten completely by 1965, recognizes both modern theory and materials. On the theory side, the results of laboratory tests have been adjusted to account for in-use conditions. Recommended new sizing methods for plumbing drainage and vent systems have been predicated on tests conducted by the National Bureau of Standards and outlined in NBS Monograph 31, and the modifications were made to provide a built-in correction for fouling of the vent and fittings in the piping. Under the new code, loop venting would be permitted as now approved by the National Plumbing Code, but the above mentioned modifications were provided. On the materials side, the new proposals will allow plastics for exposed or accessible cold water, for drainage and vent systems within buildings.

A system has been proposed for roof drainage which would distribute the drainage for 24 hours after a heavy rainfall. Purpose is to permit smaller drain piping and to prevent supercharging the currently overloaded city sewers at times of heavy rain. The limits placed on the storage time and drain-down are said not to require increase in the structural design of the floor columns. Other recommendations would permit constant pressure booster pump systems to be used for water distribution in a building, making roof-top water storage tanks unnecessary.

The proposed revisions were drafted by Francis W. Hay and George Jerus of Meyer, Strong & Jones, consulting mechanical and electrical engineers.

Fire Protection Standards Revised

Revisions of four standards dealing with heating, air conditioning and ventilation have just been issued by the National Fire Protection Association. Changes in "Ventilation of Restaurant Cooking Equipment" (NFPA No. 96) will permit dampers in restaurant cooking exhaust systems to assist in fire control. Revisions in the 1964 edition of the widely-used "Air Conditioning and Ventilating Systems of Other Than Residence Type" (NFPA No. 90A) include clarifications indicating where approved fire dampers are required and on the allowance for the concealed space formed by a ceiling and floor above to be used as a return plenum.

The new edition of "Chimneys, Fireplaces and Venting Systems" (NFPA No. 211) recognizes factory built fireplaces, including comprehensive material on vent and chimney connectors and a chimney selection chart. The thickness of duct material used in warm-air heating and air-conditioning systems in dwellings is a major revision in the 1964 edition of "Residence Warm Air Heating" (NFPA No. 90B).

Copies of the newly revised standards (NFPA No. 96, 50 cents; NFPA No. 211, 60 cents; NFPA No. 90A, 60 cents; NFPA No. 90B, 50 cents) are available from the National Fire Protection Assoc., 60 Batterymarch Street, Boston, Mass., 02110.

Proposed Lumber Standards Rejected

Last month the U. S. Department of commerce turned down the proposed revision of the softwood lumber standard submitted by the American Lumber Standards Committee on the grounds that a survey of the industry demonstrated no general concurrence in favor of the revision. In April the Department of Commerce circulated the proposed revision of the industry and interested public. Out of a total of 3,079 replies received, 1,286 were from persons named by trade associations as representing a cross-section of the industry and 1,793 replies were received from individuals who requested ballots.

The proposed standard related size to moisture content to minimize variations in dimensions of lumber, whether originally green or dry, at the time of use. For example, a dry 2 by 4, dressed, would have to be at least 1½ by 3⅝ in. A green (above 19 per cent moisture content) 2 by 4 would have to be 1 17/32 by 3 11/16 in. Now 2 by 4's either dry or green are 1⅝ by 3⅝ in.

This Month's AE Section

NOTES ON EXPOSED CONCRETE SURFACE TEXTURES, page 250. *TIME-SAVER STANDARDS:* Formwork, page 254. *CONSTRUCTION OF TWO LARGE PLASTIC BUBBLES,* page 257. *BUILDING COMPONENTS:* Application of a One-Ply Roofing System, page 263. *Products,* page 265. *Literature,* page 267.

NOTES ON EXPOSED CONCRETE SURFACES

A review of physical characteristics and a guide to surface textures

By Seymour Howard, A.I.A., Professor of Architecture, Pratt Institute

The past 10 years have seen a considerable increase in the use of exposed concrete in the United States, even in the northern sections of the country where the climate proved too severe for many earlier attempts. The reasons are several. Architects are intrigued with the plastic freedom of concrete as well as with the possibility of using a single material for structure, for screening and for finish. They have been encouraged in this attitude by successes in other countries whose climate and masonry traditions are more favorable. At the same time technical advances have improved the quality of concrete available and the techniques of building with it. Highway construction with its severe exposure requirements has led to the general use of air entrained concrete to resist freezing and thawing. Structural engineers have demanded and can now easily obtain concretes with 28 day cylinder strengths of 5,000 psi.

It should be helpful, therefore, to review some advantages and limitations of exposed concrete, and to list various types of surface treatment.

Architectural Characteristics

Enthusiasm is a proper and necessary attitude for an architect to have toward his materials. But it must be based on an accurate understanding of their characteristics, as revealed in actual buildings over a long time. The kind of concrete now available is very similar in its properties to limestone, and can be expected to behave in a similar way.

Conductivity of concrete (1 in. thick) is about 12.5 Btu per hr per sq per deg F, compared with about 26 for steel and only one for wood. Thus under certain conditions it may feel "cold" to the touch. With radiant coils embedded in it, concrete is a very pleasant floor in winter. As an exterior wall, it will let heat pass through, but it responds slowly to temperature change because its heat capacity is high.

The odor of masonry is characteristic, though hard to describe. Although it can become objectionable under humid conditions, the odor of a wall heated by the summer sun is very pleasant.

Because of the lime content, (Portland cement consists of about 66 per cent CaO) concrete which is not kept dry will foster the growth of algae, mosses and other low forms of plant life. This possibility must be kept in mind when detailing soffits along which water can trickle as well as scuppers or water spouts.

When it comes to sound, we have several aspects to consider. Concrete's mass is useful in stopping airborne sound. A 6-in. reinforced concrete wall plastered on both sides will reduce the noise transmitted from one side to the other by about 45 decibels (at 400 cps). However, impact noises are carried very well and over long distances through any continuous frame or panel structure. As far as sound control within a space is concerned, concrete absorbs almost nothing. To prevent excessive reverberation, therefore, some sound absorptive treatment is necessary.

Ordinary Portland cement is gray, with a slight greenish cast and this seems to predominate in determining the color of the finished concrete, although it can be shaded toward buff by the orange of the sand. The color of the large aggregate will not affect the surface color unless it is exposed. The light reflectivity of smooth unpainted concrete is about 50 per cent compared with 88 per cent for a white painted surface. Much lighter effects can be obtained with white Portland cement, but to get pure white requires white quartz, feldspar or marble as the aggregate.

In addition to its color, the appearance of concrete depends largely on pattern and texture. By pattern I mean the rhythms set up by the location of joints. In cast-in-place concrete these are determined by the requirements of formwork (construction joints), of surface shrinkage (control joints), and of mass shrinkage and structural isolation (so-called expansion joints). The spacing of construction joints and control joints is shown in the Time-Saver Standards on Formwork which follow this article. Expansion joints are conventionally required about every 120 ft, but can be omitted by special construction procedure. A gap is left in the wall or slab, about 3 ft wide, bridged only by reinforcing steel. About 30 days later, after the concrete has achieved about 90 per cent of its drying shrinkage, concrete is placed to fill the gap.

Texture depends on the surface of the forms. Concrete is always hard, but its texture can vary from very rough to glassy smooth. There are three categories of surface:

1. Contact (left essentially as is after stripping forms).

2. Exposed aggregate (outer layer of hardened paste or aggregate removed chemically and mechanically).

3. Coated (paints, plastics and stucco treatments).

The concluding part of this article will give a reference "dictionary" of the first two of these categories.

And how does it age? What does the concrete surface look like a few months or a few years after the first photographs have been taken? Assuming that all of the structural problems have been properly taken care of and that there are no shrinkage, no settlement and no visible tension cracks, what can go wrong?

Water can get in, the greatest enemy of construction after gravity. Concrete is relatively absorptive; even the best concrete is not better than a hard limestone. (Percentage of absorption about 6 per cent, compared with about 10 per cent for 1 per cent or 2 per cent good brick for granite). In a driving rain, absorption is much greater than simply immersing the material in water. Wind pressure on one side and suction on the other combine to pull water into

the wall. If the wall is thick enough, the water will do no harm and will migrate back to the outside and evaporate when the rain stops. Even if some water freezes inside the concrete, the tiny bubbles of air provided by proper air entrainment are sufficiently elastic to prevent cracking and spalling. If the wall is not thick enough, the water will appear on the inside face of the wall and trickle down, or it will penetrate beams and slabs and show up as stains on the ceiling.

How thick is thick enough depends on the wind direction during the worst storms. In any case, if the exterior wall is furred, it is always prudent to paint the interior surface with dampproofing. If not, the wall may have to be made thicker. Flashing should be installed at the heads of all openings and if possible under sills to isolate them from the interior stools. Horizontal surfaces of projecting elements should be minimized because water is more likely to soak in through them. If they can be covered with metal flashing or metal sills, so much the better.

The way dirt will cling to the surface and then wash off in more exposed spots is well known. Like limestone and marble, the cement paste is slightly soluble in water and will wash clean where water runs off sills or off projecting fins, moldings, etc. The protected areas will get dirtier, sometimes emphasizing the natural shadows. Thought should be given to this behavior in conceiving and detailing the design of a facade. Each elevation, having a different exposure, will have a different appearance even if it is otherwise identical. An interesting example of this is a downtown Manhattan garage. The westerly face, open to the river, is clean, sandy colored, new looking; the east, protected by neighboring high buildings, has been soiled by dirt and soot. Limestone buildings like those in Rockefeller Center show very well the way the surface is washed by the flow of water from one corner of a window sill, from a joint in a parapet, etc.; the effect of every little projection and recess is magnified into white streaks on a dark gray surface. The direction of the prevailing easterly wind which brings the rain can be determined by the patterns.

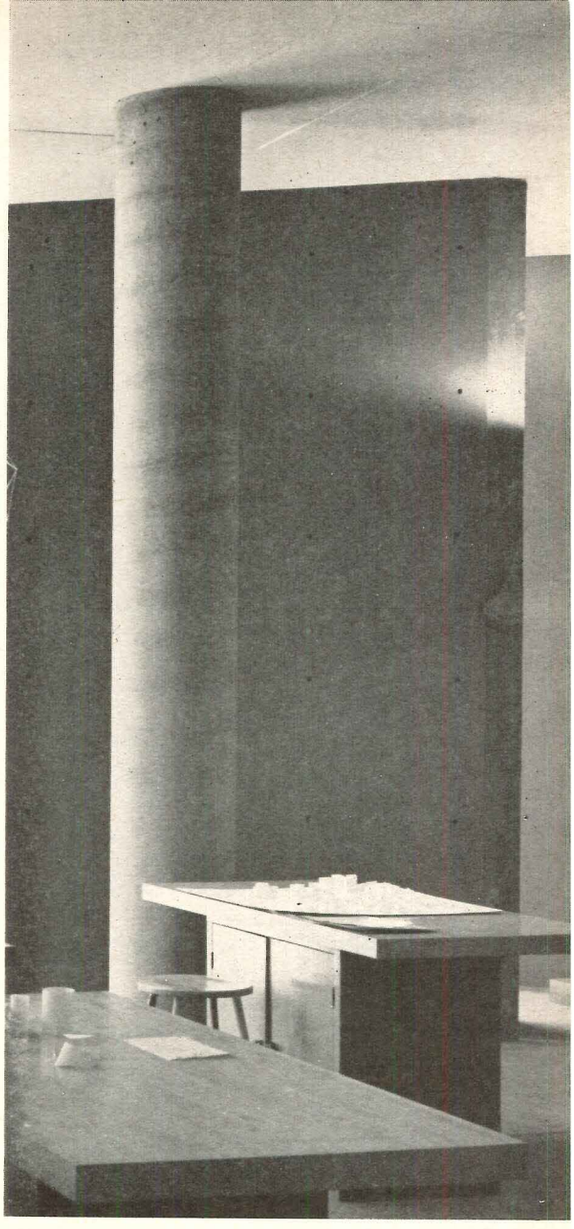
These are not meant as criticisms, but as facts of life which should be remembered during the design period. Without being scrubbed or steam cleaned every few months, a building never remains as crisp and uniform as it looked in the ink presentation drawings.

Special Considerations

It would be too much to expect that an architect could anticipate all of the aspects of a novel design. Poured-in-place concrete is a man-made material, manufactured not in the closely controlled environment of a mill like steel, but on the job, out in the weather. One cannot expect an inexperienced contractor to produce a good concrete building any more than one can expect a beginner to bake a good cake. Actually there are many points in common between baking and concreting!

If an existing building is not available as a reference standard for workmanship, tolerances and material quality (and one rarely is), the contractor should build a full-size sample bay at the site. This has been required for many jobs by such firms as Skidmore, Owings & Merrill, Eero Saarinen and I. M. Pei, and is worth many times its cost. Workers can become familiar with the detailing, formwork can be judged, rejected or accepted. The architect can check his details in sun and storm.

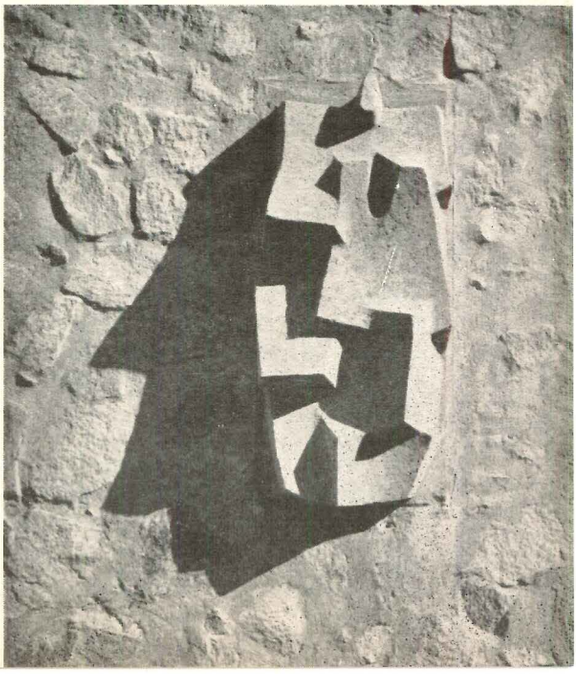
A cardinal principle for all exposed concrete work is uniformity of materials. The same cement, from the same mill and preferably from the same batching in the kiln, should be used throughout. All of the cement should be bought at one time and stored either on the job or at the ready-mix plant. The aggregate, fine and coarse, must also be constant in color and composition. While storage limitations might preclude stockpiling enough sand and gravel for a whole building, one should make certain that the pits contain enough material. The same strength concrete should be used throughout, if the appearance is to be uniform. For exposed exterior walls in cold climates this should be 5,000 psi concrete with 4½ to 7 per cent air entrainment, depending on aggregate size (the smaller the coarse aggregate the higher the percentage). For



Joseph W. Molitor photos

Figure 1: Contact finishes produced by formwork: (1) helical lines left by fiberboard tubes on columns; (2) form tie holes in walls; (3) nibs made by joints between panels

Figure 2: Concrete sculpture is set like an enormous piece of aggregate in a wall of pre-packed concrete built by placing coarse aggregate into forms and then forcing in grout



parts of the structure which are separated by function or location, different strengths may be acceptable in spite of slight differences in appearance. No one can see the interior columns on the 10th floor at the same time as those on the second. A slab could vary in color from a wall.

The architect and engineer must have inspectors on the job at all times during concreting, in addition to air-entrainment specialists and formwatchers provided by the contractor. Besides checking the placing of concrete and its quality, they can make sure that the essential operation of curing is properly carried out. The concrete must be kept constantly wet for at least five days. This should mean puddling of the upper surface and allowing the water to trickle over the face of all beams and walls; soffits will be sufficiently wet as long as the bottom forms are in place.

Dictionary of Surface Textures

There is no limit to the variety of textures which can be given to a cast concrete surface. Some have been used frequently enough or are of sufficient interest to form part of a classified system which may be useful as reference.

Coatings (stucco, paint, plastic films, etc.) are not included here. Silicone treatments, of course, can be used without affecting the appearance, but should not be needed for high strength air-entrained concrete. Only contact surfaces and exposed aggregate surfaces are listed, each one in approximate order of increasing roughness. The textures of contact surfaces are somewhat similar to intaglio sculpture, those of exposed aggregate to bas relief. In one the deviations from the idealized surface are inward, in the other, outward.

No distinction is made here between precast and cast-in-place concrete. Generally speaking, precast panels can be made thinner, more precise (for erection) and smoother than cast-in-place. Exposed aggregate surfaces achieved with retarders or aggregate transfer are simpler with pre-cast.

Since it is impossible to show the full effect of surface white photographs, the most reliable illustrations for this dictionary should be looked for in actual buildings, locally constructed.

Contact Surfaces

Listed from smooth to rough:

1. Glass fiber reinforced plastic forms give a glassy smooth surface. Since the principal danger is honeycombing, extensive vibration, both internal and external is required. Vacuum-formed thermoplastic form liners are also used for special sculptural effects.

2. Plastic sheeting gives the same type of smooth finish as plastic forms, and brings the same danger of honeycombing. Used as a form liner for a vertical surface, it will tend to hang in folds like drapery. It has generally been used as a bottom form in tilt-up construction, sometimes with rocks or pebbles placed underneath to create what is known as "dimpled concrete."

3. Plaster, extensively used before plastics as a form liner to create ornamental and sculptured effects, gives a smooth surface. P. L. Nervi uses concrete or ferro-cemento forms to obtain the same type of uniform finish.

4. Plastic-faced plywood imparts a very smooth surface to concrete, but the joints between plywood panels will inevitably show.

5. Tempered hardboard can be used as a form liner or as the form itself with closely spaced stiffners. Either the smooth side or the screen side can be put in contact with the concrete. It is also available for ribbed and waffle slabs.

6. Metal forms are usually of steel, but aluminum and magnesium are also possible. The finish is smooth, but the oiling of the forms must be carefully done so that it will not build up unevenly or stain the concrete. Used as wall panels, the joints become a design problem. Metal is most frequently employed for forming circular columns and for ribbed and waffle slabs.

7. Fiberboard is almost as smooth as steel, but not reusable. Helically wound fiberboard cylinders are good for circular columns. Diaphragm-reinforced fiberboard boxes are available for ribbed and waffle slabs.

8. Plywood is one of the most versatile form materials. The "wild grain" of Douglas fir will be transferred to the concrete surface, and so will the joints. Rougher textures can be obtained with striated plywood or with plywood which has been sandblasted to emphasize the difference between the spring and summer growth.

9. Wood boards can give a more uniformly "over-all" textured appearance than plywood because of the larger number of joints. All of the textures of wood siding or wood paneling can be reproduced in the concrete. Boards constitute the simplest, most successful form material where a moderately rough texture is desirable. Hundreds of examples exist.

10. Rubber sheeting, fastened in the form as a liner, is a simple method for achieving relatively fine flutings, criss-crossings and dot patterns. Caster oil will prevent adhesion to the concrete, although water alone may be sufficient. Only a very few patterns are currently available; a run of 45,000 sq ft is necessary to pay for a new pattern.

11. Wood flutings and ribs can transfer larger scale linear patterns to the concrete.

12. Sculptured inserts can be fastened to the face of the form to create irregular and deep patterns. In one building the architect cut up thick strips of foamed insulation and made a wall of vertical ribbons, each undulating in a direction perpendicular to the wall. Actual pieces of sculpture can be placed in the form to remain as part of the wall.

Beyond this degree of roughness, we are not dealing with textures anymore but with the whole pattern of a facade.

Exposed Aggregate Surfaces

In order of increasing rugosity:

1. Grinding and polishing are processes for achieving the smoothest surfaces with exposed aggregate. It is a kind of terrazzo finish and is expensive. Granite and quartz aggregates should generally be avoided because of their hardness, increasing

the cost of grinding, but they do take a high polish.

2. Sandblasting can be done either dry or wet to remove the surface of the concrete as deeply as one wishes. By using stencils or other masking devices the surface can be sculptured. It can be done right to the corner. Shot blasting is a similar process in which shot or other abrasive is recovered, separated from the concrete dust and re-used. These processes can produce textures varying from quite smooth to very rough, depending on how much cement paste and fine aggregate is removed and on the ratio of fine to coarse aggregate.

3. Pre-packed concrete, also called pre-placed aggregate, grout intrusion concrete or Naturbetong, is a process in which the large aggregate is placed in the forms first so that it touches the face of the boards, and the grout is then forced through pipes to fill the interstices. Covered by Norwegian patents, it is relatively expensive. The texture is as rough as the coarse aggregate; the spaces between will be as smooth as for form boarding. The best known example is the wall chosen by Eero Saarinen for the Morse and Stiles Colleges at Yale.

4. Bush hammering with electric or pneumatic hammers gives a moderately rough texture by removing the surface in ⅛-in. layers. The effect is usually to lighten the color. Bush hammering will not hide all joints and imperfections in the formwork. There is a danger of starting fine cracks in the concrete. Arrises at corners must be left untreated or they will chip off unevenly. They can most easily be treated as recesses by nailing strips of wood at the corners of the forms. Chiseling and tooling are similar processes, but, since the work is done by hand, more delicate effects can be achieved, but at greater expense. Eero Saarinen used bush-hammering for the T.W.A. Flight Center at the Kennedy International Airport and also with limestone aggregate for the Dulles International Airport.

5. Chemical retarders provide the most inexpensive method of exposing the aggregate. On horizontal top surfaces they can be easily brushed on. On vertical surfaces it is difficult to apply an even coat; at least one manufacturer sells an impregnated felt which can be fastened to the face of the form. As soon as the form is removed the surface of the concrete is washed and scrubbed down with stiff bristle brushes. The method is well tried. It should be used with gap graded concrete. Horace W. Peaslee's Meridian Hill Park in Washington is a good example which has stood up well for 30 years.

6. Aggregate transfer is another method of obtaining essentially the same type of surface as that given by the retarders. One-quarter-in. plywood panel form liners are used, covered with an adhesive into which the particles of aggregate are embedded. When the forms are removed, the aggregate is bonded more strongly to the cement than to the adhesive and the form liner can be pulled free. Obviously more expensive than a retarder when normal aggregates are acceptable on the surface, they are more practical when the architect wants to make a pattern or design with the aggregate or to use expensive stones, mosaic, glass, etc. The panel edge pattern must be studied.

7. "No fines" concrete will give a texture like a block of popcorn. Not suitable for exterior use in severe climates, it has intriguing possibilities as an interior finish. It is merely concrete made without fine aggregate, the cement acting as an adhesive to bond the larger stones at points of contact.

8. Hammered fluting is a very rough texture recently used by Paul Rudolph for the Art & Architecture Building at Yale. One-an-one-half-deep by 1½-in.-wide tapered flutings 2 in. o.c. are first cast into the concrete by nailing wood strips to the form boards; about ¾ in. of the projecting nibs are then knocked off by hand with 3 lb hammers.

CREDITS: *Figure 1:* Carpenter Center for the Visual Arts, Harvard University. Architect, Le Corbusier; collaborating architects, Sert, Jackson and Gourley. *Figure 2:* Morse and Stiles Colleges, Yale University. Architect, Eero Sarrinen and Associates; sculptor, Costantino Nivola. *Figure 3:* Transit Mixed Concrete Corporation, Pittsfield, Massachusetts. Architect, Prentice Bradley. *Figure 4*: Art & Architecture Building, Yale University. Architect, Paul Rudolph

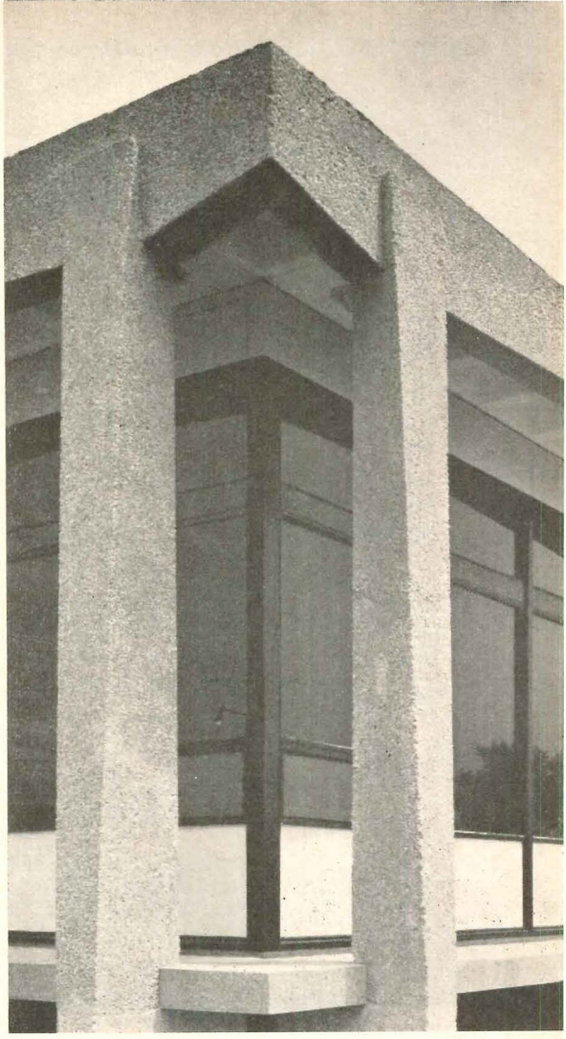
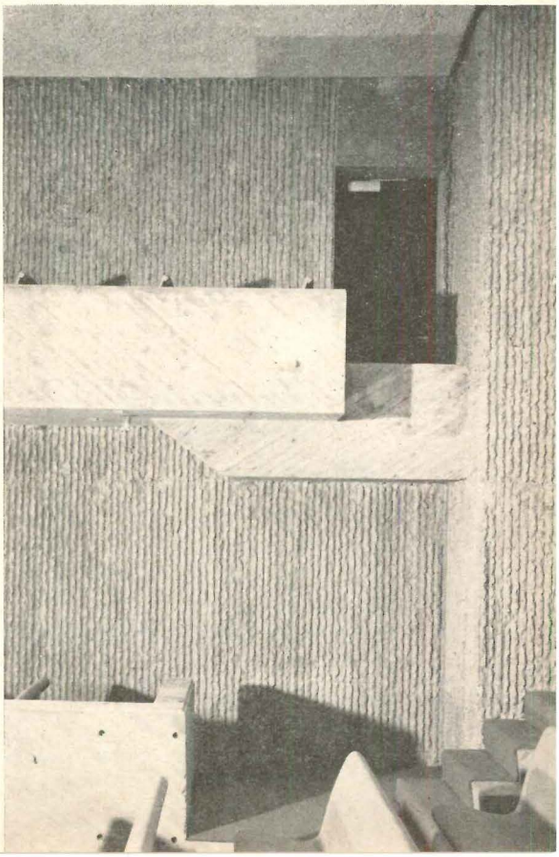


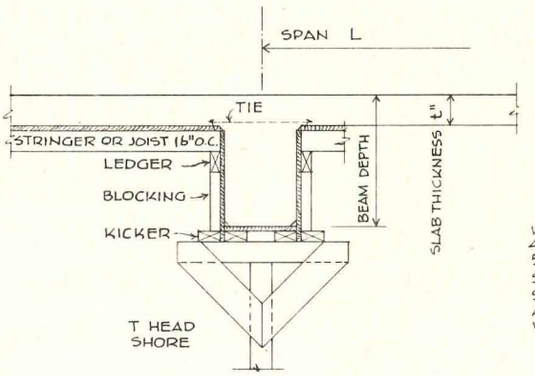
Figure 3: Exposed aggregate finish (marble chips) achieved by coating plywood forms with retarder and scrubbing surface the next day. Required some hand hammering to remove grout

Figure 4: Surface treatments include: (1) diagonal placement of 2-in. form boards on balconies and side seats; (2) the holes left by form ties; (3) hammering fluting on walls



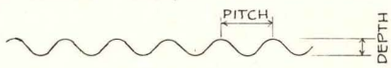
FORMWORK: 1-Slabs and Beams

By Seymour Howard, Professor of Architecture, Pratt Institute



	SIMPLY SUPPORTED	ONE END CONTINUOUS	BOTH ENDS CONTINUOUS	CANTILEVER (OVERHANG)
BEAM DEPTH	L/20	L/23	L/26	L/10
ONE-WAY SLAB	4" OR L/25	4" OR L/30	4" OR L/35	4" OR L/12
TWO-WAY SLAB	3½" MIN. OR PERIMETER/180			

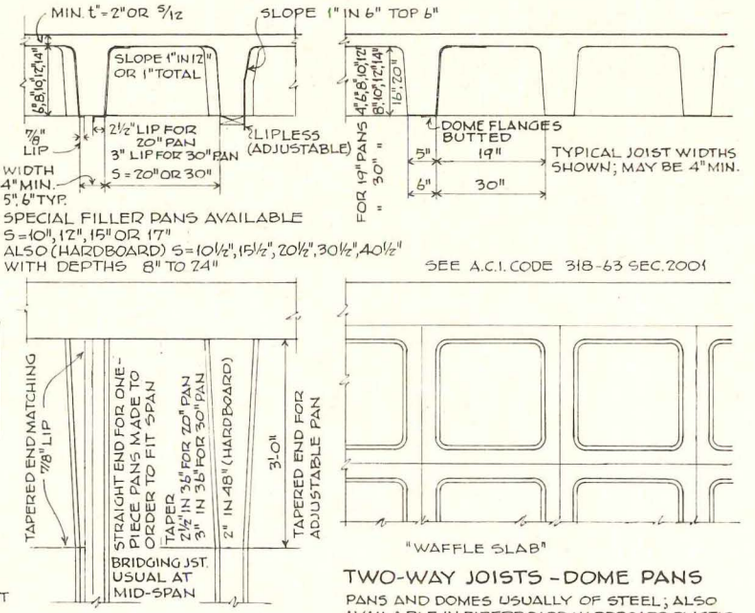
SEE A.C.I. CODE 318-63, SECS. 909 b AND 2007



CORRUGATED STEEL DECK USED AS PERMANENT FORM:
PITCH 2⅜" DEPTH 9/16" SPAN 3'-6" HEAVIEST ALSO USED AS
" 3½" " ⅞" " 5'-0" COMBINED FORM AND
" 4½" ± " 1⅝" ± " 8'-0" POSITIVE REINFORCEMENT

ONE AND TWO-WAY SLABS

TOLERANCES: SLAB THICKNESS +½" −¼"
(SAME AS LISTED ON "WALLS" SHEET)

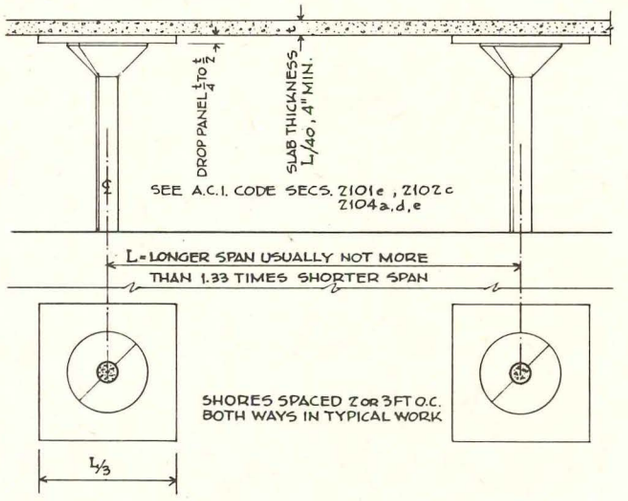


ONE-WAY JOISTS PANS

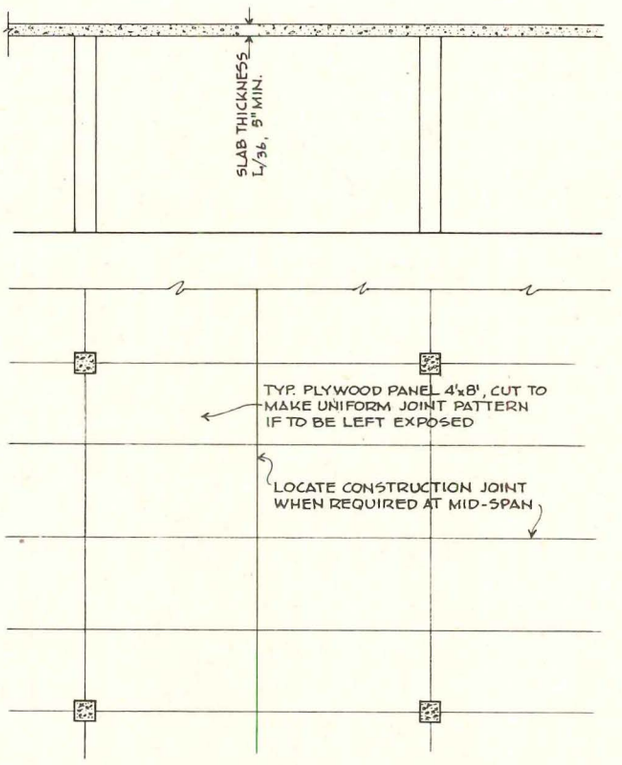
SIZES STANDARDIZED BY U.S. DEPT. OF COMMERCE
SIMPLIFIED PRACTICE RECOMMENDATION R87-32

TWO-WAY JOISTS - DOME PANS

PANS AND DOMES USUALLY OF STEEL; ALSO AVAILABLE IN FIBERBOARD, HARDBOARD, PLASTIC



FLAT SLAB (WITH DROP PANELS)

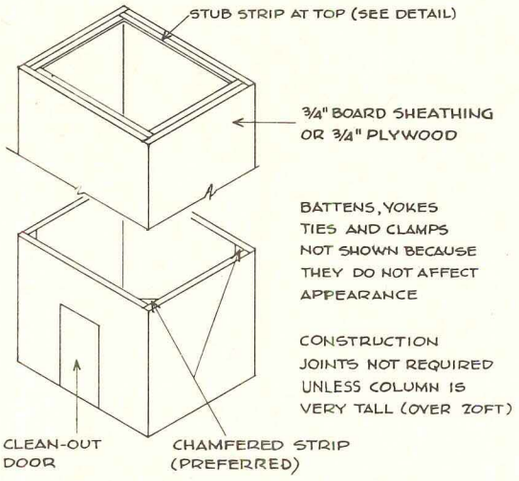


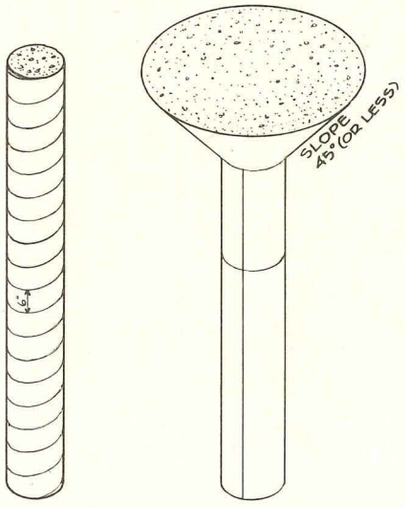
FLAT PLATE (FLAT SLAB WITHOUT DROP PANELS)

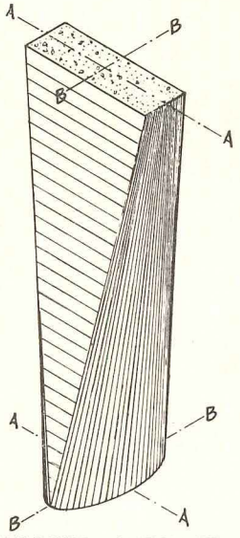
FORMWORK: 2-Columns

By Seymour Howard, Professor of Architecture, Pratt Institute

TOLERANCES SAME AS FOR WALLS







RECTANGULAR

MIN. DIMENSION: 8"x12" (A.C.I. 318-63)

TO SIMPLIFY DETAILING, MAKE DIMENSIONS MULTIPLES OF 2" TOLERANCES -¼", +½"

FOR ECONOMY IN CHANGING COLUMN SIZES HOLD THREE FACES PLANE, OFFSET ONLY ONE FACE

TWISTING OF FORMS IS DIFFICULT TO PREVENT CHECK VERTICAL ALIGNMENT OF CORNERS

CIRCULAR

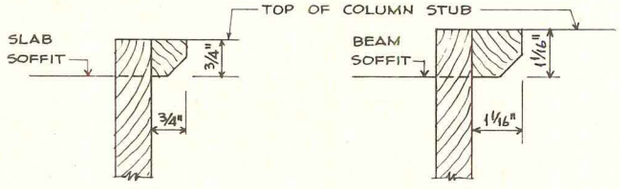
MIN. DIMENSION 10" ϕ (A.C.I.-318-63)

FIBER TUBE FORMS AVAILABLE IN EVEN INCH DIAMETERS FROM 6" TO 48" 8 FT LENGTHS (SOME 12 FT LENGTHS)

PREFABRICATED STEEL FORMS ARE MADE IN TWO OR THREE SEGMENTS LEAVING SEAM MARKS ON THE COLUMNS

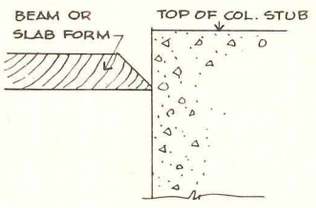
WARPED SURFACE

SECTION AT TOP RECTANGLE; SECTION AT BOTTOM ELLIPSE; AXES ROTATED THROUGH 90°; TWO FACES INCLINED PLANES; TWO FACES CONOIDS FORMED WITH NARROW SLATS BEVELED AND TWISTED



STUB STRIP DETAILS FOR SQUARE JOINT

COLUMNS ARE USUALLY FORMED WITH A STUB EXTENDING ½" OR MORE INTO SLAB OR BEAM, WHICH IS CAST LATER, USE OF A STUB STRIP AS SHOWN HERE HELPS TO ENSURE SHARP, STRAIGHT JOINT BETWEEN COLUMN AND SLAB OR BEAM ALTERNATIVELY, THE JOINT CAN BE CHAMFERED BY BEVELING THE END OF THE BEAM OR SLAB FORM

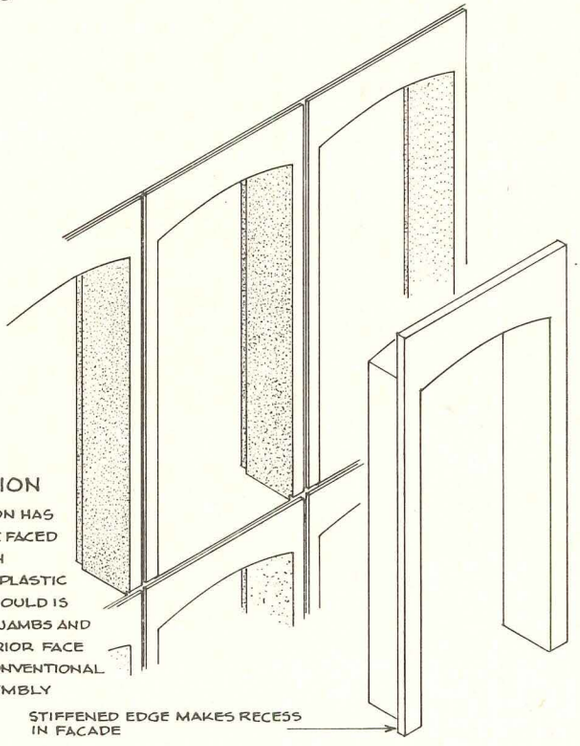


CHAMFERED JOINT

NOTCHING THE BEAM OR SLAB AT COLUMN FACE IS NOT RECOMMENDED BECAUSE STRUCTURE IS WEAKENED AT POINT OF MAXIMUM STRESS

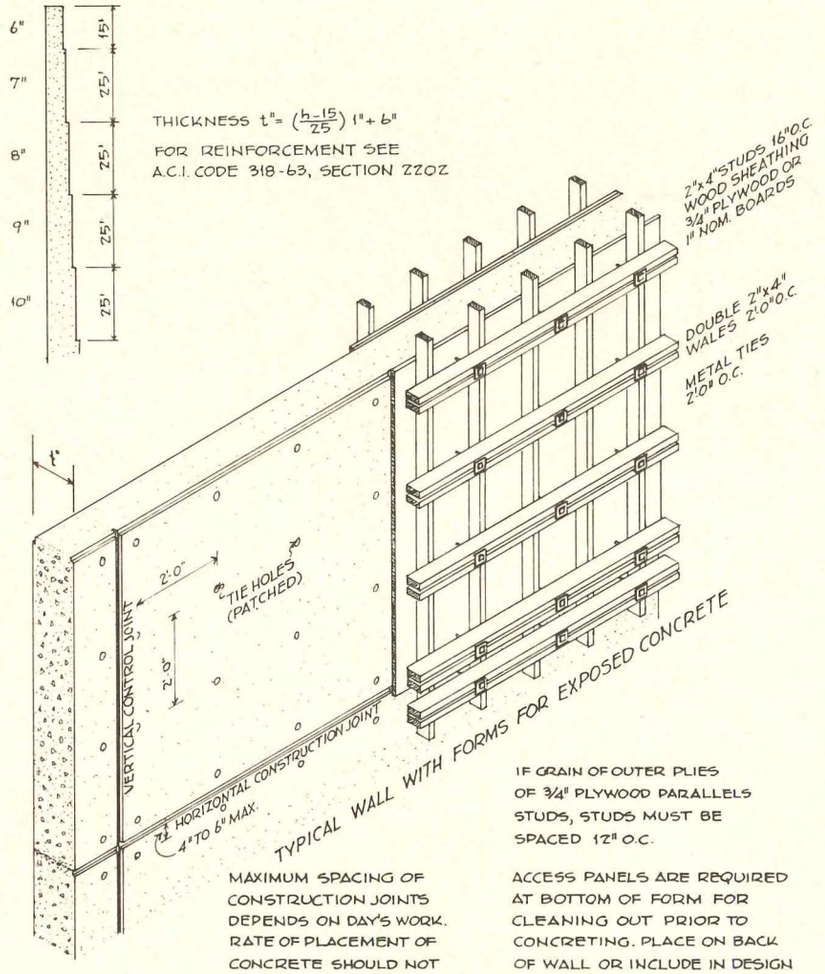
BEARING WALL OR STRUCTURAL MULLION

THIS TYPE OF CONSTRUCTION HAS BEEN FORMED WITH PLASTIC FACED PLYWOOD AS WELL AS WITH GLASS FIBER REINFORCED PLASTIC MOULDS AS SHOWN. ONE MOULD IS USED FOR EXTERIOR FACE, JAMBS AND SOFFIT, ANOTHER FOR INTERIOR FACE WOOD STIFFENERS AND CONVENTIONAL TIES COMPLETE THE ASSEMBLY



FORMWORK: 3-Walls

By Seymour Howard, Professor of Architecture, Pratt Institute

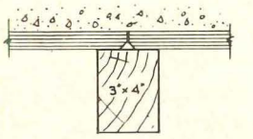


TYPICAL WALL WITH FORMS FOR EXPOSED CONCRETE

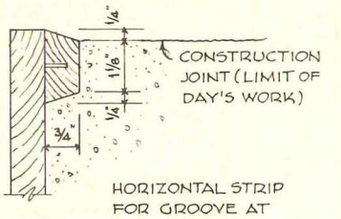
MAXIMUM SPACING OF CONSTRUCTION JOINTS DEPENDS ON DAY'S WORK. RATE OF PLACEMENT OF CONCRETE SHOULD NOT EXCEED TWO FEET PER HR.

IF GRAIN OF OUTER PLIES OF 3/4" PLYWOOD PARALLELS STUDS, STUDS MUST BE SPACED 12" O.C.

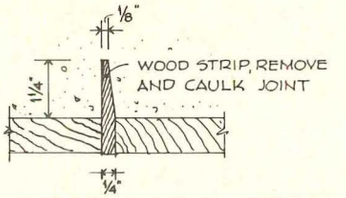
ACCESS PANELS ARE REQUIRED AT BOTTOM OF FORM FOR CLEANING OUT PRIOR TO CONCRETING. PLACE ON BACK OF WALL OR INCLUDE IN DESIGN



RECOMMENDED PLYWOOD JOINT MINIMUM CONTACT AREA FOR MAXIMUM TIGHTNESS



HORIZONTAL STRIP FOR GROOVE AT CONSTRUCTION JOINT



VERTICAL CONTROL JOINT

SPACE 25'-0" MAX., WALLS WITHOUT OPENINGS SPACE 20'-0" MAX. AND IN LINE WITH ALL JAMBS FOR WALLS WITH OPENINGS.

TOLERANCES

	IN 10 FT	IN ONE BAY (20 FT. MAX.)	ABSOLUTE MAX. (IN OVER 40 FT.
OUT OF PLUMB (WALL)	±1/4"	±3/8"	± 3/4"
" " " (VERTICAL JOINTS)		±1/4"	± 1/2"
OUT OF LEVEL		±1/4"	± 1/2"
PLAN LOCATION (WALLS)		±1/2"	± 1"
WINDOW OPENINGS			± 1/4"
THICKNESS			+1/2", -1/4"

BENDING RADII FOR CURVED WALLS

	ACROSS GRAIN OF OUTSIDE PLY.	PARALLEL GRAIN OUTSIDE PLY
1" (NOM) BOARDS (HORIZ.)	-	11'-5"
1" " " (VERTICAL)	POLYGONAL	-
1/4" FIR PLYWOOD	1'-3"	2'-0"
3/8" " "	3'-0"	4'-6"
1/2" " "	6'-0"	8'-0"
5/8" " "	8'-0"	10'-0"
3/4" " "	10'-0"	12'-0"
1/4" HARDBOARD	2'-1"	2'-1"

DRAFT

ALL STRIPS FOR GROOVES AND JOINTS AND ALL FORM LINER ELEMENTS (WOOD, PLASTER, METAL OR PLASTIC) FOR DECORATIVE OR WATER SHEDDING MOLDINGS, ETC., MUST HAVE ADEQUATE DRAFT OR SLOPE TO ENSURE EASY STRIPPING. 1 TO 3 DESIRABLE. 1 TO 12 MINIMUM

SIZES OF FORM MATERIALS

PLYWOOD: 4'x8' SHEET USUAL. MANY PREFABRICATED PANEL FORMS ARE BASED ON 2 FT. WIDTH BY 4', 6', 8' LENGTHS

BOARD FACE WIDTHS. (ADD ABOUT 1/16" FOR JOINT)

NOMINAL WIDTH	DRESSED SQ. EDGE	DRESSED & MATCHED	SHIPLAP
4"	3 5/8"	3 1/4"	3 1/8"
6"	5 5/8"	5 1/4"	5 1/8"
8"	7 1/2"	7 1/4"	7 1/8"

SOUTHERN YELLOW PINE OR DOUGLAS FIR MOST USUAL. TANNIN IN SOME WOOD MAY WEAKEN CONCRETE. REDWOOD LIKELY TO STAIN SURFACE.

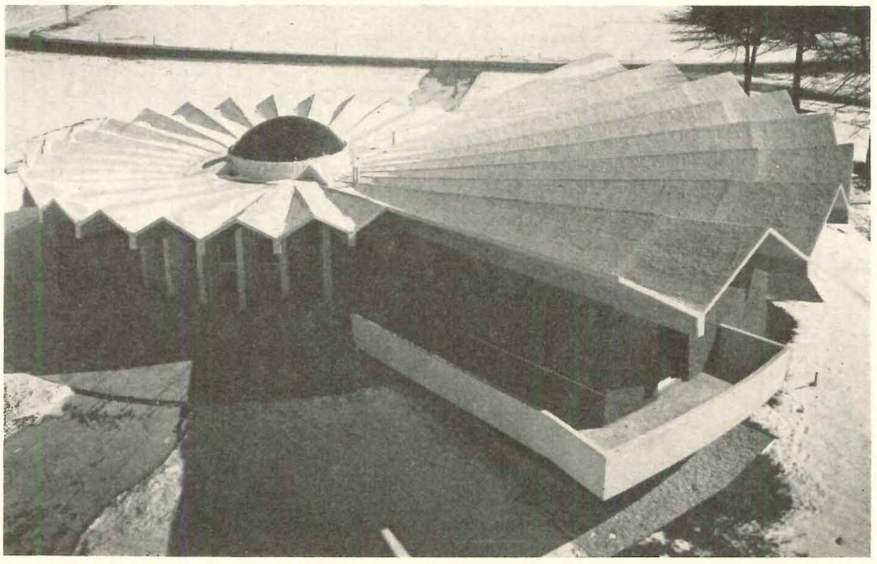
BOARDS WIDER THAN 8" NOT RECOMMENDED; LIKELY TO CUP
2" BOARDS ARE USED FOR SMALL AREAS
TOP THREE FORM BOARDS BELOW CONSTRUCTION JOINT SHOULD NOT BE PLACED UNTIL REST OF FORM HAS RECEIVED 12 HOUR SOAKING. RIP THESE THREE TO ONE THIRD HEIGHT BETWEEN LAST FULL WIDTH BOARD AND CONSTUCTION JOINT.

CONSTRUCTION OF TWO LARGE PLASTIC BUBBLES

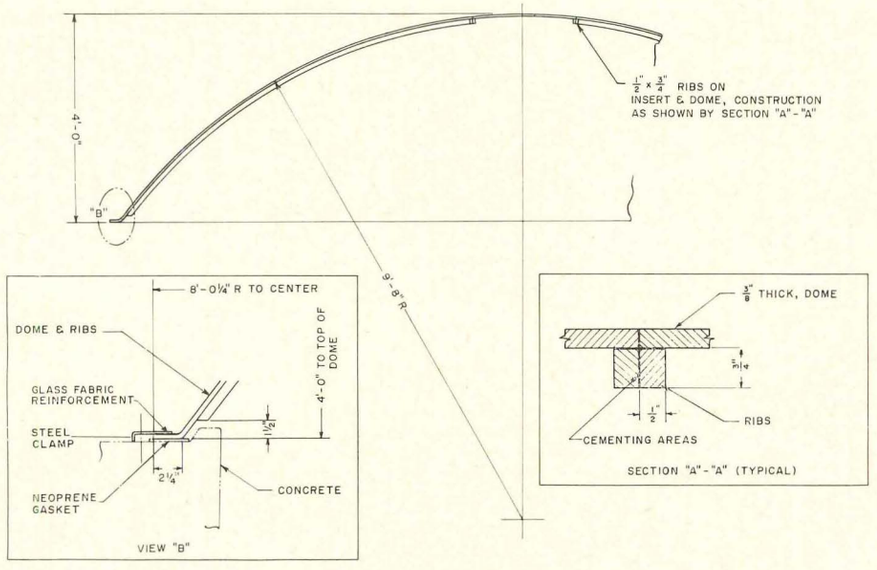
Two of the largest self-supporting acrylic plastic domes to be fabricated in this country have been used to provide special effects in two new buildings, the Physics Lecture Hall Building at Rutger's University, New Jersey, by McDowell-Goldstein, Associated Architects, and the New York State Pavilion at the World's Fair, by Philip Johnson.

In the university building, the 16-ft-diameter dome covers the center of a two-story rotunda building, which forms a lobby to the lecture hall itself. The dome is visible from both levels, and the gray-tinted transparent acrylic plastic cuts glare without diminishing the effectiveness or clarity of the sky view.

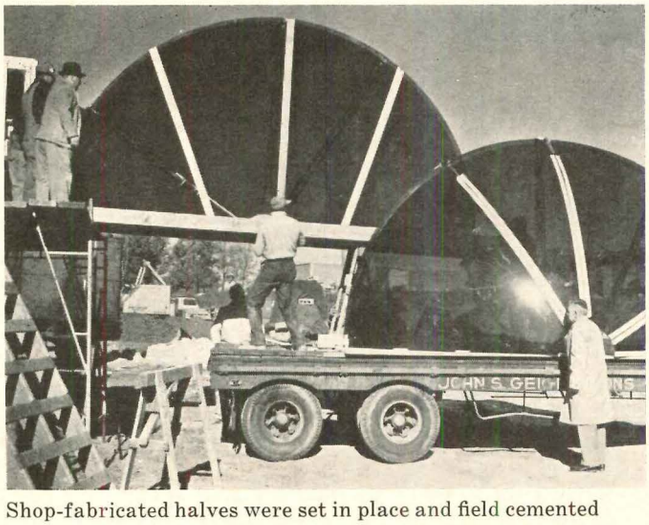
The dome, which weighs about 1,500 lb and is 4 ft high, was formed from 10- by 12-ft, ⅜-in.-thick sheets of transparent acrylic plastic, cut roughly to size and then heated to forming temperature. Placed on built up forms, they were clamped and allowed to cool to shape. The calculated bending radius of 9 ft 8 in. determined the "orange peel" shape of the segments, which were formed to a flange at the bottom. The architect specified that there should be eight sections, four of 30 and four of 60 deg; ¾- by ½-in. clear ribs were inserted at the adjoining edges to give greater rigidity to the dome and a larger contact area for cementing. A polymerizable cement was used to join the sections together. This was used in preference to a solvent cement as it is quick setting and does not require annealing for strength.



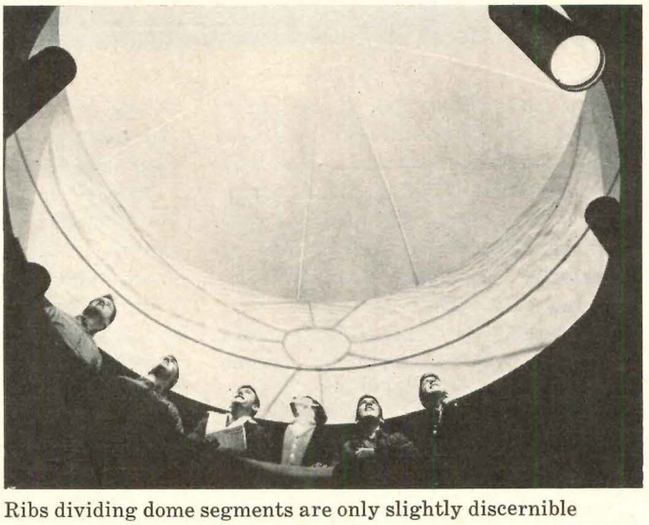
Lobby of Physics Lecture Hall is capped by a 16-ft diameter acrylic plastic dome



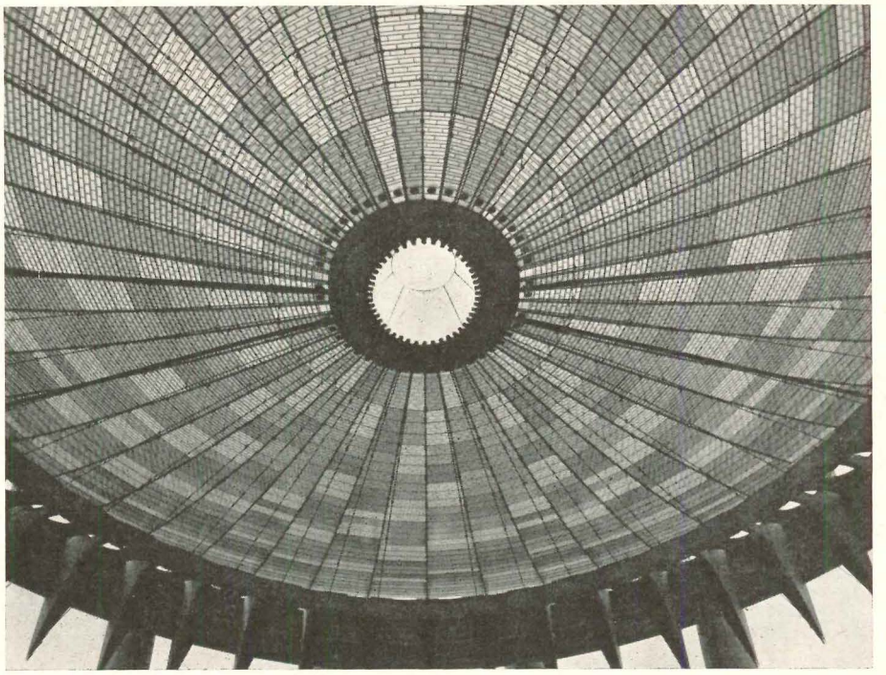
Details of dome attachment and of ribs which provide more cementing area



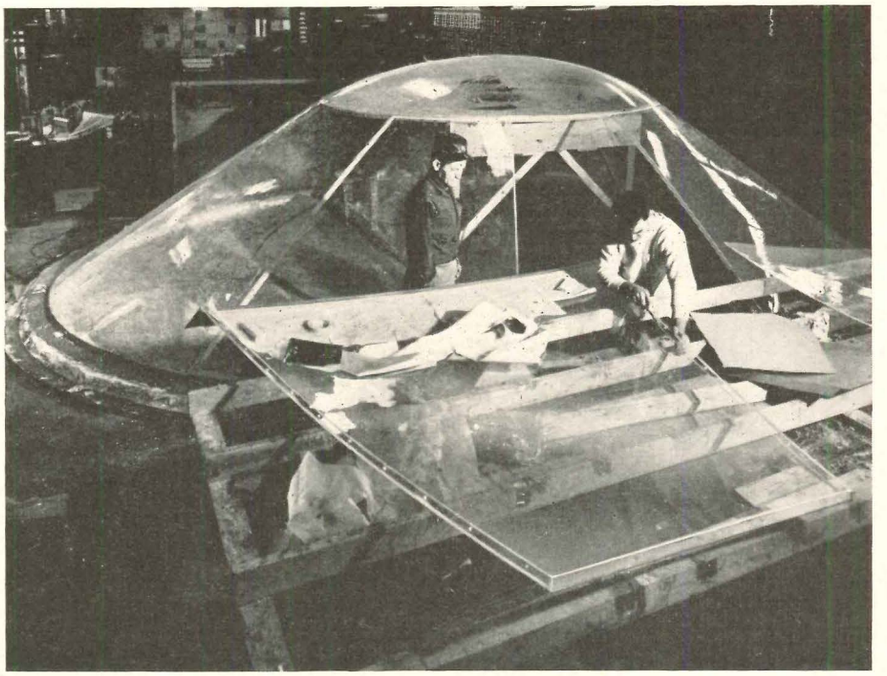
Shop-fabricated halves were set in place and field cemented



Ribs dividing dome segments are only slightly discernible



Plastic dome forms an "oculus" in the roof of the New York State Pavilion at the New York World's Fair. It covers the opening left by the steel tension ring which restrains the roof cables at the center of the suspended roof



The oval shaped acrylic dome has an elliptical base with a 27-ft major axis and a 19-ft minor axis; height is 6 ft. It was formed from 10 side sections and one top section, bolted together on ½- by 1-in. plastic ribs

The dome was shipped to the site in two quarter sphere sections and was lifted manually into place. The 2-ft diameter hole at the top of the dome, formed by cutting the apex of each segment, was sealed in the field by cementing a circular disc into the opening. The flange of the dome is held in place by steel clamps bolted to the concrete sill. The bolts do not penetrate the acrylic plastic.

From the outside, with the masking tape removed from the joint areas, the dome has a dark, almost opaque, gleaming appearance, which forms an effective central focus for the rough surfaced concrete plate roof surrounding it.

The New York State Pavilion at the World's Fair is capped by a transparent, oval shaped acrylic plastic dome which has an elliptical base with a 27-ft major axis and a 19-ft minor axis. The height of the dome is 6 ft.

The 10 side segments were hot formed of ¼-in. clear acrylic sheet, and the top section was free-blown from ⅜-in. sheet. The sections are bolted together on ½- by 1-in. continuous plastic ribs. In this case, bolting was found to be a more convenient process than cementing, and could be used without ill effect, since the height of the building is such that the bolts cannot be seen by people looking up at the dome.

The acrylic plastic sheets were manufactured by Rohm and Haas Company, Philadelphia. The Rutgers University dome was fabricated by Crewe Plastics Inc., Newark, New Jersey, and the New York State Pavilion dome by Universal Unlimited, Glen Cove, New York.

1. EICHLER SUMMIT — San Francisco

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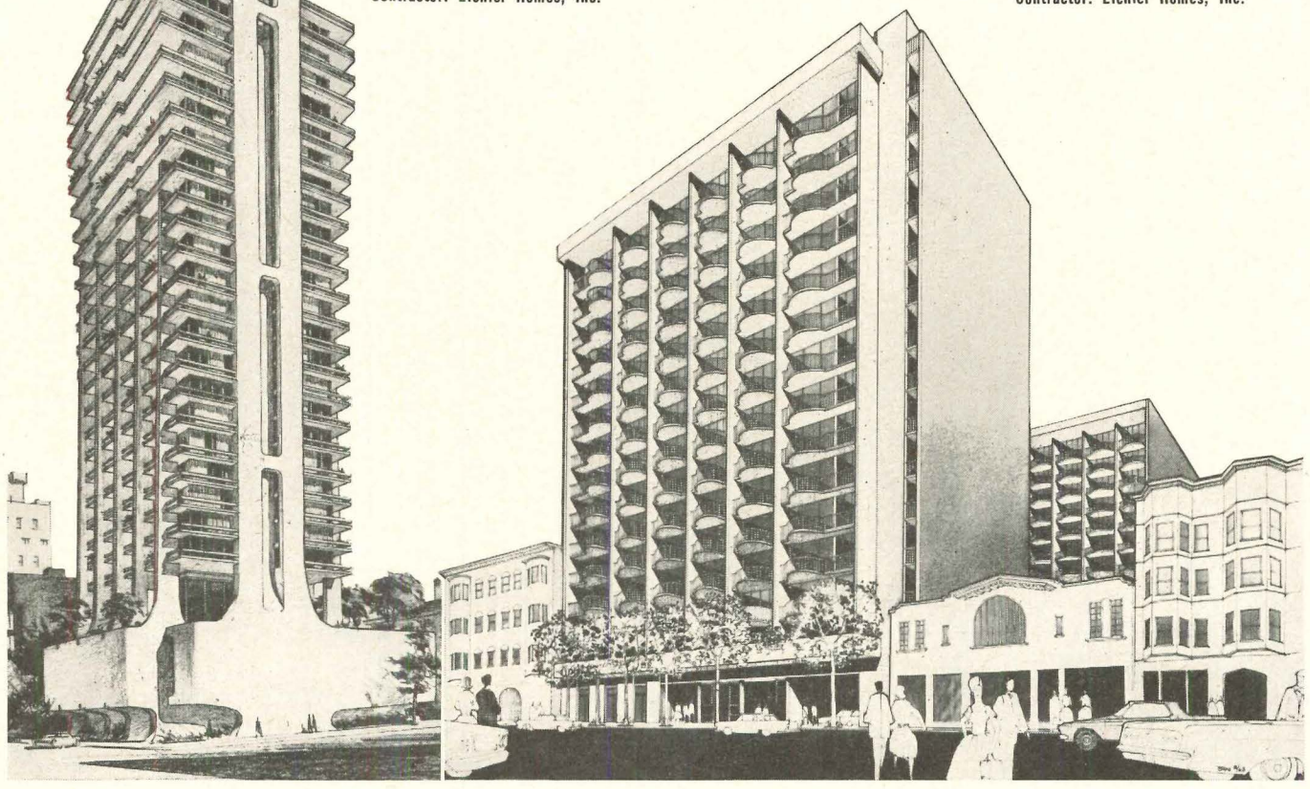
Architects: Neill Smith & Assoc.; Claude Oakland, Associate Architect
Structural Engineer: Stefan J. Medwadowski
Contractor: Eichler Homes, Inc.

2. EICHLER CENTRAL TOWERS — San Francisco

Owner: Eichler Homes, Inc.
Architect: Claude Oakland, A.I.A.
Structural Engineer: T. Y. Lin & Associates, International
Contractor: Eichler Homes, Inc.



COLUMN-FREE AREAS (1), SLIP-FORMED WALLS WITH POST-TENSIONED SLABS (2) ACHIEVED USING PRESCON SYSTEM

THE EICHLER SUMMIT 30-story apartment building has completely column-free living areas. It is thought to be the highest reinforced concrete structure west of Chicago. The 10″ floor slabs are post-tensioned by PRESCON tendons, with bays 35′ x 104′. The first six floors are for parking and the lobby. An unusual design feature includes the tapering-in of the upper part of the nine columns while the post-tensioned floor slabs cantilever out, so that the structure flares outward and is wider at the top than at the bottom.

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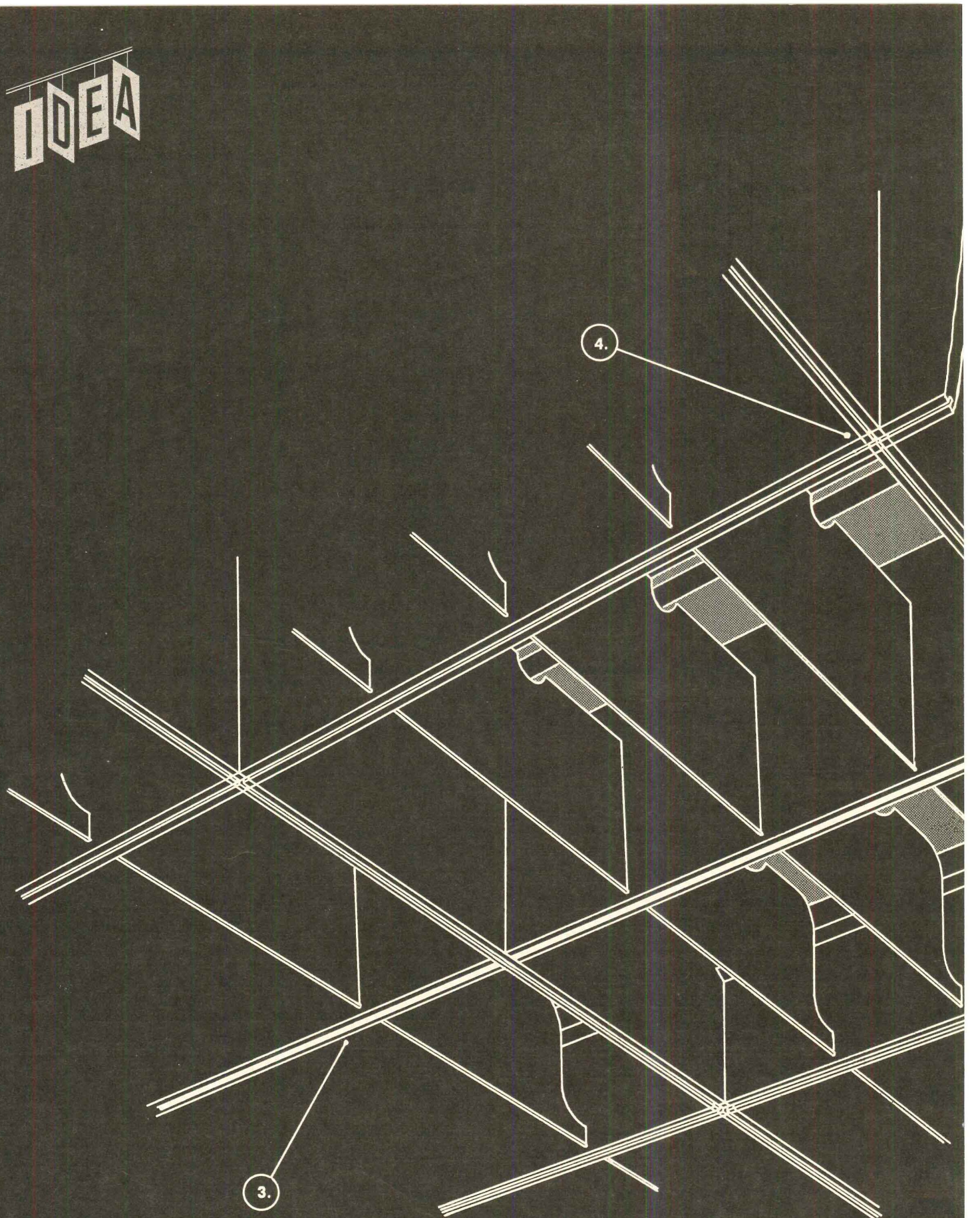
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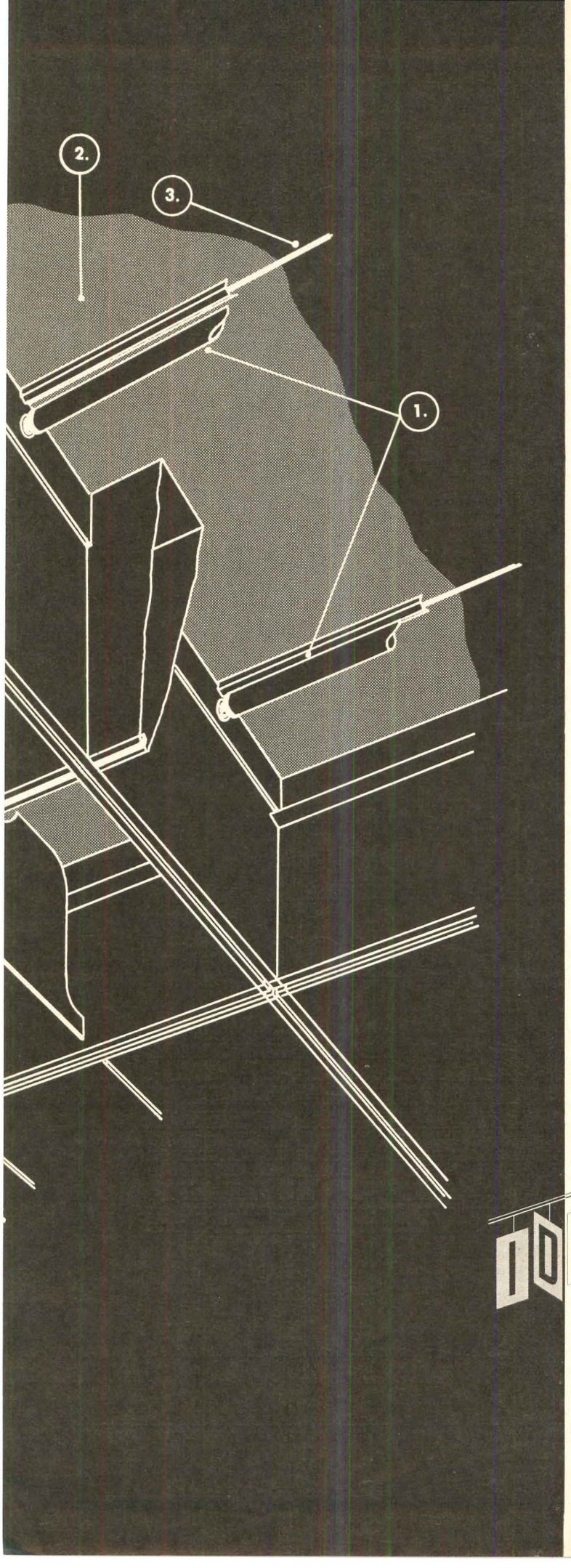

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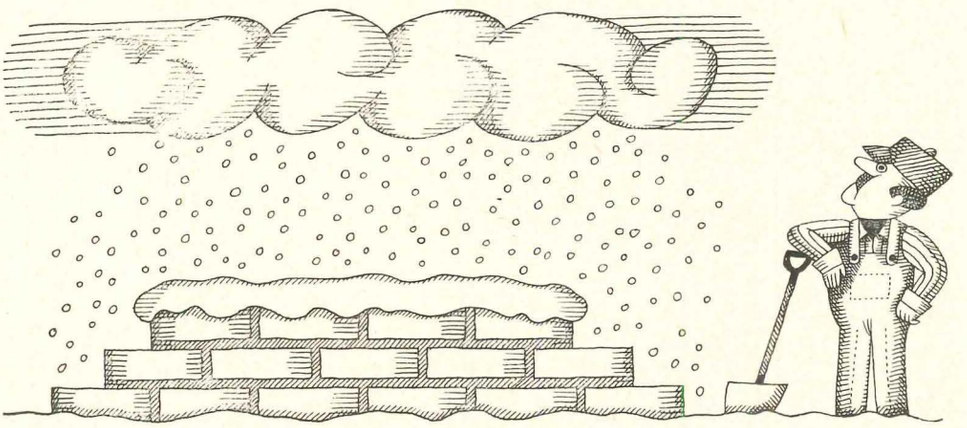
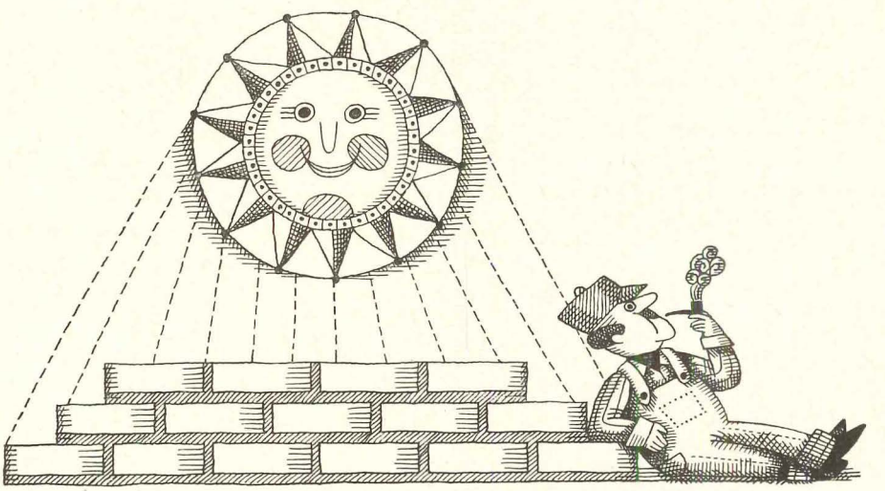


No weather woes



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APPLICATION OF A ONE-PLY ROOFING SYSTEM

By Dr. Ernest G. Long, Chief of Roofing Section, Johns-Manville Research and Engineering Center

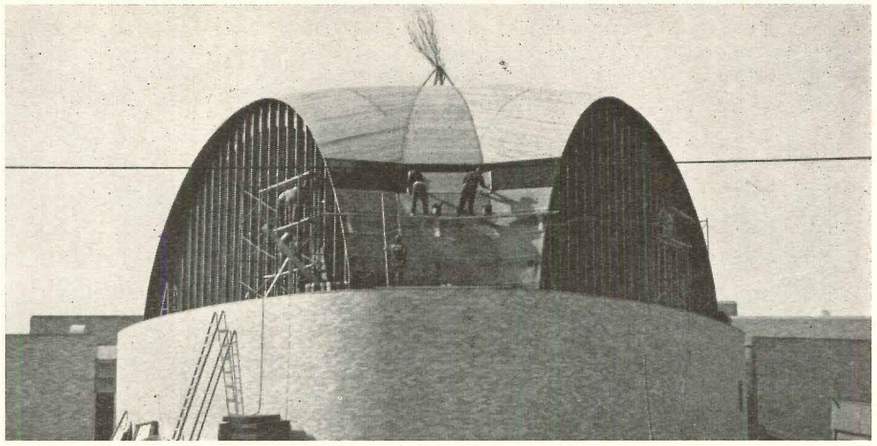
Roofing materials are no longer in a status quo situation. A whole new generation of materials has been developed to match the numerous changes taking place in the design and construction of roofs, and in construction practices themselves. Three of the most pressing needs have been to: (1) simplify and thus speed up and improve the quality of field application of roofing materials; (2) provide materials suitable for practically any shape, slope or type of roof; (3) offer increased resistance to both mechanical and thermal stresses. Other important qualities desired by architects include resistance to extreme weathering elements, ease of repair, simplification of roof specifications, attractive appearance, good fire rating and reasonable cost.

In response to these demands, Johns-Manville introduced a one-ply roofing membrane called Last-O-Roof which uses polyisobutylene as the key raw material. This material was subjected to exhaustive accelerated weather tests at our research center, and test roofs were applied in all types of climate from Florida to Alaska. Also, over 10 years experience with polyisobutylene in Germany has offered no evidence of deterioration or surface degradation.

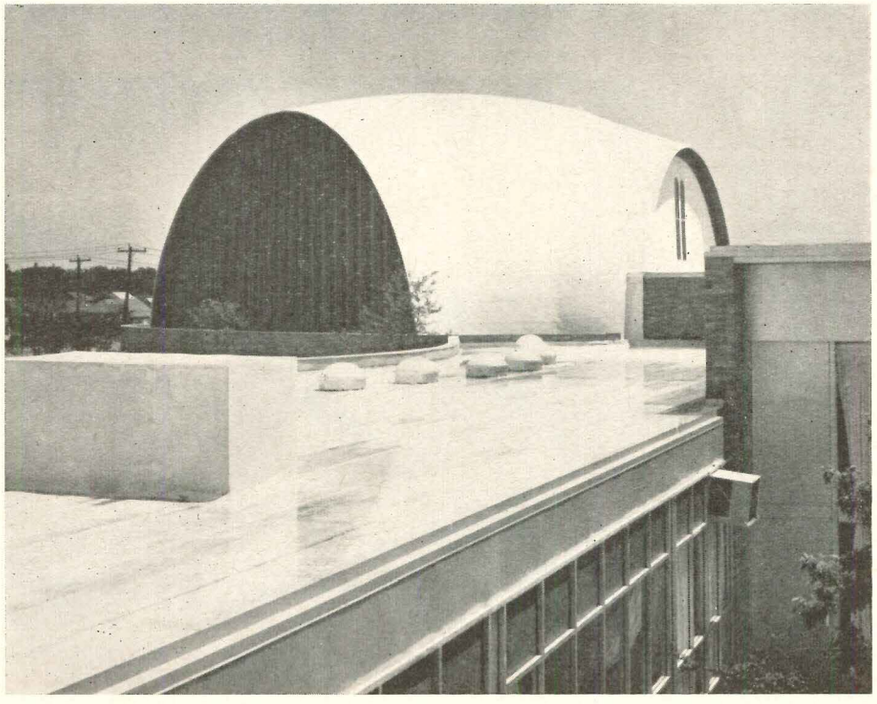
The new system comprises four basic components: a primary roofing membrane, flashings, adhesives and a liquid finish coating. The primary roofing membrane is a flexible laminate which comes in roll form. The upper exposed surface is a heavy film of polyisobutylene, 0.030 in. thick. The under surface is a rubbery latex-bonded asbestos felt, 0.025 in. thick, designed to improve handling properties and improve adhesion of the roofing membrane to the roof deck. The rolls are each 36 in. wide and contain enough roofing to cover 150 sq ft.

Two flashing membranes are provided. The primary flashing membrane consists of an extra heavy layer of polyisobutylene laminated to glass fabric. A second flashing membrane is polyisobutylene but omits the reinforcement to permit the film to be stretched for special fitting work such as around vent pipes.

Three grades of adhesives are provided, all based on polyisobutylene. The first is a pourable adhesive which may be applied by hand using

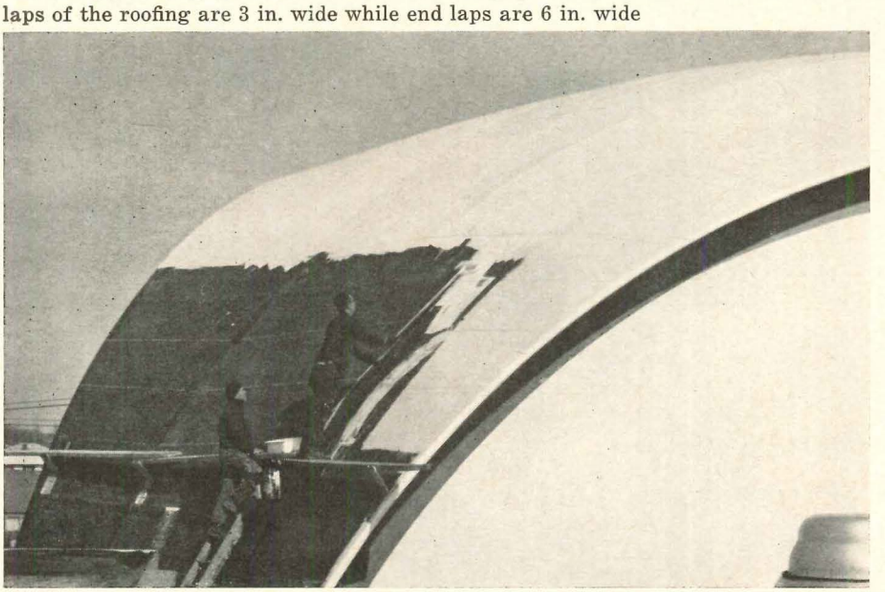


One-ply membrane of polyisobutylene bonded to asbestos felt is roofing for both the steep-sloped vaulted section as well as the flat roof surface of the Sephardic Temple, Cedarhurst, N. Y. Bertram L. Bassuk, architect; Julius Stein, associated architect. Photo (*above*) shows roofing being laid over insulation board



Substrate irregularities should be minimized since they may "telegraph" through roofing. Here insulation board was nailed to wood deck; adhesive is troweled on

The one-ply roofing is laid in the full coat of polyisobutylene-based adhesive. Side laps of the roofing are 3 in. wide while end laps are 6 in. wide



Finish coat of roofing over the wood vaulted shape is a vinyl-acrylic formulation. In this case the coating is white. Roofing contractor was Triple M Roofing Co.

a pouring can or automatically from an applicator on wheels, and is used on roof decks up to 2 in. per ft slope. The second has asbestos fibers added for reinforcing and flow control, can be applied by brush or mechanical equipment, and is used for decks with slopes of from 3 to 6 in. per ft and for sealing the laps on all slopes. The third is of extra heavy consistency for application by trowel and is used for cementing flashings in place and for adhering the one-ply membrane to roofs having slopes over 6 in. per ft.

The finish liquid coating is a vinyl-acrylic formulation which is available in white, aluminum and three pastel colors. The coating can be applied to the roofing membrane by roller or spray.

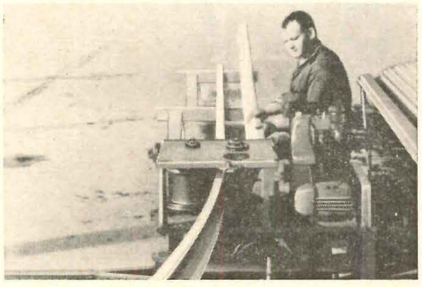
The system is bondable for up to 20 years except for the finish coating. This is easily renewed should the color fade after a number of years.

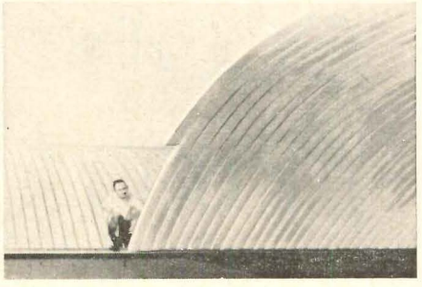
Experience from actual installations indicates some precautions that should be taken to insure optimum results:

1. The laps of roofing must be fully sealed with adhesive. This is essential with any one-ply system. (The membrane is applied with 3-in. side laps and 6-in. end laps).
2. The surface of the substrate is of major importance in the finished appearance of the roof, since surface irregularities can "telegraph" through.
3. Simplicity of the system may encourage carelessness on the part of applicators. If any sharp objects are left on the roof during application and are stepped upon, the membrane may be punctured. Even though the puncture is easily repaired, the appearance of a "patch" may be undesirable.
4. Any unusual configuration should be carefully studied for application procedure—particularly where the roof performs an esthetic function. In some cases architects have carefully worked out lap patterns to insure an organized appearance. This is more important when the roof is seen from nearby; at a distance the laps will not be obvious. The layout of lap patterns should take into consideration the length of rolls so that materials will not be unnecessarily wasted.

For more information circle selected item numbers on Readers Service Inquiry Card, Pages 371–372

STRUCTURAL ARCH CEILING AND DECK IN ONE OPERATION

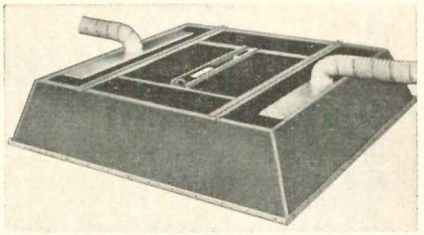


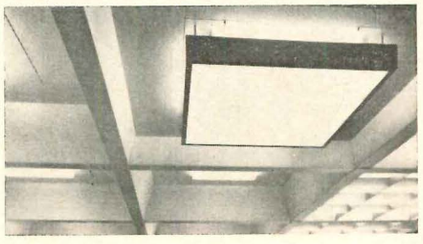


Self-supporting sheet metal arches spanning up to 40 ft with 30 lbs per sq ft live load can be field assembled from 6-in.-wide, 2-ft-deep U-shaped steel sections, which are perforated for acoustical properties and have a baked vinyl enamel finish on the underside. The top of each leg of the U is designed to slide and interlock with the leg of the adjoining section to provide a complete roof assembly. The material is cut to the specified length in the plant and is shipped in straight sections to the site where it is curved to the radius of the arch. A man sitting on the main arch supporting beam operates a pair of power driven rolls which grip the bottom of a section and push it across the arch interlocking it into the preceding section. Conventional insulation may be used. *Donn Products Inc., Westlake, Ohio*

CIRCLE 300 ON INQUIRY CARD

MODULAR CEILING SYSTEM



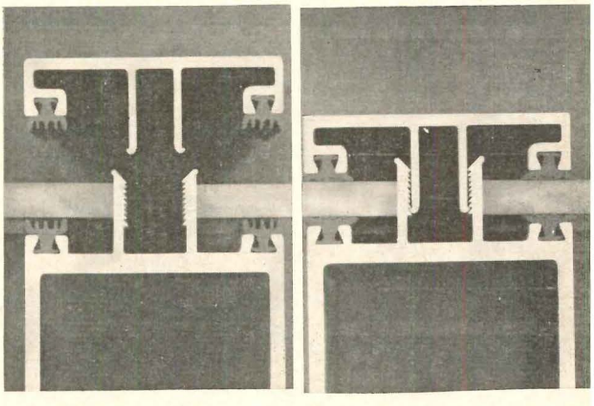


Planned to meet the demand for maximum flexibility in building interiors, the *ALKConditioned* integrated modular system is made up of individual lighting coffers that each incorporate the functions of lighting, air conditioning, heating, ventilation, insulation and acoustical control. Each coffer unit is factory assembled, and may be suspended from structural framing or other suitable overhead structures. When installed, special channels formed at the module line of each coffer provide for wall partitioning. Because each coffer is a complete, self-sufficient unit system, the partitioning arrangements of room layouts may be changed at any time without major construction changes in the location of lighting, heating, ventilating and other supply outlets.

A variety of types and shapes of lighting coffers are available. The module size can be varied to meet individual requirements. *Alkco Manufacturing Company, 4224 North Lincoln Ave., Chicago, Ill.*

CIRCLE 301 ON INQUIRY CARD

SELF-LOCKING ALUMINUM EXTRUSIONS



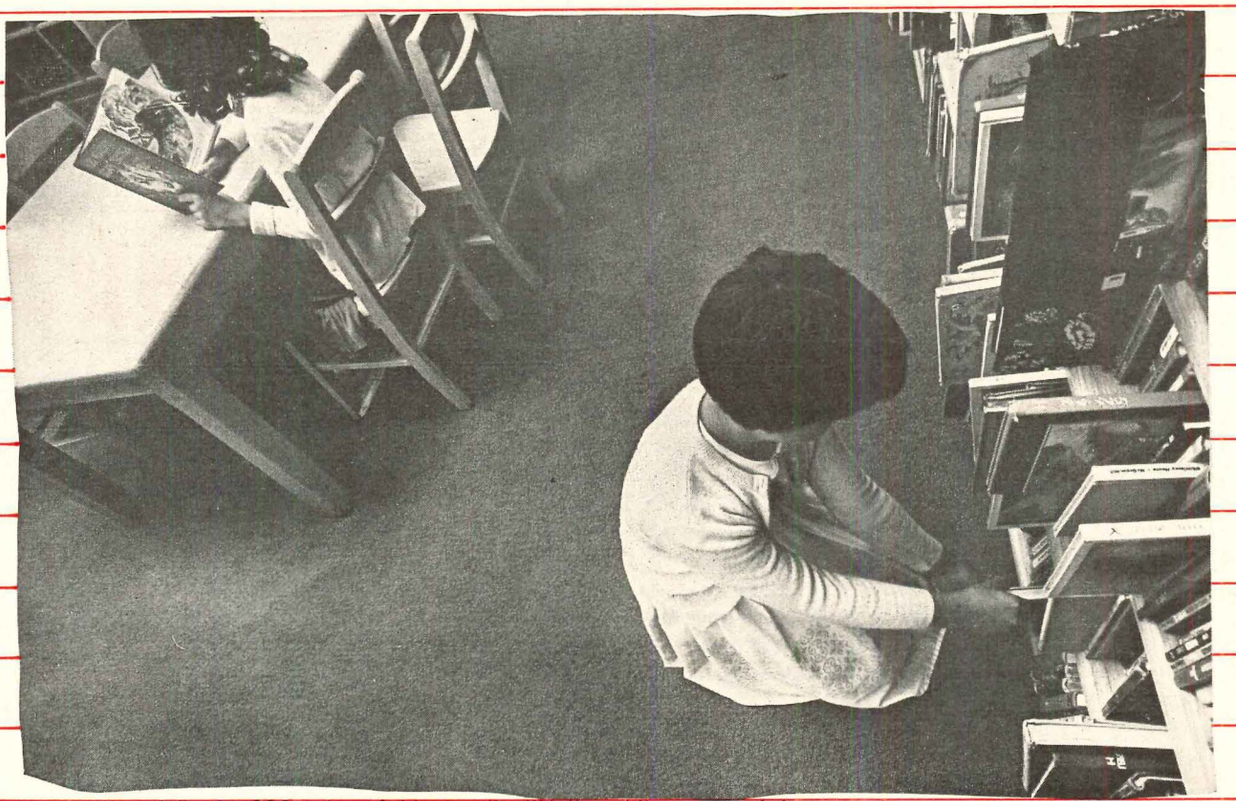
Designed for ease of handling and quick installation, the *Ratchet* aluminum extruded building system has a wide range of applications, including low-rise construction for skin or curtain walls, slab-to-slab construction for any height building, commercial and industrial construction, as well as interior partitions, light openings and store fronts.

This new concept in glazed wall systems employs a precision extruded ratch and pawl design, which when attached with a sharp tap of a rubber mallet, locks itself together. A weather bar makes the system weather tight. There are no exposed screws or fastenings. *Amarlite, Division of Anaconda Aluminum Company, P.O. Box 1719, Atlanta, Ga.*

CIRCLE 302 ON INQUIRY CARD

more products on page 276

A progressive school gets an economics lesson from Caprolan.



Q. What's 600 yds. of Masland's "Nylbrook" carpet of Caprolan® nylon doing in the halls, library, and gym of the new A.M.Kulp Elementary School in Hatfield, Pa.?

A. Saving 25% on heating, more on maintenance—and cutting out an entire costly wing.

"Muffles sound so," says Supervising Principal Colwell Carr, "we were able to use central corridor space, right next to the library, for our gym. No walls, just carpet, borders the area. With only a three-quarter partition sectioning off the library, not a sound gets through."

Second only to summer vacation in keeping halls and library noise-free, rugged Caprolan adds beauty and comfort that a whole school-full of cavorting quiz kids can't subtract.

Next time, specify carpet of 100% continuous filament Caprolan nylon. For further information write: Fiber Marketing Dept., Allied Chemical Corp., 261 Madison Ave., N.Y. 16, N.Y.

carpets of caprolan nylon by Allied Chemical

For more data, circle 116 on Inquiry Card

For more information circle selected item numbers on Reader Service Inquiry Card, pages 371–372

UNIT VENTILATORS FOR SCHOOLS

Catalog No. 1100 contains 104 pages describing and illustrating Schemenauer's *60 Series* unit ventilators and accessory cabinets. The catalog includes specification data, dimensional information, construction features and complete capacity and performance ratings. *Schemenauer Mfg. Co., Holland, Ohio*

CIRCLE 400 ON INQUIRY CARD

INDUSTRIAL COATINGS CATALOG

The new Steelcote catalog includes for the first time a complete section on surface preparation for steel and concrete for various types of exposure. The specifications given in this section are standards for the coatings industry and may be used regardless of brand or type of coating system applied. The catalog also incorporates a set of tables of engineering data and square foot cost comparisons for selection of optimum performance metal primers, wall and floor coatings. Another new feature of the catalog is a chart of specifications on the preparation of various types of surfaces for adhesive application, and glue line thicknesses when using epoxy adhesives. *Steelcote Mfg. Co., St. Louis, Mo., 63103**

CIRCLE 401 ON INQUIRY CARD

STEEL SHELVING

Stainless steel *Main Line* shelves, suitable for a wide variety of uses, are featured in a 12-page catalog. Schedules of shelf sizes and basic assembly instructions are given as well as specifications for all models. *Southern Equipment Company, P.O. Box 7115, St. Louis, Mo.**

CIRCLE 402 ON INQUIRY CARD

SERVICE FITTINGS CATALOG

An eight-page illustrated catalog gives details of floor service fittings for use with underfloor cable distribution systems. Included are items for new installation and expansion of telephone, intercom and electric services in existing buildings. *T. J. Cope, Collegeville, Pa.*

CIRCLE 403 ON INQUIRY CARD

REMOVABLE CORE LOCK CYLINDERS

Details of different models of the Yale removable core lock cylinder are given in an illustrated four-page brochure. The new models are said to provide a high degree of security and to simplify removal of the cores from the lock for rekeying or replacement. Sizes and details of interchangeability of the different types of cores are included. *The Yale & Towne Manufacturing Company, Yale Lock and Hardware Division, White Plains, N.Y.**

CIRCLE 404 ON INQUIRY CARD

SOUND CONTROL BOOK

"Basics of Sound Control" contains three major sections on the nature of sound, its transmission and effects; the principles of sound control in architecture and building; and specific applications of these principles. Although not designed as a textbook on the physics of sound, the book is intended to give architects and builders basic information to assist them in the design of acoustically satisfactory buildings. *United States Gypsum Company, 101 South Wacker Dr., Chicago, Ill.*

CIRCLE 405 ON INQUIRY CARD

HOOD AND FAN CATALOG

An extensive range of coverage hoods and ventilating fans is fully described and illustrated in a 20-page catalog. Specifications and installation drawings are included for all models. Two pages at the back of the booklet are devoted to drawings and details of 16 fan and hood accessories obtainable from the company. *Miami-Carey Division, The Philip Mfg. Co., Middletown, Ohio*

CIRCLE 406 ON INQUIRY CARD

CRAWLER TRACTORS

The *Case 1000 D* series of crawler tractors is featured in a new catalog which describes the wide variety of uses to which the drawbar tractor, loader, angling dozer or power tilt dozer can be put. Diagrammatic drawings are included, as well as details of some of the component parts. *J. I. Case Company, Racine, Wis.*

CIRCLE 407 ON INQUIRY CARD

INDOOR MERCURY LAMP BALLASTS

Complete engineering data on the company's line of indoor mercury lamp ballasts, including the new *Econo-Merc* autotransformer-type constant wattage mercury lamp ballast, is given in a 24-page manual. Rapid-selector charts give specific information on primary and secondary voltages, input watts and current, minimum starting temperatures, sizes and weights. Illustrations include product photos, wiring diagrams and dimensional sketches. *Jefferson Electric Company, Bellwood, Ill.*

CIRCLE 408 ON INQUIRY CARD

U FACTOR BULLETIN

The Holland Plastics Company has prepared a U Factor Formula Bulletin to assist architects, engineers and heating and cooling firms in estimating U Factors for complete wall systems. More than 50 different building materials have R Factors listed which can be added together in any combination, then divided into a reciprocal of 1, to reach a U Factor for the wall. Examples are given to show how the formula and list can be used. *Holland Plastics Company, Gilman, Iowa*

CIRCLE 409 ON INQUIRY CARD

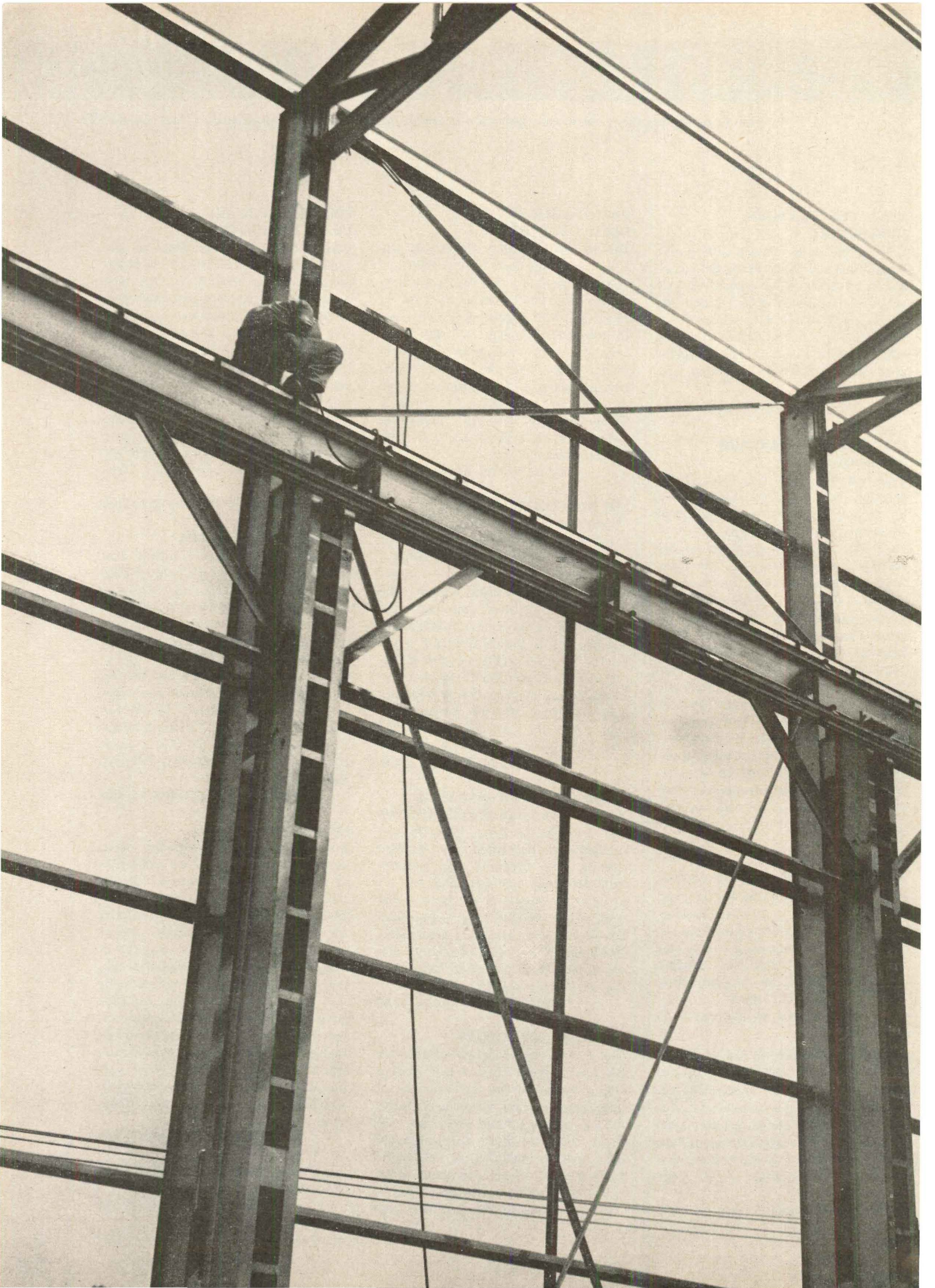
FIBER GLASS FANS

An eight-page engineering data guide No. 176 covers Aerovent's line of 100 per cent fiber glass automatic roof ventilators and tubeaxial fans. These fiber glass units are designed for use in highly corrosive atmospheres, and the bulletin includes a complete table of corrosive materials, with nomenclature and corresponding fiber glass performance in ventilating equipment for situations involving each type. Cut away drawings give precise construction details and installation data; special performance tables are also included. *Aerovent Fan Company, Inc., Piqua, Ohio*

CIRCLE 410 ON INQUIRY CARD

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

more literature on page 314



STEEL'S SYMBOL
OF STRENGTH, LONG
LIFE AND ECONOMY

Builder saves 26 tons—$8,000 using J&L lightweight structurals

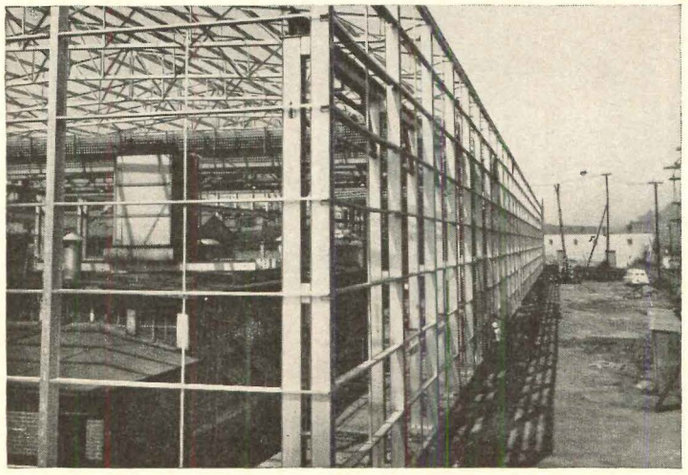
Extensive use of J&L Junior Beams cut costs substantially in a building constructed for Kanawha Manufacturing Company, according to J. C. Morton, Assistant Chief Engineer for Holston Steel Structures, Inc.

He said: "Each of the composite crane and building columns were fabricated from four 12″ Jr. Beams weighing 11.8# per foot. Completed, the composite column weighs 2,100 lbs. compared to the formerly required standard steel column weighing over 3,000 lbs. For purlins and girts we used Junior Beams."

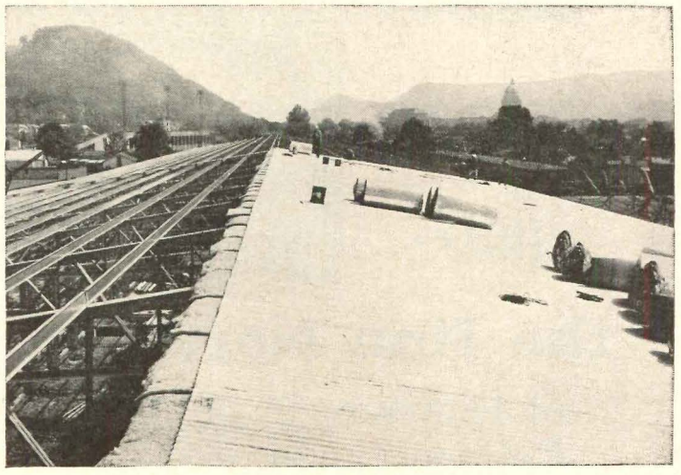
Bill Setzer, Holston Executive Vice President, added, "We specialize in custom-made structural steel buildings. This is a highly competitive field. Therefore, we constantly look for new and more economical design, fabrication and erection methods. J&L lightweight structurals give us a wide building scope—that's why we use them whenever possible."

You, too, can enjoy similar savings with J&L lightweight structurals. They are easy to adapt to a wide range of architecture.

For information on J&L lightweight sections, call your nearby J&L sales office, or write: Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh, Pennsylvania 15230.



J&L lightweight structural steel used in the composite crane and building columns reduced the steel weight by 26 tons.



Junior Beam roof purlins were covered with aluminized steel sheets.

Jones & Laughlin Steel Corporation

J&L STEEL

Two 12″ Junior Beams extend 38′ high to support the roof of the Kanawha Mfg. Co. industrial building, Charleston, W. Va. The inside two 12″ Junior Beams extend 28′ high to support the crane runway. Both J&L sections are joined together forming a composite column weighing 2,100 lbs. A single standard steel column would have weighed over 3,000 lbs.

For more data, circle 117 on Inquiry Card

Main reception hall, a primary corridor and gymnasium, Milwaukee-Downer College. Erected 1895-7. Architect A. C. Eschweiler, Milwaukee. Photographed December, 1963, by R. F. Hildebrand, Milwaukee.

•

MILWAUKEE-DOWNER COLLEGE, founded 1859, adjoins the young University of Wisconsin-Milwaukee's Downer Avenue campus. The latter swiftly-expanding institution has purchased the Downer College property and will occupy it during 1964, when Downer College moves to Appleton, Wis. as the undergraduate women's college of Lawrence University.

On duty since 1897!

the fine Northern Hard Maple floors

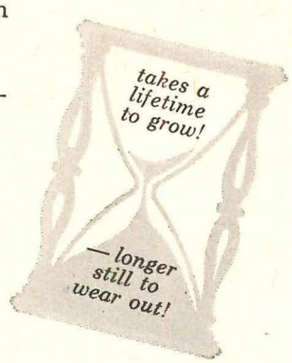
of Downer College

The countless footsteps of more than 67 years of student use haven't worn away so much as a measurable fraction of an inch from the bright, tight-grained northwoods maple of these Milwaukee-Downer College floors. They're still downright beautiful — a solid endorsement of the sound judgment of Architect Alexander C. Eschweiler (1865-1940), who specified them in 1896.

In that year the infant Maple Flooring Manufacturers Association had just begun to enforce uniform standards of seasoning, grading, precise milling and careful floorlaying, sanding and finishing — all with strict, industry-wide self-discipline. Today, the Association's mark, MFMA, pressed into the underside of genuine Northern Hard Maple, means all of that *and much, much more.*

The MFMA mark stands now for 67 years of experience — second and third generation know-how. Proper kiln-drying and moisture control are *musts.* MFMA research has greatly advanced floor installation and finishing techniques. Today's floors of Northern Hard Maple are *better than ever.* Their blonde, delicate grain is modern-to-the-minute. Their foot-friendly comfort, warmth and impact resistance are vital assets. They stiffen a structure enormously. Not only are they ideal for gymnasiums and ballrooms (universal first-choice!), but for classrooms, corridors, offices, professional suites, residences, textile mills, bakeries, electronics plants, Northern Hard Maple floors are a sound, economical specification.

Write for latest listing of MFMA-tested and approved floor finishing products and MFMA Specification Manual. See SWEET'S (13H-Ma).

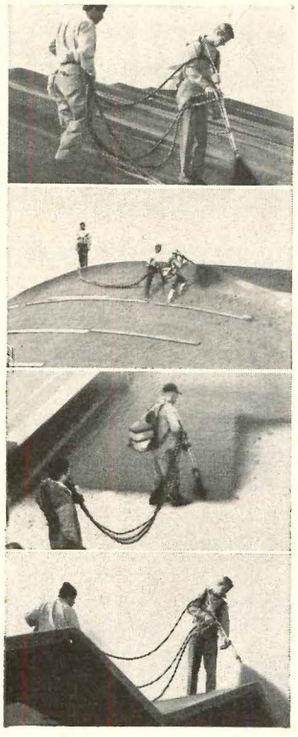


MAPLE FLOORING MANUFACTURERS ASSOCIATION
SUITE 1050 • 35 EAST WACKER DRIVE • CHICAGO, ILLINOIS • 60601

For more data, circle 118 on Inquiry Card

ROOF MAINTENANCE

comes out HERE!



FLINTKOTE® MONOFORM® ROOFING SYSTEM*

Special Monoform compounds meet in mid-air with chopped reinforcing glass fibers to form a tough, weather resistant monolithic protective membrane . . . that's how the versatile Flintkote® Sealzit® roofing gun works on all types of roof shapes, designs and most surfaces . . . over large areas, in small cul de sacs, around and under obstacles. UL approved for new construction, Class B, 20-year bondable application. The Flintkote Sealzit roofing gun is manufactured under one or more of the following U. S. patents: 2,813,751; 2,787,314; 2,933,125; 3,033,472; 3,039,702 and D-187,504. Other U. S. patents pending. Patented in Canada. World wide patents pending.

*U.S. PATENT APPLIED FOR

THE FLINTKOTE COMPANY
30 ROCKEFELLER PLAZA
NEW YORK, N.Y. 10020
or BOX 2218
TERMINAL ANNEX
LOS ANGELES, CALIF. 90054

Please send bulletin MS-23 on Flintkote Monoform Roofing System.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

I AM AN ARCHITECT ROOFER CONTRACTOR

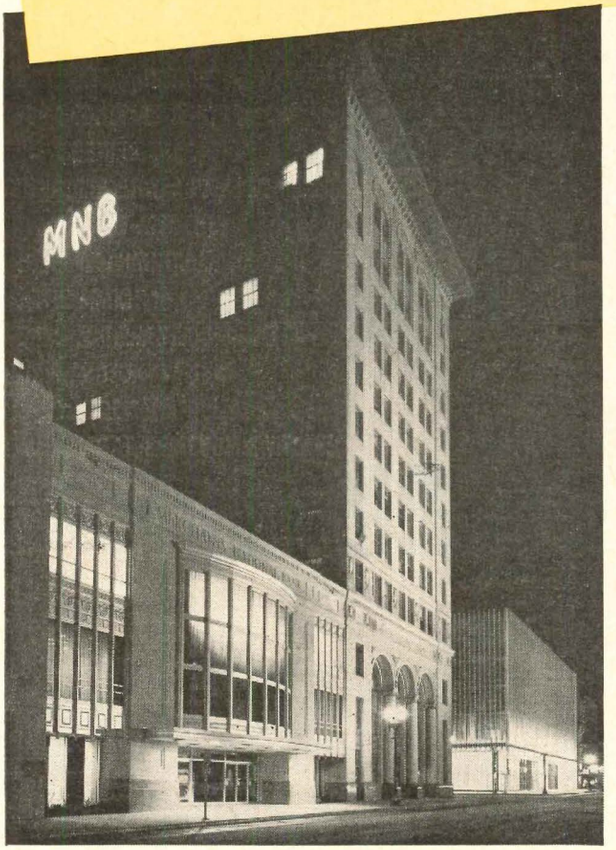
BUILDER, OTHER _____

AR-964

For more data, circle 119 on Inquiry Card

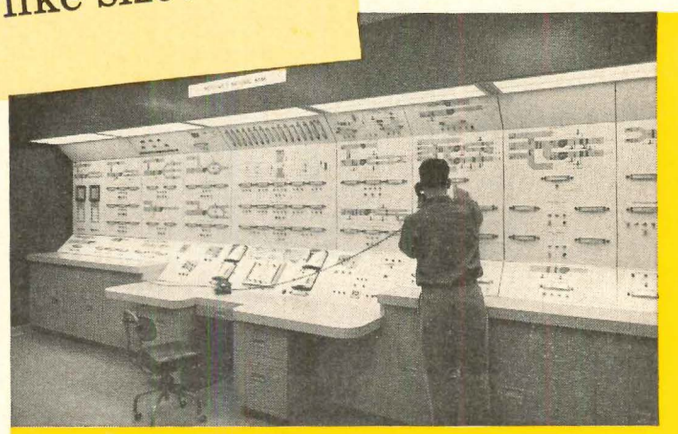
Square D--whereve

A 3-year building and remodeling program has brought customers of **THE MERCHANTS NATIONAL BANK of CEDAR RAPIDS, IOWA** more services and facilities than are provided by any other bank in the world in a community of like size!

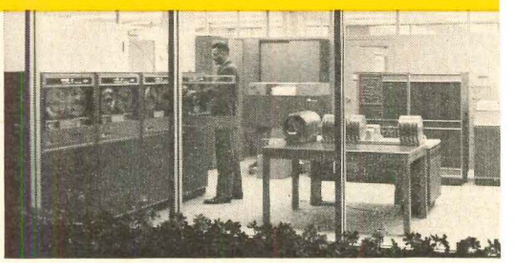


in foreground • New three-story addition to the Merchants National Bank. In background, the new Motor Bank with 156,000 sq. ft. floor space.

below • This master control station provides automatic, continuous monitoring of temperatures, humidity, heating and air-conditioning functions throughout every important area in the bank. It also provides smoke detection and door security.



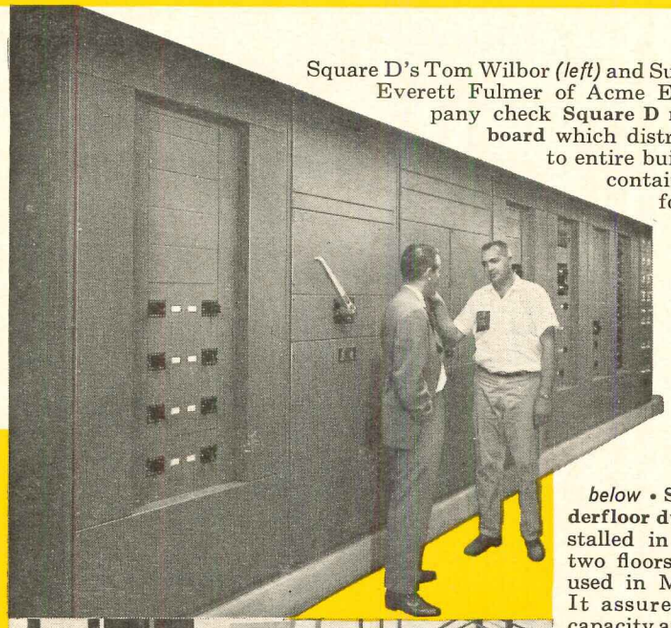
right • Electronic computer includes inscribers, readers, sorters, control units and a complete "stored program." Checks are processed at speeds up to 1600 per minute!



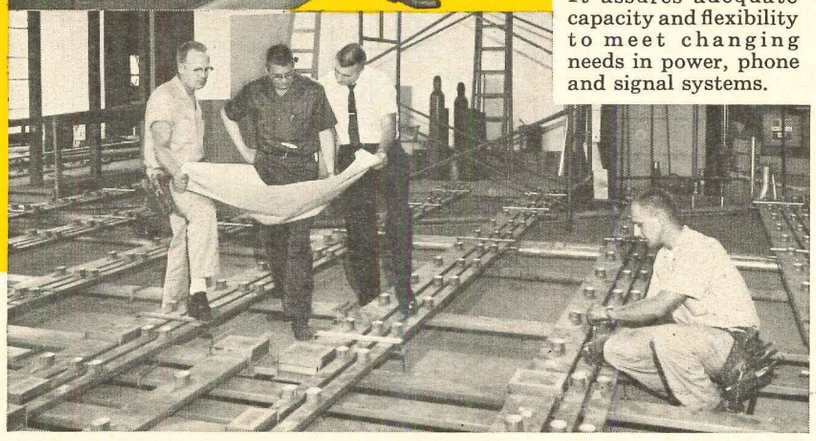
above • Five of Motor Bank's seven drive-through teller stations which provide right-from-the-car banking. There is free parking for customers and multi-level parking for tenants and the public.

SQUARE D COMPANY

electricity is distributed and controlled



Square D's Tom Wilbor *(left)* and Superintendent Everett Fulmer of Acme Electric Company check **Square D main switchboard** which distributes power to entire building. It also contains the control for all motors in the basement areas. Other motors are controlled from a **Square D control center** on fourth floor.



below • **Square D underfloor duct** being installed in one of the two floors where it is used in Motor Bank. It assures adequate capacity and flexibility to meet changing needs in power, phone and signal systems.

Electricity contributes substantially to the over-all efficiency, convenience, safety and comfort of this most modern banking facility. There are 60 miles of control wiring alone. The monthly power requirement would supply 800 average homes.

Square D electrical distribution and control equipment is on duty throughout the bank and motor bank.

Architects for West Bank Building, HOWARD R. GREEN COMPANY
Architects for Motor Bank, BROWN, HEALY & BOCK
Consulting Engineer, MOORE & BOUSE
Contractor, O. F. PAULSON CONSTRUCTION COMPANY
Electrical Contractor for West Bank Building, ACME ELECTRIC COMPANY
Electrical Contractor for Motor Bank, A-1 ELECTRIC COMPANY
(All of Cedar Rapids)

EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

A *Complete* LINE OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT

ADJUSTABLE SPEED DRIVES
BUSWAYS & WIREWAYS
CIRCUIT BREAKERS
CONTROL CENTERS
CRANE & HOIST CONTROL
DISTRIBUTION SWITCHBOARDS
ELECTRIC TRUCK CONTROL
HIGH VOLTAGE CONTROL
LAUNDRY CONTROL
LIFTING MAGNETS
LIGHTING AND POWER PANELBOARDS
LIMIT AND FOOT SWITCHES
MACHINE TOOL CONTROL
MAGNETIC BRAKES
METERING EQUIPMENT
MOTOR STARTERS
PRESS CONTROL
PRESSURE, FLOAT, & VACUUM SWITCHES
PUSH BUTTONS
RELAYS AND CONTACTORS
RESISTORS
SAFETY SWITCHES
SERVICE ENTRANCE EQUIPMENT
STAGE DIMMERBOARDS
STATIC LOGIC CONTROL
STEEL MILL CONTROL
SWITCHGEAR & UNIT SUBSTATIONS
SYNCHRONOUS MOTOR CONTROL
TERMINAL BLOCKS
TEXTILE MACHINE CONTROL
TIMERS
UNDERFLOOR DUCT
VOLTAGE TESTERS
WELDER CONTROL

For more data, circle 120 on Inquiry Card

Every window in a curtain wall has its own particular variances, deviations, gaps and crevices. You've filled them with butyl rods. And stuffed them with caulking. It still rains in. Now maybe it's time you oozed them full of enormously expansive, permanent, stable, waterproof, economical, never-failing

GLOP

Technically, rigid polyurethane foam. You shoot it between windows and building columns with a gun. Appropriately called the glop gun. The glop expands and hardens instantly into what looks like great mounds of solidified shaving cream. Then you scrape off the excess. And there. Not a gap. Not a crevice. Not a variance or deviation in sight. Glop has molded itself to fit precisely. And permanently. The leak in the curtain wall building has been plugged. No more rain trickling in, and down, and around, and emerging heaven-knows-where. No more contractors playing the expensive and exasperating game of trickle tracking.

Glop saves money in other ways, too. The present multiple caulking operations are reduced to one. The tolerances of both window frames and columns become less critical. Heating costs are reduced. (In addition to being a better sealant, urethane foam is also a better insulator.)

Since both the building problem and the foam have been around for a while, how come you're just hearing about this? Because it finally occurred to somebody *(us)* that the two belonged together. The first curtain wall building to have windows foamed in position is the Security Life Building in Denver. The special prepolymers used were made from Olin raw materials by Phelan's Resins & Plastics, Burlington, Iowa. When the operation was over, Mr. George W. Skinner, Superintendent of the Harmon Construction Co., made a statement. "We say that we have solved the problem with urethane foam, and we say it unequivocably and without reservation." Not bad for homely old glop.

For more information, contact us.

ORGANICS DIVISION **Olin**
460 PARK AVENUE, NEW YORK, N.Y. 10022

For more data, circle 121 on Inquiry Card

OUTER DRIVE EAST

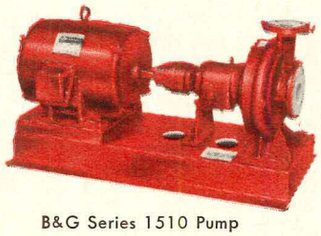
Chicago's new lake front high rise depends upon a wide variety of B&G *Hydro-Flo* Pumps and Heat Exchangers

Architects:
Hirschfeld, Pawlan & Reinheimer,
Chicago, Illinois

General Contractor:
Crane Construction Co., Chicago, Illinois

Mechanical Engineers:
Nachman, Vragel & Associates,
Chicago, Illinois

Piping Contractor:
Economy Plumbing & Heating Co., Inc.
Chicago, Illinois

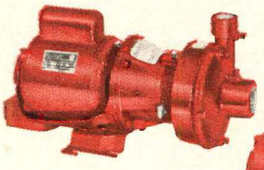


B&G Series 1510 Pump

B&G No. 125
Booster

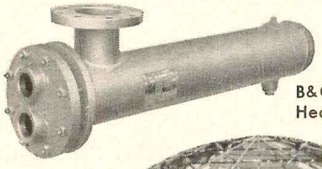
B&G
HD Pump

B&G PD Pump



B&G Series
1522 Pump

B&G 60 In-Line Pump



B&G "SU"
Heat Exchanger

The needs for circulated water to serve this soaring structure are many and varied. To meet them, B&G *Hydro-Flo* Pumps were selected in a wide variety of models to satisfy differing requirements of head, capacity and operating conditions. Six B&G type "SU" steam-to-water heat exchangers were also installed to provide hot water for the heating system and for domestic use.

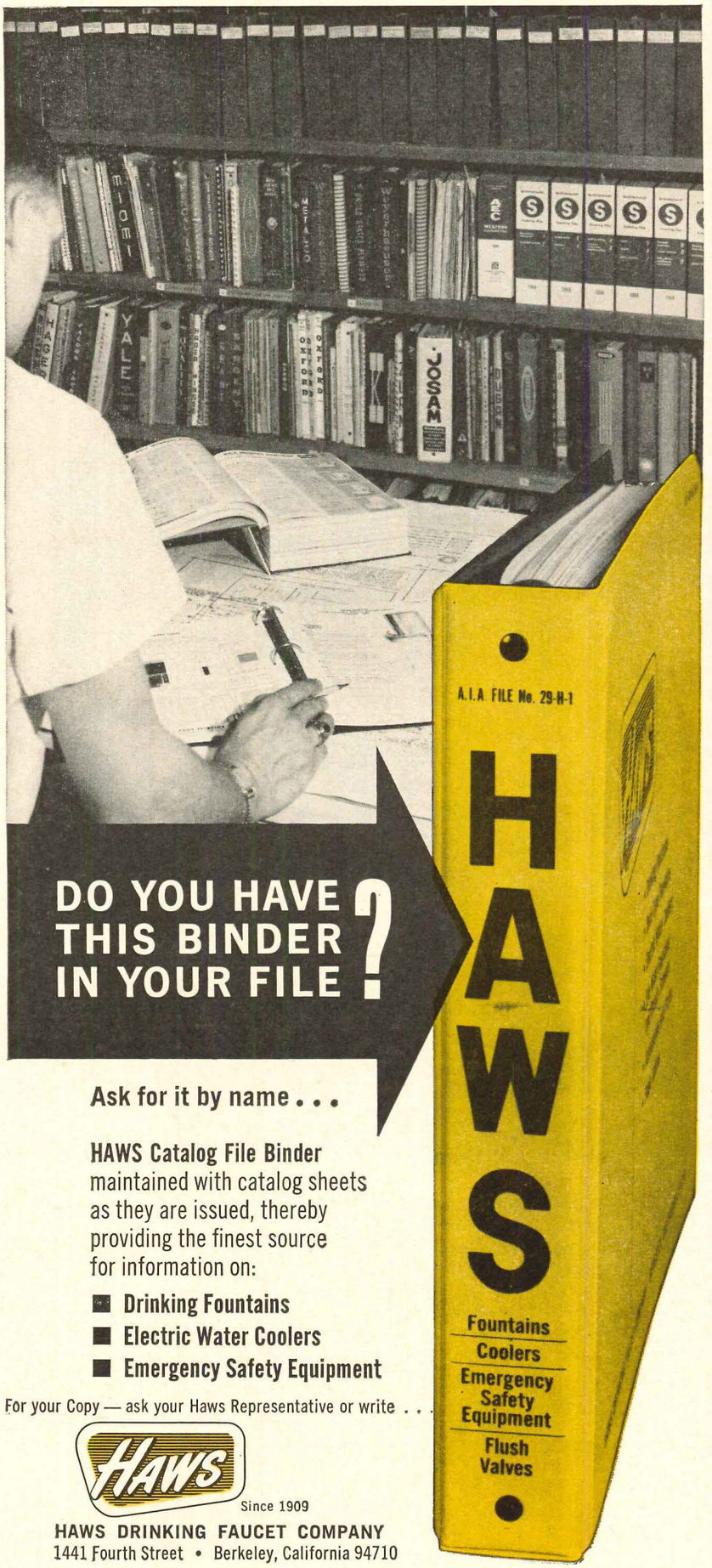
The preference for B&G *Hydro-Flo* Pumps is easy to understand... they have a long record for trouble-free performance. Sound design and sturdy construction of the best materials assure faithful service for years.

B&G *Hydro-Flo* Pumps are produced by an organization which stands back of its products—offers help in any problem of design or installation—and whose local distributors maintain adequate stocks and replacement parts.

The millions of B&G *Hydro-Flo* Pumps in operation today are ample evidence of their acknowledged quality and efficient performance. For information address ITT Bell & Gossett Inc., *a subsidiary of International Telephone and Telegraph Corporation*, Morton Grove, Ill., Dept. IE-32.

BELL & GOSSETT
a subsidiary of ITT

For more data, circle 122 on Inquiry Card



Ask for it by name . . .

HAWS Catalog File Binder
maintained with catalog sheets as they are issued, thereby providing the finest source for information on:

- Drinking Fountains
- Electric Water Coolers
- Emergency Safety Equipment

For your Copy — ask your Haws Representative or write . . .

HAWS Since 1909

HAWS DRINKING FAUCET COMPANY
1441 Fourth Street • Berkeley, California 94710

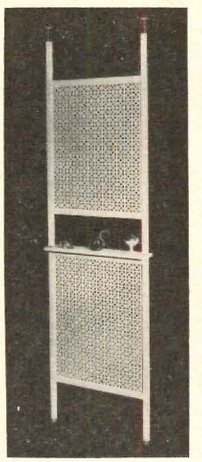
For more data, circle 123 on Inquiry Card

Product Reports

continued from page 265

ROOM DIVIDER KITS

Panelaire do-it-yourself room divider kits, for making inexpensive room dividers with decorative hardboard grillwork inserts, have been created for separating activity areas in residential, commercial and institutional buildings. These room divider kits are specially designed with only two basic parts—upper and lower sections which contain inserts of Panelaire Grillework, framed in hardwood molding. The kits make dividers



that are adjustable from 88 to 99 in. in height and either 18 or 26 in. wide.

Assembly of the kits is fast and easy and can be accomplished without tools. It simply requires joining the upper and lower divider sections by inserting pegs extending from the frame of one into holes in the other. A practical 5-in.-deep, 1-in.-thick shelf fits between the two sections. *The Panelboard Manufacturing Company, Inc., 222 Pacific St., Newark, N. J.*

CIRCLE 303 ON INQUIRY CARD

WASHROOM ACCESSORIES IN ONE UNIT

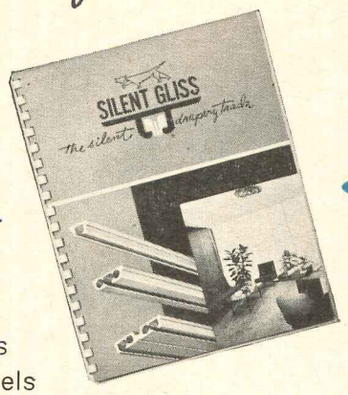
A single stainless steel cabinet which incorporates a fluorescent light, mirror, paper towel dispenser, shelf and soap dispenser is now available in two different models, *B-324* and *B-329*. Both units are constructed of 22 gauge, type 302 stainless steel with satin finish, with a drawn, one piece seamless flange. *Brobrick Dispensers, Inc., 503 Rogers Ave., Los Angeles, Calif.*

CIRCLE 304 ON INQUIRY CARD

more products on page 280

SILENT GLISS

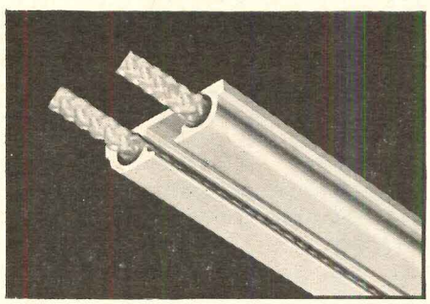
the silent drapery tracks®



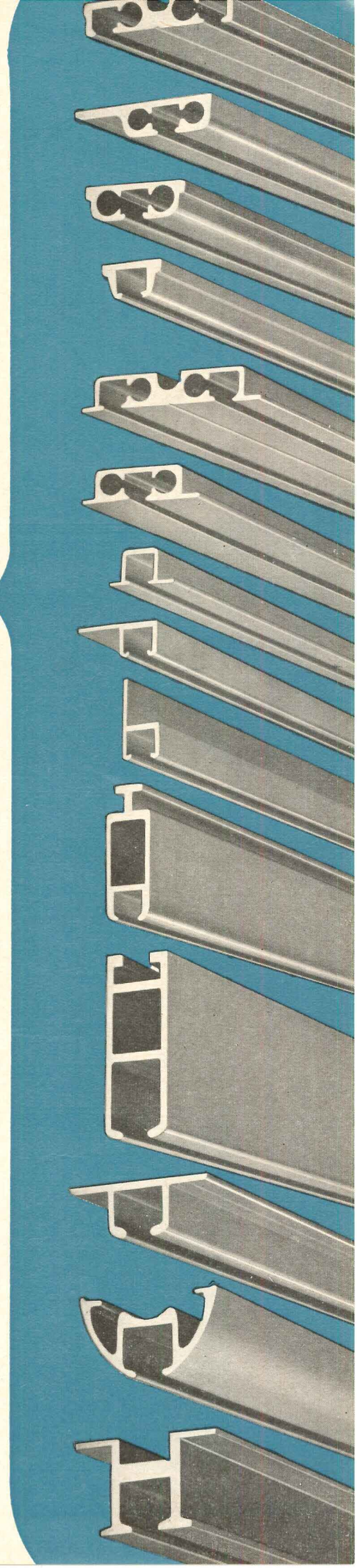
Whatever you may read, hear, or be told — one thing is sure: *there is no other track to equal Silent Gliss.*

The reasons are clear: ■ No other track has the patented system of cords traveling in separated, semi-enclosed channels (to prevent drooping, tangling, and other problems of tension systems). ■ No other track features the silence of satin-smooth rounded nylon carriers traveling in precisely fitted channels (no annoying "echo chamber" roller noise.) ■ No other track has the slim, trim lines of Silent Gliss (with the gracious contours of the thoroughbred).

Silent Gliss offers *fourteen* track styles to choose from: tracks for surface mounting, bracket mounting, or recessing . . . tracks for cord traversing or hand operation . . . tracks for cubicle, extra-duty or specialty use. All are shown and described in the complete illustrated catalog shown above. Write for full details today; address Dept. AR-9.



☐ Here is the *secret of Silent Gliss* . . . with its all-nylon cord, traveling in patented, *separated* channels. This means minimum maintenance, because there's no drooping, no tangling *ever*. It's one of the reasons why Silent Gliss is the *prestige* track, chosen for quality installations the world over.



SILENT GLISS, INC.

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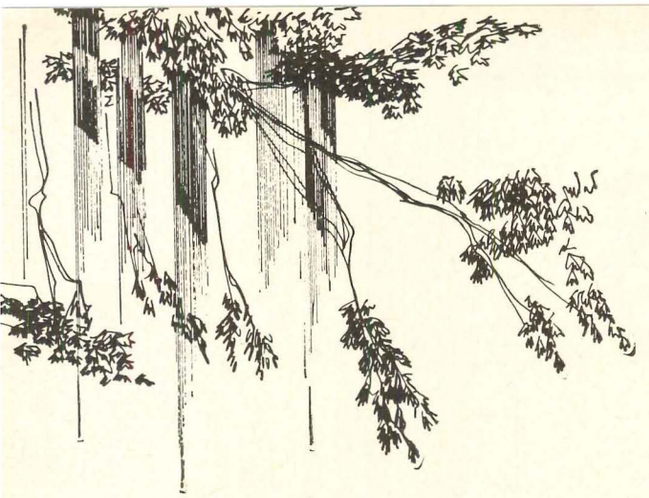
Drapery Hardware Mfg. Co., Monrovia, California

THREE OF THE Newell COMPANIES

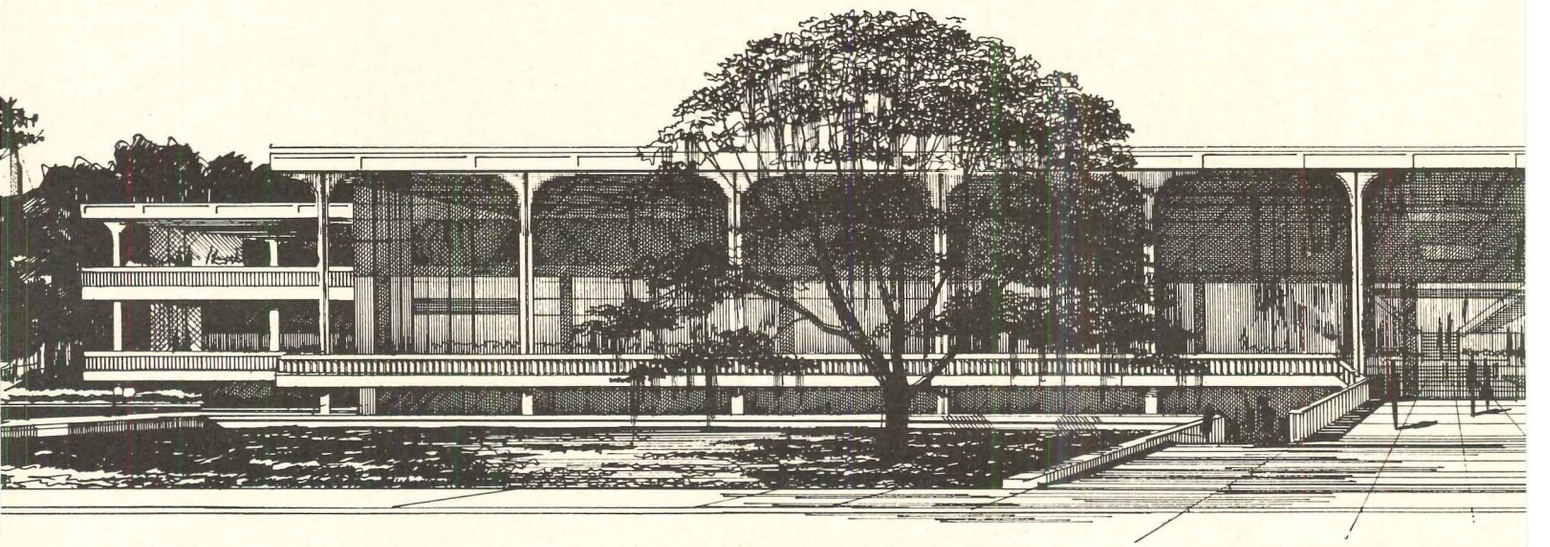
Manufacturers of Quality Drapery Hardware Since 1903

For more data, circle 124 on Inquiry Card



Lone Star goes to LOUISIANA STATE UNIVERSITY

Brilliant use of concrete featured in new Student Union Building



STUDENT UNION BUILDING
Louisiana State University, Baton Rouge, La.
Architects:
MATHES, BERGMAN & ASSOCIATES, New Orleans
WILSON & SANDIFER, Shreveport
JOHN J. DESMOND, Hammond
Engineer:
ALFRED G. RAYNER, Baton Rouge
General Contractor:
R. P. FARNSWORTH & CO., INC., New Orleans
Precast Concrete:
ARCHITECTURAL STONE CO., New Orleans
Exposed-Aggregate Panels:
GRANT-LEHR CORPORATION, Baton Rouge
Ready Mixed Concrete:
ALTEX READY MIXED CONCRETE CORP.,
Baton Rouge

Central lobby

A student union building traditionally serves as a campus "family room"—a place for relaxation and recreation. Its design should be informal, even light-hearted in spirit, esthetically interesting. On the other hand, it should be in keeping with the existing campus atmosphere—in this case, dominated by a repeated use of arches.

To meet all these requirements, the planners of Louisiana State University's new $4,300,000 Student Union Building chose to design in concrete, the basic construction material offering plasticity and freedom of form. The photographs here show the success of their efforts.

Of special interest is the orderly, exposed structural system, with tall columns flared in four directions to support the overhead beams on a 12-foot grid. This design results in continuity of stress flow from beams to columns.

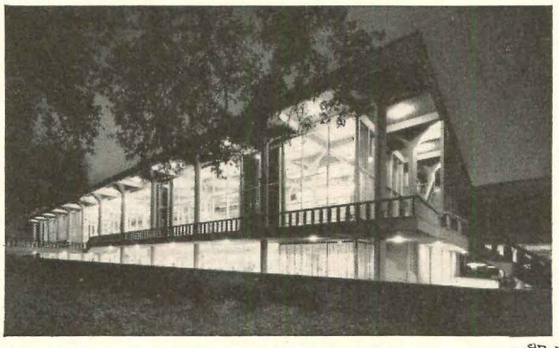
Preparation of reusable wooden forms for the columns required skillful planning and supervision by the contractor, but no special forming personnel were required.

Precast, exposed-aggregate concrete units included rails and balusters for the exterior balustrades, all stair treads and risers, and copings and roof facias. A matching effect was obtained on the exterior concrete walls through the application of prefabricated exposed-aggregate panels. These were asbestos-cement panels, to which aggregate had been applied in an epoxy binder.

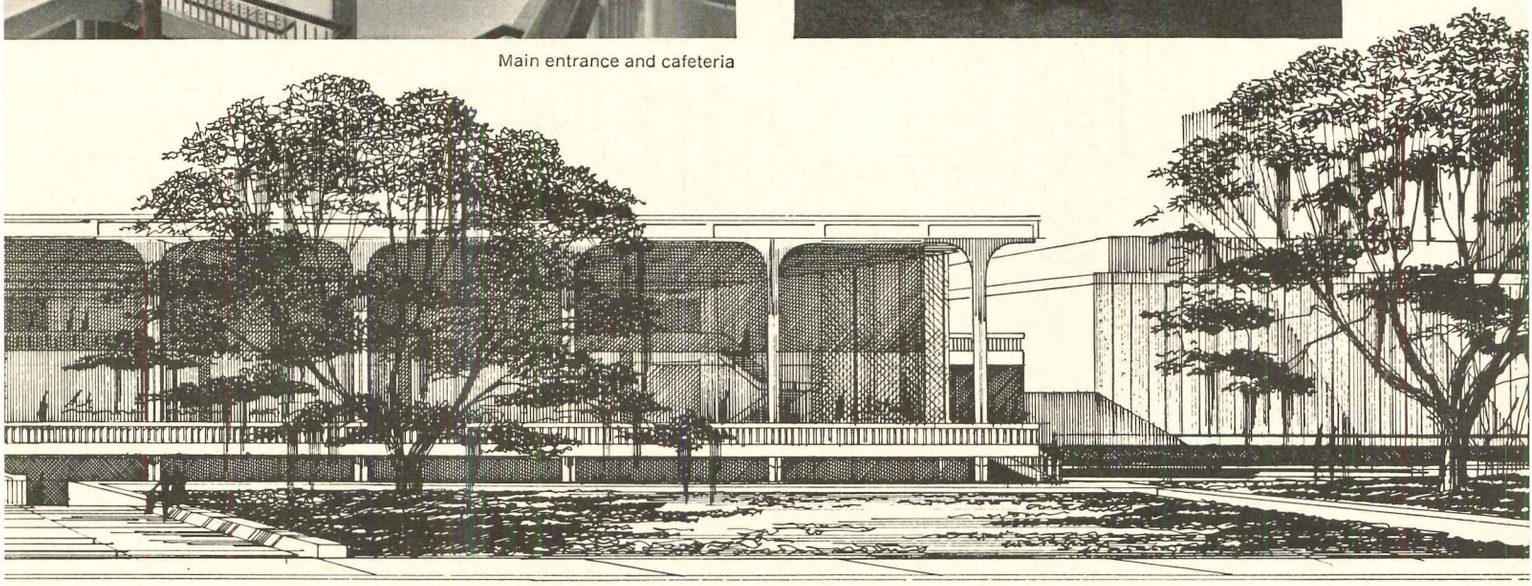
It is a matter of great pride that Lone Star Portland Cement was selected for use throughout this significant and beautiful structure.

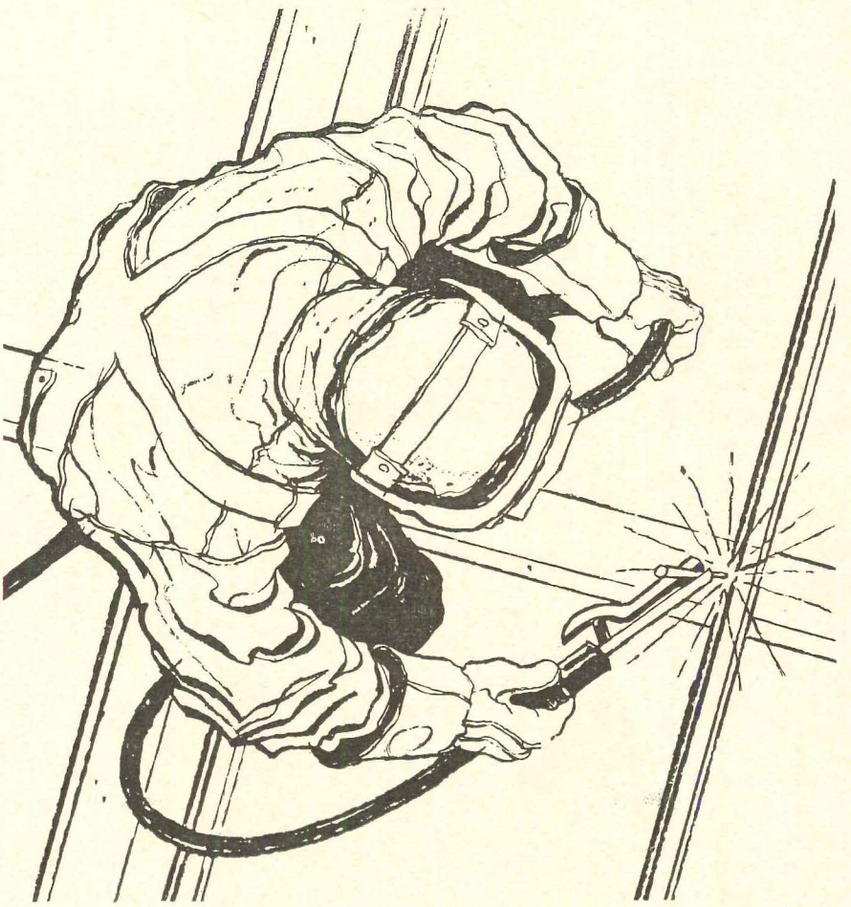
LONE STAR CEMENT CORPORATION

New York 17, New York



Main entrance and cafeteria



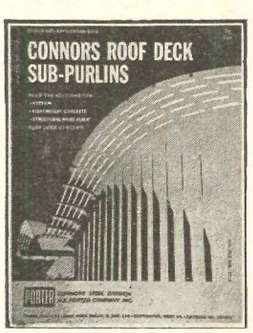


BULB TEE ROOF DECKS

ECONOMICAL, VERSATILE, FIRE-RESISTANT

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.

PORTER **CONNORS STEEL DIVISION**
H. K. PORTER COMPANY, INC.



Please send application and design data covering Connors Bulb Tee Sections for Roof Decks

NAME_____

FIRM_____

Address_____

City_____ State_____

For more data, circle 125 on Inquiry Card

Product Reports

continued from page 276

PACKAGED TRANSFORMER SYSTEM

A completely packaged isolating transformer system for hospital operating rooms has recently been introduced. The new product combines the step down transformer, ground detector, primary and secondary circuit breakers into a single enclosure, which obviates the need to purchase and install components separately. All components have been carefully coordinated to insure proper operation of the over-all system.

In-wall design permits flush mounting of the isolating system in any location outside of the operating room. The unit saves space, simplifies installation and maintenance and is extremely flexible; components can be varied according to individual specification. Separate compartments are provided for the transformer and secondary equipment to keep them isolated from each other. A dead front construction is standard on the secondary compartment. Electrostatic shielding between the primary and secondary windings is available as an added safety feature. Both the primary and secondary windings will meet 400 volt dielectric test requirements between the windings and the ground. A low sound level of 35 decibels or less makes the transformer particularly suitable for hospital installation. *Hevi-Duty Electric Co., Milwaukee, Wis., 53201*

CIRCLE 305 ON INQUIRY CARD

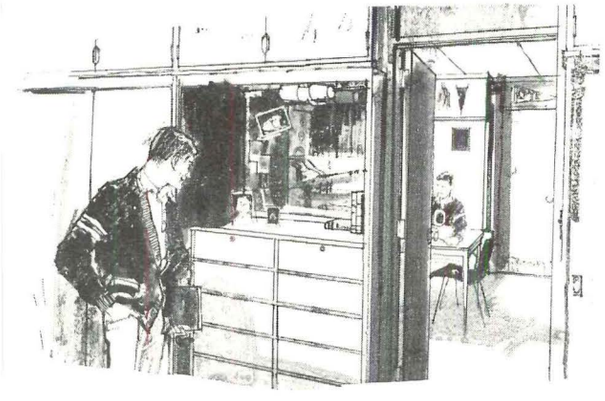
STEEL CEILING HANGERS

The *T Hanger* has been developed to make it easier and less expensive for the mechanical trades to work from T and slab ceilings. The hangers, which are formed from a solid continuous piece of 16 ga galvanized steel, can be used to support plumbing, electrical fixtures, sprinkler systems and suspended ceilings. They require no on-the-job fabrication and can be installed by placing the stem between the T's or slabs and stepping on the anchor wings to secure them in position before topping. The hangers are available in 4-, 6-, 8- and 10-in. lengths. *Fehr Bros., Manufacturers Inc., 116 John St., N.Y., 10038*

CIRCLE 306 ON INQUIRY CARD

more products on page 293

North Hall, Oberlin College, Oberlin, Ohio; design and construction by The Austin Company, Cleveland, Ohio; Painting Contractor: Broadway Decorating Co. Inc., Cleveland, Ohio



Inventive color use matches spirit of new college dormitory

The Man from Devoe works directly with designers to insure perfect color planning and color matching. L. A. Heininger is The Man from Devoe who serves architects throughout Ohio.

Since its completion, North Hall—new men's dormitory at Oberlin College—has established itself as an outstanding residential hall. It was designed to serve successfully as a place of modern collegiate living today . . . designed, as well, to absorb the anticipated expanding needs of tomorrow. Aesthetically, it was designed to dramatically complement a lovely campus—a result achieved throughout with the help of coordinated color schemes.

When the Man from Devoe was consulted, he needed to call on his ingenuity and inventiveness: the problem presented to him was to match colors from magazine illustration clippings.

With the help of Devoe's vast Library of Colors® system—over 1,000 shades—and expert Devoe technicians, he helped meet these exacting requirements.

Assistance in color planning is just one part of the total service to designers performed by the Man from Devoe. He can supply data on paint performance and costs, weather resistance, light reflectivity and special formulations. He's there just to help you.

Call in the Man from Devoe on your next project—and find out how he can save you time and trouble. There is no cost or obligation involved. Merely phone or write the nearest Devoe office.

DEVOE PAINT

DEVOE

DEVOE & RAYNOLDS COMPANY, Inc.

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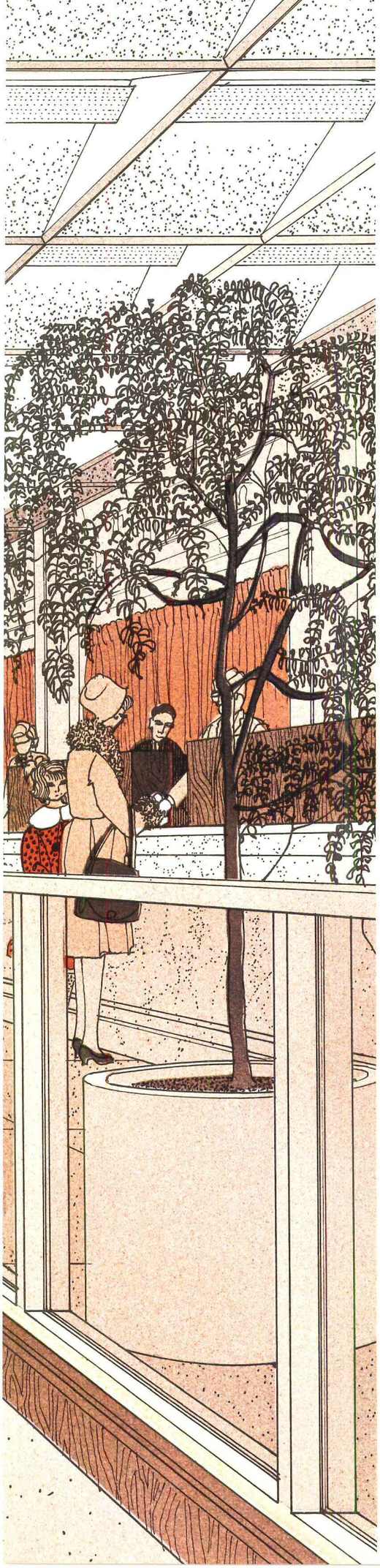
For more data, circle 126 on Inquiry Card

Jacoby



At work in Mississippi:
THE Armstrong LUMINAIRE CEILING SYSTEM

Here, the first integrated ceiling system creates an exciting new banking atmosphere. It also cools, heats, illuminates, and quiets.

The Armstrong Luminaire Ceiling System harmonizes beautifully with traditional interiors. That's why the architect chose it to modernize this Jackson, Miss., bank. But the Luminaire System contributes more than good looks. It also uniformly delivers conditioned air year round, illuminates, and controls noise.

Two-lamp, shielded fixtures illuminate to 100 footcandles . . . ideal for modern banking procedures. The light is even, yet visually interesting. (The system is available with one-, two-, or three-lamp fixtures. Light levels can vary from 50 to well over 200 footcandles.)

To assure the most comfortable banking environment, the system delivers 3.74 cfm/sq. ft. of conditioned air. It cools, heats, and ventilates. With the entire ceiling used to deliver air, distribution is draft-free and virtually noiseless.

The system's modular design greatly simplifies the ceiling and plenum. It eliminates all diffusers and most ductwork. Each 50″ module is a self-contained air- and light-distribution source. There are 128 modules installed throughout this 2,600-sq.-ft. area.

All Luminaire components are available from one supplier, supported by one grid. Installation is fast (especially valuable in remodeling installations). Even shielded, as here, lamps are easy to clean, replace. Initial savings of 30¢ to 50¢/sq. ft. are common, compared with independent lighting, air-distribution, and acoustical systems.

Horizontal ceiling panels allow the system's adaptation to any size or shape room. Specially designed to accommodate ceiling-high partitions, the system offers limitless layout flexibility. Further design variation is possible with the new B-48 modification. This system achieves an open, folded-plate effect, creates continuous bands of light. For complete information on both systems, write to Armstrong, 4209 Rock Street, Lancaster, Pa.

Jackson-Hinds Bank, Jackson, Miss.
Architects-Engineers: Cooke-Douglass-Farr, Jackson, Miss.
Electrical Consultant: Leigh Watkins III & Assoc., Jackson, Miss.
General Contractor: Wise Construction Co., Inc., Jackson, Miss.
Electrical Contractor: Seymour Electric Co.
Ceiling Systems Contractor: Nicholas Acoustics & Specialties, Jackson, Miss.
Mechanical Contractor: Independent Plumbing, Heating and Air Conditioning Co., Inc.

Ceiling Systems by Armstrong

For more data, circle #1 on Inquiry Card

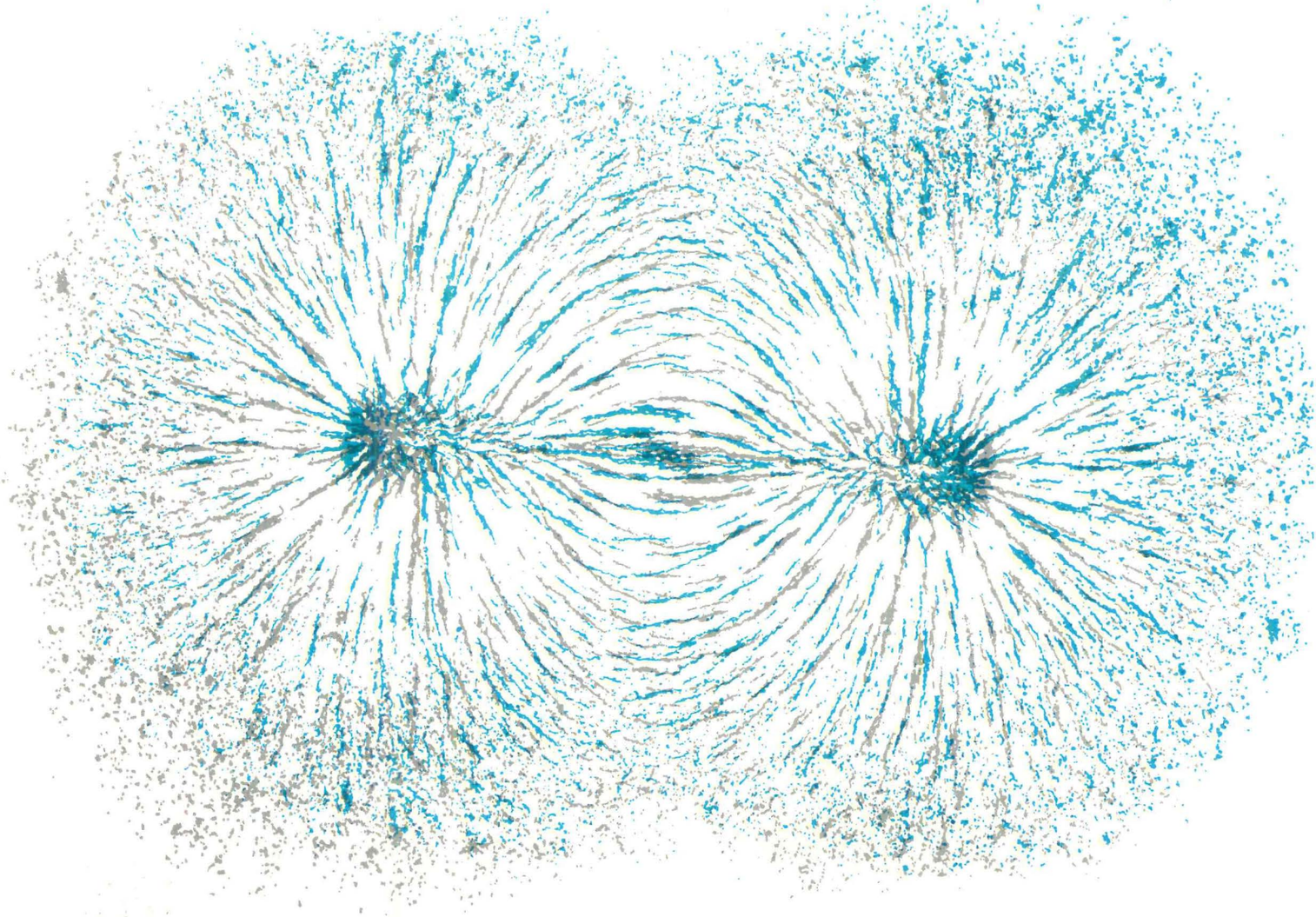
"The Epoch" by Hans Felbinger

Thinking stainless steel?

Dodge helps architects realize their ideas. The project information you give to your Dodge Reporter helps contractors and suppliers fit their skills and products to your requirements more accurately, at greater savings of everybody's time—and money.

McGraw-Hill DODGE REPORTS

For more data, circle 127 on Inquiry Card ➔



Who's creating exciting new carpet with electronics?

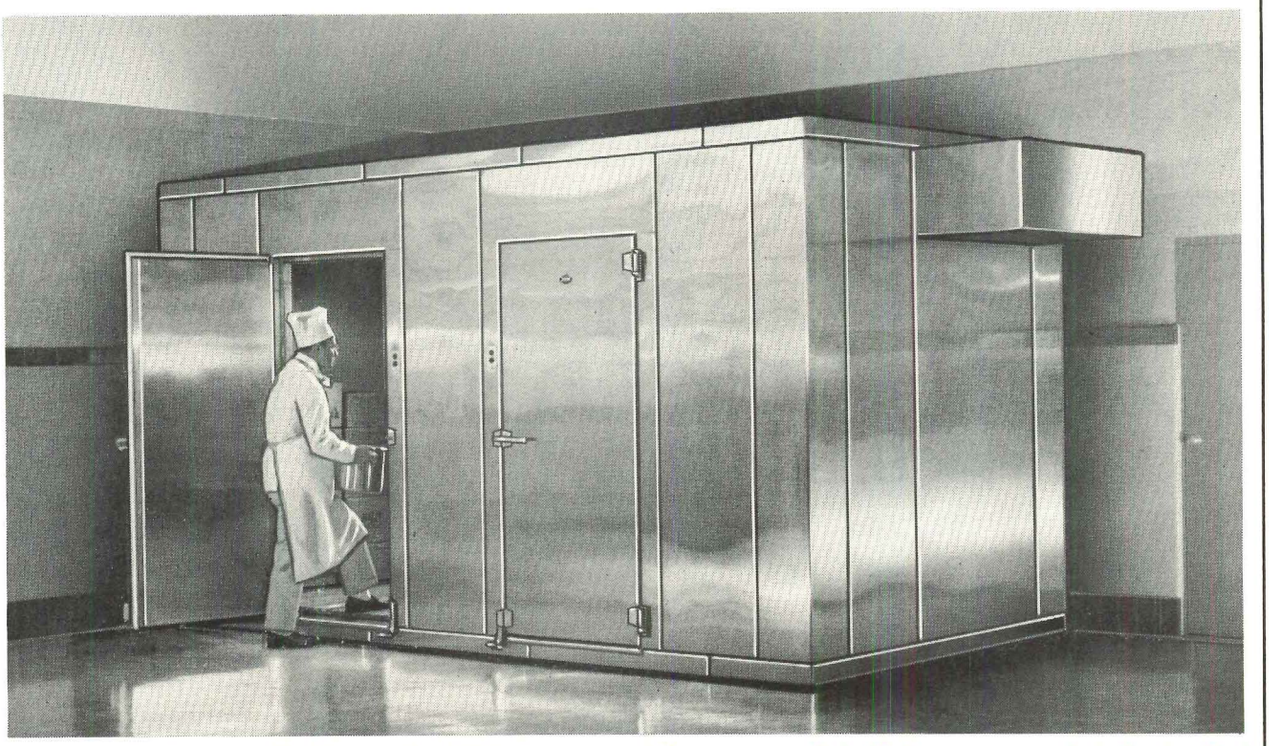
Monarch is . . . with Colorset

When electronics and carpet get together, watch out for COLORSET. When multicolor patterns come vibrantly alive in free-flowing uninhibited designs, then it's **sure** to be COLORSET. And when you see the same plush resilience, the same deep, deep pile and luxurious quality in each patterned carpet, of course it's COLORSET! Monarch's COLORSET process combines the creative craftsmanship of the past with electronic know-how and inventiveness of today. COLORSET glows with progress and personality . . . with new ways to magnetically dye and preserve color . . . to shape designs . . . to turn out better quality in less time — at a lower cost. The old laborious, loom-threading methods for making patterned carpet are obsolete. Monarch's COLORSET marks the advent of a modern era in carpet-making. So . . . if you like to pioneer . . . look to COLORSET for exciting interiors. Select from a collection of elegant patterns in a wide range of color combinations . . . in any yarn. For additional information and samples, please write today to our CONTRACT DEPARTMENT.

Monarch fashions ACRILAN ACRYLIC — NYLON — HERCULON OLEFIN (the longest wearing carpet fibers known) into luxurious COLORSET carpet pile of radiant, enduring multicolor designs.

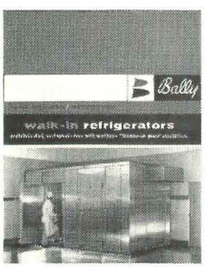
Monarch carpet mills
CHAMBLEE, GEORGIA

Bally Walk-In Refrigerators, assembled from prefabricated sections, provide highest efficiency, maximum sanitation and are easy to enlarge or relocate.



Bally Walk-Ins for normal or low temperature can be assembled in any size or shape from all-metal sections with features you can't get in "built-ins".

❶ 4-inch thick urethane has insulation value equal to 8½ inches of fibreglass. Suitable for temperatures as low as minus 40°F. Has 97% closed cells. Never absorbs moisture. Ideal for outdoor use. ❷ Urethane's "foamed-in-place" strength eliminates need of internal wood or steel structural members and 100% of every section is insulation. ❸ Bally Speed-Lok makes assembly accurate, fast and easy. ❹ Lightweight door with automatic self-closing hinges . . . improved hand lock (inside safety release) and foot treadle . . . opens and closes easily. Magnetic gasket provides air-tight seal. ❺ Galvanized or aluminum interior and exterior assure maximum sanitation. Stainless steel also available. ❻ Self-contained refrigeration systems . . . factory-tested and hermetically sealed to eliminate service problems. ❼ Bally Walk-Ins cost less than "built-ins" constructed by building trades. And the cubic-foot cost is less than half that of "reach-ins".



See our brochure in Sweet's Architectural File 25a/Ba or write for details about Bally engineering service and sample of urethane wall.

Bally

Address Correspondence to Dept. AR

Bally Case and Cooler, Inc., Bally, Pennsylvania

For more data, circle 128 on Inquiry Card

For more data, circle 129 on Inquiry Card →

VISUAL DRAMA WITH GLASS

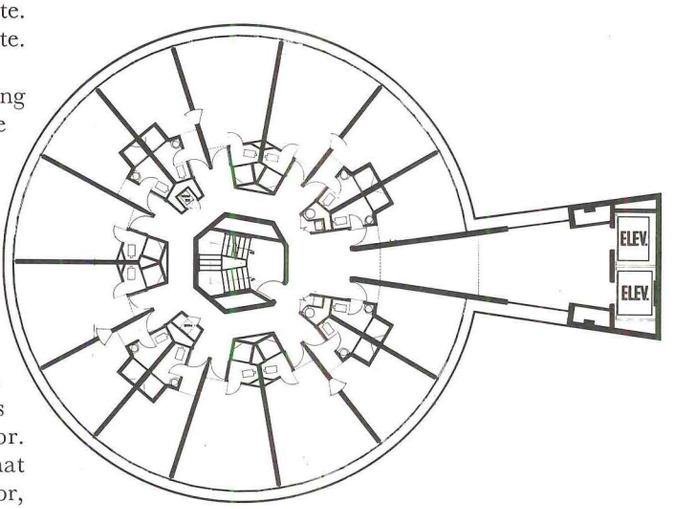
Glass brings color, reflectivity and contrast to a circular tower

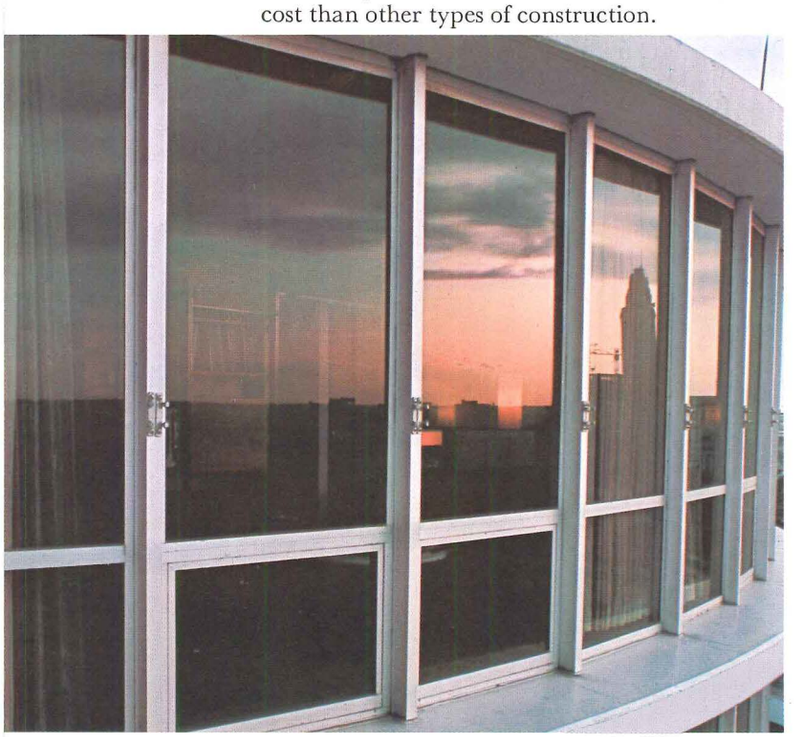
For The Christopher Inn, Karlsberger and Associates, architects, have used glass to create openness and contrast for a circular structure which overcomes the limitations of a small site. Fifteen stories of glass and reinforced concrete. Simple. Pure. Practical. Economical.

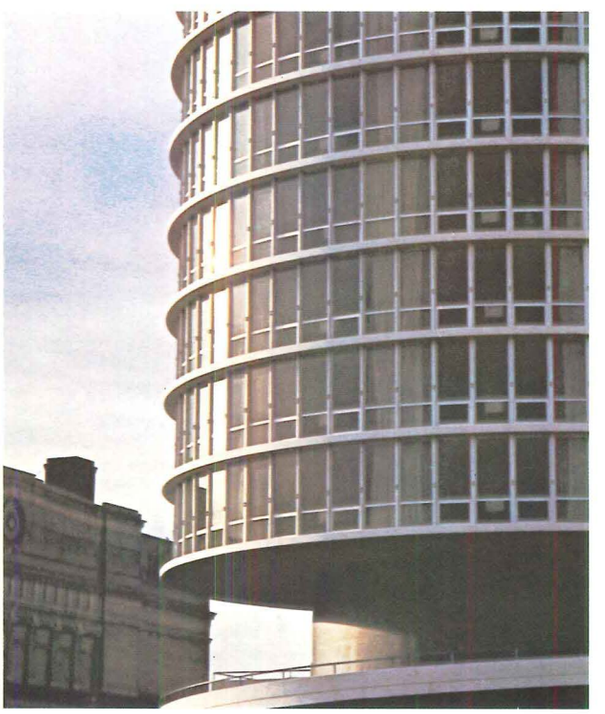
Above the public rooms and spiral parking ramp, ten floors of guest rooms encircle the structural core of the building. Each room is a modified wedge shape. Its sidewalls fan to the outside, and open on a striking floor-to-ceiling wall of glass. Although average in size, the rooms look spacious. Glass creates this illusion—carries the eye beyond the room to the horizon.

PPG GRAYLITE™ was chosen for the tower to provide visual contrast and to temper the glare of the sun. GRAYLITE's soft gray tint does that admirably, with no distortion of color.

Once again, glass wall construction proves that it can give all the advantages of openness, color, reflectivity and drama—and still be lower in cost than other types of construction.







For further information, contact your nearest PPG branch office or distributor, consult Sweet's catalog file, or write to **Pittsburgh Plate Glass Company,** Room 4042, 632 Fort Duquesne Boulevard, Pittsburgh, Pennsylvania 15222.

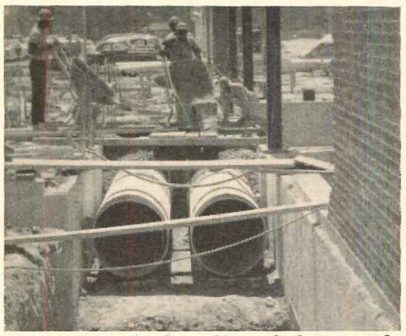
Architect: Karlsberger and Associates, Columbus, Ohio
Structural Engineers: Fling and Eeman, Inc., Columbus, Ohio
Mechanical Engineers: Heapy and Associates, Dayton, Ohio
General Contractor: Elford, Inc., Columbus, Ohio

PPG makes the glass that makes the difference

After dark,
The Christopher Inn
radiates light and
warmth in a
glowing invitation
to the passing
traveler.

PPG makes the glass that makes the difference

Now! Buildings can have modern design above ground and superior heating-cooling distribution below!



TRANSITE air duct lines below grade permit maximum design freedom above.

Interior and exterior design flexibility reached a new high with the introduction of in-slab heating-cooling systems with TRANSITE* air duct. With the ducts buried below grade, buildings can be lower, ceilings higher . . . more glass areas can be utilized . . . exposed roof construction can be used . . . the need for furred ceiling and beam construction is eliminated. As a matter of fact, this system offers virtually no interference with the structural and architectural elements of a building.

There's no more efficient or economical system either. TRANSITE air ducts radiate heat, putting warmth into the slab, eliminating cold spots. And, their long lengths and smooth bore permit the conveying of air with 30% less pressure drop than sheet metal. As a result, smaller ducts or smaller blowers can be used.

Easy-to-install TRANSITE is available in a wide range of sizes (4″ to 36″) and with all needed fittings. For full details, write to Johns-Manville, Box 362, AR-9, New York, New York 10016. In Canada: Port Credit, Ont. Cable address: Johnmanvil.

*TRANSITE IS A JOHNS-MANVILLE REGISTERED TRADEMARK FOR ITS BRAND OF ASBESTOS-CEMENT PRODUCTS.

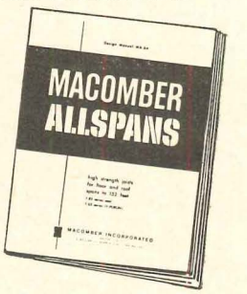
JOHNS-MANVILLE JM pipe products

For more data, circle 130 on Inquiry Card

This new shopping center designed with ALLSPANS® is off to a better start

As you can see, this shopping facility is not limited to any one architectural effect. ALLSPANS were used as floor and roof framing members and the results are attractive and practical. ALLSPANS, with cold rollformed chords and web systems, are engineered to function as you have a right to expect. ALLSPANS are versatile, permitting maximum design freedom.

ALLSPANS come in any length you need, from 8 feet to 152 feet. These are the *quality* joists in open-web framing. Production of ALLSPANS is carefully controlled through a stringent inspection program.



Before you go to the drawing board on your next shopping center, factory, school, hospital or office building, get the details on ALLSPANS. Write to us and ask for Catalog MA-64.

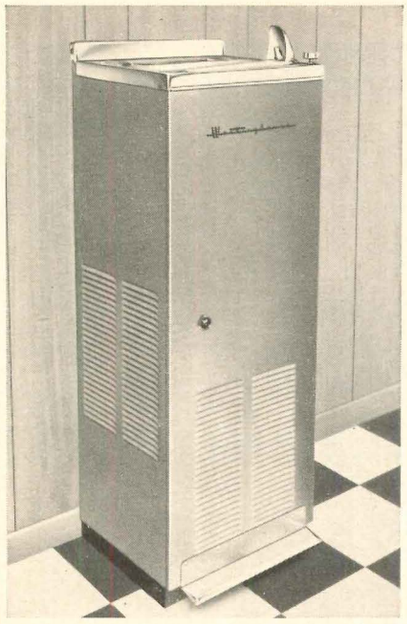
MEMBER AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC. FOUNDED 1921

MACOMBER INCORPORATED

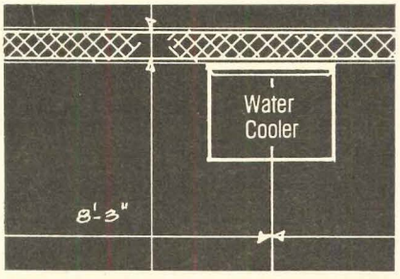
CANTON 1, OHIO

SUBSIDIARY OF SHARON STEEL CORPORATION

For more data, circle 131 on Inquiry Card



Westinghouse Wall Line Water Coolers... fit your plans



(and take 26% less space at that)

Compact design projects only 12" from wall . . . takes 26% less space. No exposed plumbing or dirt-catching space behind cooler. Easier and less expensive to install, too, because slip fitting eliminates pipe threading and soldering. Available in 6- to 20-gallon capacities plus "on-the-wall" models in 8-, 11-, and 15-gallon capacities. Full 5-year warranty on all functional parts as well as refrigeration system. Check the Yellow Pages for your local distributor or send in the coupon below.

You can be sure if it's Westinghouse

Westinghouse Electric Corporation
Water Cooler Department
Columbus 16, Ohio

Please send me details on Westinghouse Water Coolers.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

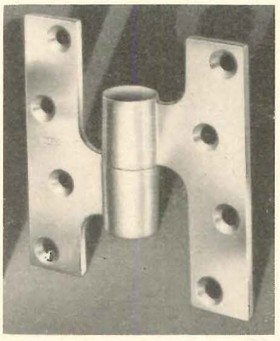
For more data, circle 132 on Inquiry Card

Product Reports

continued from page 280

IMPROVED PAUMELLE HINGE

A new paumelle hinge, the *BB140*, with ball bearings for average frequency doors, has been introduced by Stanley Hardware for use in office buildings, executive suites and private residences. The hinge, which is an up-to-date version of the *BB93* hinge, incorporates several new features. The vertical load of the door is taken by new improved ball bearing raceways equipped with superior chrome alloy balls. Lateral bearing capacity of the hinge has been materially improved through the use of a nylon lateral bearing sleeve encasing the pin and bearing against the inside of the knuckle. Test information



indicates that the principal advantage will be improved performance in lateral load carrying.

A wide variety of caps are available for the knuckles, the only part visible when the door is closed. In addition to all metal finishes, the caps can be furnished in black or white "Tenite" or rosewood, cocobolo or walnut. A mortising jig is available. *Dept. PD, Stanley Hardware, Division of The Stanley Works, 195 Lake St., New Britain, Conn.*

CIRCLE 307 ON INQUIRY CARD

BRASS PLUMBING LINE

Briggs Brass is a new line of brass plumbing fixture which will replace the company's existing *Trimline* products. Several new items such as concealed ledge sink faucets and wide spread lavatory fittings are included in the new line. All valved items will be available with either lucite or chromed handles. *Briggs Manufacturing Co., 6600 East 15 Mile Rd., Warren, Mich.*

CIRCLE 308 ON INQUIRY CARD

more products on page 298

HOLD EVERYTHING...

FOOD SERVICE: KITCHEN STOREROOMS, PREPARATION AREAS, UTENSIL STORAGE.

HOSPITALS: CENTRAL SUPPLY, UTILITY ROOMS, MOBILE SUPPLY CLOSETS.

SCHOOLS: STATIONERY SUPPLIES, BOOKS, ART SUPPLIES, LUGGAGE.

...WITH MARKETIER SHELVING

Modular Marketier Shelving and Modular Storage Systems are designed and built especially for institutional storage needs. RUGGED — Patented corner construction and double reinforced edges withstand years of use and abuse. ADJUSTABLE — Shelves may be instantly set at any desired spacing. Nine modular scientifically determined shelf sizes. Easy to install or relocate. SANITARY — Maximum ease of cleaning with solid crevice-free construction. Spills wipe up easily. Stainless steel or aluminized steel with wide variety of casters and accessories for mobile use and other applications.

Send for new brochure showing dozens of actual in-use photos.

Market Forge
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SINCE 1897

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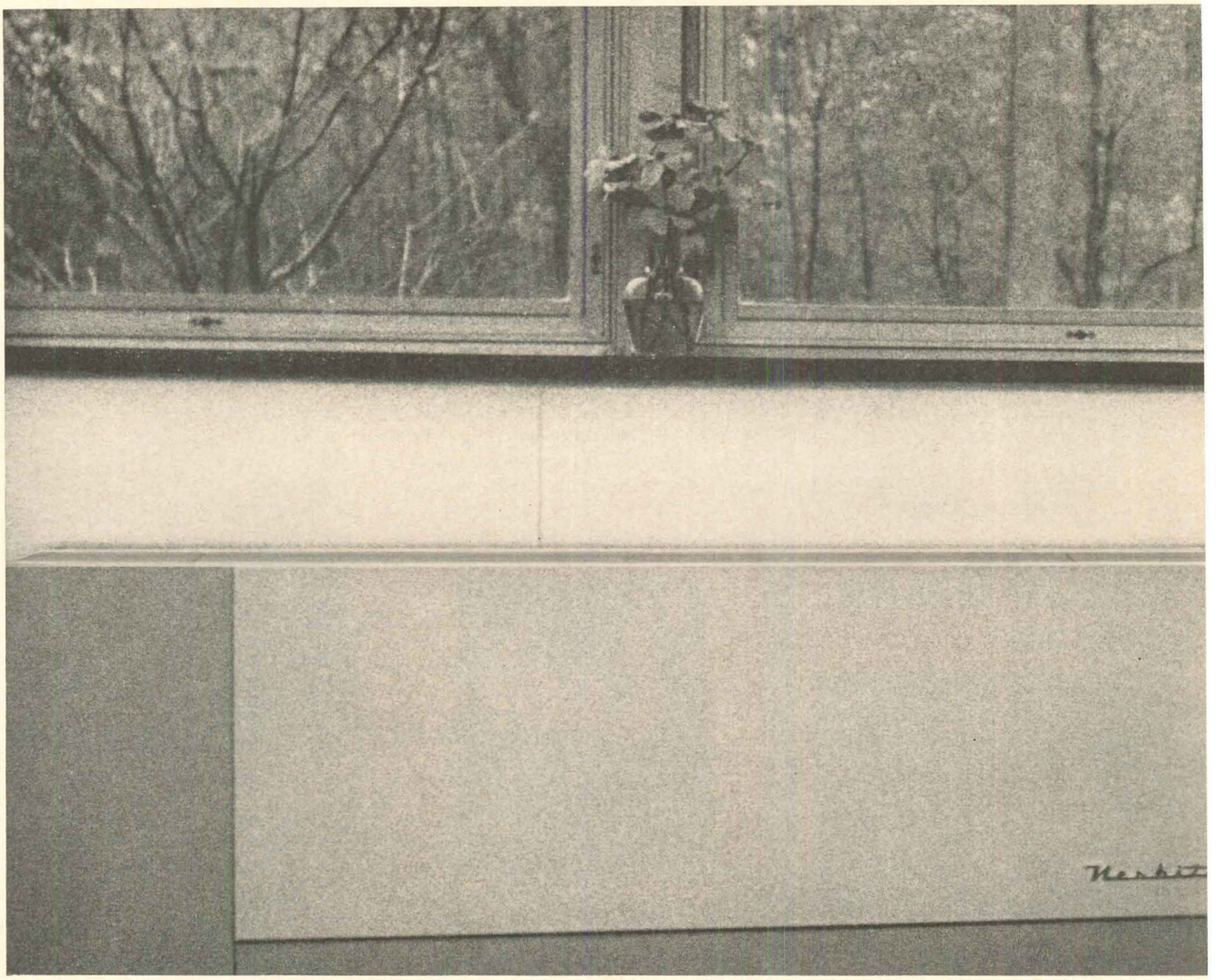


Mail from home. A most pleasant pause in a long, long day. Student nurses put all they have into their jobs. And when they get a chance to relax, they make the most of it. That's where the architect who designed their living quarters made things a little bit easier for these young ladies.

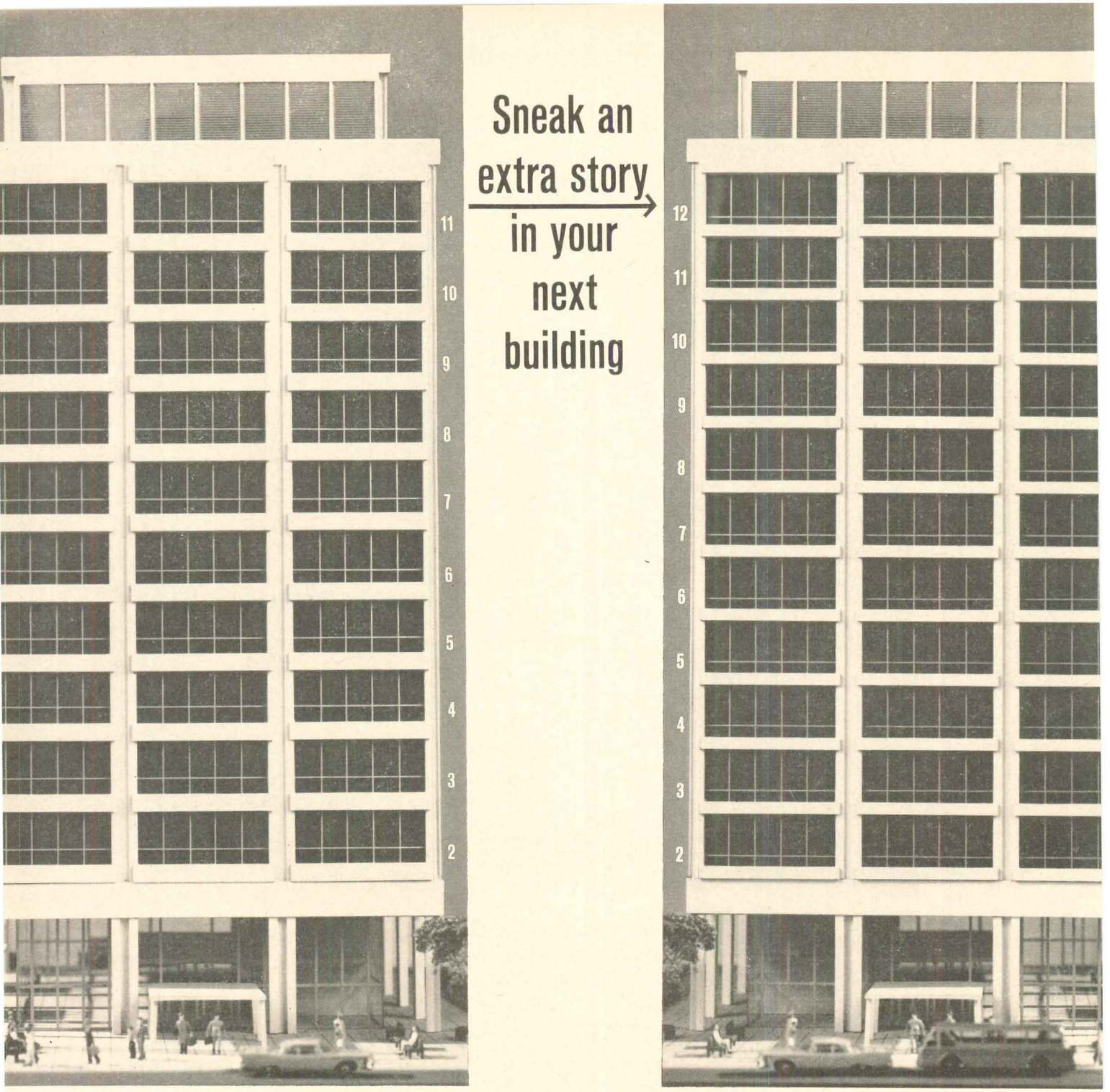
He knew that even such a small matter a a letter from a hometown boy friend ca send temperatures soaring in the nurse dorm. And so he included air conditio ing in his design. Nesbitt air conditio ing. The Nesbitt Roommate II in the bac ground behind the girls chatting abov

Roommate II provides heating, cooling, dehumidification and ventilation. But its biggest advantage to architects is looks. No longer must you compromise contemporary design to use cabinet air conditioners. Now plans that call for room-by-room temperature control are feasible.

The clean, crisp lines of Roommate II and the wide range of colors, arrangements and sizes available make an architect's job easier and more rewarding. Write to ITT Nesbitt Inc., a subsidiary of the International Telephone and Telegraph Corporation, Philadelphia, Pennsylvania 19136.

AIR CONDITIONING, HEATING AND VENTILATING EQUIPMENT ITT Nesbitt

For more data, circle 134 on Inquiry Card



Sneak an extra story in your next building

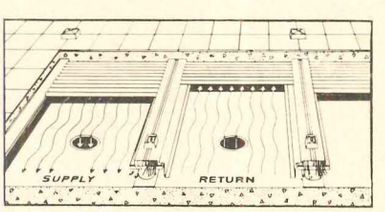
Here's how:

Save space by conducting air over, rather than under or around, obstructions.

Granco's new, compact A-E (Air-Electric) Floor system eliminates bulky ductwork. This saves space at *every* floor level and allows you to design a maximum number of stories into a given building height.

In the illustration above, the 12-story building was designed into an 11-story-building height. A-E Floor's shallow air plenum and electrical cells (see detail right) sandwiched between structural slab and finished floor reduced over-all floor depth 25% . . . saving enough space for an extra story!

Saving space is just one benefit. For more information on how the A-E Floor system permits continuous grills under floor-to-ceiling windows, luminous or exposed ceilings, full services for cantilevered floors, write for new A-E Floor catalog AE-641, Granco Steel Products Company, 6506 North Broadway, St. Louis, Missouri 63147. A subsidiary of Granite City Steel Company.



A-E FLOOR
AIR-ELECTRIC FLOOR SYSTEM
GRANCO

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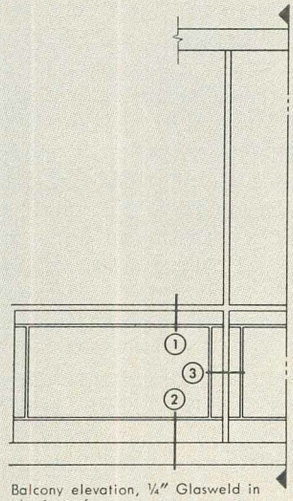
Steel

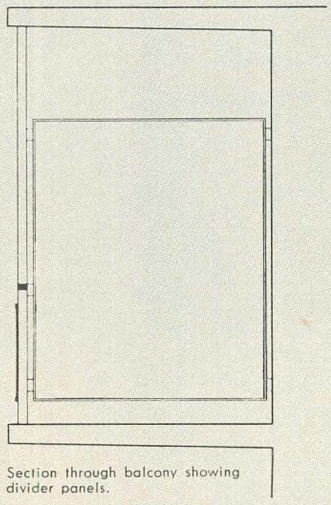
For more data, circle 135 on Inquiry Card

Balconies:

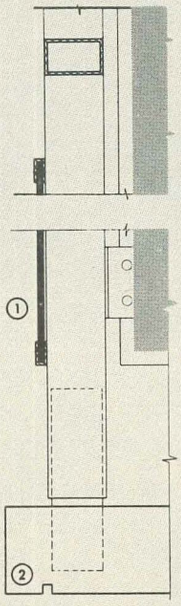
Permanent, maintenance-free color, strength, and imperviousness to weather make Weldwood® Glasweld® an excellent choice for balcony facing and divider panels.



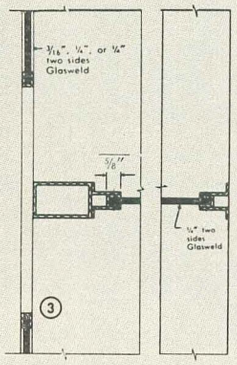
Balcony elevation, ¼" Glasweld in aluminum frame.



Section through balcony showing divider panels.



Section through rail showing divided connection.



Plan view of upright.

Balcony facings panels.
Balcony inserts employ 3/16" and ¼" Glasweld in metal sections on established centers to sustain impact. For large panel size facings use ¼", one-sided, or ¼" laminated-two-sides Glasweld.

Balcony dividers.
Glasweld ⅛" thick is installed back-to-back to form units of desired dimension. Consult your Weldwood Architectural Representative who can arrange for quotations by local fabricators. When economy is a factor, savings can be realized by utilizing stock size Glasweld sheets.

Weldwood®

GLASWELD®

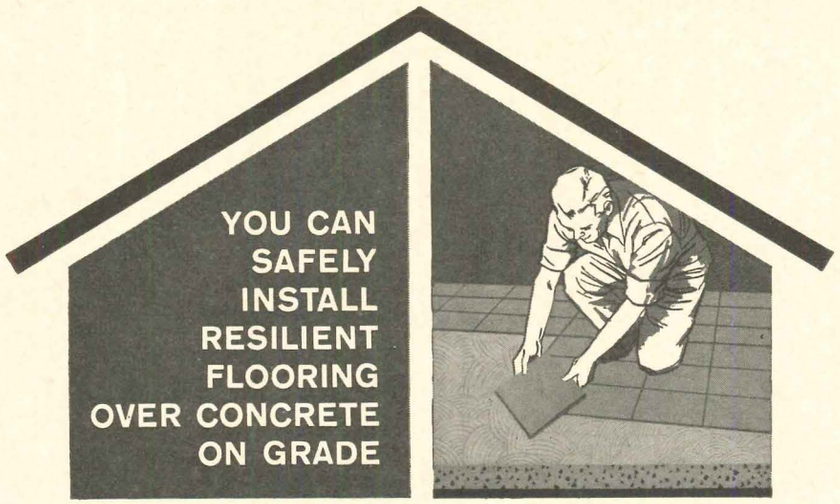
Product of United States Plywood

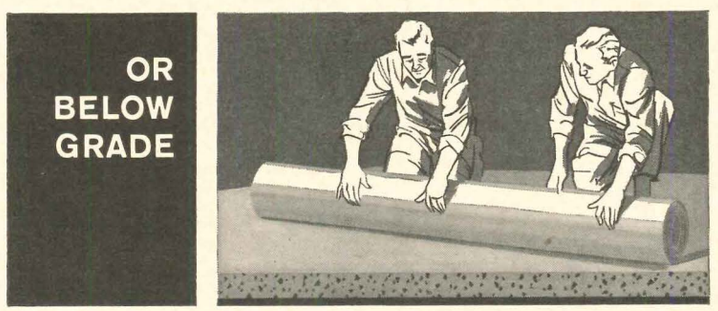
Glasweld is an autoclaved asbestos-reinforced exterior grade panel with a permanently colored mineral coating. Completely inert, it appears optically flat and is 100% incombustible (UL rating 0-0-0). Glasweld's wide range of non-fading colors can be used singly or in combinations; its great versatility makes it equally suitable for curtain walls, fascias, soffits, and fences, as well as for balcony facings. In addition to 48" x 96" and 48" x 120", Glasweld is now available on special order in sizes as large as 64⅝" x 126".

Come see us at the New York World's Fair—Better Living Building.

Left: Whitehall Apartments, Bethesda, Md. Architects: Cohen, Haft and Associates.

For more data, circle 136 on Inquiry Card





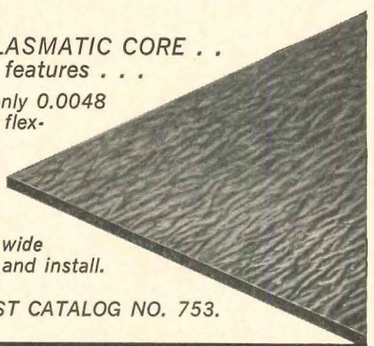
...WHEN THE FLOOR SLAB IS PROTECTED BY THE ORIGINAL TRUE VAPOR SEAL, PREMOULDED MEMBRANE WITH PLASMATIC® CORE

In the past, there has been a justifiable hesitation on the part of many architects and contractors to specify and install resilient floors of asphalt, cork and vinyl tile and linoleum directly over concrete slabs on-grade or below grade. *Justifiable* because moisture migration into the slab, caused a deterioration of the adhesive that bonded the resilient flooring to the concrete.

However, many forward thinking architects and contractors first protected the slab from excessive moisture by installing PREMOULDED MEMBRANE Vapor Seal and the resilient flooring has functioned effectively for years. Protect your flooring application and the entire structure by first installing the best vapor seal available—PREMOULDED MEMBRANE with PLASMATIC® Core.

PREMOULDED MEMBRANE with PLASMATIC CORE . . the only vapor seal offering all these features . . .

• Water and vapor proof . . . WVT rating only 0.0048 grains/per square foot/per hour • 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 • Lightweight, easy to handle and install.



FOR COMPLETE INFORMATION REQUEST CATALOG NO. 753.

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PRODUCTS FOR BETTER CONCRETE CONSTRUCTION

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ATLANTA, GA. 30331

W. R. MEADOWS OF CANADA, LTD.
130 TORYORK DRIVE
WESTON, ONTARIO, CANADA

For more data, circle 137 on Inquiry Card

Product Reports

continued from page 293

FIRE HYDRANT

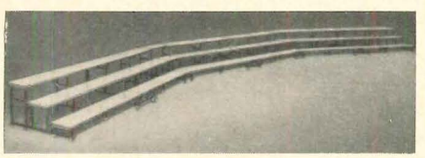
Special features of the new *Mueller 1107* fire hydrant include a streamlined shoe; an easily-removable compression-type main valve with an increased net valve opening; integral, automatic, all-bronze drain valves that provide positive drainage; safety flange and stem coupling design that prevents damage from vehicles; and a one-piece, unitized bonnet with sealed-in lubrication which requires no adjustment and no disassembly for field maintenance. The main valve assembly is designed to allow maximum water flow through a full net valve opening area. The compression style main valve is made of a resilient synthetic rubber, soft enough to withstand abrasion and damage by rocks or foreign matter, yet hard enough to withstand the pressure. The use of this material is said to assure positive closure. *Mueller Company, 500 West Eldorador St., Decatur, Ill.*

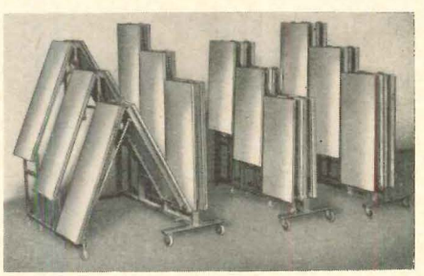
CIRCLE 309 ON INQUIRY CARD

FOLDING CHORAL RISER

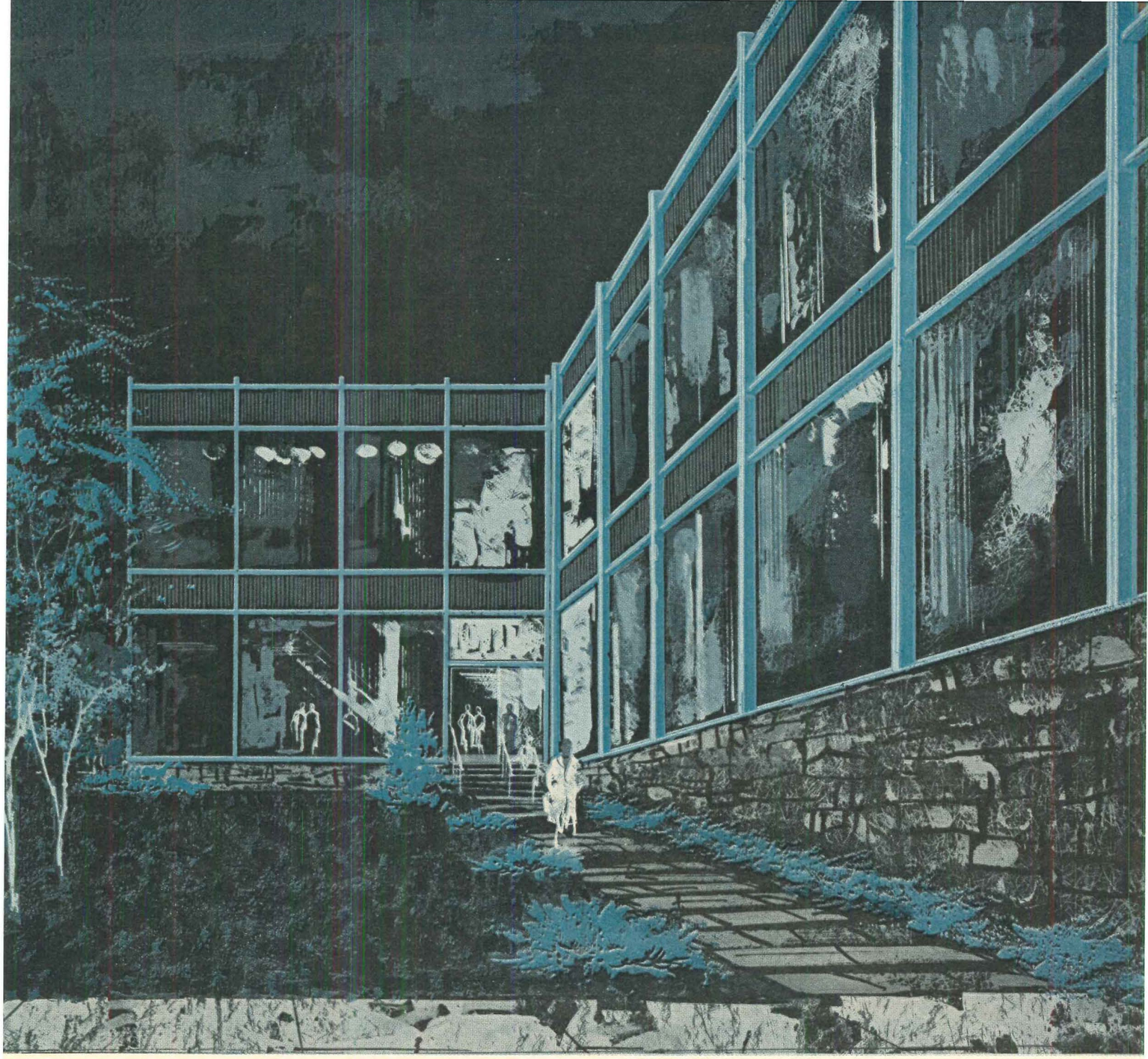
The company claims that this new folding choral riser is free from bounce and sway when opened, and because of an enclosed mechanical assist spring is easier to fold and unfold than previous models. An all-welded, unitized frame makes for sturdiness and rigidity. The linkage and understructure is not screwed to the top, but the whole unit is welded together with the tops mounted on it. Damaged tops are easily replaced. *Schieber Manufacturing Co., 12955 Inkster Rd., Detroit, Mich.*

CIRCLE 310 ON INQUIRY CARD





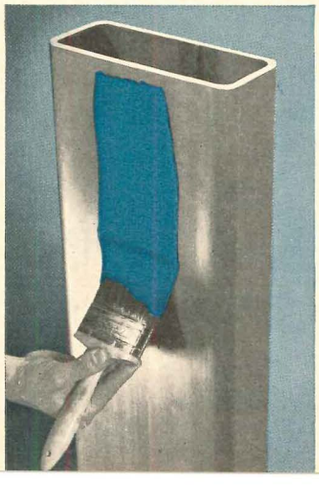
more products on page 302



expose

Bethlehem Hollow Structurals

...they paint beautifully



We *cold-form* our hollow structural sections from blast-cleaned steel to make sure you get a smooth surface that paints beautifully. 146 sizes and gages from which to select the sections that fit your ideas exactly. Good reasons to *specify Bethlehem.*

Hollow structural sections are ideal for exposed beams and columns... handrails, mullions, lintels . . . spandrels, roof trusses, and joists, curtain wall systems, and space frame structures . . .

Steel for Strength

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Sales:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

For more data, circle 138 on Inquiry Card

Three Cleveland architectural firms have organized Cleveland Federal Building Architects to design the new Cleveland Federal Office Building. They are: Outcalt, Guenther, Rode, Toguchi & Bonebrake; Shafer, Flynn & Associates and Dalton-Dalton Associates. The contractors (joint venture) are Frank Briscoe Company, Newark, N.J., and Huber, Hunt and Nichols, Inc., Indianapolis, Ind.

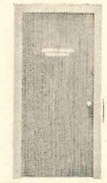
HAUGHTON TOTALLY-AUTOMATED ELEVATORS TO SERVE THE NEW CLEVELAND FEDERAL OFFICE BUILDING

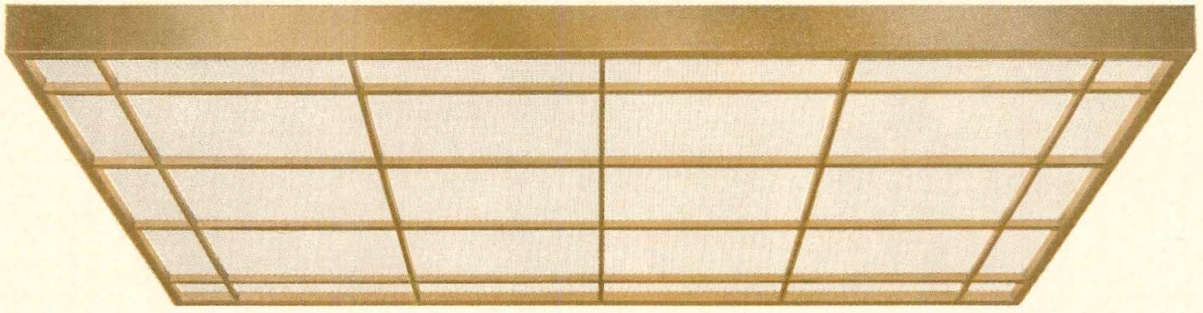
28-totally-automated Haughton high speed elevators are specified for the new 32-story Federal Office Building to be built on Lakeside Avenue in Cleveland, Ohio. They will provide service that is precisely matched to traffic demand around the clock. ■ Total elevator automation is made possible by a number of unique developments to come from our work in Elevonics*. One example: our remarkable new electronic computer-control system. This advancement in elevator technology constantly monitors elevator service demands on every floor . . . automatically controls each car to coddle tenants and visitors with the ultimate in swift, smooth service. ■ Even peak demand experienced during rush hours is handled with such incredible speed and efficiency that elevator service is virtually instantaneous. ■ Specify totally-automated Haughton Elevators in your plans for new construction or modernization. See our catalog in Sweet's, or write us for information. Haughton Elevator Company, Division of Toledo Scale Corporation, Toledo, Ohio 43609.

*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.

HAUGHTON ELEVATORS

For more data, circle 139 on Inquiry Card

If your client has his title  on the door, and a Bigelow on the floor, what do you put on the ceiling?



Diplomat by Lightolier, of course. The fixture that makes fluorescent a design asset. These shallow, surface-mounted panels of light, framed in extruded aluminum, in bronze-anodized finish, add distinction to important interiors. Efficient low brightness shielding is of acrylic in a fine scale prismatic pattern. Available in five sizes and with a choice of special anodized finishes, Diplomat makes it possible to create a custom look for your clients. Completely enclosed, yet engineered for easy cleaning and relamping without the use of tools, Diplomat is another high performance, cleanly detailed lighting achievement by Lightolier.

LIGHTOLIER®

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SHOWROOMS:
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1267 MERCHANDISE MART, CHICAGO;
2515 S. BROADWAY, LOS ANGELES;
1718 HI-LINE DRIVE, DALLAS

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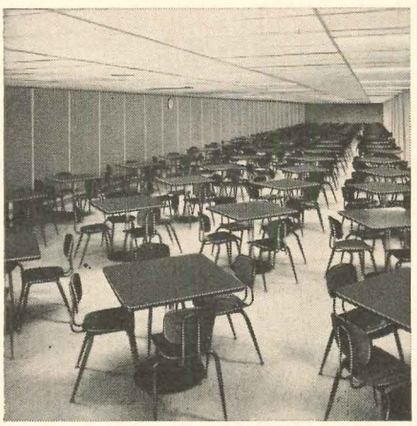
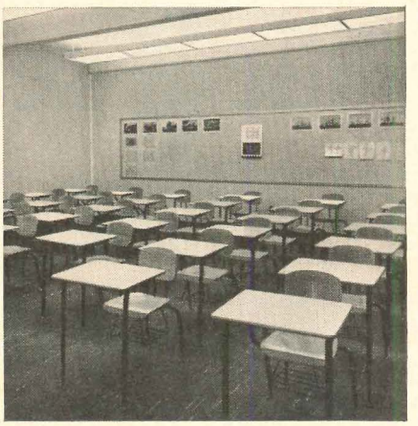
THE STANDARD DECORATION

FOR WALLS THAT WORK FOR A LIVING!





MALMFELDT ASSOCIATES, ARCHITECTS of the new $8,825,000 HARTFORD HIGH SCHOOL, CONNECTICUT, say:

"Wallclad Heavy Duty offered us beauty in its wide selection of colorings. We installed 90,000 square feet of the Bombay pattern in 10 different colors in the cafeterias and classrooms." In addition you'll find that Wallclad has been specifically designed for institutional, commercial and industrial hard wear. It is durable, scuff and stain resistant vinyl that's washable and easy to maintain. Wallclad is made in two weights and can effect savings of up to 50% over comparable products for this reason.

Wallclad is listed by Underwriters' Laboratories, Inc. and meets the specifications of Federal, State and Local agencies.

THESE LEADING INSTITUTIONS HAVE INSTALLED WALLCLAD:

NOTRE DAME UNIVERSITY
South Bend, Ind.

UNIVERSITY OF CALIFORNIA
Berkeley, Cal.

HOLIDAY INNS
(21 installations)

THUNDERBIRD HOTEL
Las Vegas, Nev.

CHARLES F. KETTERING MEMORIAL HOSPITAL
Kettering, Ohio

HARRINGTON MEMORIAL HOSPITAL
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SAN LEANDRO LIBRARY
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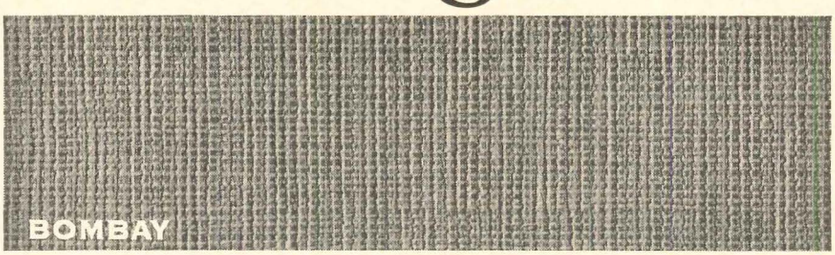
Wallclad® VINYL
FABRIC WALL COVERING
BY THE MAKERS OF Sanitas



STANDARD COATED PRODUCTS INCORPORATED, Buchanan, New York
GENTLEMEN: Please send me quality samples and specifications on WALLCLAD Vinyl Fabric Wall Covering.

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COMPANY _____

ADDRESS _____

CITY _____ STATE _____ AR/9

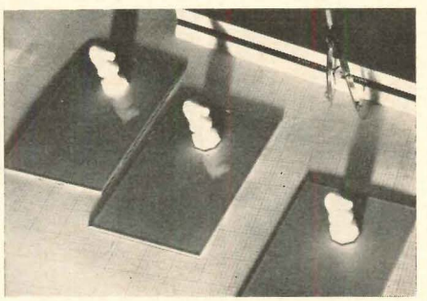
For more data, circle 141 on Inquiry Card

Product Reports

continued from page 298

NEW FINISH FOR PORCELAIN ENAMEL

Porcelmatte is a new type of full-matte porcelain enamel finish which does not reflect images, but is said to insure a high level of weather resistance, comparable with that provided by conventional gloss porcelain



enamel. Extensive laboratory testing predicts that this finish can be successfully used for a wide variety of exterior applications. *Ingram-Richardson Manufacturing Company, Beaver-Falls, Pa.*

CIRCLE 311 ON INQUIRY CARD

VINYL SIDING

Non-combustible Monsanto vinyl siding is available as a complete system which includes special pre-cut grooved fiber sheeting, J-strips, sill trim and corner caps. The company claims that this new vinyl siding is easy to clean, does not require repainting, and will stand up well to all extremes of weather and to corrosive atmospheres. The color is built in to the siding to resist peeling, discoloration and fading. *Monsanto Building Products, St. Louis, Mo.*

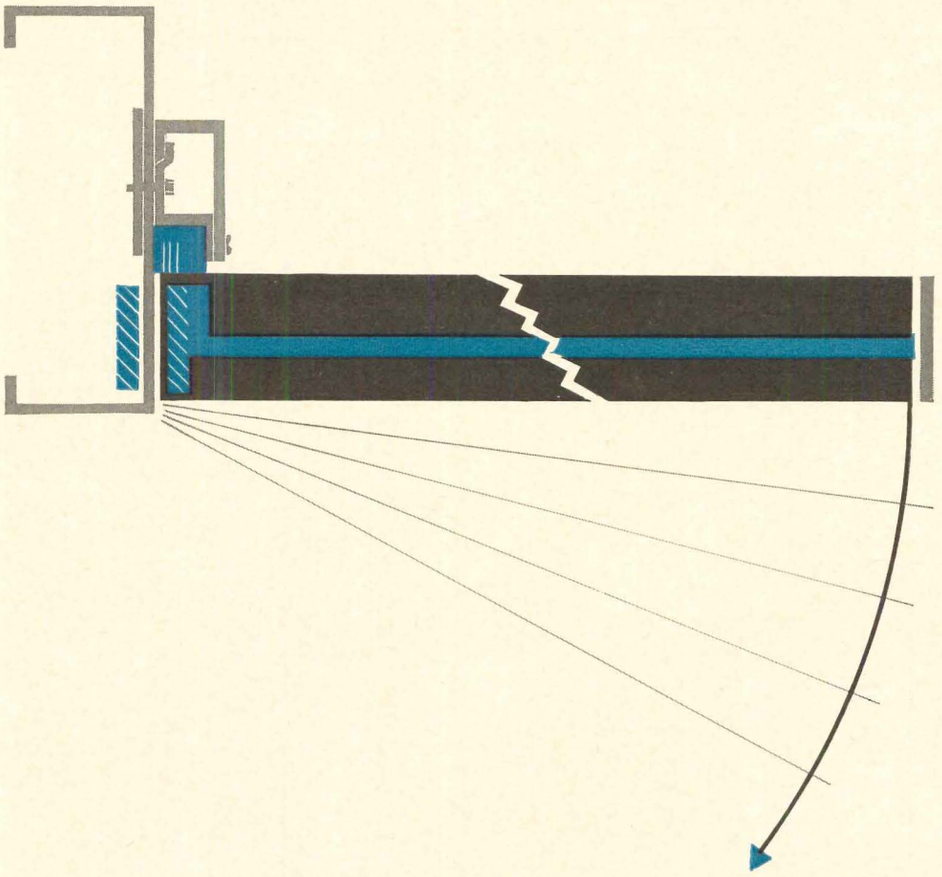
CIRCLE 312 ON INQUIRY CARD

CENTER HUNG DOOR PIVOT

The new *Adjust-A-Piv* center hung door pivot is said to be the only one on the market which can be adjusted after the door is hung. The use of this pivot makes it possible for adjustments to be dialed on any aluminum door without removal of the door. Full race ball-bearings, lifetime lubrication, permanent sealing against rust and ease of installation are features of the new pivot. *Jackson Exit Device Corp., 3447 Union Pacific Ave., Los Angeles 23, Calif.*

CIRCLE 313 ON INQUIRY CARD

more products on page 306



Must acoustical doors be thick?

No! It's the internal design that counts. Overly's Acoustical Doors are standard 1¾" door thickness, and are built in all conventional sizes. These fully operable Overly doors were tested in 72 separate tests at Riverbank Acoustical Laboratories, Geneva, Illinois, and offered superior Sound Transmission Class Ratings to doors four times as thick. STC Ratings from 35 db through 62 db are available.

The performance secret is a sound deadening core and a new sound seal that is efficient at all frequencies. Gone are cumbersome sill conditions and refrigerator-type hardware. Here are doors that are thinner, more attractive, use standard hardware and are lighter in weight. One model has 3 hours U/L rated fire resistance.

We do make huge acoustical doors, but they're built for unusual conditions, with concealed compression hardware. See our catalog in Sweet's 16n/Ov, for full test data, specs and details.

Overly

MANUFACTURING COMPANY
Greensburg, Pennsylvania 15602
Los Angeles, California 90039

For more data, circle 142 on Inquiry Card

Quarry Tile of Special Shapes

The unique beauty of Ludowici special shapes shale flooring tile is now practical for your most budget minded client. Because of greatly increased demand, price reductions have been made on all special shape styles. No difference in quality or texture.

You can now afford the world's most beautiful flooring tile.

Provence, Valencia and Renaissance patterns available in brushed or smooth, in red or fire flashed colors.

For complete information and the name of your nearest distributor write:

FLOORING TILE DIVISION—Dept. A. R.

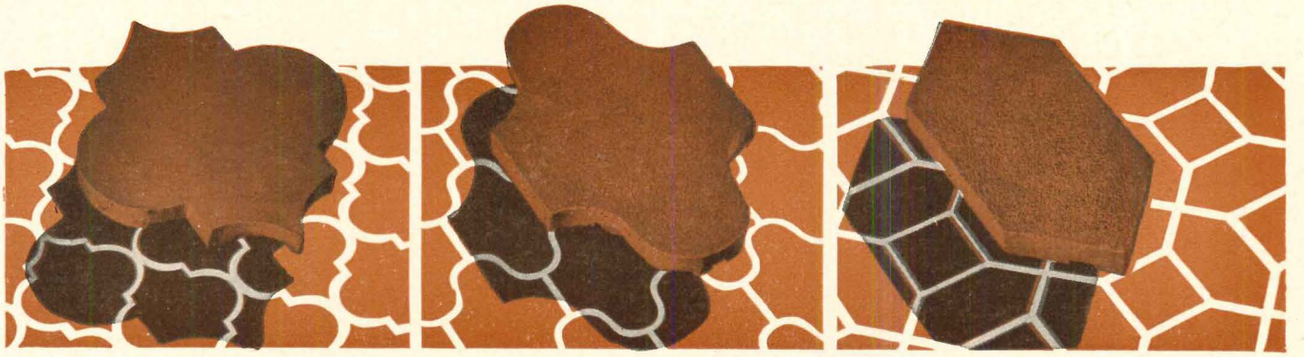
LUDOWICI-CELADON CO. • 75 East Wacker Drive, Chicago 1, Illinois

Manufacturers of quarry tile, the nation's largest producer of roofing tile and NAILON Facing Brick

WEST COAST REPRESENTATIVES: International Pipe & Ceramics Corp., Los Angeles

HAWAII REPRESENTATIVES: Lewers & Cooke, Ltd., Honolulu

VALENCIA **PROVENCE** **RENAISSANCE**



For more data, circle 143 on Inquiry Card

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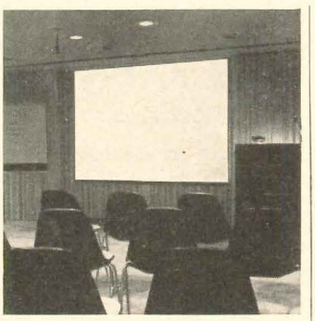
when architects buy audio-visual equipment the screen, most often, is



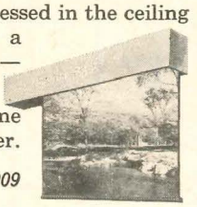
Shown is the 8 ft. electrically operated Da-Lite Electrol® projection screen installed recently in a conference room in the Apollo Support Department of General Electric's Daytona Beach plant.

DA-LITE®

For important conferences, the Da-Lite projection screen at General Electric plays a useful role. Out of sight when not in use, the electrically operated screen lowers automatically at the touch of a button. Superb reproduction of projected pictures on Da-Lite's White Magic II® Chemi-Cote® glass beaded surface is assurance of effective visual presentations.

Experts in the audio-visual field recommend the Da-Lite Electrol for unsurpassed performance. Electrols have been giving trouble-free service for over 26 years.

Da-Lite Electrol screens are available in a wide selection of sizes to fit your needs. They can be recessed in the ceiling or installed on wall or ceiling. Choose a Da-Lite screen—get the *Big Difference*—and the difference costs you nothing.



Write for specifications, prices and name of nearest franchised Audio-Visual dealer.

perfection in projection since 1909

Da-Lite Screen Co., Inc., Warsaw, Indiana

Information You Need for Planning Spotlight Installations *in*

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- COLLEGES
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Specification sheets and descriptive brochures on

Strong

INCANDESCENT AND CARBON ARC FOLLOW SPOTLIGHTS

Foot candle readings and diameters of spots at various throws are included.

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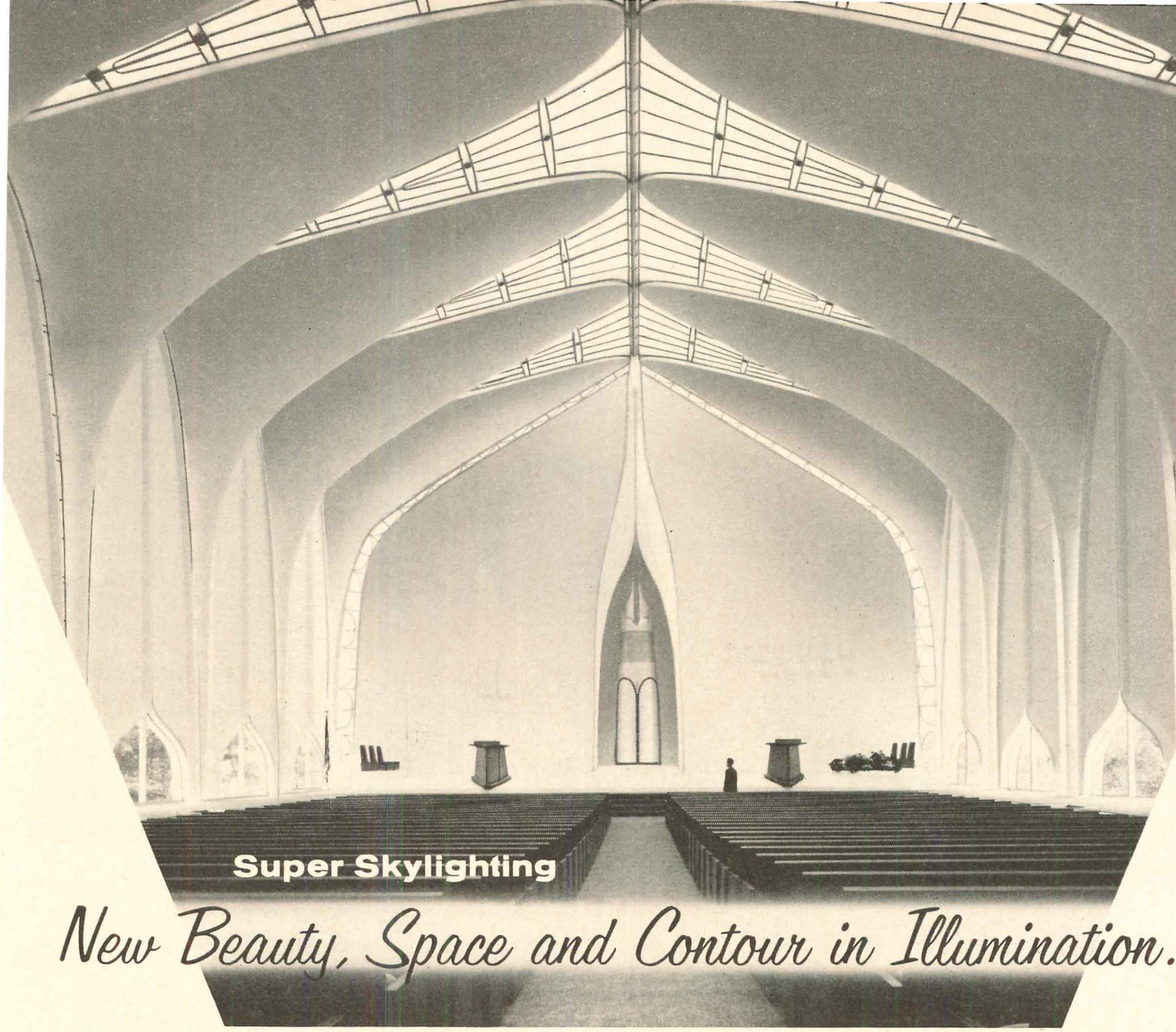
A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

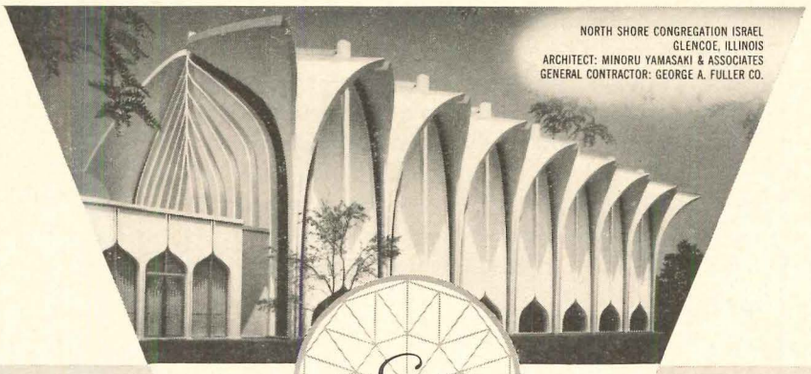
For more data, circle 145 on Inquiry Card

For more data, circle 146 on Inquiry Card →



New Beauty, Space and Contour in Illumination...

Natural lighting is one of the most expressive components at the architect's command. He can — as is shown here with Super Skylighting — reflect the true mood of the building, and highlight its architectural focal point with unique beauty and startling plane and contour. Consider the imaginative and functional use of natural illumination on your next project. From *your* plans, Super Sky will design, fabricate, erect and even *guarantee* the skylight — whether specialized, or a custom or standard, pyramid, dome or ridge unit. Write for detailed drawings, engineering data, estimates and suggestions. No obligation, of course.



Engineering Features:

- Extruded aluminum custom skylight with custom suspended ceiling lights
- Exposed aluminum — 215-R5 anodized
- Continuous extruded neoprene sealing gaskets
- Hue-white wire glass
- Completely self-supporting
- Integrated lighting system

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SUPER SKY PRODUCTS, INC.
BOX 113-E
THIENSVILLE, WISCONSIN
PHONE: CHestnut 2-2000
Milwaukee phone:
FLagstone 4-6700

Write direct or contact representatives listed:

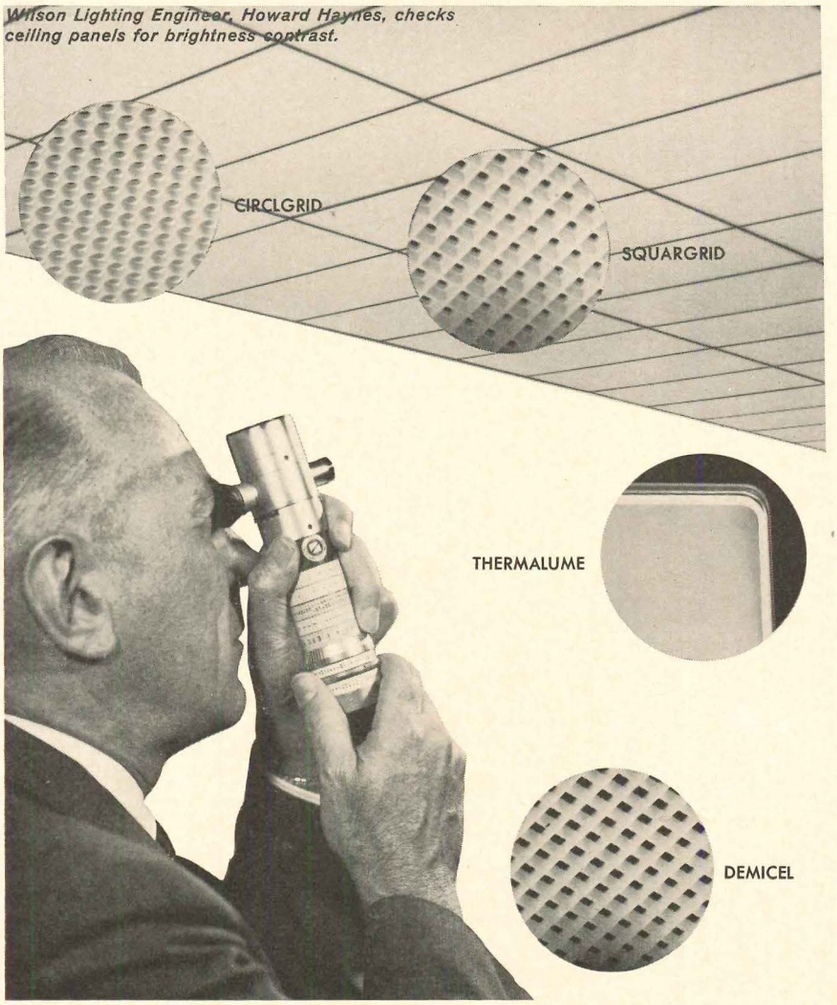
Don Endres
18514 Mack Avenue
Grosse Pointe Farms 36, Mich.
Phone: TU 1-3496

Frederic N. Dodge
2648 Marion Drive
Ft. Lauderdale, Florida
Phone: 524-9169

Dekkers Davidson
101 Park Avenue
New York, New York
Phone: MU 3-6740

Earl Ham
819 Dietz Street
Marengo, Illinois
Phone: 568-7113

Jack Perling
3424 E. Lake Street
Minneapolis, Minn.
Phone: PA 1-2465



CHOOSE THE RIGHT
WILSON LIGHTING PANEL FOR
YOUR NEXT ILLUMINATED CEILING

Light quality and appearance are important factors in choosing the right illuminated ceiling. Wilson gives you both in a variety of laboratory designed and tested panels to fit your needs. **Circlgrid:** A patented, non-burning vinyl louver with great rigidity and lightness. Open or closed cell construction available—open panels approved for sprinkler systems. **Squargrid:** Same as Circlgrid, except for square cell motif. Sizes to 2½′ x 5′. Offers same wide choice of colors. Both have UL-20 Tunnel Test Classification. Self-cleaning design lets air circulate, without catching dust. **Demicel:** Economical styrene panel with excellent strength. Less material, lower cost, and 10% more light output than conventional eggcrate louvers without glare. UL approved for use with sprinklers. **Thermalume:** New, lightweight single or double layer PVC ceiling panel. Excellent light transmission plus effective thermal control over large areas. Keeps heat in during winter, out in summer. Self-extinguishing PVC film will not sag or discolor. An economical, shadow-free, air-tight way to seal off dead space. For additional tips on choosing the **right** panel on your next job, write: Wilson Research Corporation, 2001 Peninsula Drive, Erie, Pa.

WILSON

Cryvac plastics
Serving the O. E. M.

WILSON CEILING PRODUCTS
Serving the Accoustical Trade

S WILSON BUILDER PRODUCTS
Serving the Building Market

J. A. WILSON LIGHTING.
Serving the Lighting Industry

For more data, circle 147 on Inquiry Card

Product Reports

continued from page 302

BATH MASSAGE UNIT

The Built-In Jacuzzi Whirlpool Bath is a permanent water massage unit which can be installed in any standard make or size tub. Equipped with a ½ hp motor, the unit is available in two models, the *J-500* and the *J-600*. The *J-500* was designed mainly for second floor bathrooms, or for new or remodeled bathrooms on the ground floor. In this model, the pump and motor are placed either behind the tub at the drain end, or in a linen closet adjacent to the tub. The *J-600*, which was designed for existing bathrooms on the ground floor, places the pump and motor beneath the flooring at the drain end of the tub. *Jacuzzi Research, Inc., Berkeley, Calif.*

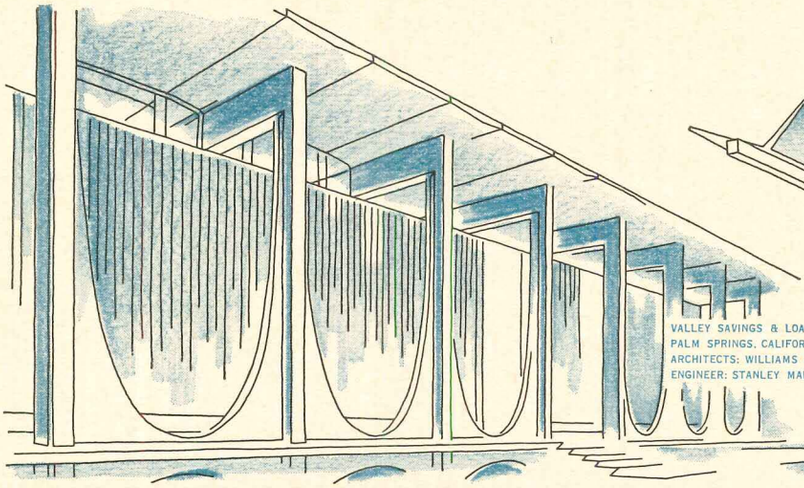
CIRCLE 314 ON INQUIRY CARD

PATIENT'S CHAIR TABLE

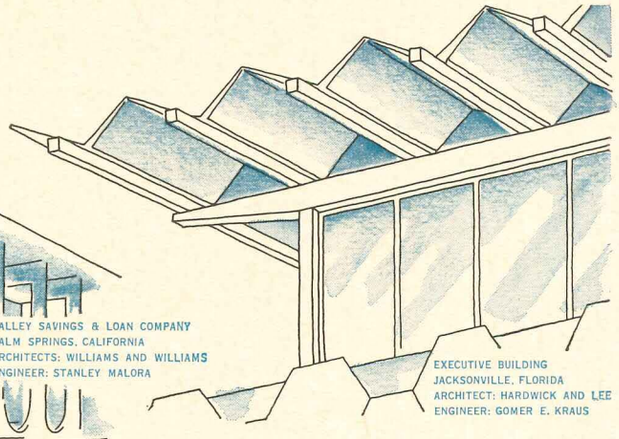
The *Lumex Chair-Table* for use in old people's homes and nursing homes has a convenient swing-away table and extended "patient-aid" arms. The chairs have a polished heavy 1-in. steel tubular frame with plastic leg tips. The high tapered backrest permits the use of standard pillowcases and a small pillow as a head rest. The push handle doubles as a towel rail or blanket bar. A pull button lock holds the table in five different positions and acts as a mild safety restraint. Chairs can also be provided with a retractable footrest and casters to convert them into transportation units. *General Medical Equipment Corp., Division of Lumex Inc., Bellmore, N.Y.*

CIRCLE 315 ON INQUIRY CARD

more products on page 310



VALLEY SAVINGS & LOAN COMPANY
PALM SPRINGS, CALIFORNIA
ARCHITECTS: WILLIAMS AND WILLIAMS
ENGINEER: STANLEY MALORA



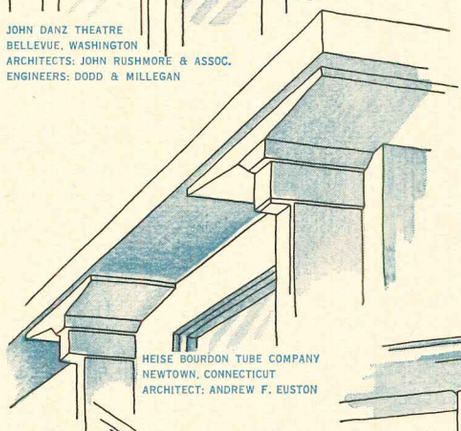
EXECUTIVE BUILDING
JACKSONVILLE, FLORIDA
ARCHITECT: HARDWICK AND LEE
ENGINEER: GOMER E. KRAUS

PRESTRESSED CONCRETE

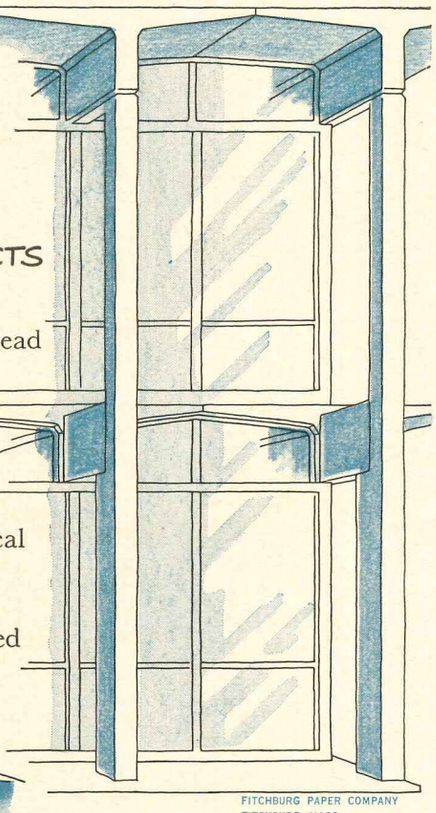
JOHN DANZ THEATRE
BELLEVUE, WASHINGTON
ARCHITECTS: JOHN RUSHMORE & ASSOC.
ENGINEERS: DODD & MILLEGAN

CREATIVE DESIGN GIVES CUSTOM LOOK TO STANDARD PRODUCTS

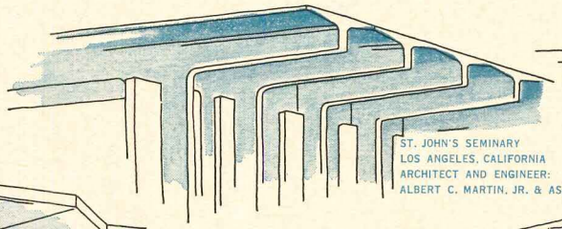
Architects and engineers whose esthetic concepts and ingenuity lead them to seek broad versatility find prestressed concrete a truly cooperative structural material. Simple techniques in manufacture permit virtually unlimited variations in economical standard sections. Let your next building express bold individuality with plant-produced prestressed concrete.



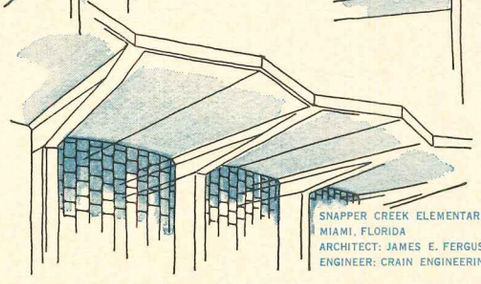
HEISE BOURDON TUBE COMPANY
NEWTOWN, CONNECTICUT
ARCHITECT: ANDREW F. EUSTON



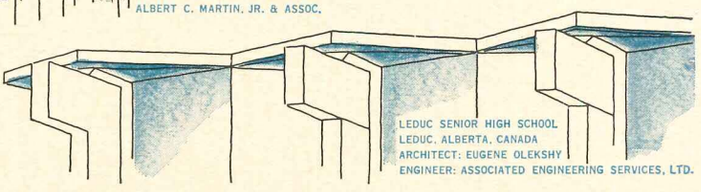
FITCHBURG PAPER COMPANY
FITCHBURG, MASS.
ARCHITECT: CARL KOCK & ASSOC.
ENGINEER: SOUSA & TRUE



ST. JOHN'S SEMINARY
LOS ANGELES, CALIFORNIA
ARCHITECT AND ENGINEER:
ALBERT C. MARTIN, JR. & ASSOC.



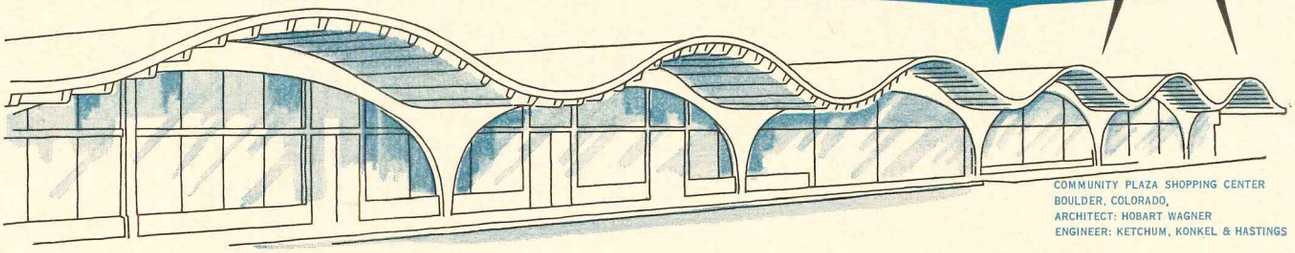
SNAPPER CREEK ELEMENTARY SCHOOL
MIAMI, FLORIDA
ARCHITECT: JAMES E. FERGUSON & ASSOC.
ENGINEER: CRAIN ENGINEERING CO.



LEDUC SENIOR HIGH SCHOOL
LEDUC, ALBERTA, CANADA
ARCHITECT: EUGENE OLEKSHY
ENGINEER: ASSOCIATED ENGINEERING SERVICES, LTD.

PRESTRESSED CONCRETE INSTITUTE

205 WEST WACKER DRIVE • CHICAGO, ILL. 60606



COMMUNITY PLAZA SHOPPING CENTER
BOULDER, COLORADO,
ARCHITECT: HOBART WAGNER
ENGINEER: KETCHUM, KONKEL & HASTINGS

For more data, circle 148 on Inquiry Card

First Completed Suspended Glazing of a Commercial Building in the U.S.A.

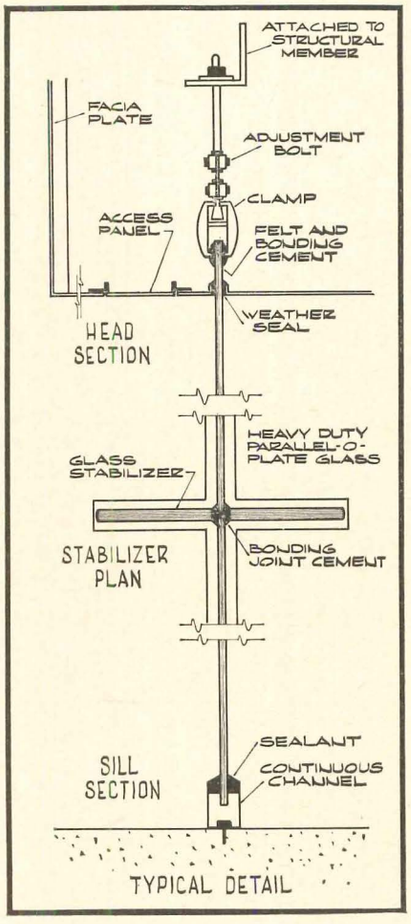
MADE IN U.S.A.

LOF GLASS

Susquehanna Savings & Loan Association Building, Wilkes-Barre, Pa. Main plates of glass are 62″ x 246″, and ½″ thick. Vertical glass stabilizers ¾″ thick are 8″ x 246″. *Tuflex*® tempered plate glass doors help complete the open feeling. Architects: Lacy, Atherton & Davis, Wilkes-Barre. Glazing contractor: Scranton Plate Glass Co., Scranton, Pa., and F. H. Sparks Co., glazing consultant and system licensee, New York.

New glazing system lets you think BIGGER THAN EVER with L·O·F GLASS Heavy-Duty Plate Glass

By hanging the glass, you can create all-glass walls —for dramatic "Open World" design



FREE KIT! If you'd like a kit showing how the strength tests were made and giving complete data, write to L·O·F, 2194 Libbey·Owens·Ford Building, Toledo, Ohio 43624.

This new system . . . suspended glazing . . . was developed in Germany and has been used successfully in Europe. It permits virtual elimination of visual barriers . . . creating a feeling of greater openness, greater freedom of architectural design.

Large sheets of Heavy-Duty *Parallel-O-Plate®* are suspended with metal clamps. To provide required strength against pressure loads, vertical glass supports, called stabilizers, are used at butting joints. All joints are sealed with a bonding material. At the sill the glass hangs in a metal channel and is sealed with a resilient weatherproofing. Exposed edges of the stabilizers are polished to enhance the beauty of the all-glass front.

New L·O·F test data helps you design with greater confidence and safety. L·O·F distributors and L·O·F sales offices are provided with the latest technical data to help you solve glass design problems... data on light transmission, heat gain or loss, *strength* against pressure loads.

To give you reliable P.S.F. data on glass strength, L·O·F recently tested over 1,500 lights of plate glass to destruction. This information is already available on thicknesses from ¼" through ¾". Also, results of new tests on reduction of sound transmittance with Heavy-Duty Plate are available.

L·O·F recently lowered prices on Heavy-Duty Plate by about one-third, so go ahead and think BIG as you design!

Libbey·Owens·Ford

TOLEDO, OHIO

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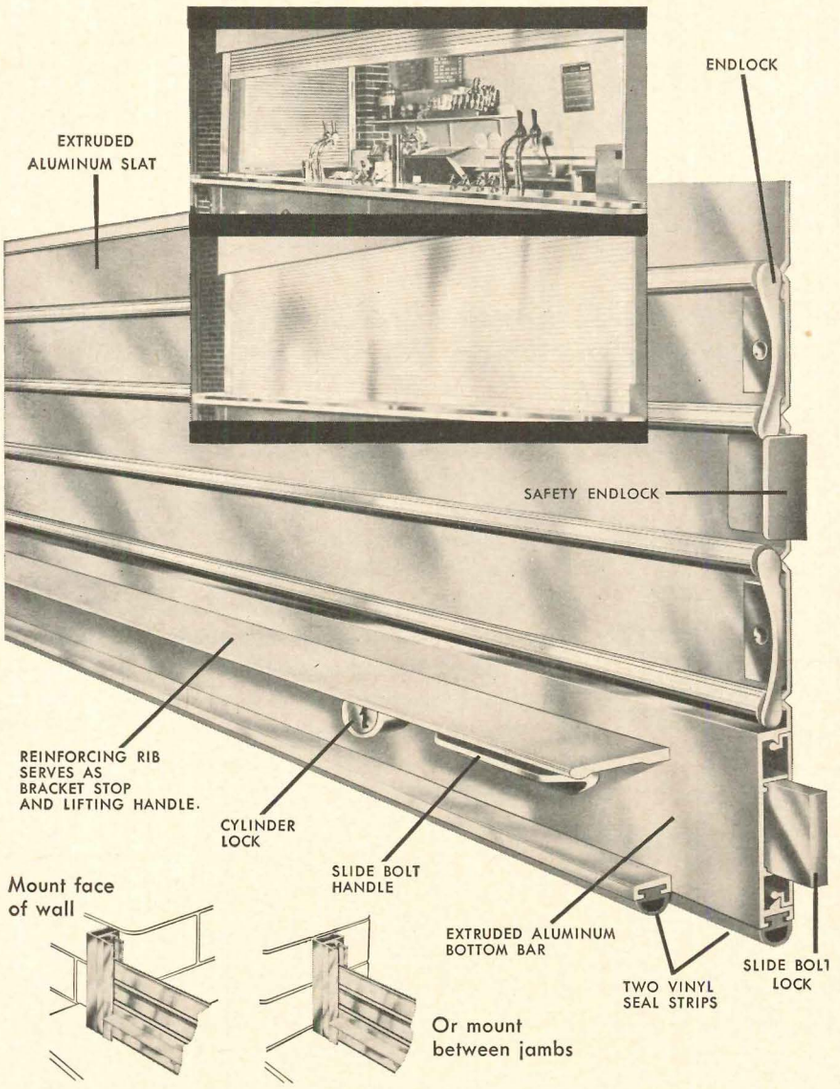
Kinnear ROLLING Counter Shutters

(steel or aluminum)



Regardless of the category of building, the Kinnear Rolling Counter Shutter offers the most modern, attractive and efficient closure for service counters, dispensing booths, bar areas, luncheon counters, pass windows, alcoves or other areas. The neat curtain of interlocking metal (aluminum or steel) slats coil above the opening on a barrel which houses a spring counterbalance. This means the Kinnear Counter Shutter provides the same convenient, easy operation and space economy of a window blind.

The Kinnear Counter Shutter can be built to fit the opening. Let us work with you on any of your current needs for a modern closure.

Remember, these shutters are made by the same people that have built Kinnear Metal Rolling Service and Fire Doors for more than 65 years.

The KINNEAR Manufacturing Co. and Subsidiaries

FACTORIES: 1860-80 Fields Avenue, Columbus, Ohio 43216

1742 Yosemite Ave., San Francisco, Calif. 94124 — 3683 Dundas St. West, Toronto, Ont., Canada

Offices and representatives in all principal cities

KINNEAR® ROLLING DOORS
Saving Ways in Doorways

For more data, circle 150 on Inquiry Card

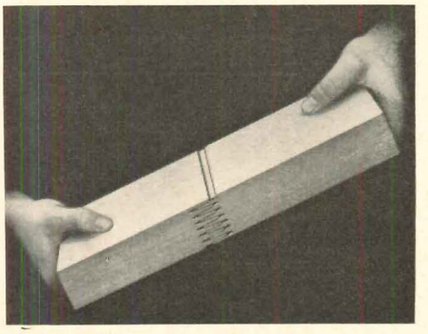
Product Reports

continued from page 306

FINGER JOINTING FOR WOODEN DOORS

A new system for assuring long lengths of flaw-free, straight-grained wood has been introduced by the Crawford Door Company to meet the difficulty of obtaining sound lumber in lengths long enough for the manufacture of wood doors.

In the finger-jointing method, a half-dozen or so "fingers" about 7/8 in. deep are cut into the ends of the two



lengths to be joined. A waterproof glue is applied and the joint is forced together under pressure and held while setting. Thus, less than an inch of useable wood is lost per joint. All knots, bark pockets, etc. are removed during the process. The new system can provide lengths up to 32 ft with a size range from 3/4 by 3 in. to 2 by 8 in. *Crawford Door Company, 20263 Hoover Rd., Detroit, Mich., 48205*

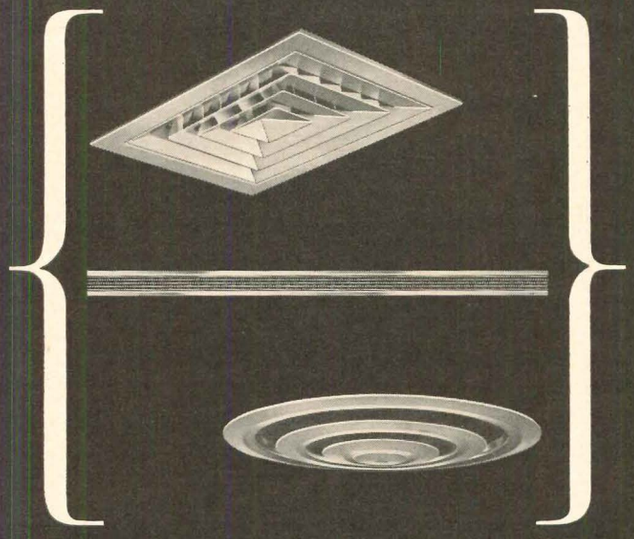
CIRCLE 316 ON INQUIRY CARD

HIGH VELOCITY REHEAT UNIT

Carnes Corporation has announced the addition of a high velocity reheat acoustical terminal control unit to its line of high velocity equipment. The single duct reheat unit is available in six sizes ranging from 80 to 1,700 CFM and a choice of either hot water or steam coils. The units are designed for ceiling mounting and have either end or bottom discharge. One- or two-row coils are offered and water or steam connections are external. Features include external valve adjustment for easy initial balancing or easy rebalancing in the event of revision of the building layout, acoustically baffled casing lined with coated fibrous glass to prevent air erosion, and an access door to the coil for cleaning. *Carnes Corp., Verona, Wis.*

CIRCLE 317 ON INQUIRY CARD

How AGITAIR® Created Diffuser Thinking



25 Years of Pioneering Air Distribution

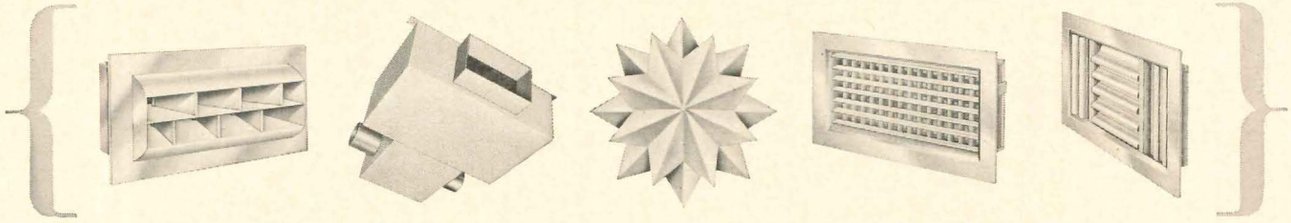
Twenty-five years of Engineering Achievement in Air Distribution, achievements resulting from long experience with the problems involved and the approach to solving them.

Distinctive products were born of the necessity to control conditioned air to insure the greatest possible comfort. Thus, AGITAIR pioneered the field and has led the industry with innovations.

Beginning with square and rectangular diffusers with diffusing vanes and pattern control in 1-2-3-4 way blows... *Adjustable Circular Diffusers... Slot Type Diffusing Outlets*... AGITAIR has never ceased to improve its design while adding new designs and concepts which appeal to architect, engineer and contractor.

AGITAIR products and data are imitated but the pioneering experience and engineering know-how can not be imitated.

There will always be AGITAIR products to fill current demands with Air Devices leading the field.



AGITAIR®

AIR DEVICES INC., 185 Madison Avenue, New York 16, New York

BETTER PRODUCTS FOR...AIR DISTRIBUTION • AIR CLEANING • EXHAUST

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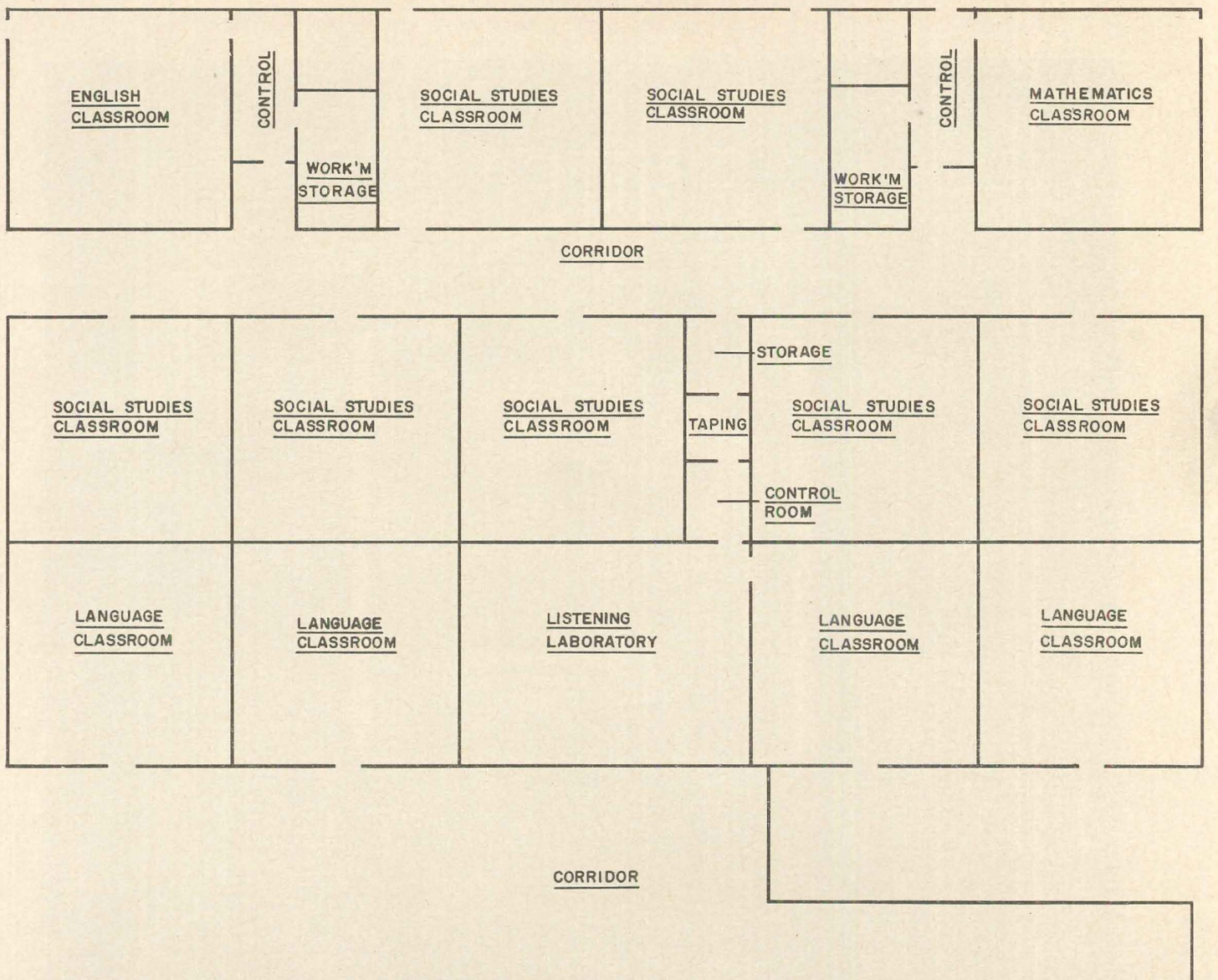
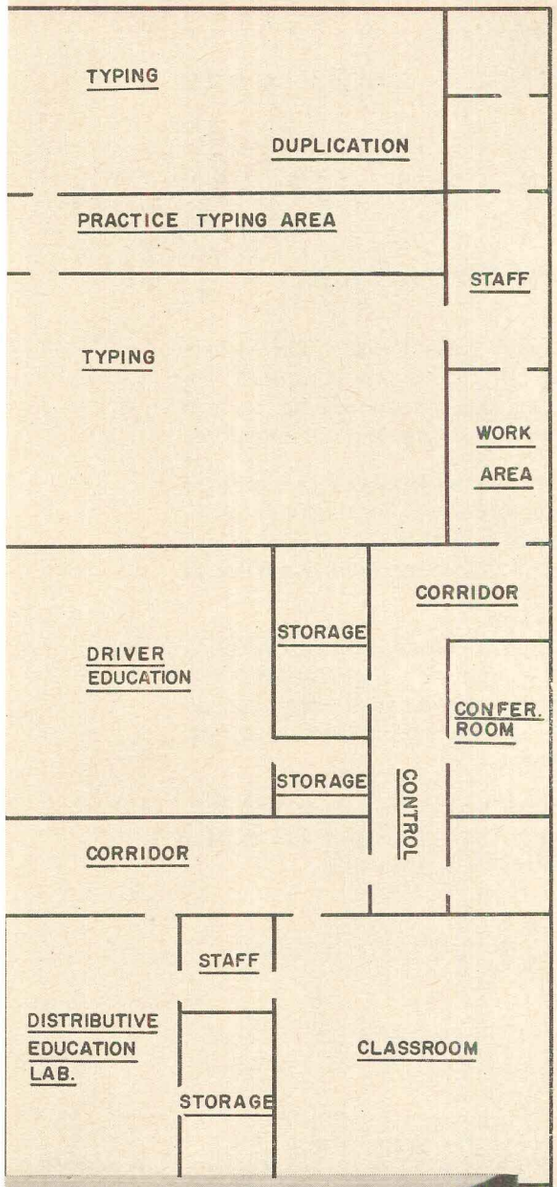
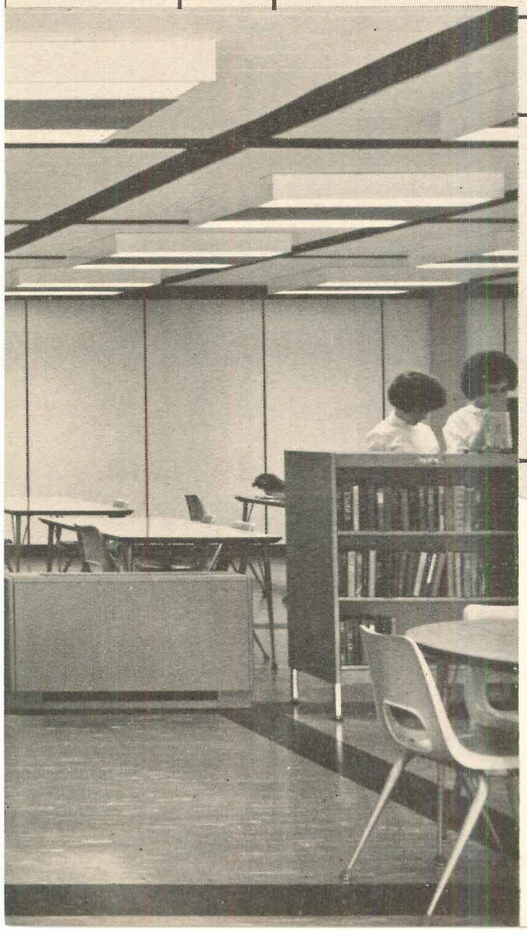


▲ Movable partitions can be assembled on a grid in every 28′ x 28′ module of East Campus Project of the Pekin (Ill.) High School.

General Electric Remote Control Switching makes rearrangement of lighting control as flexible as the movable partitions in this library. ▶





Modern school features windowless classrooms

Lighting control depends on low-voltage General Electric Remote Control Wiring in movable partitions

In the big, square East Campus Project of the Pekin (Ill.) Community High School, classrooms, study halls, laboratories and corridors are formed by movable partitions that can be arranged in 28′ x 28′ modules.

Rooms depend on artificial light

Because artificial light is the only method of illumination in most of the modules, the lighting system must be as flexible as the partitions.

To solve the problem, all 4-wire, 120/208V feeder circuits are run in the attic space — and all switch legs are low-voltage General Electric Remote Control Wiring.

Changes in switch wiring made easy

The G-E Remote-Control Wiring can be disconnected and reconnected quickly and easily as changes in partitioning are made. The low-voltage wiring is fed from the remote control switches . . . through the door jambs . . . up through access panels in the ceiling . . . then to the relays which are permanently wired in each lighting fixture. This permits the partitions to be moved without disturbing the higher voltage lighting circuits in the ceiling.

Flexibility combines with low cost

Since G-E Remote-Control Wiring uses only 24 volts, it eliminates the need for conduit to all switch legs. And the simplified 120-volt runs saves the contractor layout and installation time.

For complete information about the many advantages of General Electric Remote-Control Wiring in all types of commercial/institutional/industrial buildings, write today for your copy of the new General Electric Manual of Lighting Control Concepts. General Electric Company, Wiring Device Department, Providence, R. I.

Progress Is Our Most Important Product

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ELECTRICAL CONTRACTOR:
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For more data, circle 152 on Inquiry Card

Office Literature

continued from page 267

AIR-INDUCTION UNITS
A new 50-page illustrated two-color looseleaf engineering manual, bulletin 52-1-52, describes the new *Series 64* Inductor line of room air-induction units for use in modern high-velocity air-conditioning systems. *American Standard Industrial Division, Detroit 32, Mich.*

CIRCLE 411 ON INQUIRY CARD

ROLLING DOORS, GRILLS AND SHUTTERS
A 16-page, ready-reference guide on rolling doors, grills and shutters designed to provide versatile, space-saving closures for any type of building opening has just been issued. The catalog, No. G-64 presents concise data encompassing 12 standard, Underwriters' labeled, and power-operated types of rolling doors manufactured by the company. Each, briefly described, is pictorially and schematically illustrated. Data includes a table of clearance dimensions for each type of door. *R. C. Mahon Company, Rolling Door Division, 6565 E. Eight Mile Road, Detroit, Mich., 48234*

CIRCLE 412 ON INQUIRY CARD

PNEUMATIC TUBE SYSTEMS
An eight-page bulletin describes the uses and advantages of pneumatic tube systems and gives schematic diagrams of four of the most popular conventional systems. Photos, dimensions and specifications of nine of the latest types of carriers are included, as well as a complete description of 14 dispatching inlets and receiving terminals. *Standard Conveyor Company, North St., St. Paul, Minn.**

CIRCLE 413 ON INQUIRY CARD

KITCHEN PLANNING
Colored photos of a number of contemporary kitchens featuring *Revco* refrigerators are included in this 16-page catalog. Details of the different refrigerator models are given and four basic kitchen layouts are shown with suggested positioning of refrigeration equipment. *Revco Inc., Deerfield, Mich.*

CIRCLE 414 ON INQUIRY CARD

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

more literature on page 320B

more and more
great American architects
are using

MARMET

here are a few of the reasons:

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More and more . . . experienced architects find that specifying MARMET is a long step toward successful execution of all fenestration components.

fenestration engineered to free flowing forms

NORTH SHORE CONGREGATIONAL ISRAEL TEMPLE and SCHOOL, Glencoe, Illinois

Large expanses of glass in this breathtaking structure required unusual shapes in the aluminum window framing. But rolling or shaping extruded members into precision fitting, compound radii is not a new problem for MARMET engineering. MARMET series 160 double glazed church windows were used in the temple. Series 1000 entrance frames and doors lend gleaming accents to the galleries.

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corporation

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Fenestration
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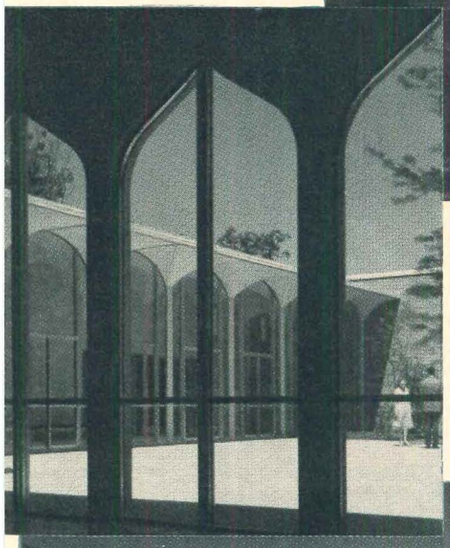
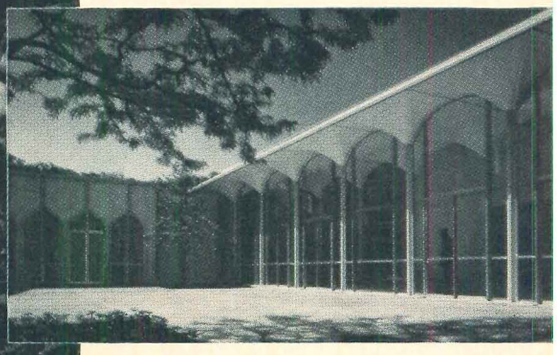
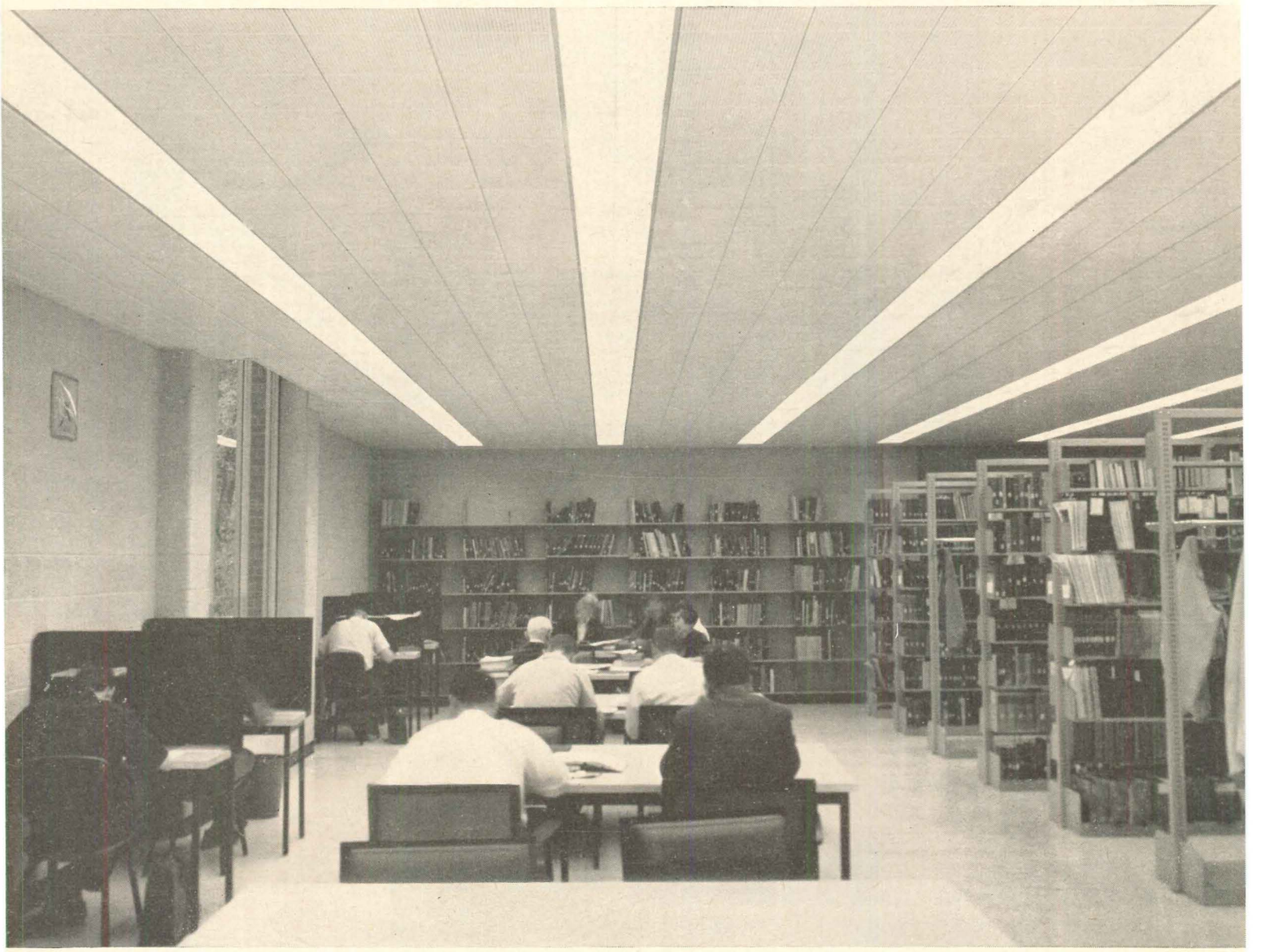


An inspiration in structure
to lift the spirit of the worshiper

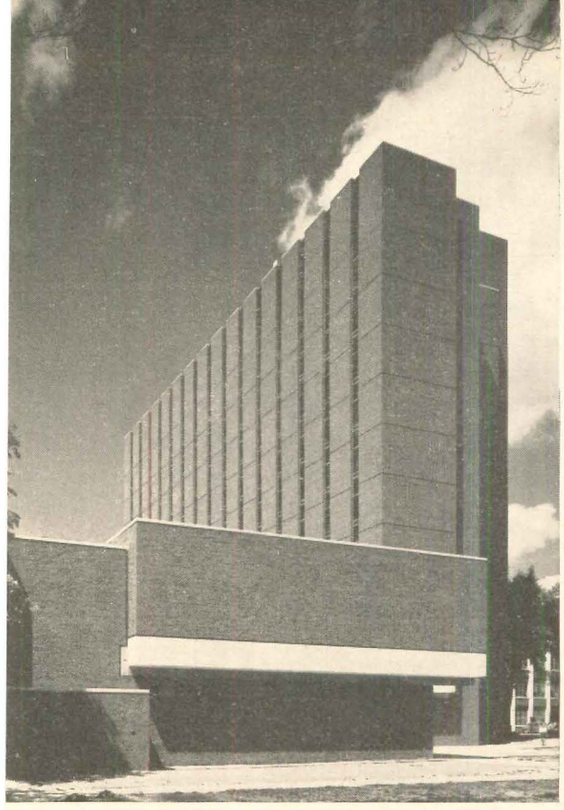


photographs by Hedrich-Blessing

More and more top architects are going Gold Bond



The Gold Bond difference: Acoustimetal ceilings at The University of Michigan are washable, paintable and almost indestructible



Physics and Astronomy Building, The University of Michigan, Ann Arbor, Mich.
Architect: Albert Kahn Associated Architects and Engineers, Detroit
General Contractor: A. Z. Shmina & Sons Co., Dearborn
Acoustical Contractor: Turner-Brooks, Inc., Detroit

The ceilings are Acoustimetal. You'll find them throughout the main areas of this new Physics and Astronomy Building. In all corridors, laboratories and library. To absorb noise. To reduce maintenance costs. Gold Bond Acoustimetal comes in 24-gauge steel or aluminum units one foot wide, one to four feet long, in 12-inch increments (center scored to simulate 12" x 12" tile). It requires little or no cutting to get around snap-in flush lights or drop lighting. And units snap out of carrying channels for easy access to areas above. New small bevel gives ceilings that flat plane and evenly finished look you want. Patterns to choose from: Needlepoint, Diagonal and Square. All are available in smooth baked-enamel finish. And now there's a Fire-Shield Acoustimetal that's 2-hour fire rated. What else? Acoustimetal has an N.R.C. average of .90. Ask your Gold Bond® Representative for literature and samples. Or write to National Gypsum Company, Dept. AR-94, Buffalo, New York 14225.

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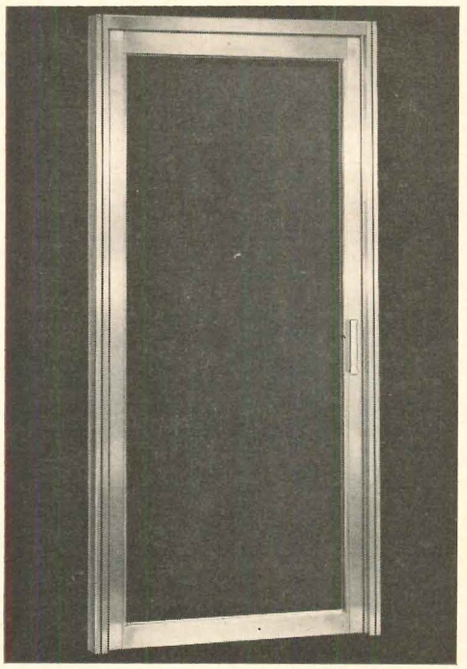

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Now from Michaels comes an important new development — a high-quality stainless steel door *at a cost comparable to that of good-quality aluminum doors!* How did Michaels do it? By applying to this problem the same sort of creative initiative that has made it a leader in all departments of the architectural metals industry. The new standard door incorporates a number of unusual features: It has a welded carbon steel sub-frame, to which 22 gauge stainless sheathing is bonded by a thermal-setting structural adhesive; The stiles are made of mechanically welded tubing; The overhead closure is concealed; Dual weatherstrips provide an uninterrupted seal; Concealed top and bolt assembly for panic hardware is available if requested; Neoprene finger guards are also available; Single or double-acting pivot is provided, and the door accommodates either standard or custom hardware. For complete information, write us.

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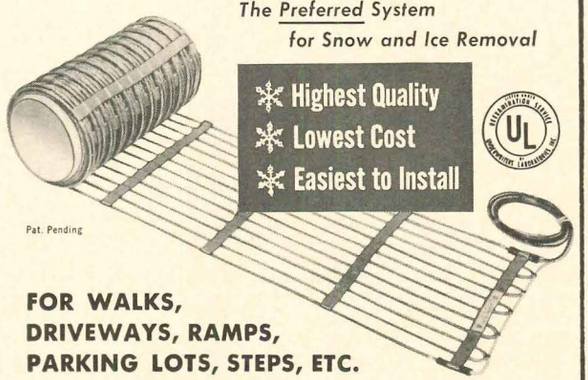
SNOW ✻ MATS®

The Preferred System for Snow and Ice Removal



FOR WALKS, DRIVEWAYS, RAMPS, PARKING LOTS, STEPS, ETC.

Embedded in Blacktop or Concrete, Smith-Gates Snow*Mats remove ice and snow efficiently and economically. Snow*Mats are fastest, easiest and least expensive to install because they come in a variety of PREFORMED lengths up to 60′ in 6 voltages and 4 heat densities. Snow*Mats are quality-produced with finest materials by the world's largest manufacturer of electric heating tape. And Smith-Gates offers you complete engineering service.

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SMITH-GATES CORPORATION FARMINGTON CONNECTICUT

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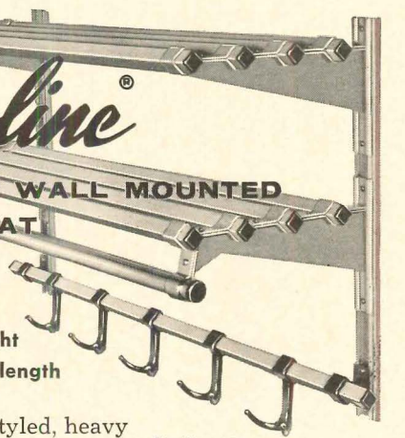
ADJUSTABLE WALL MOUNTED HAT AND COAT RACKS



- **Heavy duty steel construction**
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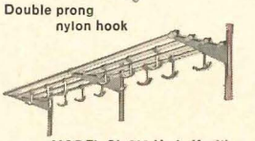
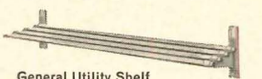
These beautifully styled, heavy duty, steel wall mount units are built to fit your exact length and multiple shelf requirements. Shelf brackets are held at wall in box formed channel mountings for vertical adjustment. Finish in choice of Mist Green, Desert Sand or Medium Gray, baked on enamel. They come with hanger rail or double pronged nylon hooks in Black, Red, Blue and Gray. Matching overshoe racks are also available.

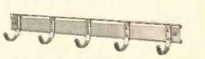
Double prong nylon hook



MODEL SL 300 U shelf with double anchor style coat hooks



General Utility Shelf SL 100 U matching all-purpose shelf



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VOGEL-PETERSON COMPANY

"The Coat Rack People" ELMHURST, ILLINOIS

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This is wool.
It is resilient.
It takes great abuse.

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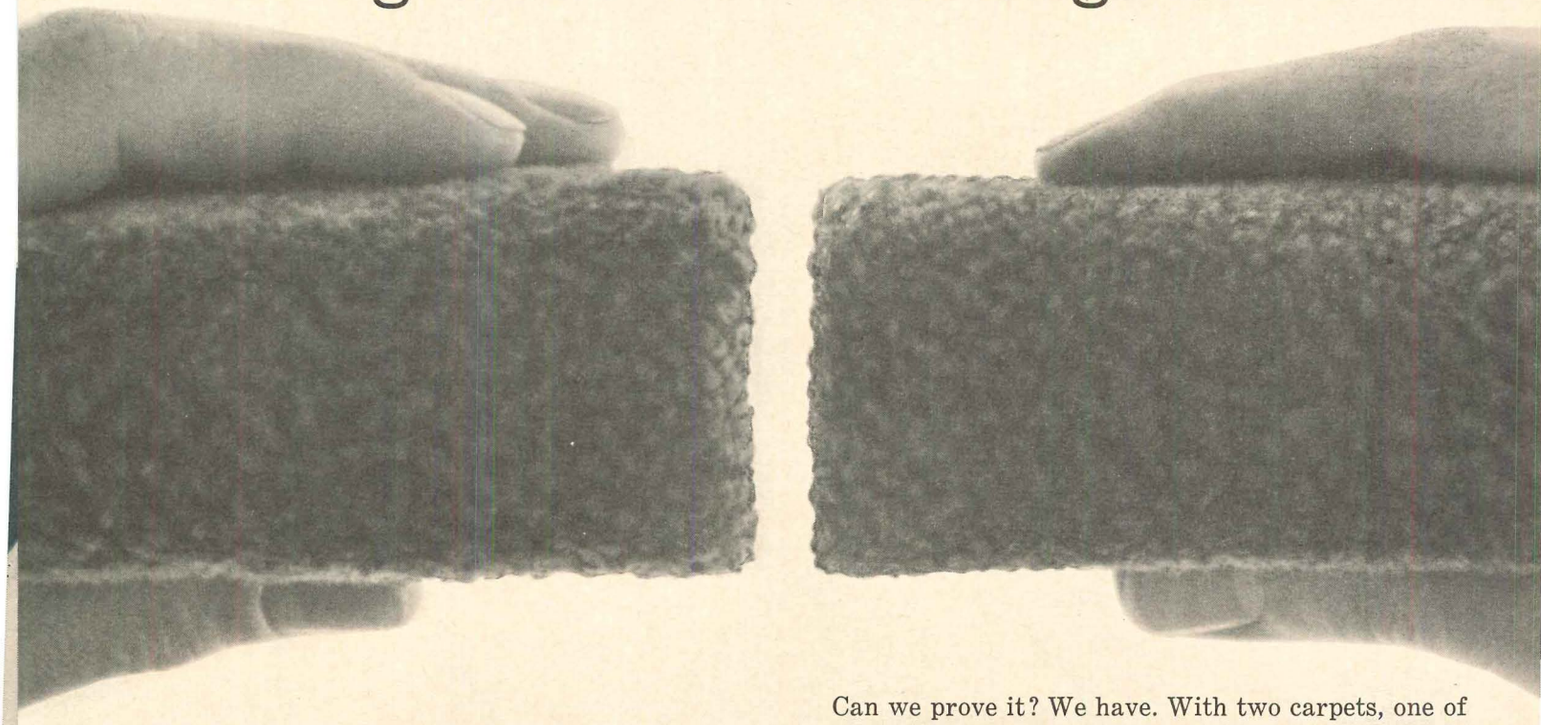
It takes greater abuse.



Can we prove it? We have. With two carpets, one of Acrilan® acrylic fiber and one of wool, both 6⅔ row cut pile construction. Each was subjected to 64,000 traffic impressions. The result: Acrilan lost only 15% of its pile height; wool lost 30%. Proving Acrilan stands up to heavy traffic better than wool. Has more than an edge in resilience and stamina. Keeps its new look longer than wool.

There are other reasons why Acrilan is superior to wool. May we give them to you? Write Contract Carpet Merchandising, Chemstrand, 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, Loomweve, Magee, Masland, Monarch, Philadelphia Carpet, Roxbury, Wunda Weve. In Canada: Harding Carpets.

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Over one hundred Rust-Oleum Factory Engineers work closely with architects all over the country. But, they don't stop there. They follow the job down the line. They work with the fabricator, the contractor, the painter. They see that the *right* Rust-Oleum system is used and that it is applied correctly. The Rust-Oleum man who was working with you on coating specifications yesterday may well be working with a painter on the job-site the next day. The Rust-Oleum man *knows* his business. He follows through at all levels. We call this DEPTH SERVICE . . . a service that very few companies are qualified to render.

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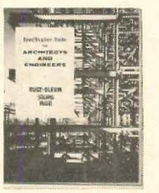

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Office Literature

continued from page 314

FLOOR SURFACINGS

A 24-page booklet describes and illustrates the company's exhibit for the World's Fair. "The Armstrong World of Interior Design," which is on display at the New York showrooms, presents a number of room settings in the style of different countries, each one displaying a specific type of floor covering. General information on resilient floors and their uses is included at the back of the book. *Armstrong Cork Company, Lancaster, Pa.**

CIRCLE 415 ON INQUIRY CARD

CHAIRS AND TABLES

Details of the complete line of chairs and sofas is given in the new JG illustrated price list. The price list is arranged in tabular style with an illustration of each model set alongside description, dimensions and prices for various finishes. Another illustrated catalog contains information about a new line of aluminum and walnut framed tables, including coffee tables, end tables, dining and conference tables. *JG Furniture Company, 160 East 56th St., New York 22, N.Y.**

CIRCLE 416 ON INQUIRY CARD

TUBULAR STEEL COAT AND HAT RACKS

Catalog sheets give full details of the new *Bevco* tubular steel coat and hat racks in chrome or enamel finishes. The standard racks are available in from 2- to 6-ft lengths, with single, double or triple shelves. Specifications and suggestions for custom installations are given in the catalog. *Bevco-Precision Manufacturing Co., 831 Chicago Ave., Evanston, Ill.*

CIRCLE 417 ON INQUIRY CARD

INSULATION BOARD

The history and present uses of insulation board are set out in an illustrated booklet published by the Insulation Board Institute to mark the industry's 50th anniversary. The booklet traces the development of the industry since 1914 and gives details of the Institute's promotional programs. *Insulation Board Institute, 111 West Washington St., Chicago.*

CIRCLE 418 ON INQUIRY CARD

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

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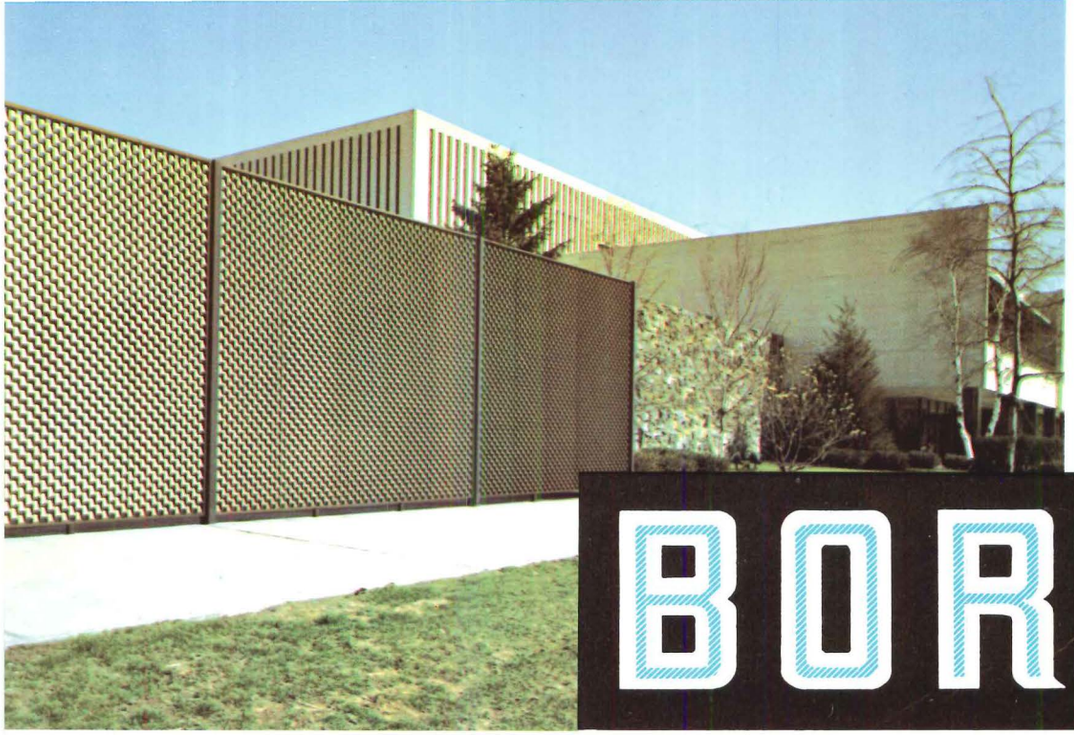
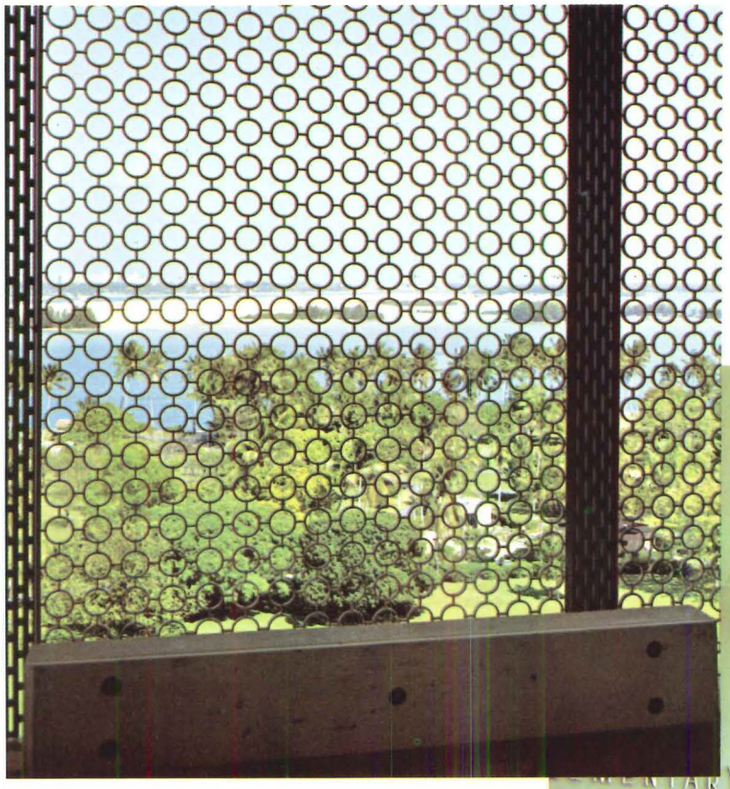


Custom-styled Deca-Grid panels obscure the service area at Saks in Garden City, Long Island.
Architect: Abbott, Merkt & Co., New York City

BORDEN



Borden Architectural Decor Panels, fabricated from sturdy lightweight aluminum, fit innumerable architectural purposes, may be custom-styled in an endless selection of forms, patterns and designs.

Widely used for facades, Borden Decor Panel is employed for interior partitions, room dividers, grilles, window guards, railing panels, doors, entry-ways, sunshades, and is especially valuable for the refacing of existing buildings.

Classic Deca-Ring style serves as the only siding on multi-level parking facility.
Architect: Wm. Rader & Assoc., Miami, Fla.

Deca-Grid panels form a handsome adjunct to this Florida elementary school while allowing free passage of light and air.
Architect: James E. Ferguson & Assoc., Coral Gables, Fla.

(over)

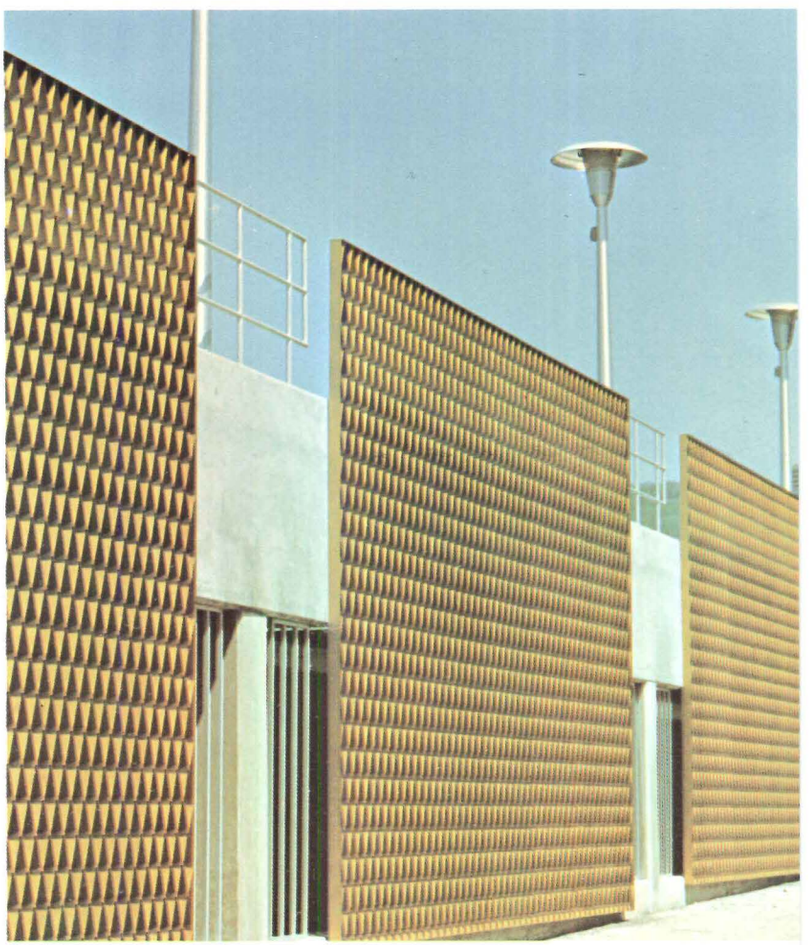
BORDEN
DECOR PANEL

Curved divider of Deca-Gril finished in baked enamel adds light to perfume shop, Rigaud - Boutiques, New York City.
Designer: Leon Barmache

Borden's architectural department can offer to registered architects and members of the American Institute of Decorators complete assistance in custom-styling plus basic designs, variations, modifications, fastening and erection details, and all other technical data.

Each of the basic Decor Panel styles, Deca-Gril, Deca-Ring, Deca-Grid, and Decor-Plank is highly amenable to pattern variation to suit the theme and purpose of the individual project.

The handsome **Deca-Grid** series is noted for its very great flexibility in detail specification and its versatile slant-tab variation. **Deca-Ring** style features classic geometric beauty fabricated in completely visible heavy bodied material. **Decor-Plank** types are eminently desirable for concealment and coverage; may be cut and fitted for a multitude of uses. **Deca-Gril** consists of strong and highly ornamental crimped bars riveted or spaced with tabs.



Deca-Gril panels with 12" tab centers as part of enclosure around public parking garage in Reading, Pennsylvania.
Architect: Martin and Dethoff, Reading, Pa.

BORDEN METAL PRODUCTS CO.
890 Green Lane, Elizabeth, N. J.
Telephone: (Area Code 201) 352-6410

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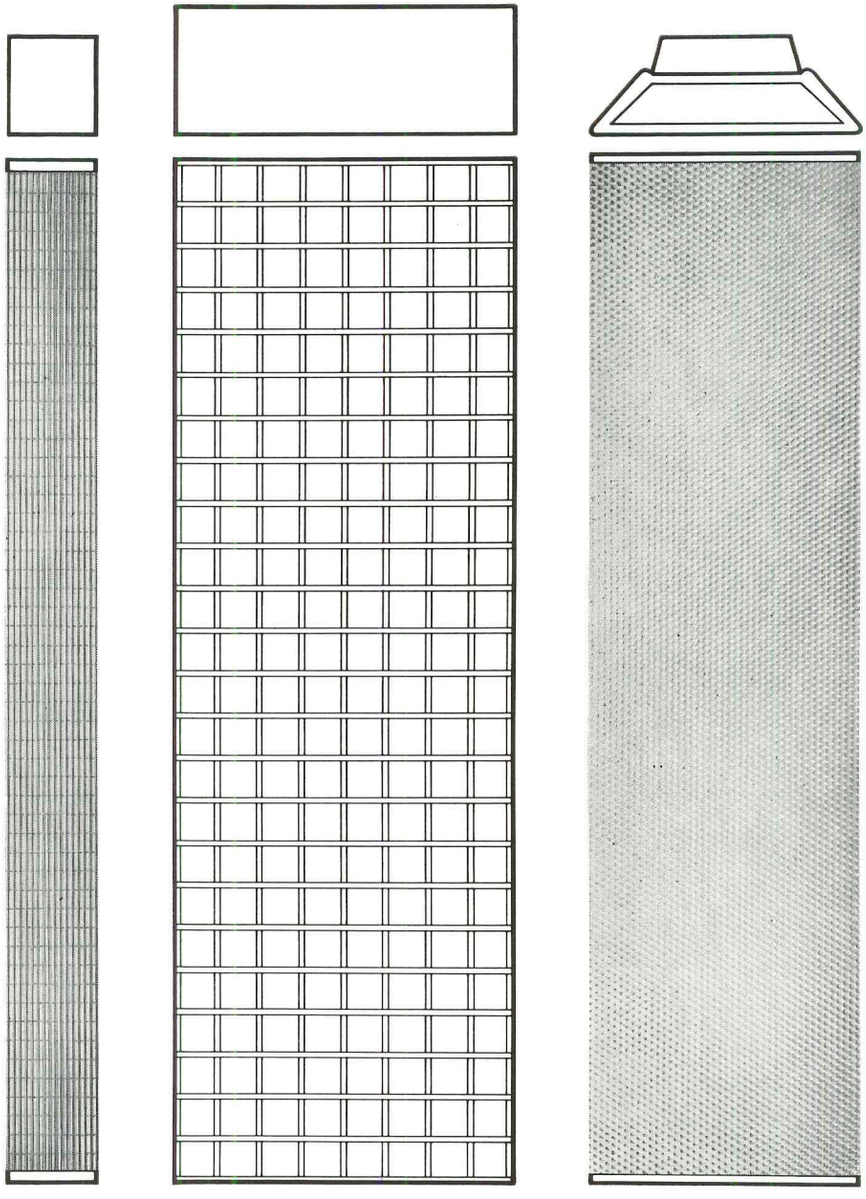
Plants: Union, New Jersey • Leeds, Alabama • Conroe, Texas

Printed U.S.A.

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.

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LIGHTING
LITECONTROL CORPORATION,
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When Wall Tile comes from the exclusive Mosaic Harmonitone® Palette, you're sure of complete color compatibility

Mosaic Wall Tile has to meet a demanding set of color standards: Wall Tile colors must be compatible with each other (see Plate 725-A). Wall Tile colors must be compatible with Mosaic ceramic mosaic colors (see Plate 692-A). Wall Tile colors must be compatible with other normally specified building materials (see Plate 568-A). ■ The Harmonitone Palette was developed to provide you with a sensitive, trouble-free selection of colors in Wall Tile and related tiles. Once installed, Wall Tile becomes permanent color. Harmonitone Colors were developed to be easy-to-live-with, no matter how tastes change. ■ The Harmonitone Palette consists of nine basic groups of colors compatible with each other. Within each group Wall Tile Colors are related to colors of other tile types, subtle differences occurring in the variety of glazes available . . . Bright-Glaze, Satin-Glaze and textured hard glaze Everglaze. ■ To provide better proportion for modern structures, and directional feeling where desired, Mosaic Wall Tile is available in 6″ x 4¼″ and 8½″ x 4¼″ oblongs, as well as 4¼″ x 4¼″ and 6″ x 6″ squares. ■ By developing colors which are harmonious with each other, with plumbing fixtures and other building materials . . . and by providing variation of hue and tone within the groups . . . we are able to offer you the most sensitive color palette for your design work. ■ The point is, Wall Tile colors don't just happen at Mosaic. For the designer's sake, we make them happen for maximum freedom and compatibility in color design. We welcome any inquiry you may have concerning the complete line of Mosaic ceramic tile. ■ Just write The Mosaic Tile Company, 55 Public Square, Cleveland, Ohio 44113. ■ For Mosaic Tile information West of the Rockies, contact The Mosaic Tile Company, 8899 Beverly Boulevard, Beverly Hills, California. ■ "Mosaic" is the trademark of The Mosaic Tile Company.

MOSAIC®

Plate 725-A. Architect: Buchart Associates; Assoc. Architect: Hugh Moore, Jr.
Tile Contractor: Allentown Tile & Marble Co.

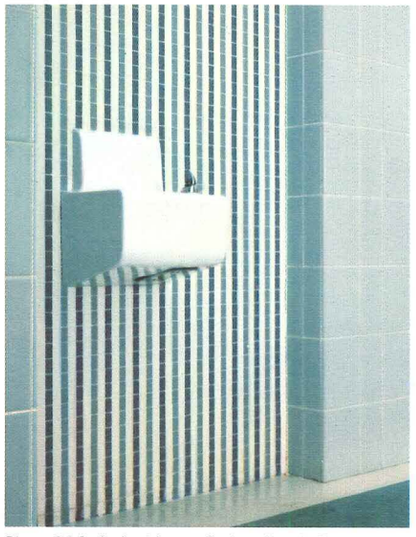
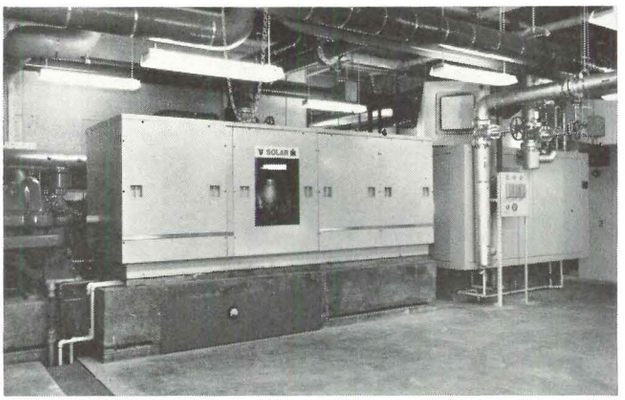
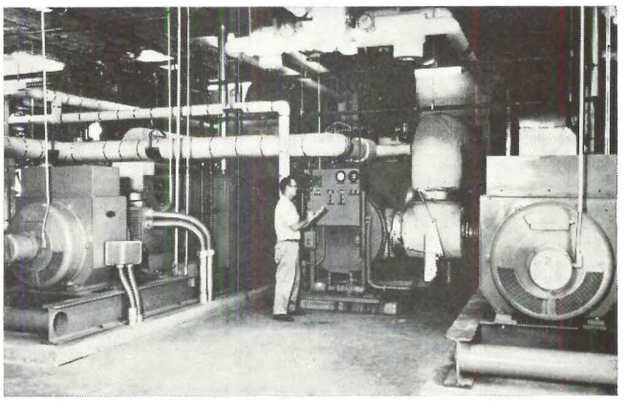


Plate 692-A. Architect: Eschweiler & Eschweiler.
Tile Contractor: Stark Mantel & Tile Co.

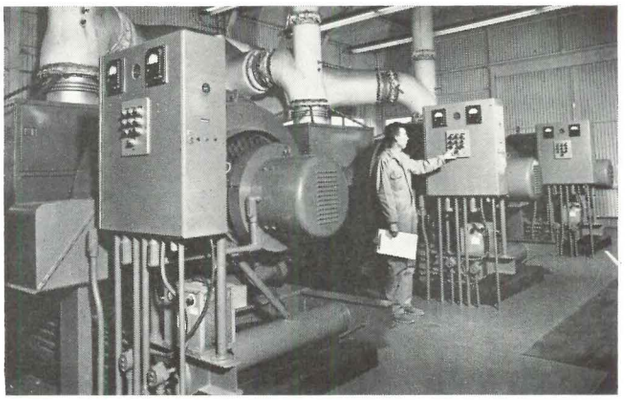
Plate 568-A. Architect: Richard L. Dorman.
Tile Contractor: Beverly Hills Tile Co.



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.

These companies get high thermal efficiencies with Solar gas turbine energy systems

The Solar gas turbine energy system concept of employing both the shaft horsepower and the exhaust heat of a rugged, dependable Solar gas turbine can achieve thermal efficiencies over 70 per cent. Significant savings in power costs are currently being realized in a wide variety of uses. Here are four typical applications that demonstrate the versatility of Solar gas turbine energy systems.

Washington Natural Gas Company

Washington Natural Gas Company's new four story Seattle office building is air conditioned by a Solar *T-350* gas turbine energy system. The turbine drives a centrifugal vapor cycle refrigeration compressor, while exhaust heat is recovered to run an absorption air conditioner. The system provides 320 tons of air conditioning at full load. Fuel consumption is reduced with a recuperator.

McAllen High School

Two 1100 hp Solar *Saturn*® turbines are in operation at McAllen, Texas, high school. Shaft power is used to generate 60 and 840 cycle electricity, and exhaust heat is used to make steam for heating and 467 tons of absorption air conditioning. All of the 2400-pupil school's high frequency lighting, cooling and electrical needs are supplied by the system.

Warren Petroleum Corporation

Three Solar *Saturn* 1100 hp gas turbines driving 700 kw generators provide all of the electrical power used at Warren Petroleum Corporation's Monument, N.M., natural gasoline refinery. Exhaust heat is ducted from the turbines into a boiler, which produces 17,350 lbs of steam per hour at 65 psig for plant processes.

Standard Pipeprotection, Inc.

Exhaust heat without processing of any kind is used to dry pipe at Standard Pipeprotection's new Houston, Texas, plant. Two Solar *T-350* gas turbine energy systems drive 60-cycle, 200 kw generators to supply electrical power in the plant.

Write for Information

For more information about Solar gas turbine energy systems, write Solar, Dept. M-230, San Diego, California 92112.

SOLAR

A Division of International Harvester Company

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Architect and Engineer:
Donald P. McGinn, Dubuque, Iowa

General Contractor:
C. J. Droessler Construction Co., Kieler, Wis.

Photograph by William Wollin

LONG-SPAN STEEL ROOF DECK DOUBLES AS ACOUSTICAL CEILING

Inland Long-Span Acoustideck® goes to great lengths to control sound here in the multi-purpose room of the School for St. Joseph's Parish, Key West, Iowa. Acoustideck serves as a combination steel roof deck and exposed acoustical ceiling with a noise reduction coefficient of .70. ■ By combining the advantages of steel deck with outstanding acoustical values, Acoustideck provides economy and versatility. You enjoy speed of erection. You save on structural supports. Acoustideck weighs less than half of equivalent poured-in-place or precast construction — carries loads over greater spans. Acoustideck is delivered to a job-site painted on both sides with Inland's protective two-coat Duo-primer. ■ Acoustideck is part of a complete line of Inland roof systems. See Sweet's, section 2i/Inl. Or write for catalog 248.

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EP-40

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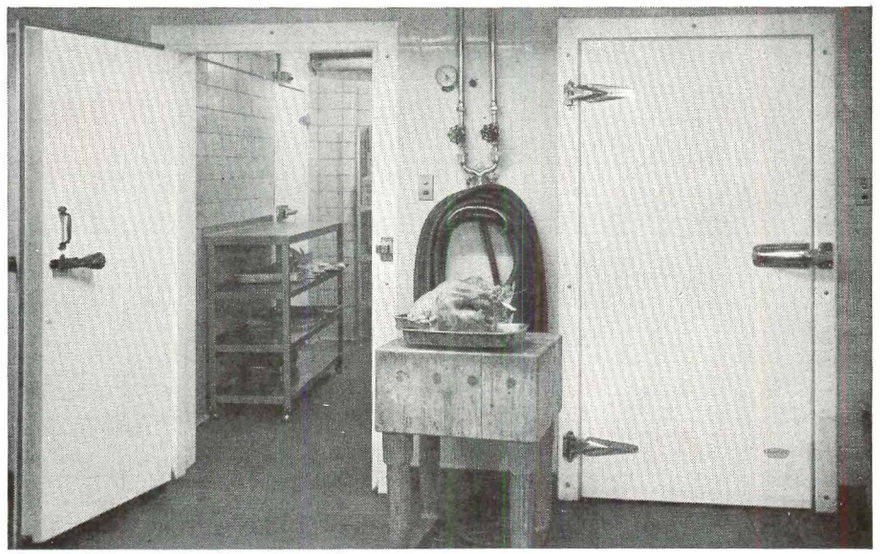

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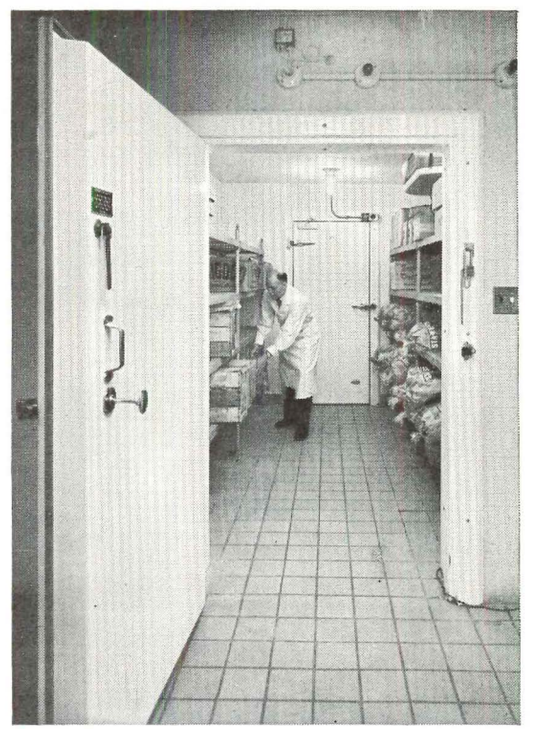

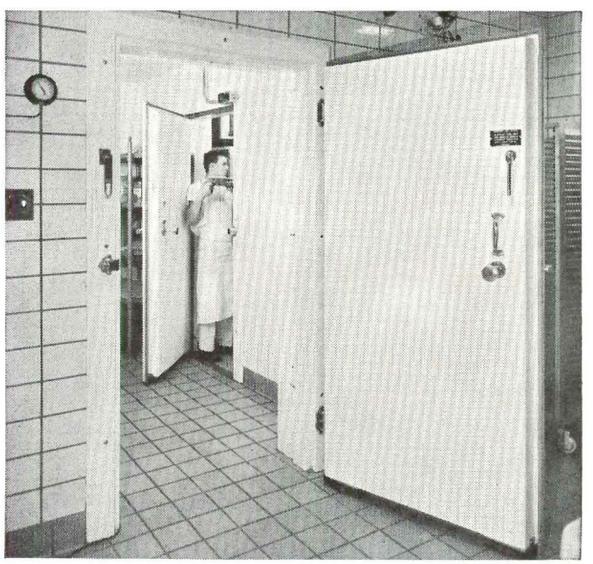

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COLD STORAGE DOORS

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(PATENT PENDING)

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PF-15 SIDINGS

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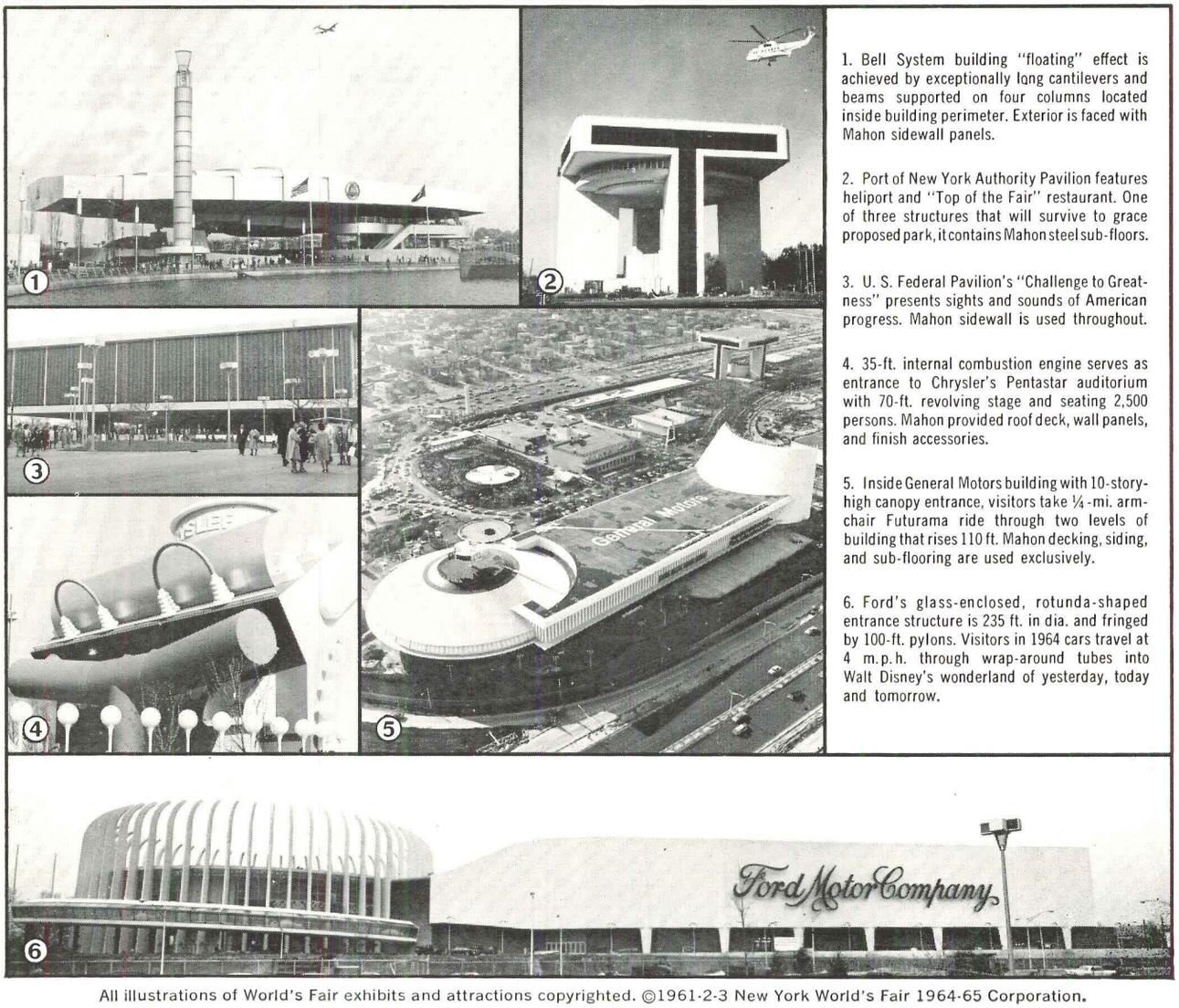

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2. Port of New York Authority Pavilion features heliport and "Top of the Fair" restaurant. One of three structures that will survive to grace proposed park, it contains Mahon steel sub-floors.

3. U. S. Federal Pavilion's "Challenge to Greatness" presents sights and sounds of American progress. Mahon sidewall is used throughout.

4. 35-ft. internal combustion engine serves as entrance to Chrysler's Pentastar auditorium with 70-ft. revolving stage and seating 2,500 persons. Mahon provided roof deck, wall panels, and finish accessories.

5. Inside General Motors building with 10-story-high canopy entrance, visitors take ¼-mi. armchair Futurama ride through two levels of building that rises 110 ft. Mahon decking, siding, and sub-flooring are used exclusively.

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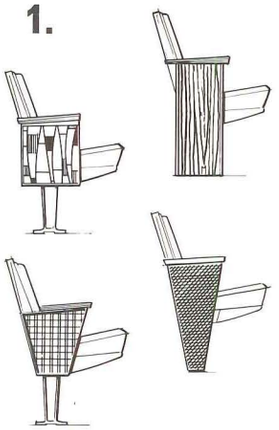

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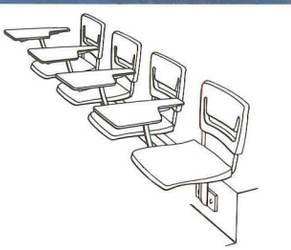

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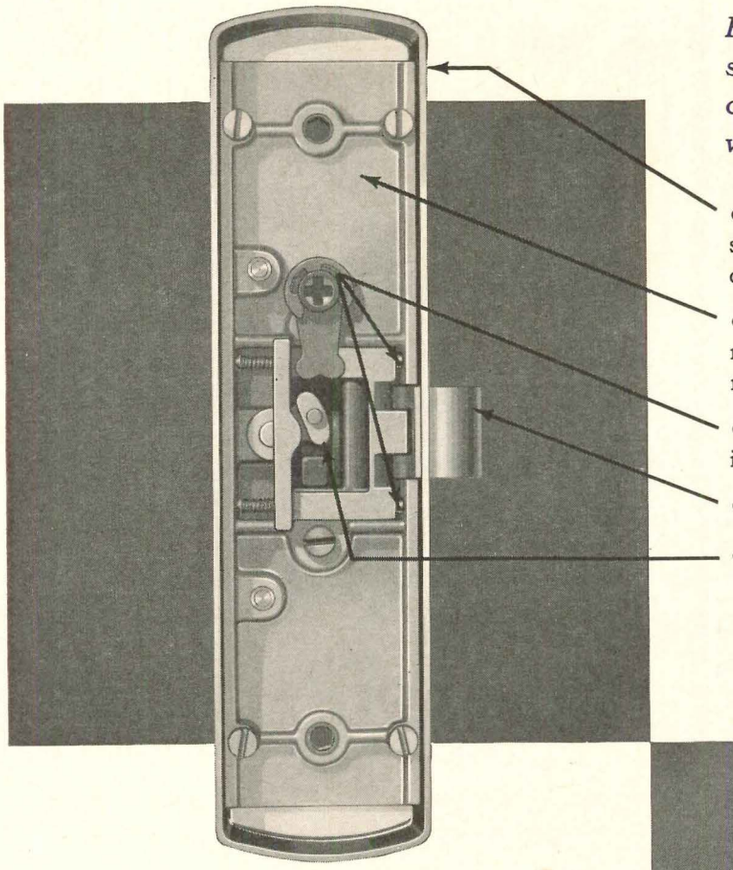

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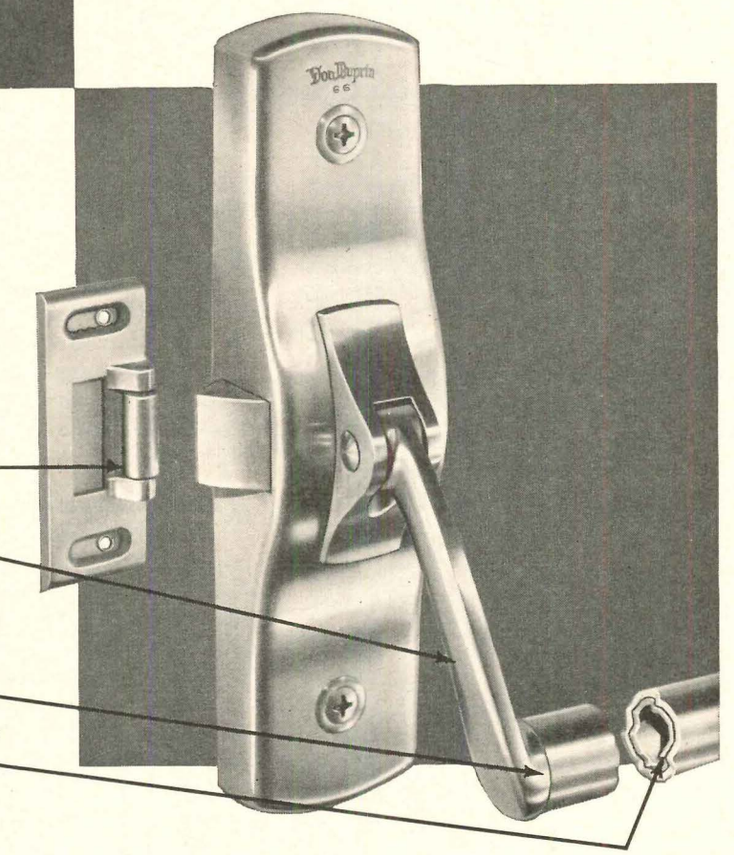

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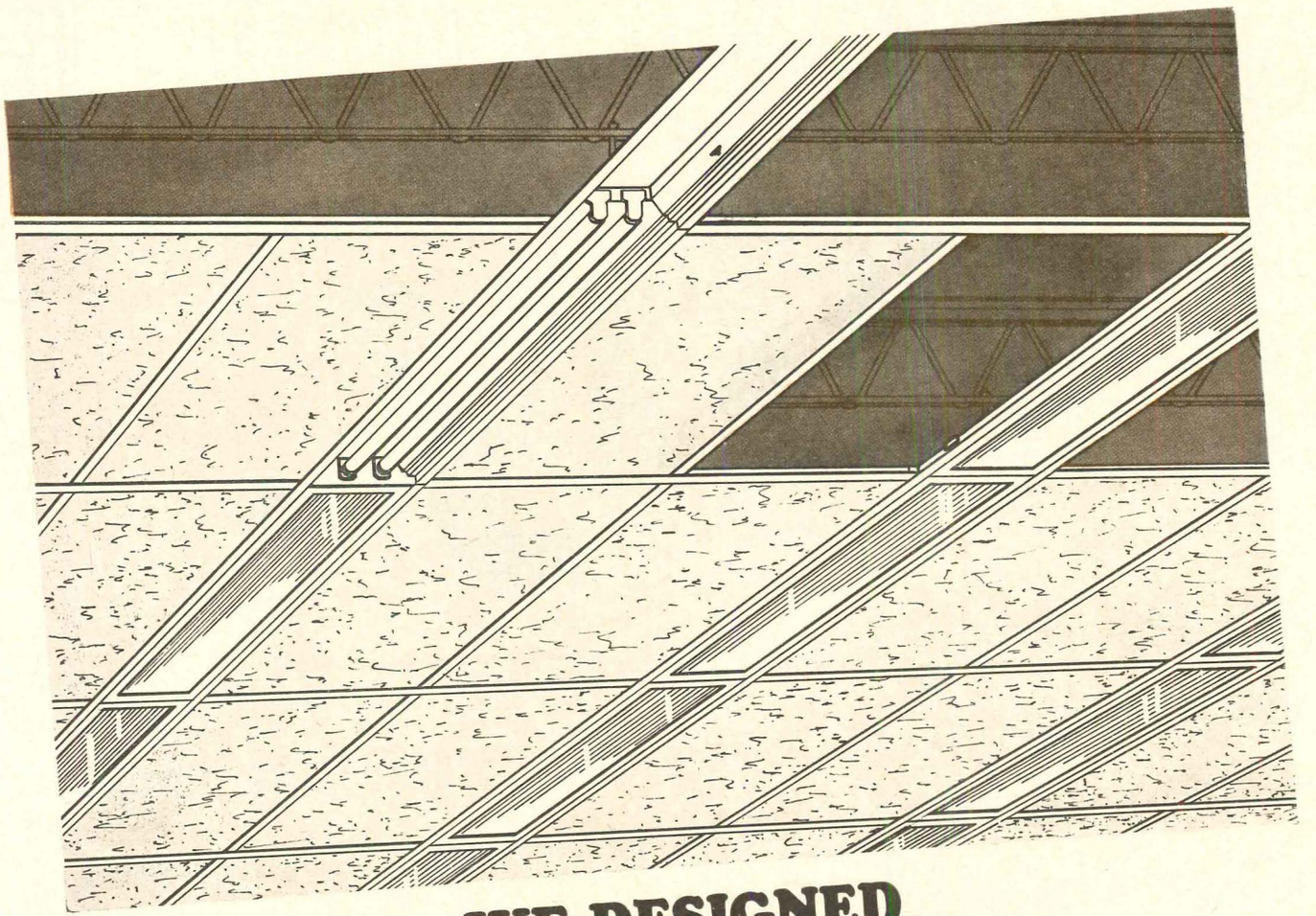

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INTRODUCTION TO CPM

A step-by-step primer of the basic elements of critical path network planning

By E. Van Krugel

Defects in methods of job planning and schedule control used in the past have begun to emerge due to three burdensome characteristics of practice which have evolved and have become prevalent in recent years.

First, more tasks are being defined as "projects" wherein a definite goal is set up for attainment at some specific future point in time.

Second, greater size of projects and more technical complexity have required more technical specialists in narrower fields, more complex administration, more problems in communication. It is in short, more involved to do business.

Finally, target dates are sometimes set by fiat, due to various pressures, so that time is severely limited leaving the project manager hard constrained to make optimum use of men, money, material and machines.

The old methods of planning and scheduling (bar charts and Gantt charts) show only limited relationships of job phases, fail to adjust automatically for unexpected delays, lack specificity in spelling out trade-offs of men and machines (as in the progressive forming and pouring of concrete wall sections, for example), fail to predict accurately where to expedite, do not deal with details of planning. Lacking detailing, the manager cannot accurately know what is critical, and all activities tend to receive equal executive attention. The Critical Path Method (CPM) overcomes all of those limitations.

CPM is a formal and graphic means of determining the relationships between tasks associated with any project. Each task that is time consuming *and* definable is represented by an arrow with its origin at an initial (*i*) node representing completion of all necessary previous tasks and its head at another junction (*j*) node representing its own completion and end-to-end junction with subsequent tasks. The arrows form a closed network bridging the interval between two terminal nodes representing the beginning and end of a whole project.

The arrow diagram, then, represents the sequence and interrelated dependencies of all the operations that comprise the project. When a time lapse is assigned to each arrow, the longest end-to-end total or "main chain" of these operations forms the Critical Path through the network, and any delay in the performance of tasks along the Critical Path will directly delay completion of the project. The fact that only a small fraction (usually less than 15 per cent) of the operations of any project lies on the Critical Path means that proper control of these key operations produces better results in the duration and cost of the project.

At this point, we should clarify some definitions and provide one theorem. The theorem is: "Every critical job (with the exception of the first and last) has at least one critical immediate predecessor and at least one critical immediate successor. Every

continued on page 340

GLOSSARY

Activity: Any definable, significant, and time-consuming task, operation, or function to be executed in a project.

Critical Path: That longest sequence of activities in a network which establishes the minimum length of time for accomplishment of the end-event of a project. The path from the first event through the end-event that consists entirely of critical activities.

Dummy: A logic rectifier that is not a definable activity and is of zero-duration, but appears as a dummy activity in the network to show logical sequence of parallel events while avoiding the illogic of having more than one arrow originate and terminate in the same pair of nodes. (See Figures 1 through 9.)

Float: Also known as slack. It is the amount of time that an activity can be delayed without affecting the project duration. Only non-critical paths can have float.

Network: Also called an arrow diagram. A project graph. A set of numbered nodes connected by arrows representing activities.

Node: Also known as event, verse or burst. Each activity has a node at the tail of the arrow, called the "*i*" or "initial" node and another node at the head of the arrow, called the "*j*" or "juncture" node. A point in time indicating beginning (*i*) or ending (*j*) of one or more activities.

Planning: The establishment of project activities, their logical interrelations and the sequence in which they are to be accomplished, exclusive of time.

Project: Any organized undertaking consisting of many activities required to attain a single goal.

Scheduling: The assigning of time intervals and dates to activities in development of a project time plan.

Mr. Van KRUGEL was director of schools of the Construction Evaluation Branch of the Military Construction Division, U. S. Army Corps of Engineers when the material from which this article is extracted was prepared for COE training courses. He is now Employe Development officer for the General Services Administration Institutes

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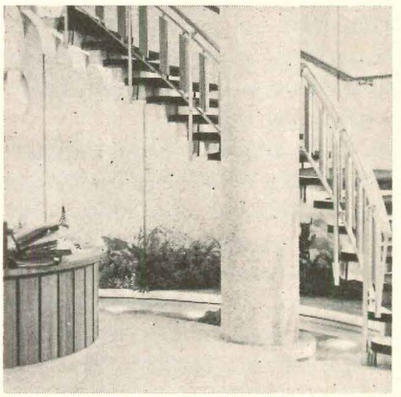
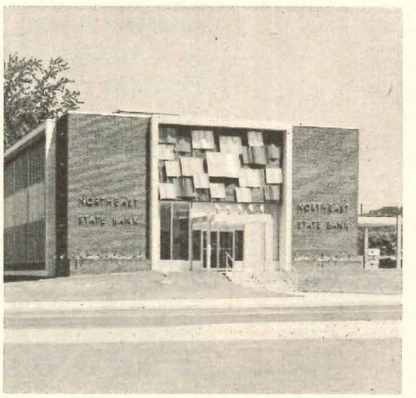


Tuff-Lite and aggregate exterior looks clean and handsome after several severe northern winters.



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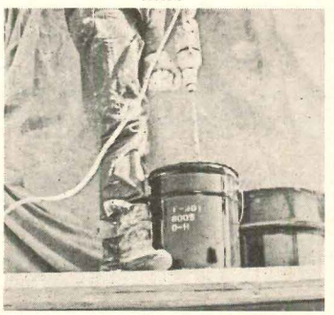

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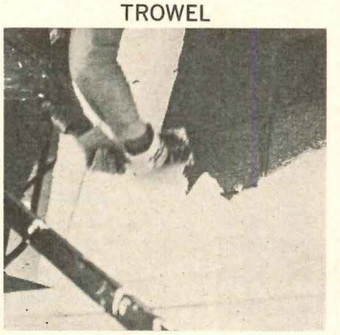

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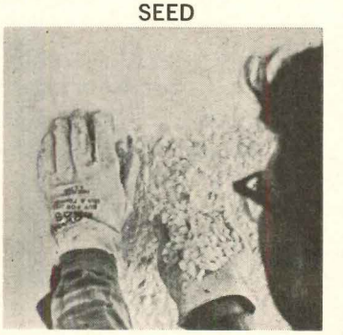

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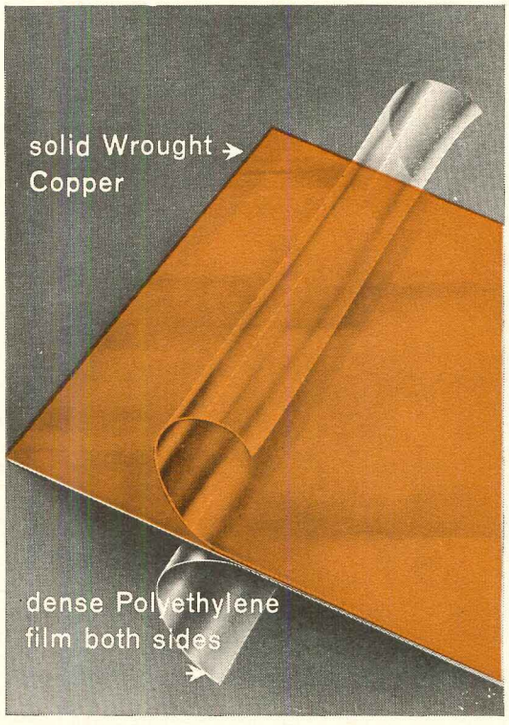

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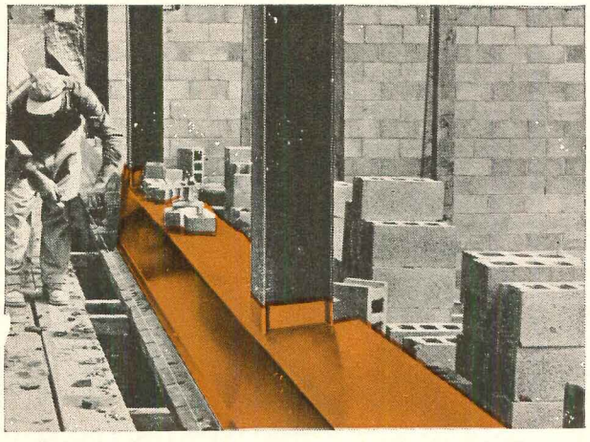

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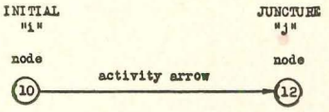


Figure 1. Basic element of a network diagram

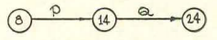
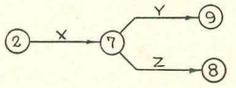


Figure 2. Q (activity 14-24) cannot begin until P (activity 8-14) is completed



Figrue 3. X (2-7) must be finished before either Y (7-9) or Z (7-8) starts

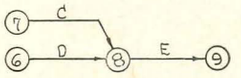


Figure 4. E is restrained from starting until C and D are finished

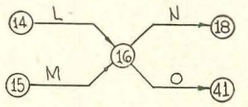


Figure 5. Both L and M restrain beginning either N or O

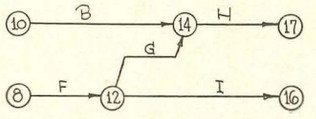


Figure 6. H cannot begin until B and G are complete. Neither G nor I can begin until F is completed. Thus, B and G restrain H; F restrains G and I

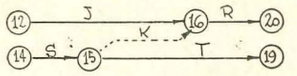


Figure 7. K (15-16) is a dashed arrow called a "logic dummy," which has no activity description or temporal value. It keeps the network's logical sequence intact. Here we are saying that J and S must be done before R can start. T is only dependent on S, not on J

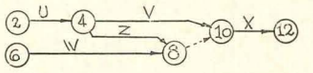


Figure 8. Activity 8-10 is a "numbering dummy." The computer can get caught in a "loop" (i.e., have identical instructions for two different activities) if more than one activity begins and ends in the same two nodes. Hence, although both V and Z could be activity 4-10, we "correct the loop" by placing 8-10 into the network. Thus, V and Z cannot start until U is complete; V, W and Z must precede X

continued from page 337

project has at least one critical path, and every critical job lies on one or more critical paths." The definitions are shown in the glossary.

Key Questions For Network Logic

Questions of precedence, concurrency, and succession must be asked about each activity to form the basis for setting up a project network. Although each activity is represented by an arrow, CPM is not a vector technique in that the length of the arrow is meaningless and has no effect other than a visual one on manipulations. We start at the beginning and connect the arrows, usually from left to right, to show the logical flow of work. As each activity is added to the diagram, we examine it in relation to the other jobs and ask:

1. What other activities must be completed *before* this activity can start? (Precedence)
2. What other activities can be done *while* this activity is being done? (Concurrency)
3. What activities cannot start *until* this job is done? (Succession)

The answers to these questions will form the basis for drawing the network and identifying activities in an ordered sequence of relationships. This is network planning, a distinct phase of the operation that is followed by scheduling.

Constructing Arrow Diagrams

Each arrow on a network is separately identified by its activity description and/or its *i*—*j* numbers. Thus, Figure 1 could be identified by an activity description, such as "Place Concrete Forms," or by the definition, "activity 10-12." Each arrow must have a separate and unique *i*—*j* sequence.

The nodes (bursts, burst-points or intersections) are points in time and cannot represent work as the arrows do. In CPM the nodes are usually sequentially numbered so that every *j* node has a higher number than its corresponding *i* node. In the examples illustrated here, nodes are numbered with skipped numbers. It is possible to number nodes sequantially and by units, but this limits flexibility. Not infrequently, in developing the network, one finds the need for inserting an additional activity or a dummy (see glossary and Figures 7 to 9). When such an addition is made, the availability of a number that can be sandwiched into the network can prevent a great deal of erasure or redrawing. A good rule-of-thumb for numbering is to divide the

*Although CPM is essentially a manual technique, it is readily programed into either punch-card or magnetic storage computers. The computer identifies each activity by node numbers at beginning and end of each arrow. Three-digit entry means simply that these numbers can lie anywhere between 000 and 999. A computerized network gains significant advantages in accuracy and scope even where only 50 to 75 activities comprise a project. Larger projects gain proportionately, especially during network planning when repetitive runs with various sets of time and cost data are required

number of nodes in the network into 1,000. In other words, if there are 250 nodes, sequencing may be by fours. This rule will accommodate three-digit computer entries;* i. e., up to 999. Where a computer will go to 9,999, the rule-of-thumb would be 10,000 divided by number of nodes.

Figures 2 through 9 show some network segments and their interpretations. They demonstrate restraints, constraints, dependencies, succession, concurrency and precedence. They illustrate why, if two or more activities are given the same *i* and *j* nodes, the mind of man might resolve the inconsistency but a computer, lacking unique forwarding instructions for each activity, would get "caught in a loop" and must be corrected by a *numbering* dummy. The *logic* dummy is shown as an actual restraint with no time or work value.

The network emerges as some sort of geometric shape determined by relationships between tasks which must converge at a final point in order to complete the project and tell us: (1) the expected project duration; (2) the tasks that are critical; (3) the points-in-time when tasks can begin and finish; (4) where tasks *must* begin and finish in time so as not to interfere with the over-all project duration; (5) where tasks (and which ones) must be expedited to reduce duration; and (6) the leeway (float) available for scheduling.

A network which demonstrates all the points made thus far is shown in Figures 10 and 12.

Temporal Evaluation

The Critical Path Method uses just one time estimate for each job or activity. The philosophy here is that one time estimate is just as reliable and realistic as the statistical average of three time estimates, such as PERT uses. Since most estimates are in terms of man-hours or man-days, it is relatively simple to establish activity durations in any logical and consistent system of time units.

Figure 12 shows the same network as in Figure 10 but with the addition of durations in the form of time units. It should be remembered that, as of this point, we are still in the network planning phase and we must establish time boundaries before we can establish any schedule; in other words, we are still dealing with work-logic.

Figure 13 and its caption show how temporal evaluations are made and how the network communicates job durations and so-called criticality of the longest continuous path through the network. Numbers under activities are durations; numbers in circles adjacent to nodes are cumulative times in a forward direction which represent the earliest time that each event can be completed. When we went through our forward pass additively (as described in the caption for Figure 13), the largest totals became the earliest finish times. Then we made a

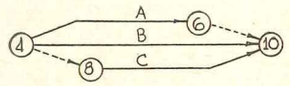


Figure 9. Numbering dummies again. Here, activities A, B and C are concurrent, beginning and ending at common points. The numbering dummies have corrected the loop. Note that the dummy can precede or follow the activity

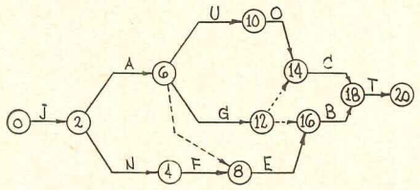


Figure 10. This network says that J is the initial task in our project and must precede both A and N, which may be done concurrently. F follows N. Both A and F restrain E. A, alone, restrains commencement of both U and G. Both E and G restrain B. U, alone restrains O. Both G and O restrain C. T is dependent on C and B, and is the last task in our project. A segment of this network is shown in Figure 11 (below) to clarify the concept

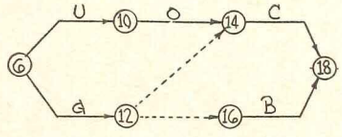


Figure 11. Can a node hang as node 12 is hanging? In order for G to restrain both C and B, why can't you make G a solid arrow from 6 to 14 and tie 14 to 16 with a dummy? Note the logic: if G restrained C directly and B by a dummy, B would also become dependent upon O. Our logic diagram does not intend this. The only restraint on B should be the activity G; however, both G and O restrain C. Thus, both activities 12-14 and 12-16 must be shown as logic dummies

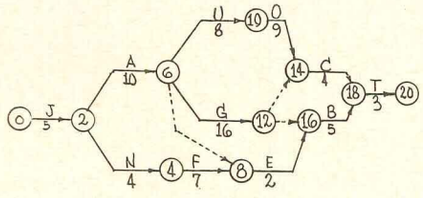


Figure 12. Figure 10 with time units assigned to each activity

"backward pass," a subtractive computation, in which the lowest answer, entered in a square, represents the latest time for starting work at each node. With single-tailed nodes, we simply subtract from the preceding nodal value and enter our late time in a square near the node. Each node must have as many calculations as it has tails to be cer-

continued on page 344

Construction Details

The floor plan is elliptical in shape and has a gross area of approximately 5,700 sq. ft. (basis of one floor only). The building was constructed on five levels, ranging from the projector room in the basement to the mechanical equipment room on the mezzanine.

Basically the entire structure is of reinforced concrete. The hyperbolic-paraboloid roof system is supported on two abutments which were in part restrained by post stressing cables. The thin roof deck itself has a gross area of approximately 9,500 sq. ft. and ranges from a tip elevation at the low point of 20′ above the ground to a tip elevation at the high point of about 54′ from the ground.

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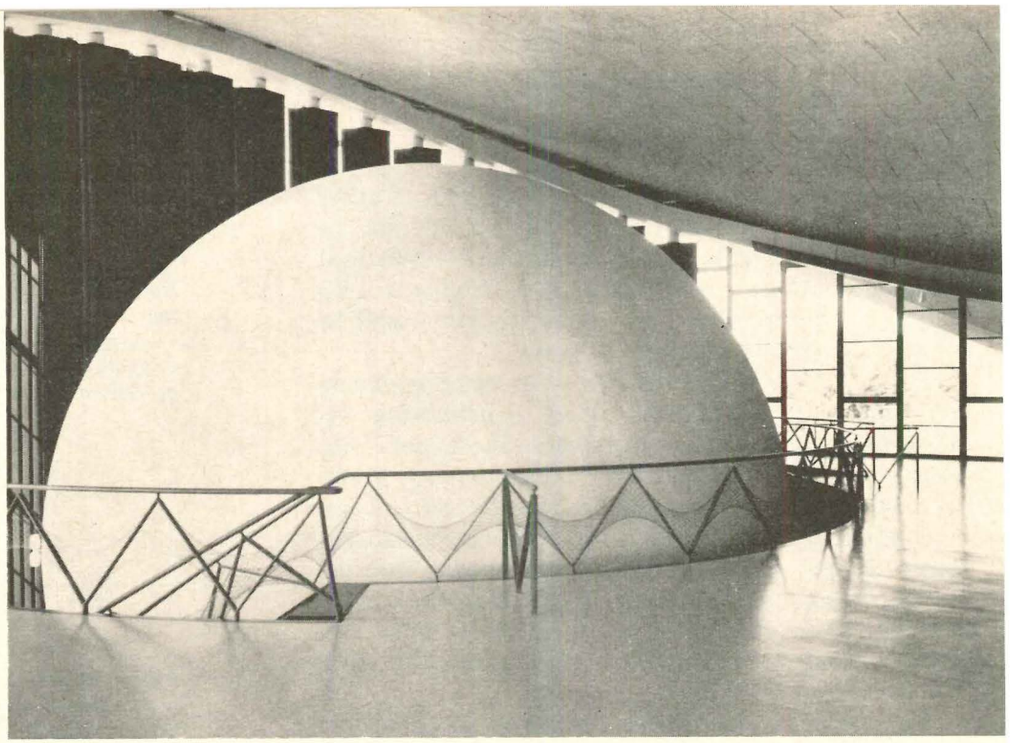

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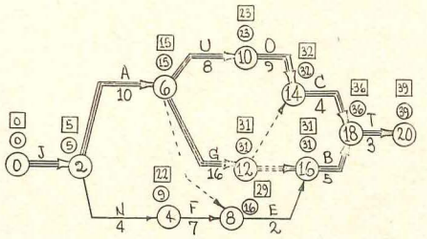


Figure 13. Assuming the time units assigned to Figure 10 are days (for ease of reading), note that the earliest start for activities A and N is on the fifth day. As one moves forward through the network and places the highest cumulative total days in a circle near each node, the earliest day for starting each succeeding task is established and the Critical Path of longest elapsed time is readily determined as J, A, U, O, C, T. Note that a second critical path exists in this example along J, A, G, B, since both paths arrive at node 18 in 36 days. The earliest one can start 3-day task T is on the 37th day and the total for completion of the project is 39 days. Although path J, N, F, E totals only 18 days, it is not possible to start activity B until G is finished.

By definition, there is no "float" along either of the critical paths in this figure, and the earliest start is also the latest permissible if the target date of 39 days is to be met. To determine the latest possible date to start each activity along the non-critical path, N, F, E, start at the terminal node 20 with 39 days and make a "backward pass" subtracting each task duration, putting the lowest result in a square near each node. The earliest and latest starting dates for each activity thus become visible

TABLE 1.—ANALYSIS OF FIGURE 13

i	j	ACTIVITY	DURATION	EARLY START[1]	EARLY FINISH[3]	LATE START[4]	LATE FINISH[2]	FLOAT[5]	CRITICAL PATH
0	2	J	5	0	5	0	5	0	x
2	4	N	4	5	9	18	22	13	
2	6	A	10	5	15	5	15	0	x
4	8	F	7	9	16	22	29	13	
6	8	dummy	zero	15	15	29	29	14	
6	10	U	8	15	23	15	23	0	x
6	12	G	16	15	31	15	31	0	x
8	16	E	2	16	18	21	23	5	
10	14	O	9	23	32	23	32	0	x
12	14	dummy	zero	31	31	32	32	1	
12	16	dummy	zero	31	31	31	31	0	x
		C	4	32	36	32	36	0	x
16	18	B	5	31	36	31	36	0	x
18	20	T	3	36	39	36	39	0	x

[1] Early Starts are the "circle" entries at the tails of arrows, the *i*-nodes.
[2] Late Finishes are the "square" entries at the heads of arrows, the *j*-nodes
[3] Early Finishes are the Early Starts plus Duration
[4] Late Starts are the Late Finishes minus Duration
[5] Float is the difference between Early Finish and Late Finish; thus, Float = LF-EF. Also, Late Start minus Early Start will yield Float. The computer reads Late Finish minus Early Start minus Duration for Float. This Float is called "Total Float"

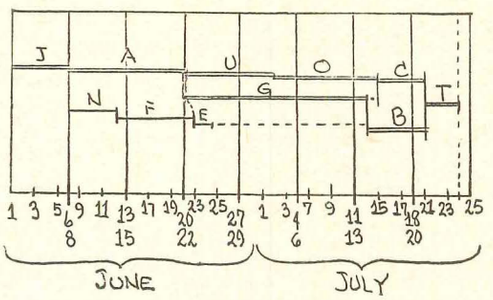


Figure 14. The dotted line from June 25 to July 14 is float on acticity E if activities N and F are on early starts. That float can be shared with both N and F if needed

continued from page 341

tain of its actual minimum value for the square. Thus, although values in squares along the critical path are by definition identical with those in the circles, the value in the square for node 6, for example, must be computed three times to find the appropriate late time entry; i.e., calculated from nodes 10, 12 and 8. Similarly, from nodes 4 and 6 to node 2, days 5 and 18 are possible late times and the lowest computation, 5, is entered. One final check should be noted: final evaluation of the backward pass must come to zero at the origin node of the network. If it does not, an error has been made.

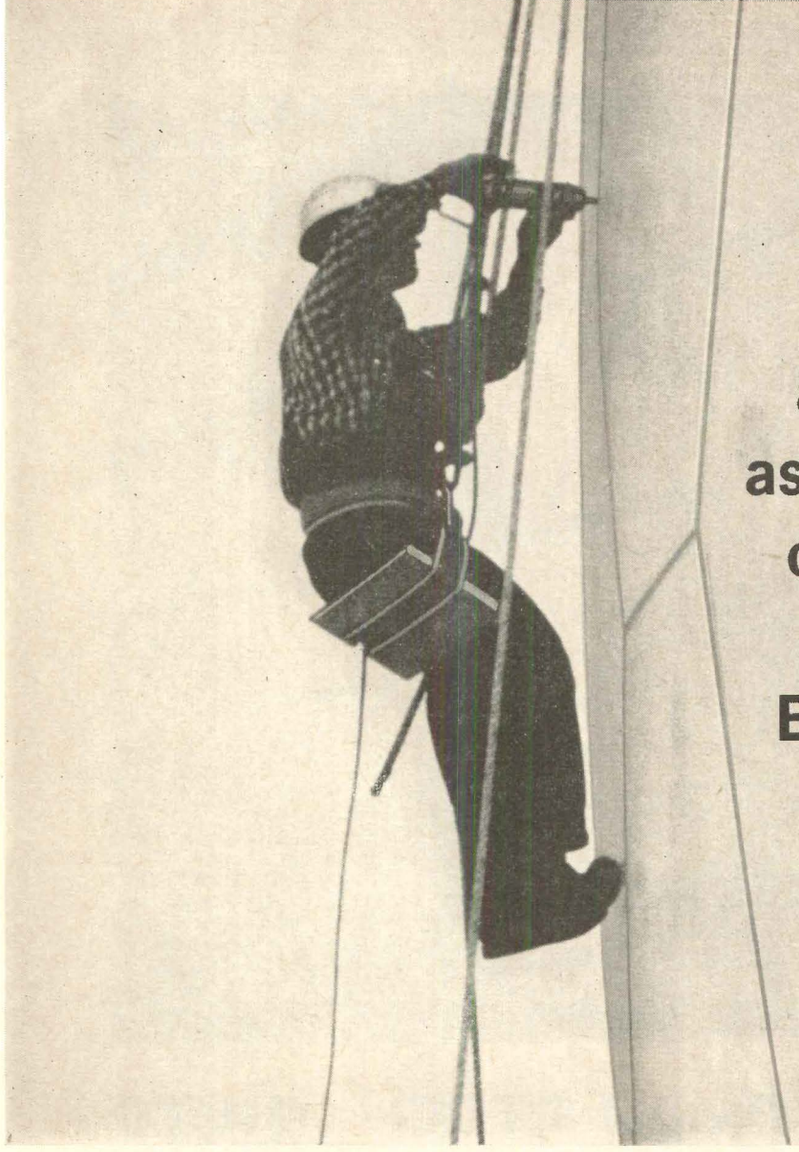
In this process of the backward pass, we begin to see the concept of "float" emerge. For instance, activity N can begin on day 5 and end on day 9; since it can end as late as day 22 without affecting the project duration, and it is a 4-day job, it can start as late as 22 minus 4, or the 18th day. Thus, we have 13 days of float, or slack. We have the same float in activity F if we start on day 9 and proportionately less float up to day 22, when F *must* start, and so on.

Criteria for establishing the critical path are: (1) early and late times at the head of each arrow are equal; (2) late and early times at the tail of each arrow are equal; and (3) the difference between the early and late time at the head and tail of each activity is equal to that activity's duration.

Having completed the networks and made manual passes, we must next tabulate the information thus obtained to determine float. The tabulation will follow what is known as an *i*-major, *j*-minor sequence; all the *i* numbers will form sets of ascending values and the accompanying *j* numbers will ascend within the *i* sets. Also, we will include a definition of each activity, its duration, and start and finish times. Then we compute float. Table 1 is the tabular entry of Figure 13 data.

One scheduling use of a network is the employment of what is called calendar-dating. We can look at an example of this to see how it develops a ready-reference of criticality and float. In Figure 13 and Table 1, note how the critical activities run through the center and the float activities branch off. Using June 1, 1964 as a starting date, a calendar-dated chart is shown in Figure 14.

The essential rule in network preparation should normally assume reasonable resources in estimation. In all cases, estimating is the life's blood of network analysis. Sometimes project duration works out to be longer than can be tolerated. When this is the case, the network must be searched for those activities that can be shortened by the application of resources from float activities. The fact is that limited resources can, and frequently do, place restraints that will increase project duration. This and an inflexible imagination comprise the major limitations on the use of the Critical Path Method.



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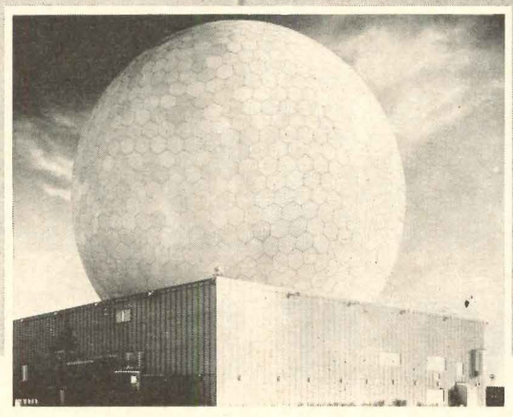
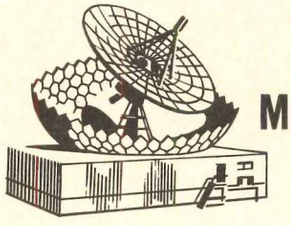


140-foot-diameter radome produced by Goodyear Aerospace Corporation to protect giant early warning radar antenna



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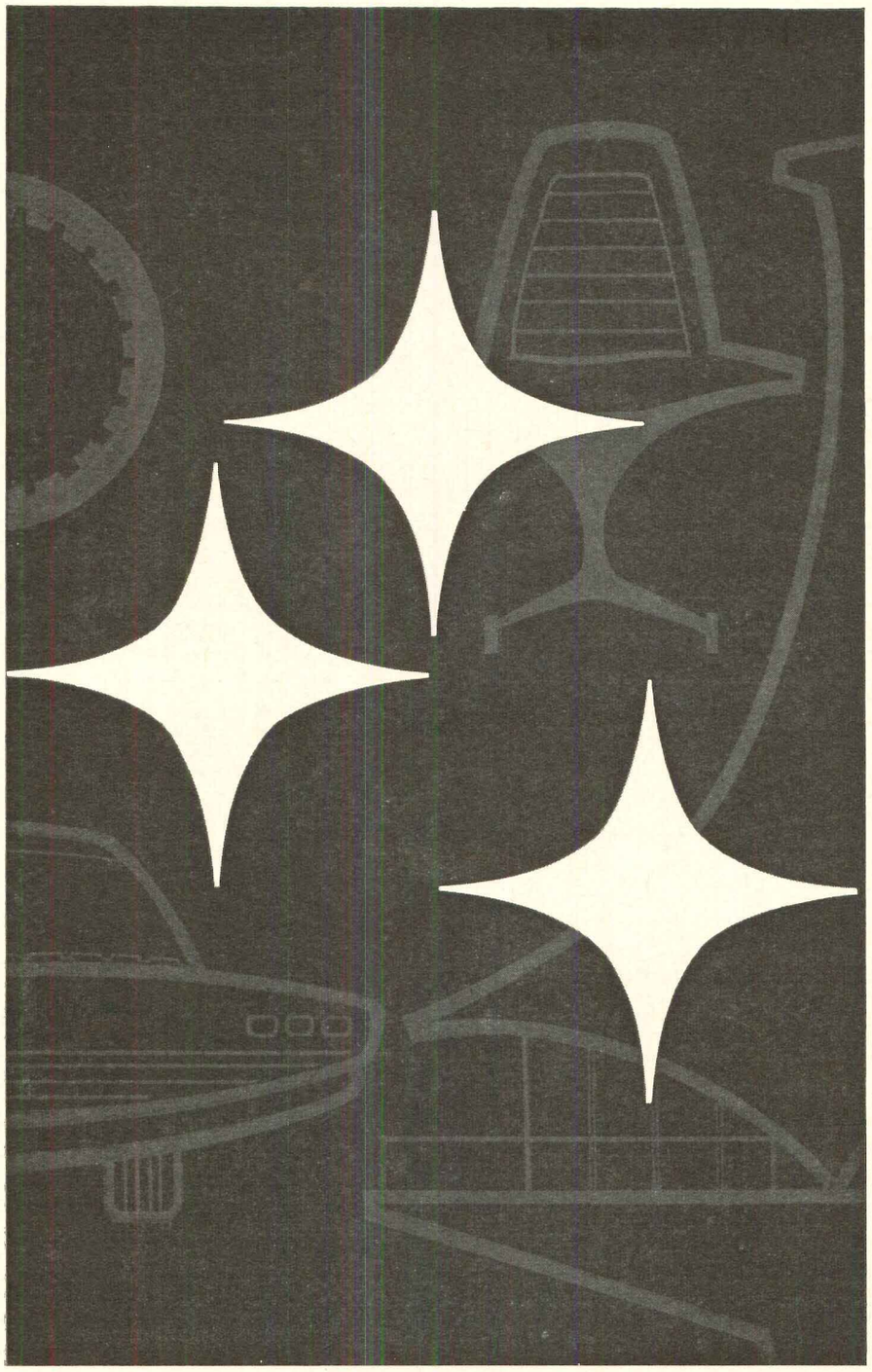
Low Rise Commercial, Industrial or Institutional Construction
High Rise Commercial, Industrial or Institutional Construction
Public Works Construction

ELIGIBILITY

Individuals or teams of professionals practicing in the fields of design, architecture or engineering in the Americas are eligible. Entries may include design or engineering of any kind of product, structure or component offered for sale or completed after January 1, 1962.



PANEL OF JUDGES

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American Institute of Architects

Robert L. Durham, Director,
American Institute of Architects

Henry L. Kamphoefner, President,
Association of Collegiate Schools of Architecture

Jon W. Hauser, President,
Industrial Designers Institute

William C. Renwick, President,
American Society of Industrial Designers

Edward J. Zagorski, President,
Industrial Design Education Association

Waldo G. Bowman, President,
American Society of Civil Engineers

Ronald Bromley Smith, Past President,
American Society of Mechanical Engineers

Kurt F. Wendt, President,
American Society for Engineering Education

For complete information, including entry form, write to:
Coordinator, Design in Steel Award Program
National Design Center
415 East 53 Street, New York, N.Y. 10022

Steel

AMERICAN IRON AND STEEL INSTITUTE
150 EAST 42 STREET, NEW YORK, N. Y. 10017

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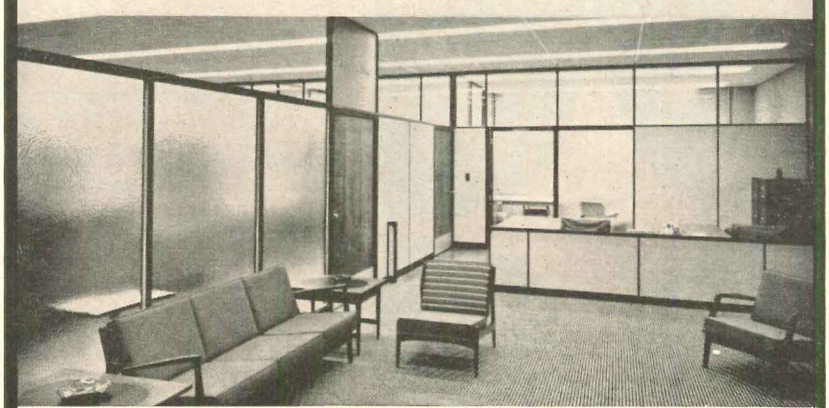
MOVABILITY

CHANGEABILITY

ACCESSIBILITY

AFFORDABILITY



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COMPETITION AIMS TO IMPROVE KITCHEN DESIGN

The first prize of $2,500 in General Electric's first national kitchen design competition was awarded to Robert Kitchen, an architectural designer from Santa Fe, New Mexico, for his design of a kitchen, square in layout with counter-height work areas on three sides providing space specifically for cooking, food preparation and clean-up.

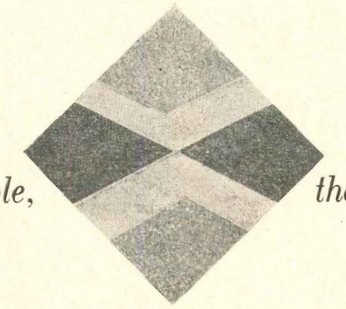
Marvin C. Sharpe of Seattle, Washington, received a second place prize of $1,000 for a double corridor design with a breakfast "banquette" facing away from the work area. Knowlton Fernald Jr. of Newport Beach, California, also received an award of $1,000 as the third place winner.

Fifteen honorable mention prizes of $100 each were also awarded by a nine-member jury composed of: Ward Buzzell, National Association of Home Builders Journal; Robert Martin Engelbrecht, A.I.A.; Milton Gralla, Kitchen Business Magazine; Olindo Grossi, F.A.I.A., dean of the School of Architecture, Pratt Institute; Robert Hamill, Practical Builder; Joseph Hazen, House & Home; Joseph Mason, American Builder; Herbert L. Smith Jr., ARCHITECTURAL RECORD; and Irving Saunders, president, Long Island Chapter, A.I.A.

The jury found the first prize winner of this initial competition to best meet the standards of incorporating good design and originality in a kitchen for the medium and low price housing field. The professional adviser, Herman A. York, A.I.A., found the results "gratifying" in this attempt to improve American kitchen design.

Addenda

In the caption on the IBM Pavilion in the article "Architecture at the New York's World's Fair" (July), design of the Pavilion and exhibits should have been credited to Charles Eames and the office of Eero Saarinen and Associates. The money tree in the garden of the American Express Pavilion was the work of Samuel E. Gallo, designer, and Wayman C. Wing, consulting engineer. Architects of the pavilion were Kelly and Gruzen.

The beauty of marble,  *the durability of concrete . . .*

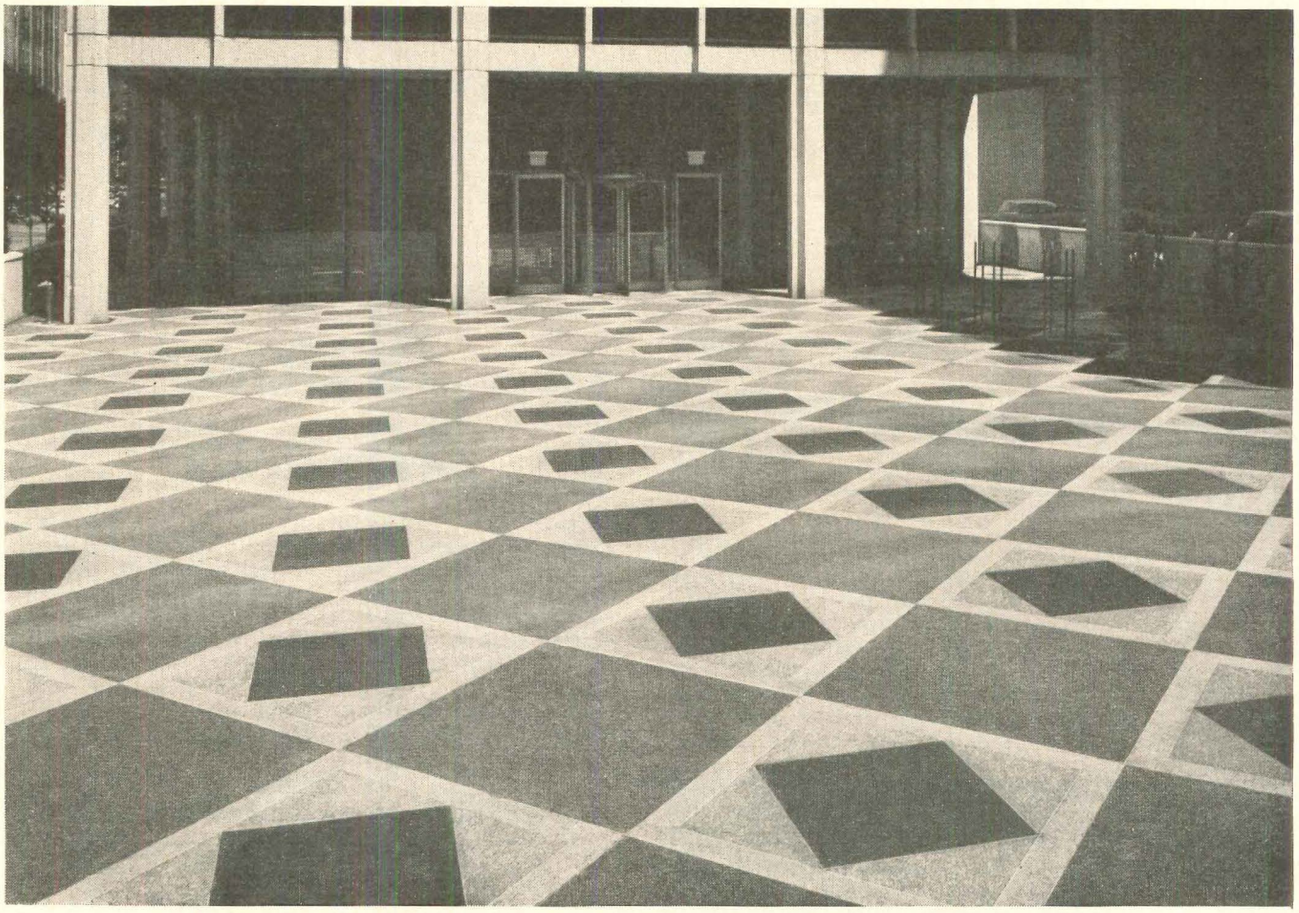
TERRAZZO brings an old-world touch to a structure of modern elegance

Textured on the plaza, highly polished for interior floors, traditional terrazzo in a bold new pattern sweeps across the entire ground level of the new administration building of the American College of Surgeons.

The striking design keys the shape and placement of outdoor pools and fountains, provides a pleasing continuity as the building is entered. To achieve the special tones desired, the architects specified both white and grey cement matrices, combined with white, black or grey marble chips, and black obsidian.

The beauty will last. Terrazzo has exceptional life expectancy, easy maintenance. Everywhere architects are recognizing the esthetic as well as the practical advantages of the age-old terrazzo process. Offering an almost unlimited range of colors and patterns, terrazzo enhances the most modern design ideas.

PORTLAND CEMENT ASSOCIATION
An organization to improve and extend the uses of portland cement and concrete



American College of Surgeons' Administration Building. Architects-Engineers: Skidmore, Owings & Merrill, Chicago, Illinois.
Terrazzo Contractor: Roman & Co., Chicago General Contractor: Turner Construction Company, Chicago

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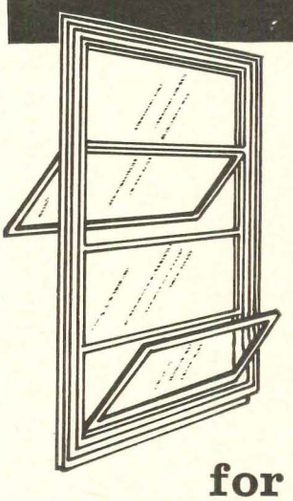
Architectural Aluminum
Manufacturers Association
announces . . .



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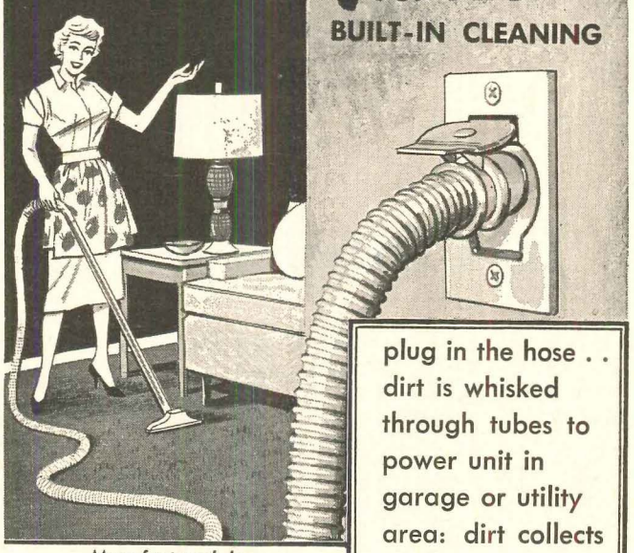

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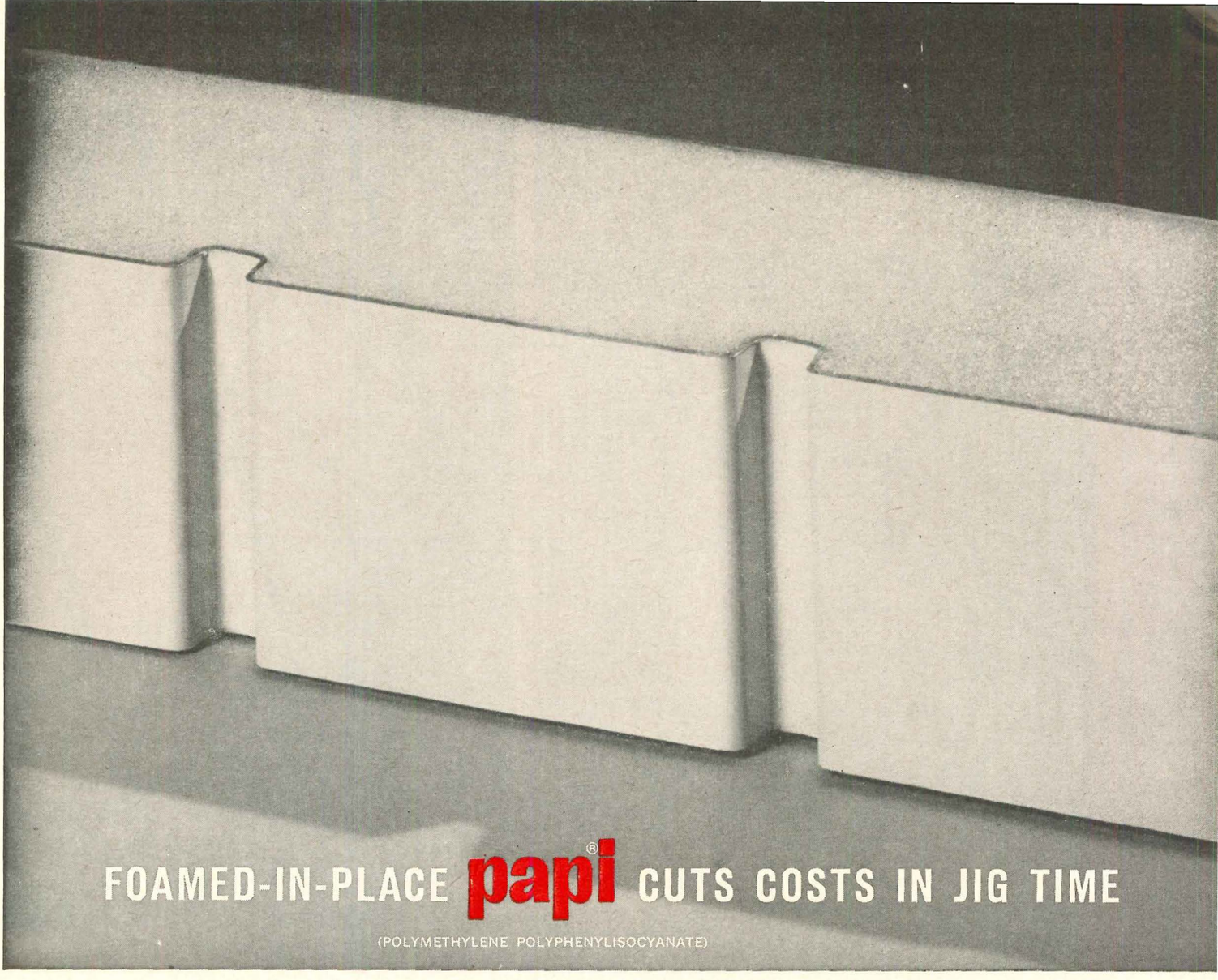

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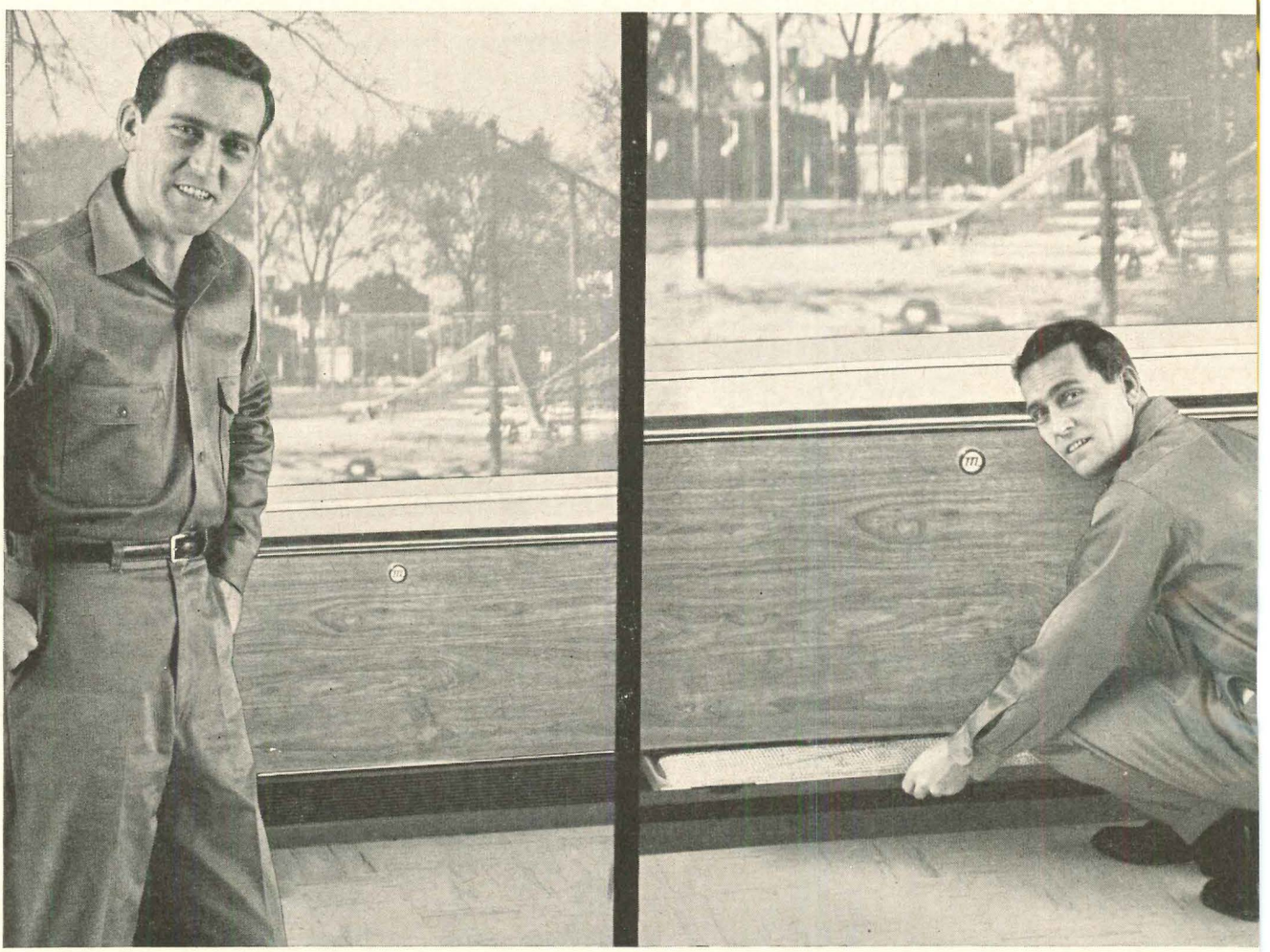
"Used to be a tough job keeping kids and teachers comfortable . . . rooms always too hot or too cold. The Valedictorian changed all that. Temperature stays just right in here . . . whatever the weather's doing."

"Another great thing about the Valedictorian . . . filters slide in and out just like a drawer. I don't even have to carry a screw driver."



Modine Valedictorian unit ventilators are constantly alert, instantly responsive to students' comfort needs. A unique "weather control center" dictates total heating, cooling, ventilating and dehumidifying. Everything Modine Valedictorian does, it does *quietly*. And it's equipped to perform the *full* air conditioning function.

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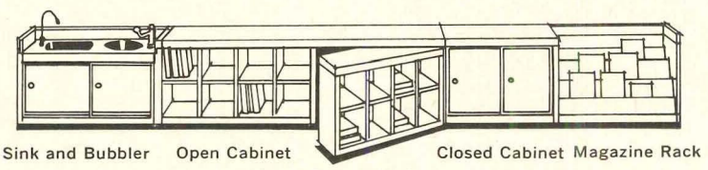

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ABOUT MODINE Valedictorian UNIT VENTILATORS

"Never thought I could throw away my oil can. But look at me now... just pushing a button to lubricate a whole unit."

"Sure easy to take care of. And tough as they come . . . take a lot of punishment from the kids and still look just as good as new."

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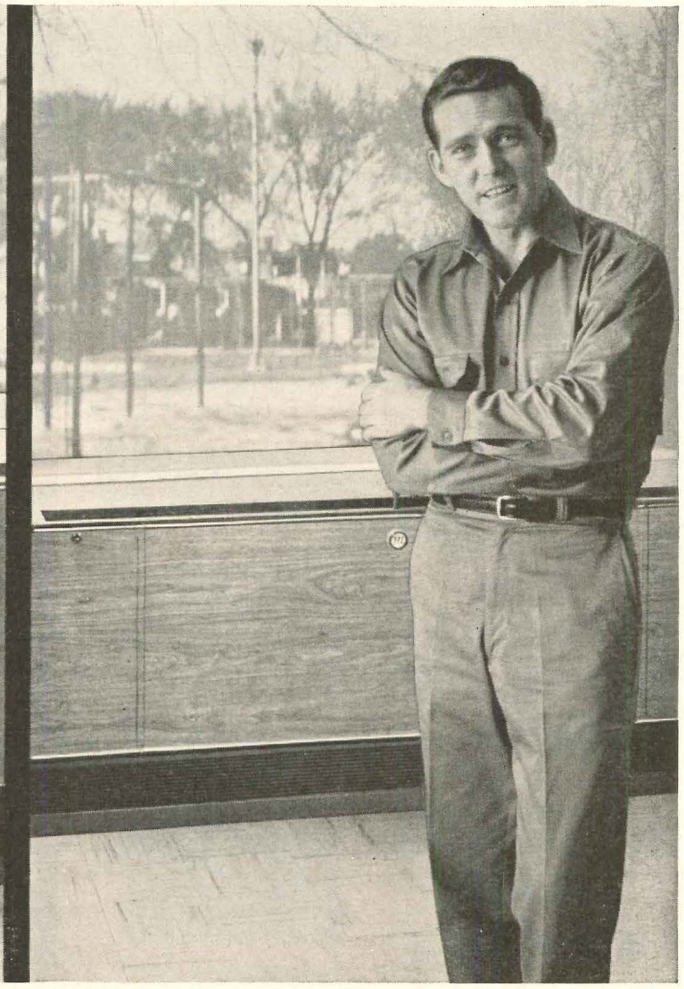

Valedictorians are virtually *student-proof*: scuff-resistant, vinyl-covered front panels; chip-resistant chrome trim; heavily-reinforced, sturdy-steel construction; long-wearing, baked-enamel finishes (7 colors). Same durability in Modine custom-styled storage cabinets and accessories.

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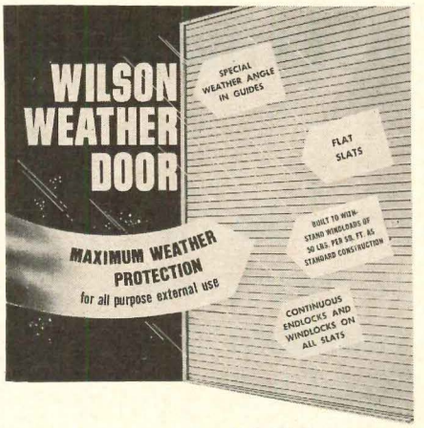

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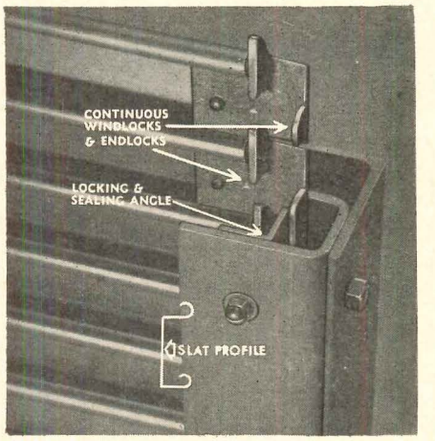
- Built to withstand a windload of 50 lbs. per sq. ft. **as standard construction.**
- Combination endlocks and windlocks are riveted to each end of every slat, assuring maximum protection against high, forceful winds.
- Special weather angle in guides, engaging combination endlocks and windlocks, for deterring wind and rain penetration.
- Flat slats to prevent wind and rain penetration and to provide an atrractive, flush appearance.
- Neoprene astragal on the bottom bar to prevent water intrusion at sill.



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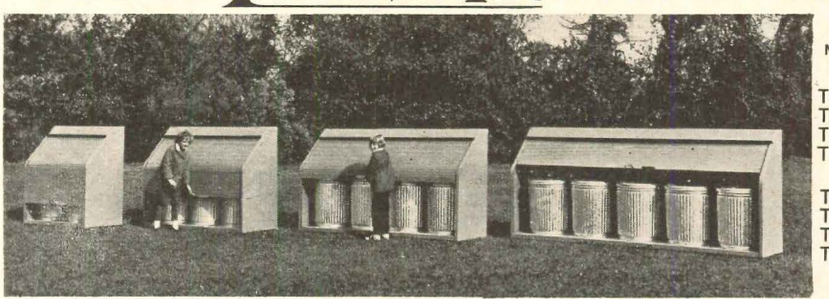

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TM 400	4 cans	27"	x55"	x 97"	600 lbs.
TM 500	5 cans	27"	x55"	x121"	750 lbs.

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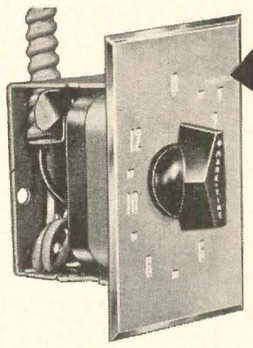

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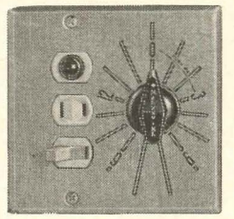

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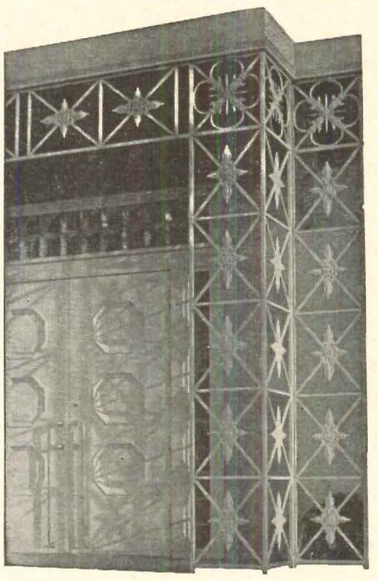

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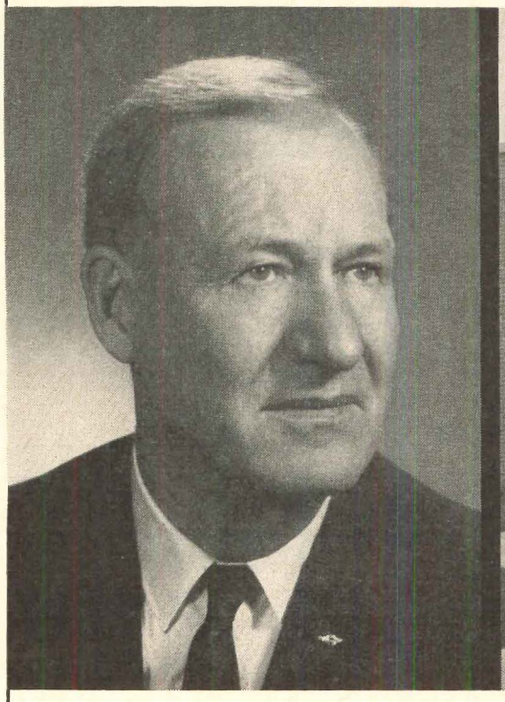

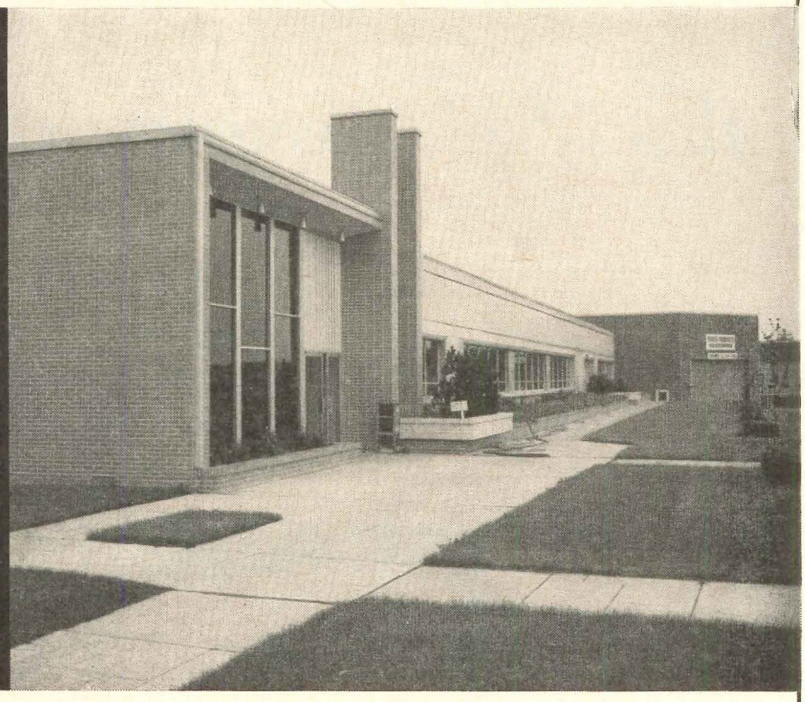

Harold W. Peterson is president of Harold W. Peterson & Sons, Inc., a Chicago firm in business continuously since 1928. Mr. Peterson was president of the Associated Masonry Contractors Association of Metropolitan Chicagoland in 1962 and 1963. He currently serves as secretary. In 1958 and 1959 he was president of the Mason Contractors Association of America, is 1964 Membership Committee Chairman.

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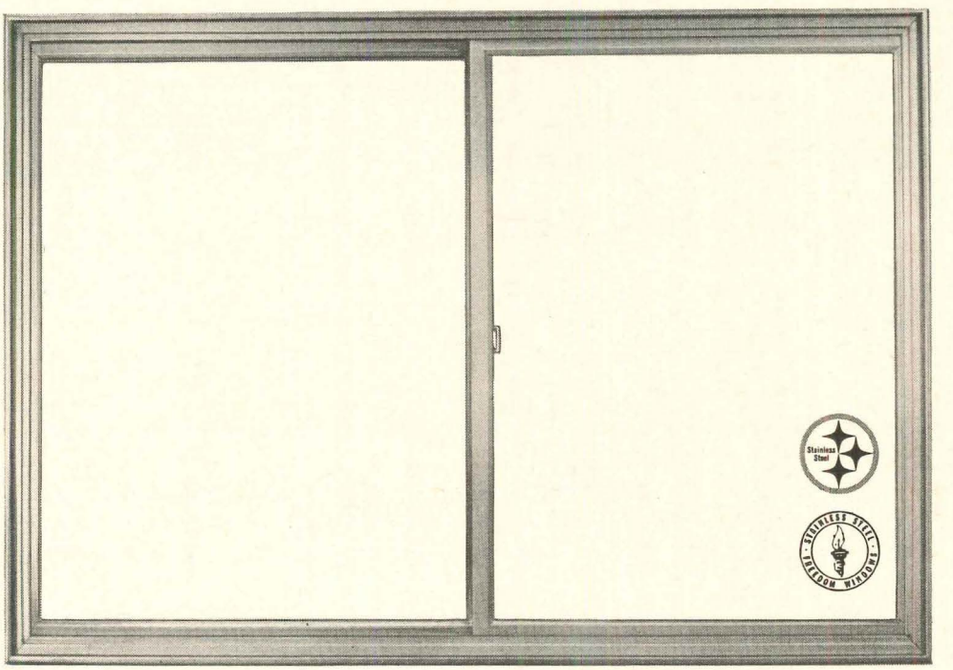
You want to use the finest materials, don't you?

Here's how to convince your client to spring



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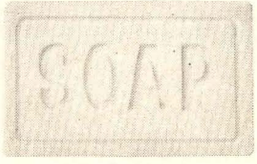

How expensive is soap and water?

So. You know how you feel about stainless steel. Be advised that you've got lots of company. Practically everybody, in fact.

Tell these things to your client in a gentle but positive tone and he'll make room for FREEDOM WINDOWS (single-hung, double-hung, or sliding) in his building budget. If you'd like additional convincing material (with specifications and working drawings) write your name, company, and address on these lines

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move 'em in—
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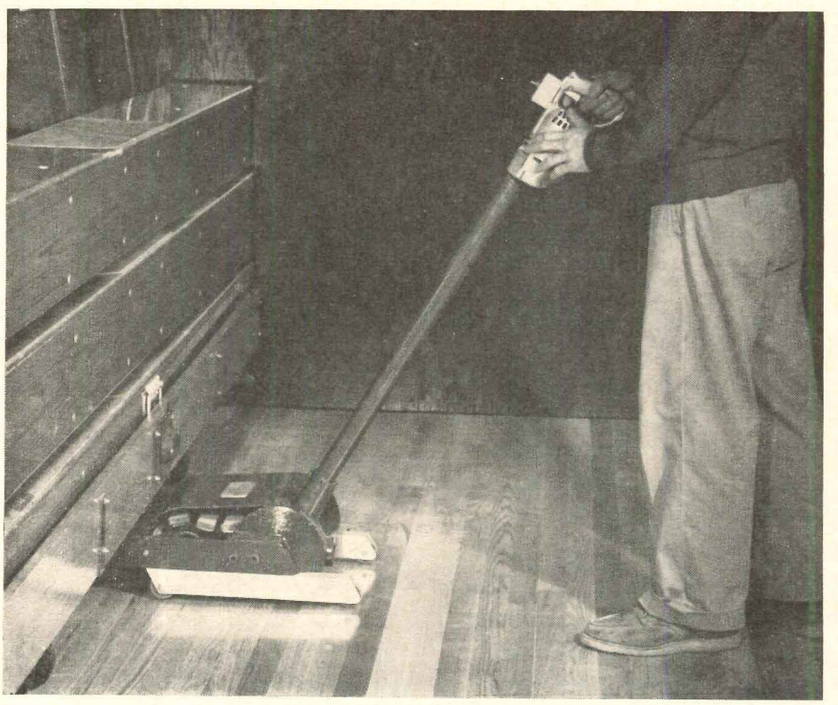

POW-R-TRAC comes in two models, built-in or portable units. POW-R-TRAC is unique! It has fewer moving parts than any other power unit. POW-R-TRAC has a simple, rugged design, and operates on conventional 110 volts, AC power. Investigate Hussey's POW-R-TRAC, with built-in alignment, before you make any decision about motorized gym seats.

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THREE NAMED TO EDUCATION POSTS

Donald D. Hanson has been named chairman of the Department of Architecture of the Chicago campus of the University of Illinois. His appointment coincides with the initiation this fall of a new curriculum in architecture anticipating a newly expanded program to be conducted at the Chicago Circle campus.

Mr. Hanson, who is 31 years old, received architectural degrees from the University of Minnesota and from M.I.T. For the past two years he had been an associate professor of architecture at the Urbana campus of the University of Illinois, and, for seven years previous to that, he was an associate of Hugh Stubbins Associates of Cambridge, Mass., where he served as chief designer.

Dr. Demetrios Aremistos Polychrone was recently appointed to head the department of architecture in the School of Architecture and the Arts at Auburn University. He succeeds Professor Charles Kelly.

Dr. Polychrone received his B.A. from Pomona College and both master's and doctoral degrees from M.I.T. For the past 11 years he had been a professor in the School of Architecture at Georgia Institute of Technology and prior to that was an assistant professor at M.I.T.

Raymond D. Reed has left the University of Southwestern Louisiana, where he was chairman of architecture and interior design, to become head of the Department of Architecture and Architectural Engineering at Iowa State University. He replaces John E. Lagerstrom, associate dean of engineering at Iowa State, who served as acting head of the department since 1962.

Mr. Reed, 34 years of age, had been department chairman at Southwestern Louisiana since 1956 and during his tenure there built the architectural program from a three-year pre-architectural one to a full five-year baccalaureate program.

Mr. Reed was educated at Tulane University, receiving a Bachelor of Architecture degree in 1953, and at Harvard University, receiving a master's degree in 1958.

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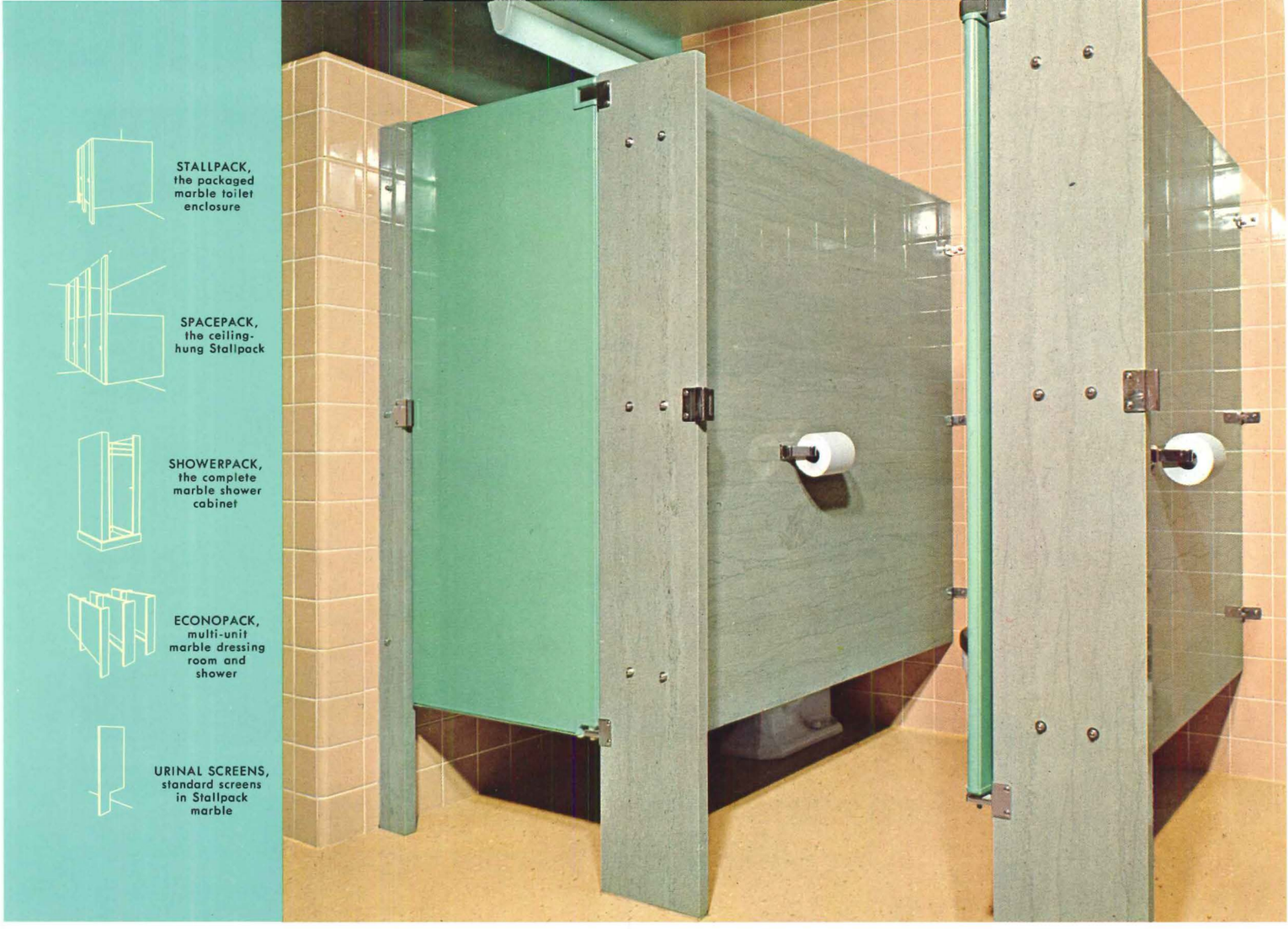


3 Stallpack units, Metzler Hall, McPherson College, McPherson, Kans. Arch: Mann & Co., Hutchinson.

Stallpack® keeps solving partition problems with durable marble and rustproof hardware

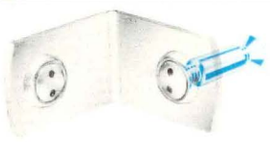
A COMPLETE PACKAGE. Stallpack gives you the unique durability of solid marble partitions precut to standard size, predrilled ready to assemble, and offered in a package unit complete with door and chrome-plated non-ferrous hardware. These package units are ready to be shipped immediately.

EASY TO SPECIFY. Just indicate water closets 2′ 10″ on centers on your drawings, then specify Stallpack. With that one easy specification you give the toilet rooms of your building the lasting beauty and trouble-free durability that cannot be had with any material but marble.

PERMANENT. Stallpack marble partitions will not rust or deteriorate. They will never need refurbishing. Washing with mild soap and water is all it takes to keep Stallpack marble partitions in perfect, shining condition. Imagine the total savings in upkeep expense!

EASY TO CLEAN. These partitions are easy to keep clean because they are solid marble. Flush construction with solid marble leaves no inaccessible hollow places around the base of the stiles to breed germs and retain odors.

New!



THEFT-RESISTANT spanner head machine screws now fasten the exclusive Carthage Marble clip-angle. It takes a special two-pronged screwdriver to remove the screws. This slotted clip-angle saves hours of setting time because it adjusts to out-of-line floors and walls.

UNIVERSAL COLOR. Stallpack partitions are made of fine Ozark Grey Veined marble. This lustrous light grey marble blends beautifully with any color scheme, stays beautiful as long as your building stands!

ECONOMICAL. High sales volume enables us to polish Stallpack marble partitions on an automated production line and to purchase top quality doors and hardware in carload lots. Stallpack is priced to compete with other types of partitions, yet it offers the durability that marble alone can give. Over the years that durability will mean true economy for the building owner.

Specify Stallpack from Sweet's Architectural File, Section 22b/Ca, or write Carthage Marble Corp., P. O. Box 718, Carthage, Missouri 64836.

CARTHAGE MARBLE CORPORATION

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 preplanning, 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.

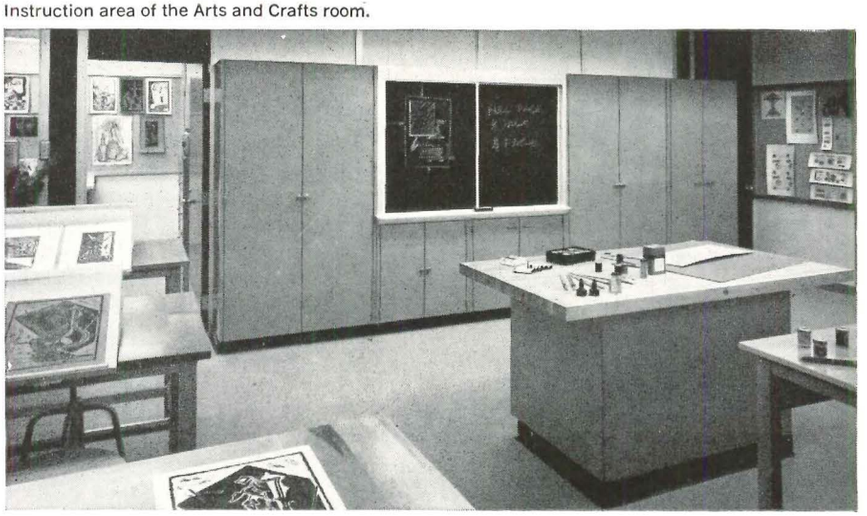
If you're an architect, or an educator with an interest in new construction or remodeling, send for our free School Storage Furniture Catalog—it's an excellent source of information and ideas.

St. Charles

CUSTOM SCHOOL STORAGE FURNITURE

St. Charles Manufacturing Co., ARS-9, St. Charles, Illinois

Instruction area of the Arts and Crafts room.



Tote-tray storage in the clothing lab.

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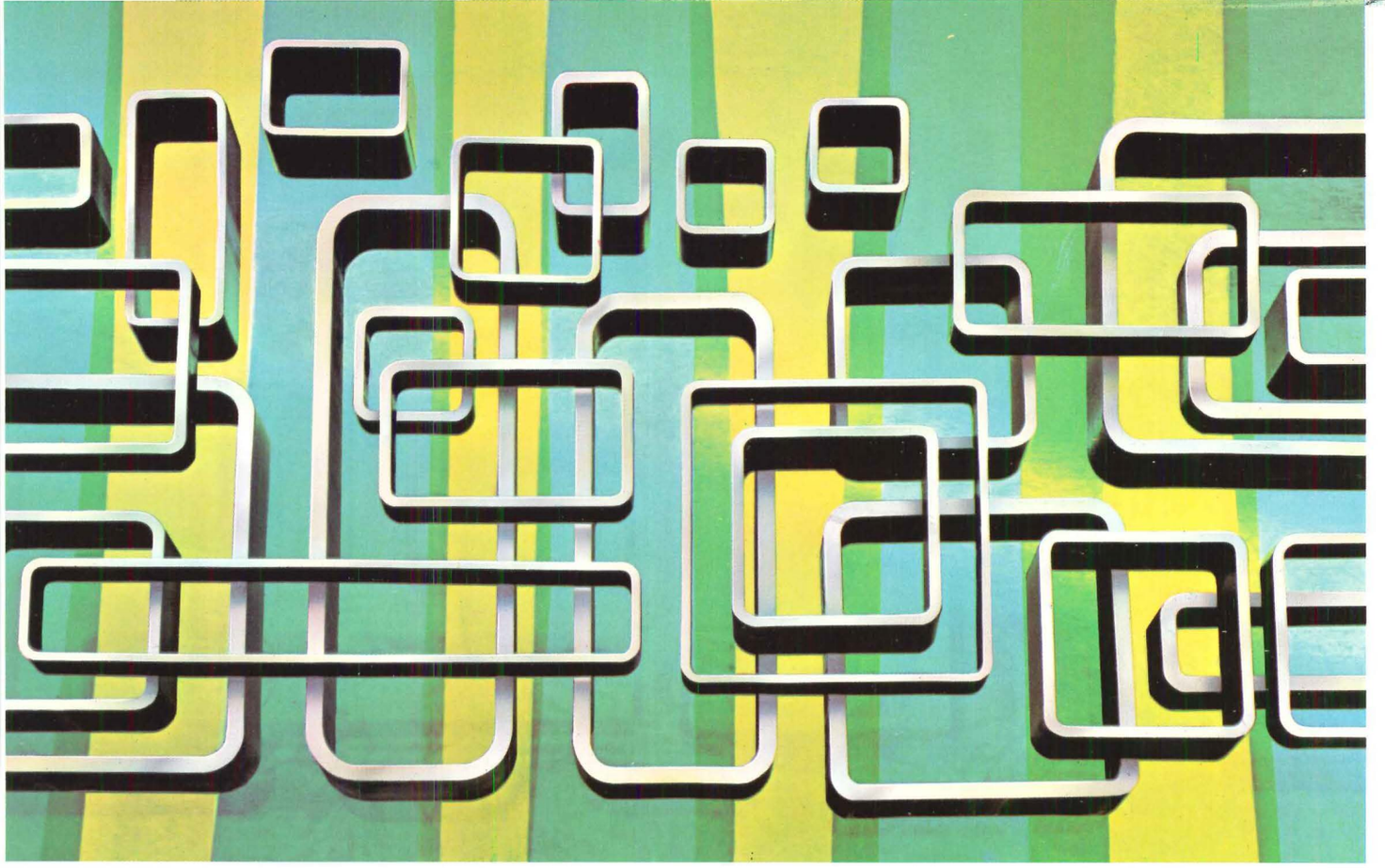
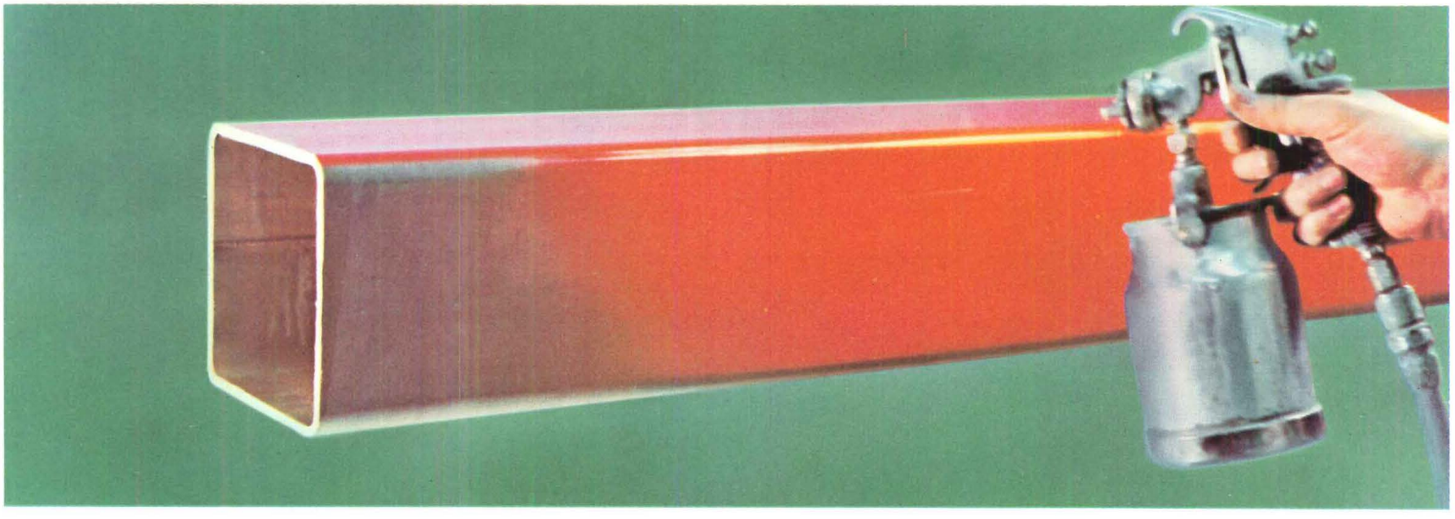


146 sizes and gages

(nation's widest variety)

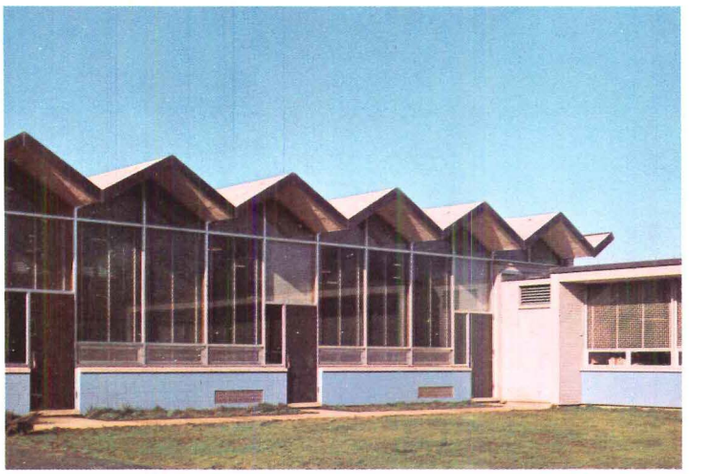


and each paints beautifully

Bethlehem Hollow Structural Sections are cold-formed from blast-cleaned steel to give you a clean, smooth surface ready for painting

BETHLEHEM STEEL

BETHLEHEM STEEL



Hollow structural sections are used as compression members in folded-plate, steel-deck roof. Sections transfer shear to the columns. They also act as exposed backup for the windows: Architect: Nicholas G. Eckert, New Brunswick, N.J. Consulting Structural Engineers for all structures shown on these pages: Schwartz & Senes, Englewood, N.J.

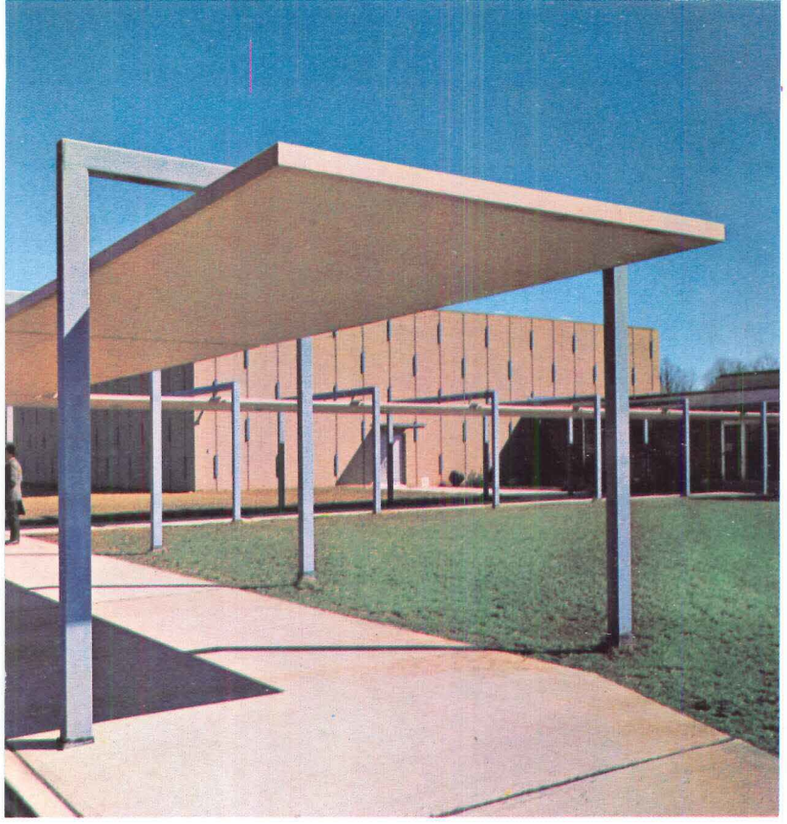
Beauty plus Strength

Many architects and engineers like the beauty and efficiency of square and rectangular hollow structural sections.

Now Bethlehem gives you a wider choice of sections (with more of them adaptable as beams!) . . . and a smooth surface finish you'll be proud to paint and expose.

New Bethlehem Hollow Structural Sections also offer certified strength and dimensional tolerances . . . flat sides . . . small corner radii . . . excellent torsional properties . . . and high strength-to-weight ratios. They are easy to detail, fabricate, join, and erect.

BETHLEHEM STEEL

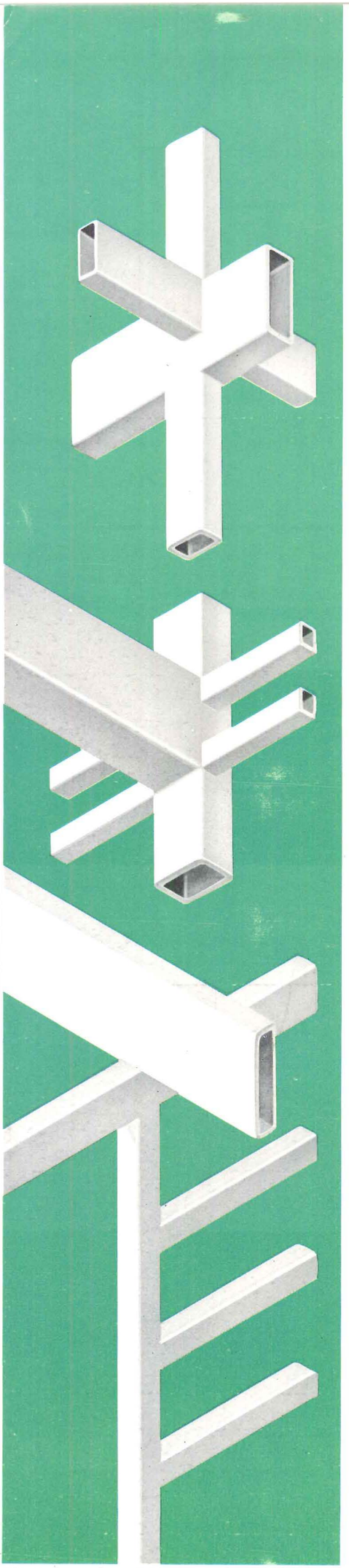


Beam and column assembly of hollow structural sections uses structural elements as window mullions. Beam is cantilevered to provide a sunshade and entrance cover. Architect: Scrimenti, Swackhamer & Perantoni, Somerville, N.J.

Bents fabricated from hollow structural sections are set at approximately 14′-0″ on center. Bents were field assembled. Architect: Merchant, Seidel & Hickey, New Brunswick, N.J.

... easy to detail and join

In Vierendeel trusses used to support roof, monorails, and mechanical equipment, hollow structural sections provide clean architectural appearance. Structurally economical for medium spans. Ductwork and piping can be routed through truss panels. Used at Guggenheim Laboratories, Princeton University to obtain maximum flexibility in meeting continually changing requirements of laboratory duct systems. Architect: Scrimenti, Swackhamer & Perantoni, Somerville, N.J.



New Freedom of Design with New Bethlehem Hollow Structural Sections

SQUARE	
Gage	Size
¼ 3/16	2 x 2
¼ 3/16	2½ x 2½
¼ 3/16	3 x 3
¼ 3/16	3½ x 3½
3/8 5/16 ¼ 3/16	4 x 4
¼ 3/16	4½ x 4½
3/8 5/16 ¼ 3/16	5 x 5
3/8 5/16 ¼ 3/16	5½ x 5½
3/8 5/16 ¼ 3/16	6 x 6
3/8 5/16 ¼ 3/16	7 x 7
3/8 5/16 ¼ 3/16	8 x 8

Steel

Steel for Strength

RECTANGULAR					
Gage	Size	Gage	Size	Gage	Size
¼ 3/16	3 x 2	3/8 5/16 ¼ 3/16	8 x 2	3/8 5/16 ¼ 3/16	9 x 7
¼ 3/16	4 x 2				
¼ 3/16	4 x 3	3/8 5/16 ¼ 3/16	8 x 3	3/8 5/16 ¼ 3/16	10 x 2
¼ 3/16	5 x 2				
3/8 5/16 ¼ 3/16	5 x 3	3/8 5/16 ¼ 3/16	8 x 4	3/8 5/16 ¼ 3/16	10 x 3
¼ 3/16	5 x 4				
3/8 5/16 ¼ 3/16	6 x 2	3/8 5/16 ¼ 3/16	8 x 6	3/8 5/16 ¼ 3/16	10 x 4
¼ 3/16	6 x 3	3/8 5/16 ¼ 3/16	8 x 7	3/8 5/16 ¼ 3/16	10 x 5
3/8 5/16 ¼ 3/16	6 x 4				
3/8 5/16 ¼ 3/16	6 x 5	3/8 5/16 ¼ 3/16	9 x 2	3/8 5/16 ¼ 3/16	10 x 6
3/8 5/16 ¼ 3/16	7 x 3	3/8 5/16 ¼ 3/16	9 x 3	3/8 5/16 ¼ 3/16	12 x 2
3/8 5/16 ¼ 3/16	7 x 4	3/8 5/16 ¼ 3/16	9 x 5	3/8 5/16 ¼ 3/16	12 x 3
3/8 5/16 ¼ 3/16	7 x 5	3/8 5/16 ¼ 3/16	9 x 6	3/8 5/16 ¼ 3/16	12 x 4

New booklet gives sizes, properties, and other useful design data on new Bethlehem Hollow Structural Sections. For your copy, write to Advertising Department, Room 1047, Bethlehem Steel Company, Bethlehem, Pa.

BETHLEHEM STEEL

BETHLEHEM STEEL

Export Sales: Bethlehem Steel Export Corporation

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648, Printed in U.S.A.

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A Fitting Facade for the Fair's Fairest . . .

Precast Panels of MEDUSA WHITE

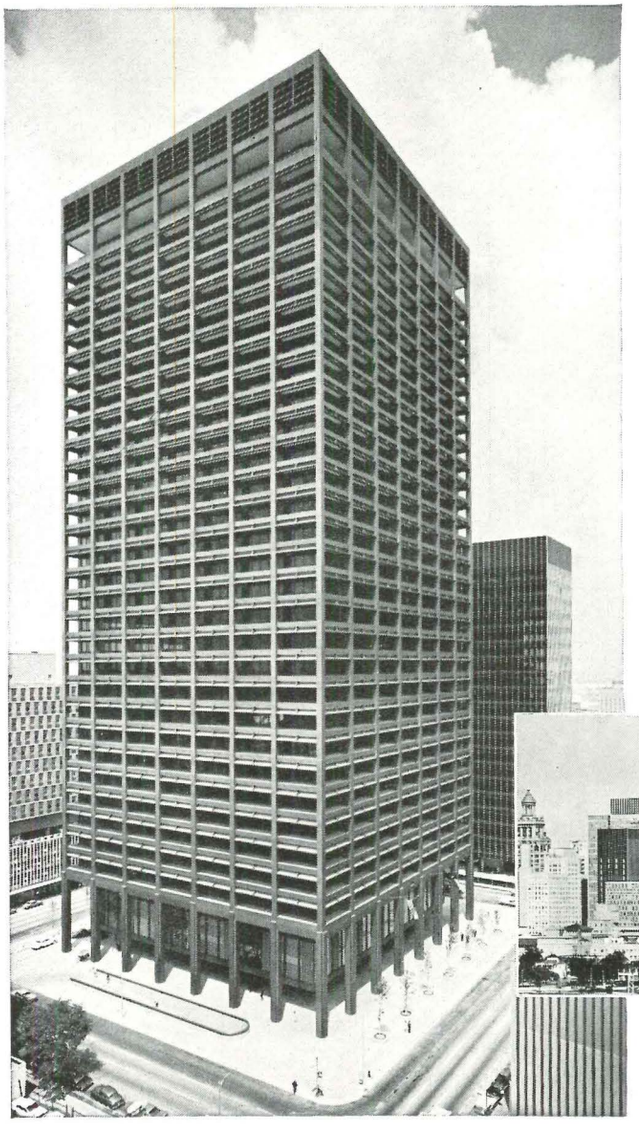
The Spanish Pavilion at the New York World's Fair has been labeled by the working press as "superbly integrated", "beautifully selected" and "sophisticated grace". And as a fitting facade of dignity for this sparkling exhibit, the architect chose precast concrete panels of Medusa White . . . star performer in colorful construction everywhere. Because this original of all White Portland Cements is true-white, it is better able to bring reality to an architect's creative theme . . . whether in striking white or in color. And in addition, Medusa White meets all ASTM and Federal specifications for strength. Write us direct for more data.

MEDUSA PORTLAND CEMENT COMPANY

P. O. Box 5668 Cleveland 1, Ohio

SPANISH PAVILION, New York World's Fair, Flushing Meadows, L. I.
Architects: Javier Carvajal, Madrid, Spain; Kelly and Gruzen, New York, N. Y.
Gen. Contractor: Paul Tishman Co., Inc., New York, N. Y.

Precast Panels by: Plasticrete Corporation, Hamden, Conn. MEMBER Mo-Sai INSTITUTE



Tennessee Building

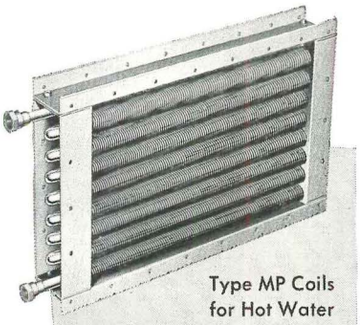
Houston, Texas

Headquarters for
Tennessee Gas Transmission Company

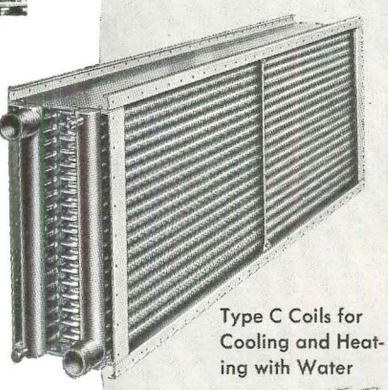
Skidmore, Owings and Merrill (San Francisco)
Architects

W. S. Bellows Construction Corp.
General Contractor

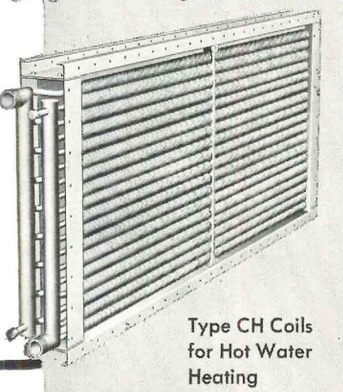
Charles G. Heyne & Co.
Air Conditioning Contractor



Type MP Coils for Hot Water Heating



Type C Coils for Cooling and Heating with Water



Type CH Coils for Hot Water Heating

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

Aerofin performance data are laboratory and field proved. You can specify Aerofin Coils at full published ratings.

AEROFIN CORPORATION

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

ENGINEERING OFFICES IN PRINCIPAL CITIES

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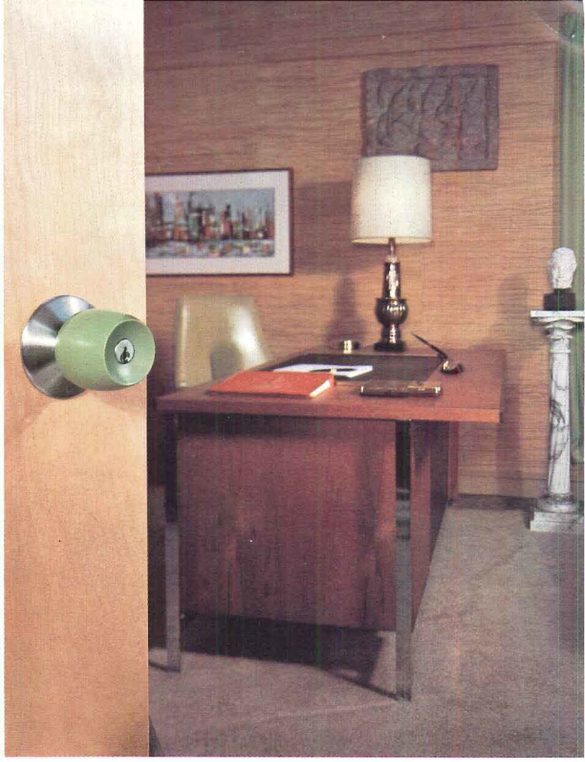
Corinthian

adj:
relating to the
most luxurious
and elaborate
of the three
Orders of Greek
Architecture.



CORINTHIAN. What more descriptive name could be given to Lockwood's new colored knob design?
Molded of tough, durable colored Celcon, an engineering plastic from Celanese, these knobs have a sculptured look and feel, and a warmth to the touch not possible with metal trim.

Wonderful design possibilities are yours with a complete range of beautiful colors from which to choose. Available as trim with all Lockwood commercial grade mortise and cylindrical locksets, this line gives you a lock, Corinthian in appearance, Spartan in performance.

LOCKWOOD

LOCKWOOD HARDWARE MFG. CO.
FITCHBURG, MASSACHUSETTS

celcon®

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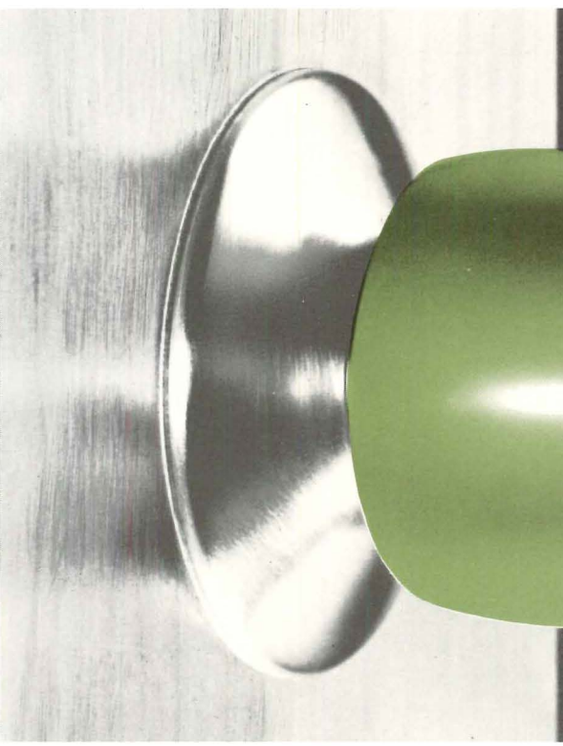

This Lockwood door knob is
pleasant to touch
has permanent beauty
never needs polishing
won't rust, tarnish or discolor

It's molded of Celanese Celcon

Celcon, the Celanese engineering plastic, brings new beauty and function to architectural hardware. In these handsomely styled "Corinthian" door knobs by Lockwood Hardware Manufacturing Company, Fitchburg, Mass., Celcon adds a pleasantly warm touch, freedom from annoying static electricity shocks, and a wide range of permanent decorator colors from which to match or complement any building decor.

Celcon acetal copolymer practically eliminates maintenance, too. It never needs polishing, won't rust, tarnish or discolor—even in the most critical salt water atmosphere.

One look—one touch—will convince you that door knobs of Celcon add an impressive note of distinction to quality buildings such as hospitals, hotels, schools and other commercial construction.

That's why you will find Celcon replacing metal for door knobs, handles, rollers, hinges, latches, hooks and in a growing number of other fine hardware products. Celanese Polymer Company, 744 Broad St., Dept. C-1, Newark 2, N. J.

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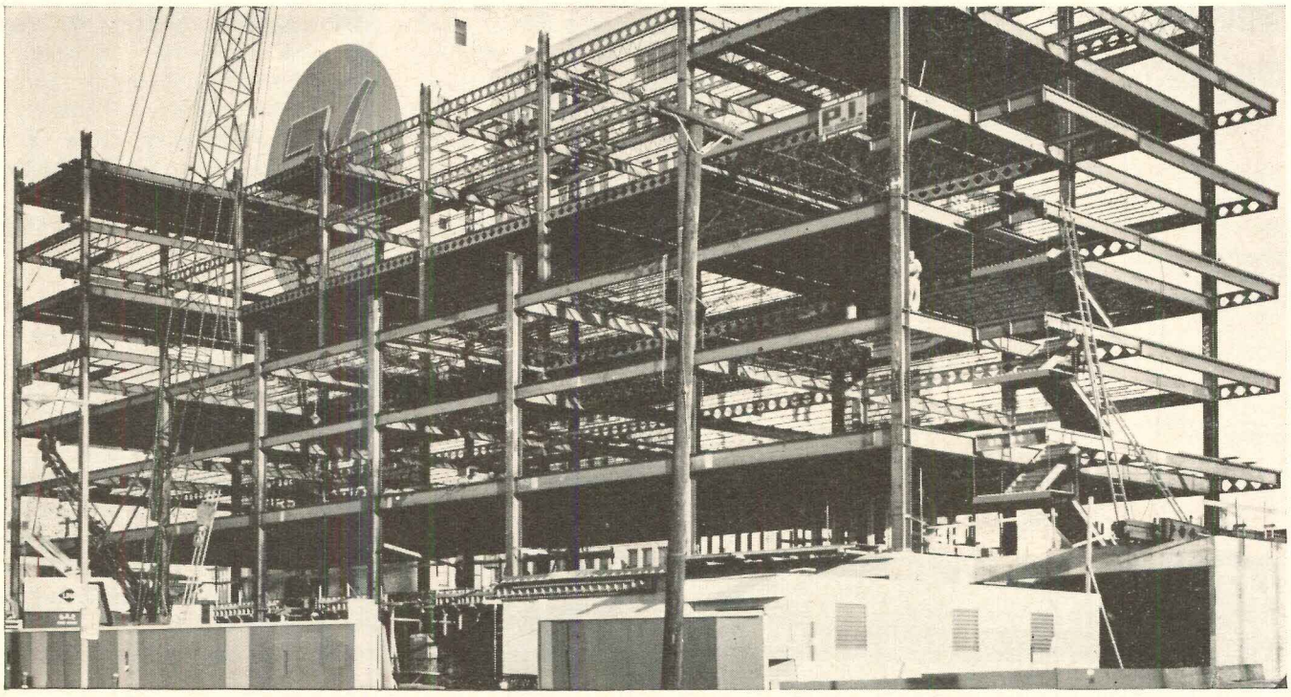
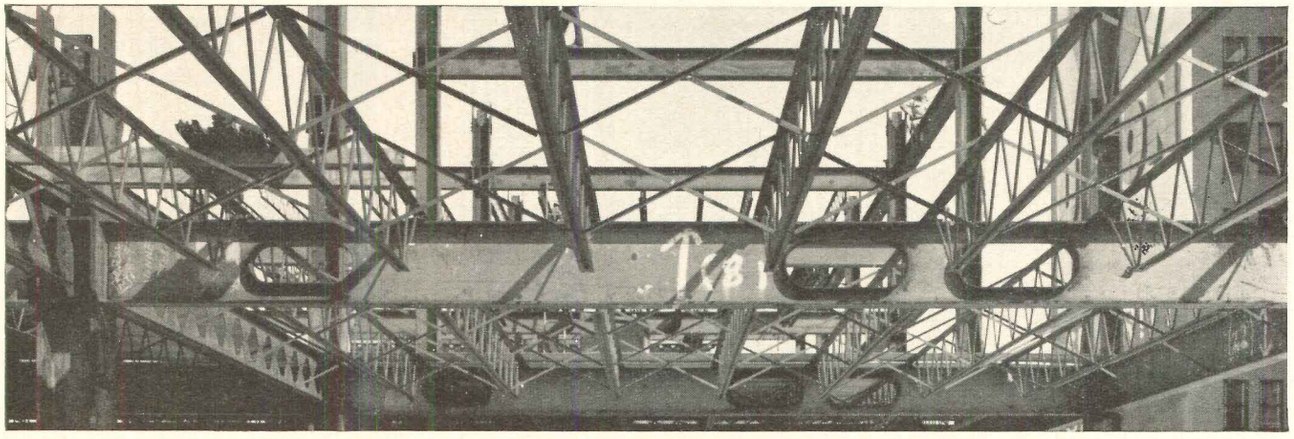


Sheffield H-Series Joists in floors of Doric Motor Hotel

OWNER: One Thousand Figueroa Corporation, Los Angeles, California
ARCHITECT: Albert Criz, A.I.A., Beverly Hills, California
STRUCTURAL ENGINEER: Zorah E. Sheffner, Beverly Hills, California
STEEL FABRICATION AND ERECTION: P. I. Steel Corporation, Los Angeles, California
CONTRACTOR: Vinnell Steel: Irwindale, California



High-strength Sheffield Steel Joists for high-rise motor hotel

Floor structure for the multi-story Doric Motor Hotel, Los Angeles, demonstrates the use of modern, high-strength steel joists to achieve economical design. Use of Sheffield H-Series Joists, made with steels having 50,000 minimum yield point, contributed to high strength-to-weight ratio. This structure was designed with columns on 28′-0″ centers in both directions. 4′-0″ spacing of the Sheffield H-Series Joists met all loading requirements.

This is another example of the acceptance of Sheffield Joists in today's structural designs. All Sheffield Joists meet the specifications of the Steel Joist Institute. See our catalog in Sweet's Architectural File or write for complete data. **Armco Steel Corporation, Steel Division, Department S-2044, 7000 Roberts Street, Kansas City, Missouri 64125.**

ARMCO STEEL ARMCO

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For more data, circle 195 on Inquiry Card

STUDENTS WORK, STUDY AND TRAVEL DURING SUMMER

Five architecture students spent a 10-week period this summer participating in a professional fellowship program initiated by the **Perkins & Will Partnership.** The purpose of the training program was to acquaint students with the over-all operation of the office as well as with the methods and techniques of job production through participation, observation and discussion. During the 10-week period, each student was counseled by a team of one partner and one senior associate. A general program was individually prepared for the student and his progress was evaluated at the end.

Each of the students was assigned to one of Perkins & Will's three offices and received a monetary award and expenses: Jeffrey W. Brown, Harvard University (Chicago office); Robert A. Hutchins, Harvard University (Chicago); Irene N. Sarli, Yale University (New York); Stephen H. Kiviat, Harvard University (New York); and Robert A. M. Stern, Yale University, (Washington).

Six college seniors received summer scholarships to study at the Fontainebleau School of Fine Arts near Paris as winners of the **Portland Cement Association's** annual architectural scholarship awards.

Students from 68 American schools of architecture entered the competition with projects completed as part of their regular class work. Designs were limited to those "meeting residential area needs and using concrete as the chief building material."

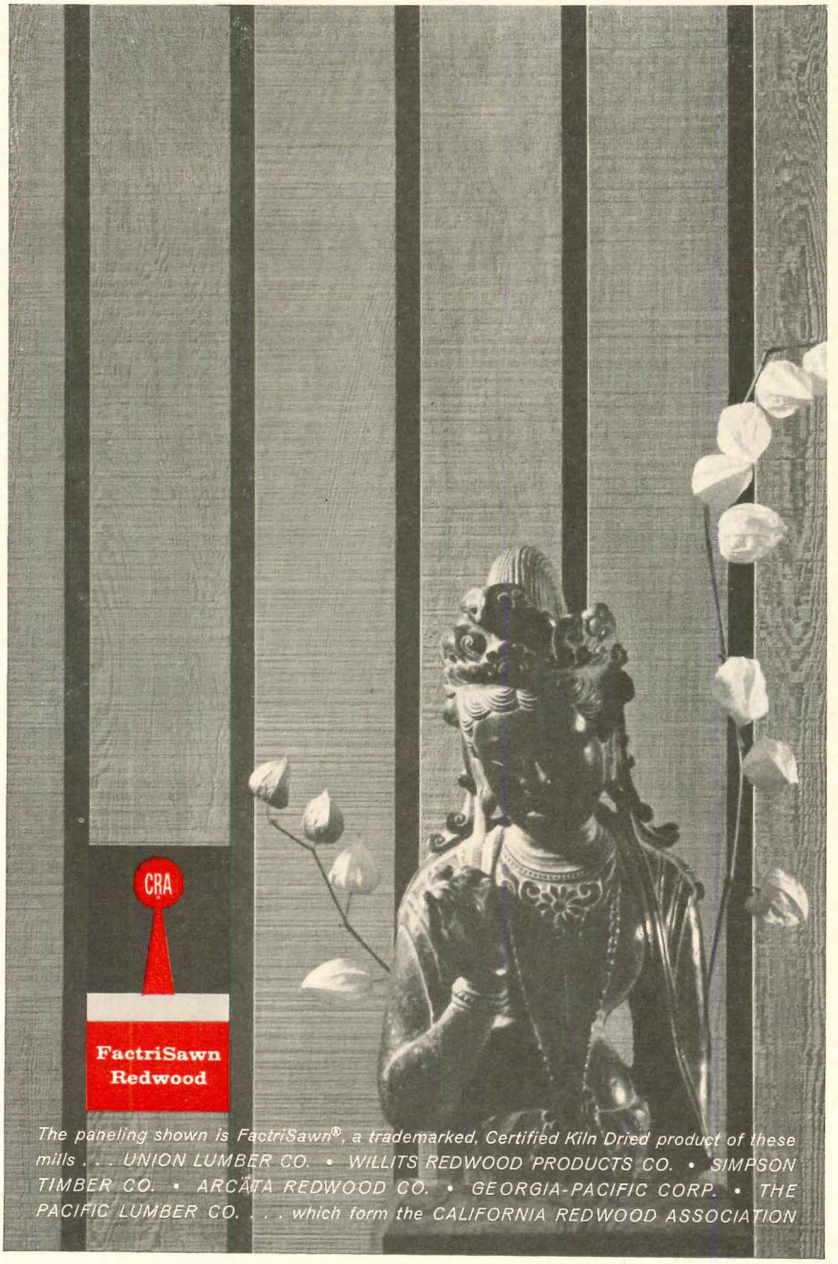
The scholarship winners, one from each of the six P.C.A. regions, were: Daniel W. Hoffman, Carnegie Institute of Technology (Eastern); Yui Hay Lee, Miami University, Oxford, Ohio (Midwestern); Jay A. Schadel, University of Utah (Rocky Mountain); David E. Williams, University of Houston (South Central); Allan C. Johnson, University of Virginia (Southeastern); and Harrison W. Skinner, University of Minnesota (West Central).

The four architects judging the competition were: Charles M. Moore, dean, School of Architecture, University of California, Berkeley; Stanley Tigerman, Chicago; R. Duane Conner, Oklahoma City; Mario Celli, McKeesport, Pa.

Thirty-six Columbia University architecture students and graduates received **William Kinne Fellows Memorial Fellowships and Scholarships,** enabling them to study abroad this summer. This was the largest number awarded in one year since they were established 11 years ago by the late Elizabeth Steele Fellows, Mr. Fellows' widow.

This year a total of $66,000 was awarded to graduate architects, planners and students who planned to study in more than 30 countries on grants ranging from $1,500 to $2,700. This is the first year that awards were opened to foreign students and fourth-year students.

REDWOOD PANELING: practical advantages make it the choice of leading architects. For detailed information on redwood paneling write: Dept. 43-A, California Redwood Association, 617 Montgomery Street, San Francisco 11.



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Detroit Bank & Trust Building, Detroit, Mich. **Builder-Owners:** Sam Minskoff & Sons. **Architects and Engineers:** Harley, Ellington, Cowin & Stirton, Inc., Detroit. **Consulting Architects:** Emery Roth & Sons, New York. **Contractor:** Minskoff-Detroit Construction Corp., New York. **Concrete Panel Manufacturer and Erector:** Pre-Cast Concrete Products Company, Marysville, Michigan.

The 2,800 precast white concrete window-frame units

of this new 26-story building were hoisted up the side and bolted to the steel in just seventy-two working days. Made with ATLAS WHITE portland cement and an exposed quartz aggregate, the floor-to-ceiling units enclose panes of gray, heat-resisting glass. Spandrels were eliminated, increasing construction economy. ■ Today, more architects are specifying precast white concrete for high-rise buildings because it lowers construction and maintenance costs while providing aesthetic distinction. It can be cast in a great variety of sizes, shapes, colors and textures. ■ For specific information, consult your local precast concrete manufacturer. For general information and a 32-page, fully illustrated brochure titled "White Concrete in Architecture," write to Universal Atlas, 100 Park Avenue, New York, N.Y. 10017.

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

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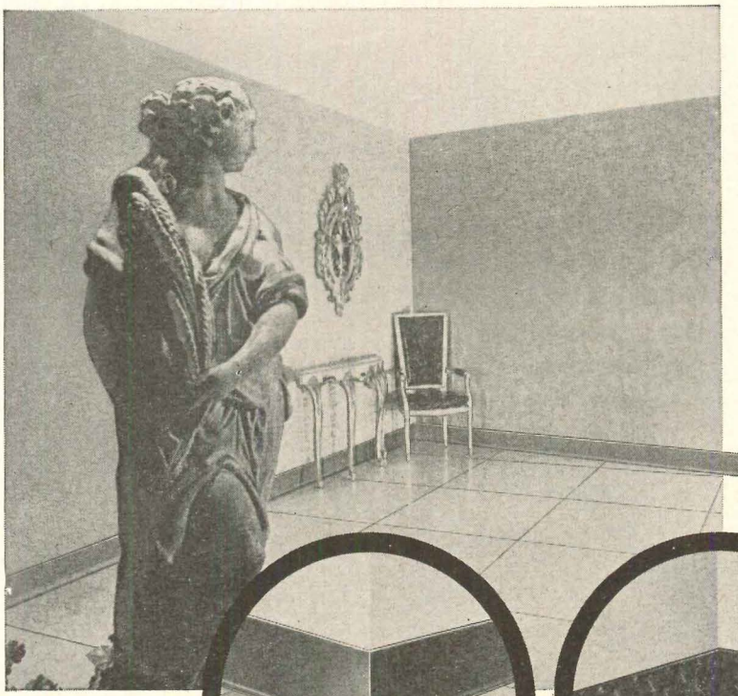

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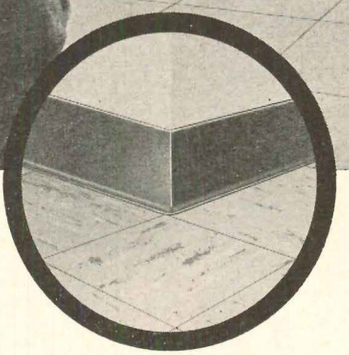
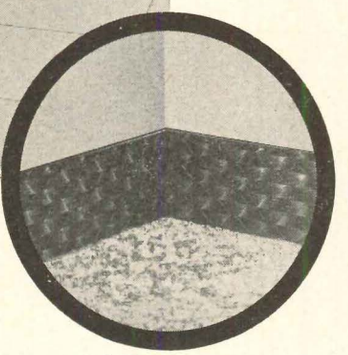
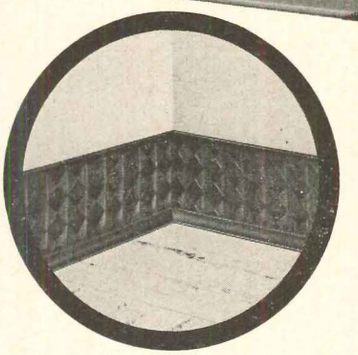
VINYL COVE BASE



PLAIN
COLOR COVE



"SATTELIGHT"
SCULPTURA



"STARLIGHT"
SCULPTURA

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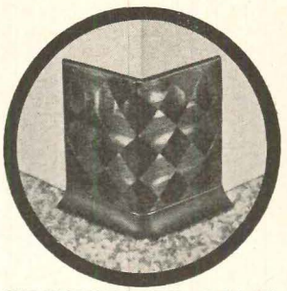
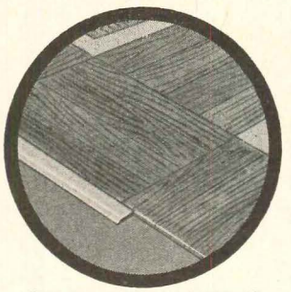
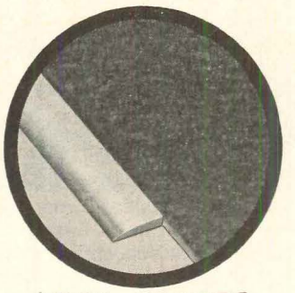
are your own best friends too... made of highest quality vinyl for long-lasting beauty at low cost. Sizes ranging from 1½" to 6" with and without toe in 19 standard colors. Want more information? Contact your nearest Mercer Distributor, or write for product sheets and samples today.



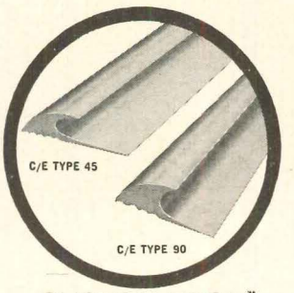
PRE-FORMED COVE
BASE CORNER



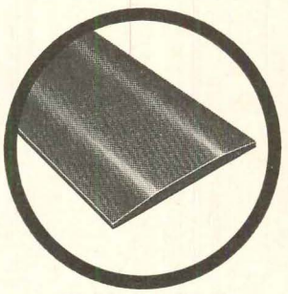
TILE REDUCER &
FEATURE STRIP



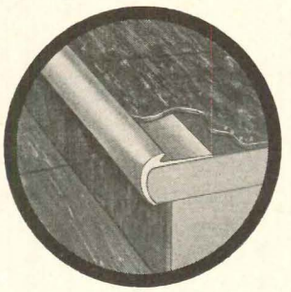
VINYL CARPET
REDUCER



CUSTOM-EDGE*
CARPET BAR

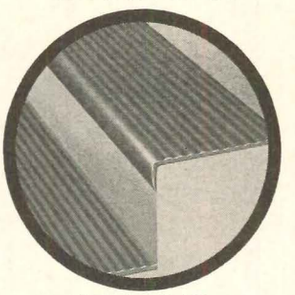


THRESHOLD



INTERIOR
STAIR NOSING

PRECISION-MADE
STEP NOSING



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Newark 5, New Jersey • Eustis, Florida
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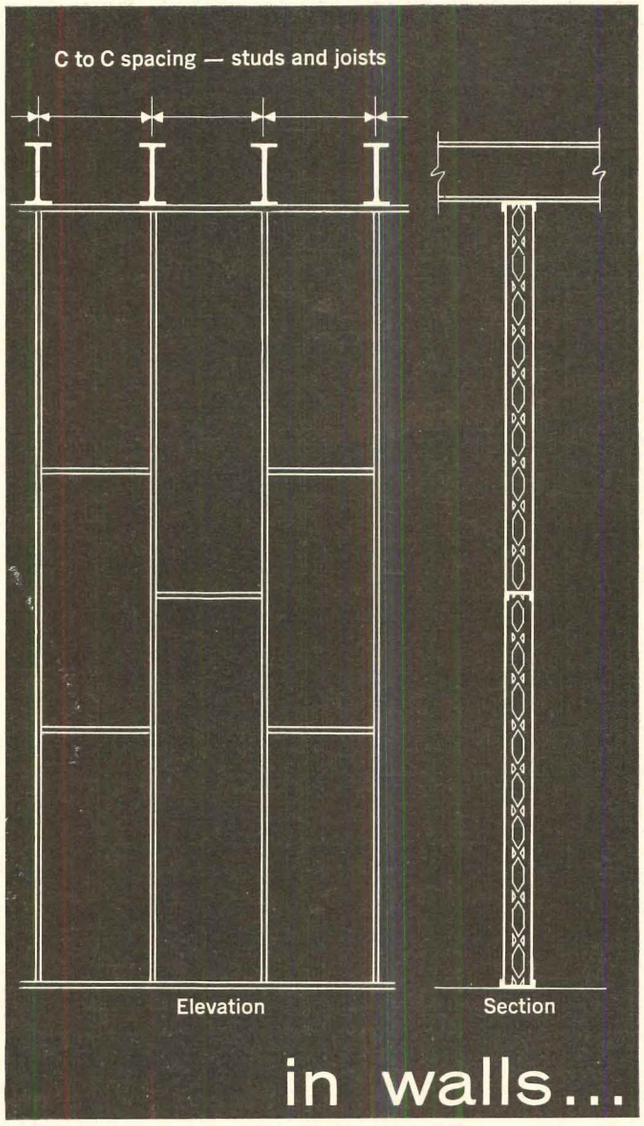
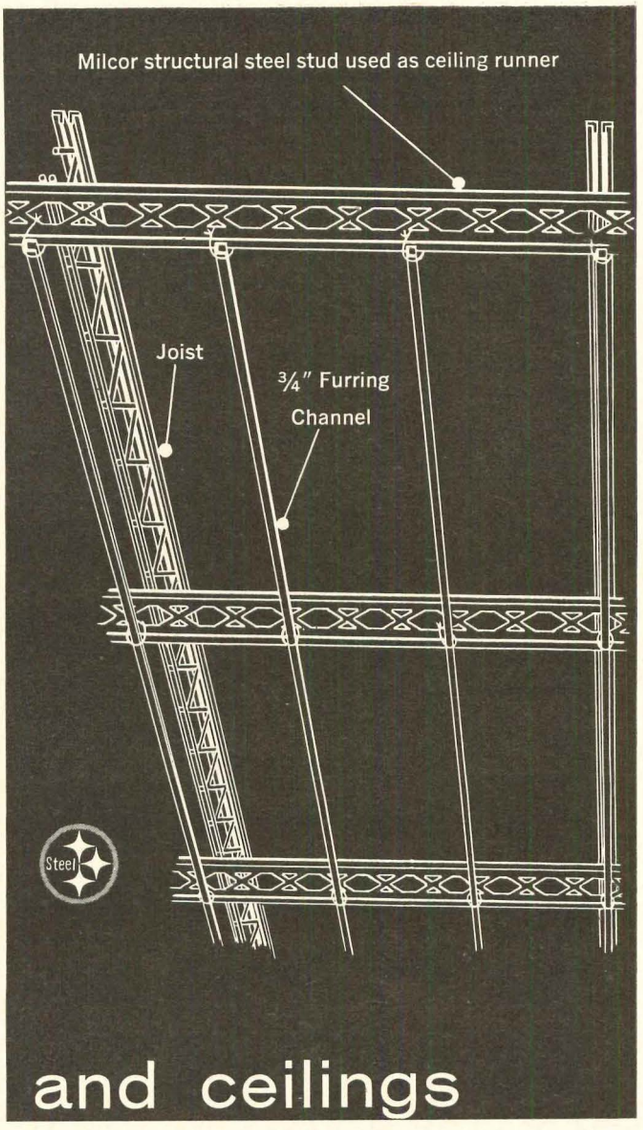
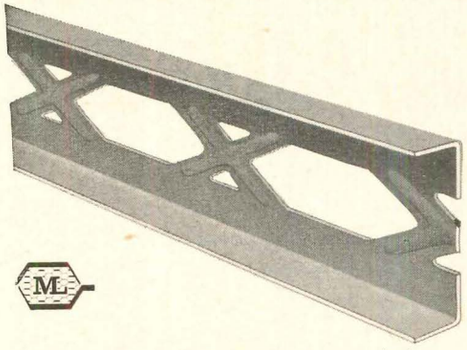
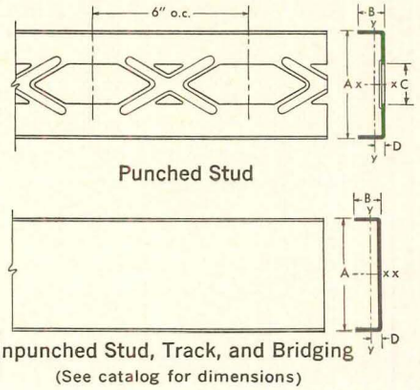


in walls...



and ceilings





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Many load bearing conditions encountered in a structure can be handled effectively and economically by Milcor Structural Steel Studs—no need to specify heavy construction materials. These strong, lightweight, incombustible structural members are easy to work with — leave little, if any, site debris. They provide sound construction, with worthwhile savings on installation time and foundation requirements, when used for: interior and exterior load bearing walls, spandrel and curtain walls, ceiling runners, door buck reinforcement, cloakroom and book shelf headers, etc. Five sizes, in lengths up to 25-ft., offer a wide range of capabilities. Specify Milcor Structural Steel Studs for your next project. For technical data see Sweet's, section 2a/In, or write for catalog 713-2.

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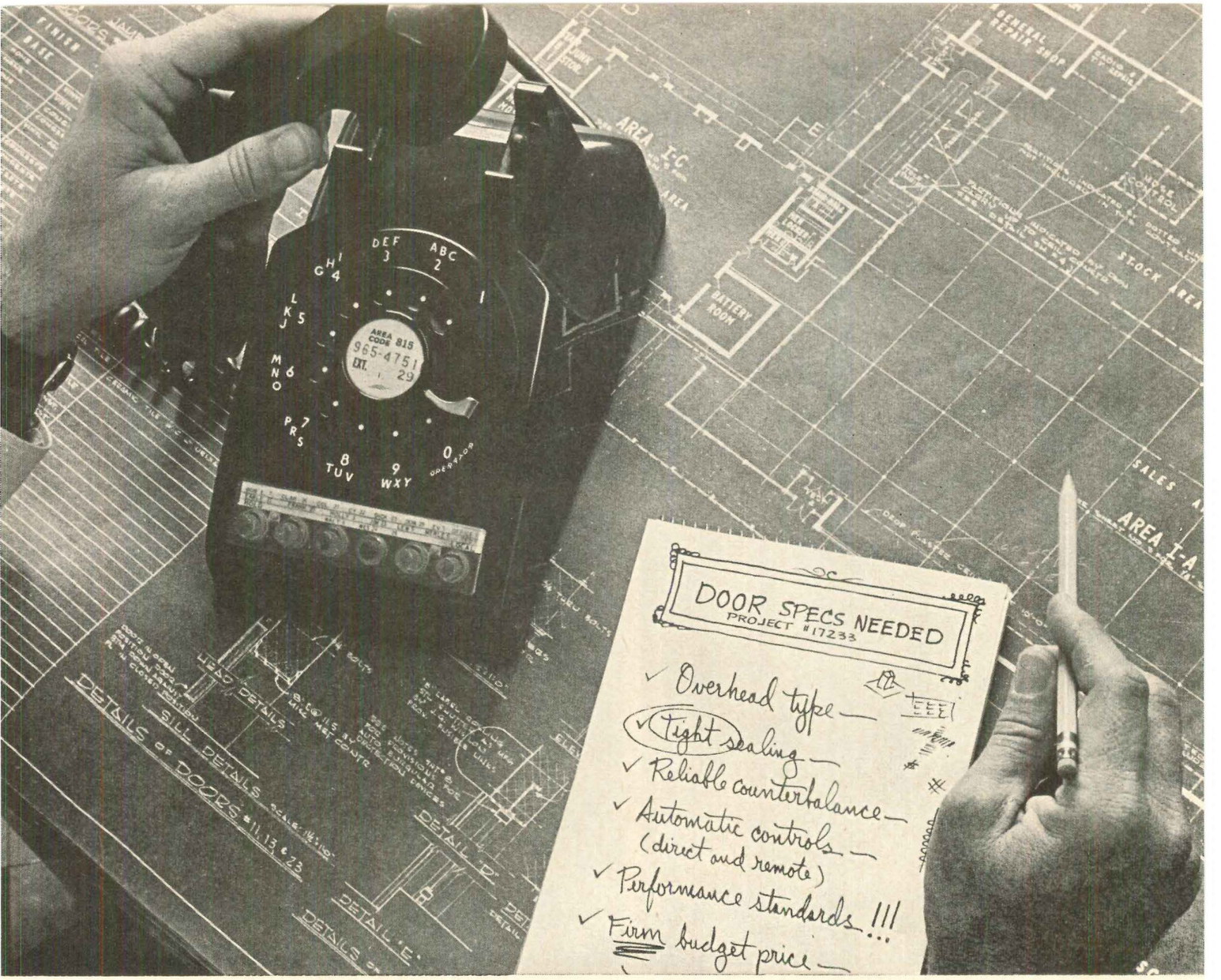

Now's the time to call the man from BARCOL

When it comes to determining the right overhead-type door for the right project, call the man from Barcol . . . he's best qualified to work with you at the preliminary planning stage.

He'll help you anticipate and prevent common door problems . . . identify penalty your client would pay with inadequate, inferior-quality doors . . . justify initial cost of door equipment . . . determine a firm, accurate budget figure . . . AND provide the proof that Barcol saves money for your client.

Barcol Overdoors with exclusive "Cam-Action" and perimeter gasketing are the tightest sealing doors on the market. For added dependability, specify Barcol's springs that are guaranteed for 100,000 cycles or 10 years.

If the buildings you're planning now require efficient materials handling, more accurate temperature control, more convenient door operation, Barcol Overdoors, electric operators and automatic controls assure more efficient performance. Barcol's superiority is fully documented . . . providing you proof of performance that justifies initial cost to clients. We're as near as your phone!

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See Barcol insert, Sweet's Architectural File

BARCOL OVERDOOR COMPANY

SHEFFIELD, ILLINOIS

Subsidiary Barber-Colman Company, Rockford, Illinois

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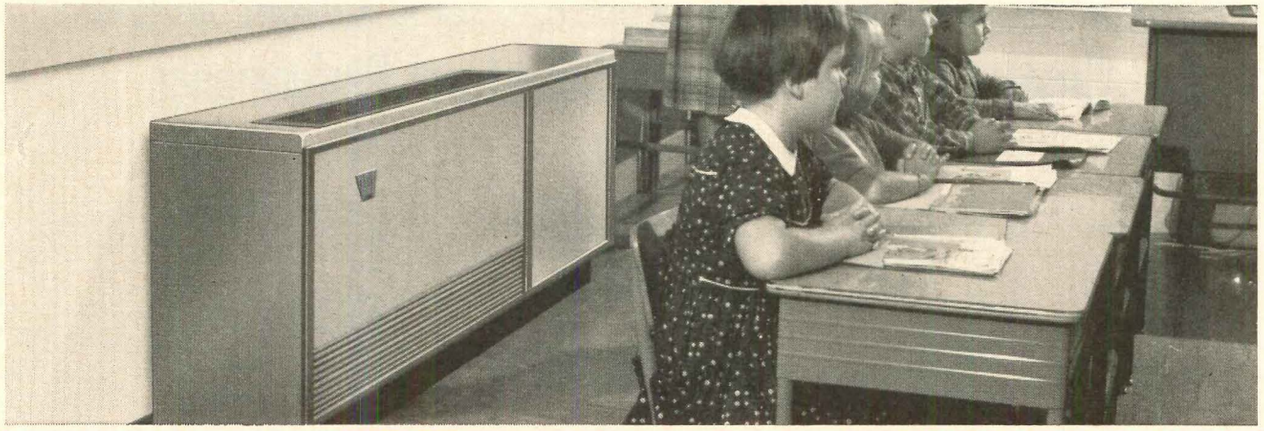
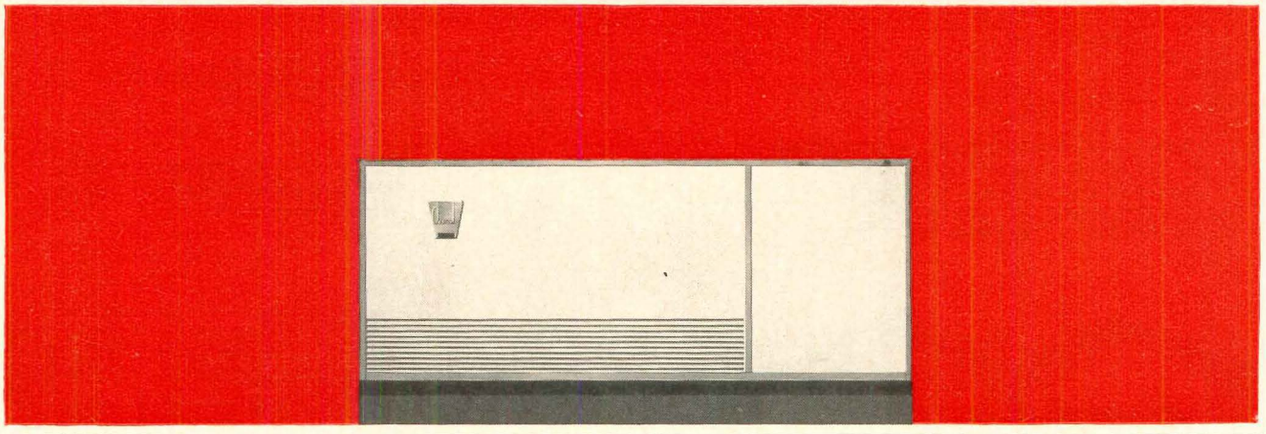
Specify Modulaire® by Chromalox®. . . the year-round electric self-contained air conditioner for customed comfort heating □ cooling □ dehumidifying □ circulating □ filtering and ventilating □ **Cooling capacity:** 18,000 BTU at 95 F. outdoor temperature—air to air operation □ **Heating capacity:** Up to 6,000 watts (20,500 BTU) heating in four control stages. Optional connections available for additional 2000 watts flanking "Draft Barrier" heat. □ **Ventilation capacity:** 0 to 150 CFM. Setting made at factory per order □ **Supply voltage:** 208, 240 or 277 volts, single-phase, 60-cycle □ **Electrical protection:** 2 pole 40 amp circuit breaker (by others) □ **Evaporator fans:** 600 CFM at high speed, 550 CFM at low speed. □ **Evaporator coil:** 3-row staggered ½" O.D. copper tube, corrugated aluminum fins, low 300 FPM face velocity for high humidity removal. Condensate evaporated to outdoors; no plumbing or drain lines needed □ **Dimensions:** Exterior cabinet 54" long, 26" high, 16¼" deep. Wall opening 41" long, 18⅛" high □ **Mounting weight:** Approximately 400 lbs. □ **One Modulaire** for rooms 400—600 sq. ft. in area □ **Two Modulaires** (one Master and one Syncro) in typical classroom with 700—1000 sq. ft. area.





Chromalox Modulaire for new and existing classrooms □ churches □ restaurants □ laboratories □ larger offices □ libraries □ conference rooms □ other commercial and institutional applications.

WC-50A

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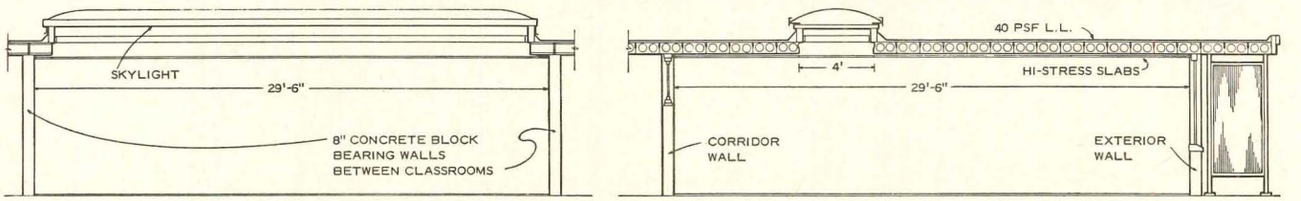
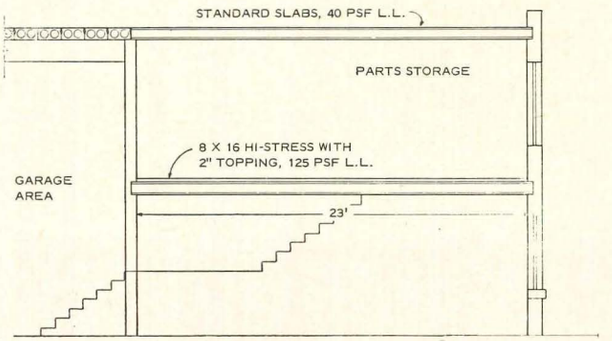
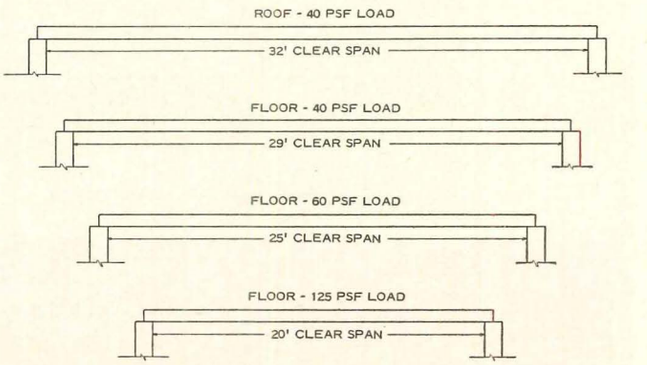


SCHOOL WITH CLASSROOM SKYLIGHTS. Flexicore Hi-Stress slabs with two 7/16" stress-relieved strands clear span the 29'-6" width of the rooms, are designed to carry 40 psf roof load. Four slabs, two on each side of skylight, have three 3/8" strands to carry the extra load of the skylight.

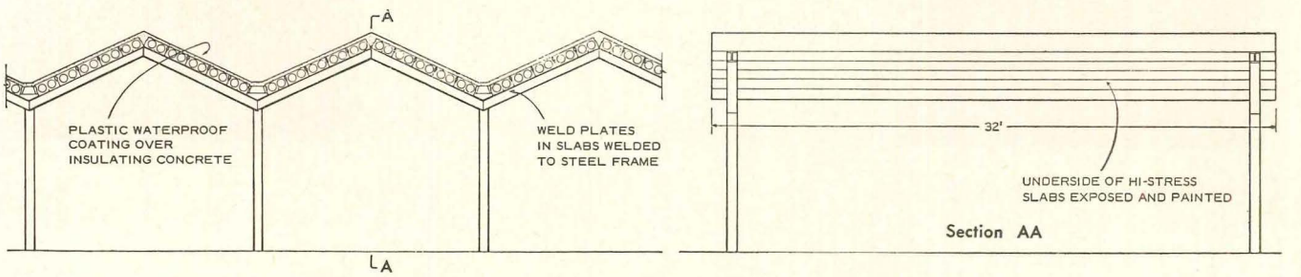
New Hi-Stress Flexicore Slabs Combine Longer Spans, Greater Loads, Improved Structural Performance



PARTS DEPARTMENT FLOOR in garage was designed for 125 psf superimposed load. Two inches of concrete topping on Hi-Stress floor gave a composite design to adequately handle this load on the 23' clear span. Standard Flexicore slabs were used on the roof.

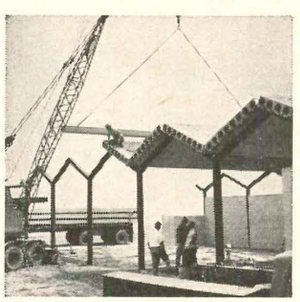


TYPICAL LOAD AND SPAN combinations for 8 x 16 Hi-Stress Flexicore slabs. Superimposed loads shown may be increased with composite design.



ONE-STORY COMMERCIAL BUILDING ROOF DESIGN requires only a steel frame on each side of the building to carry 8-inch Hi-Stress units on long clear span. Design can be repeated in any direction for larger building. Underside of slabs was exposed for neat, maintenance-free ceiling.

Floor or roof slabs erected quickly



New 8" x 16" Hi-Stress units are fully prestressed slabs (f_{si} 175,000 psi) cast in steel forms, with stress-relieved strands tensioned before concrete is poured. Appearance is similar to standard Flexicore slabs which use pretensioned intermediate grade steel bars.

For more information on these projects, ask for Hi-Stress Flexicore Facts 2, 4 & 5. Write The Flexicore Co., Inc., Dayton, Ohio, the Flexicore Manufacturers Assn., 297 S. High St., Columbus 15, Ohio or look under "Flexicore" in the white pages of your telephone book.

flexicore®
PRECAST CONCRETE DECKS

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For more data, circle 209 on Inquiry Card ➔

NEW STRUCTURE HOUSING ELECTRONICS FIRM

Highlights Skylights

COMBINES PERFECT WORKING DAYLIGHT WITH SAFETY

The objective of Granger Associates, Palo Alto, California and their architects to produce a high level of overhead light, as uniform and diffuse as possible at the working level, was effectively achieved by utilizing daylight admitted through skylights of Mississippi Wire Glass. The enterprise includes design, assembly and testing of highly technical electronic equipment and related engineering activities. The installation of 13,000 sq. ft. of translucent Smooth Rough Misco (wire) is responsible for an interior light intensity of 180 foot candles with only 5-10 foot candle variations across the daylighted area. Both the company and the architects are entirely satisfied with the results.

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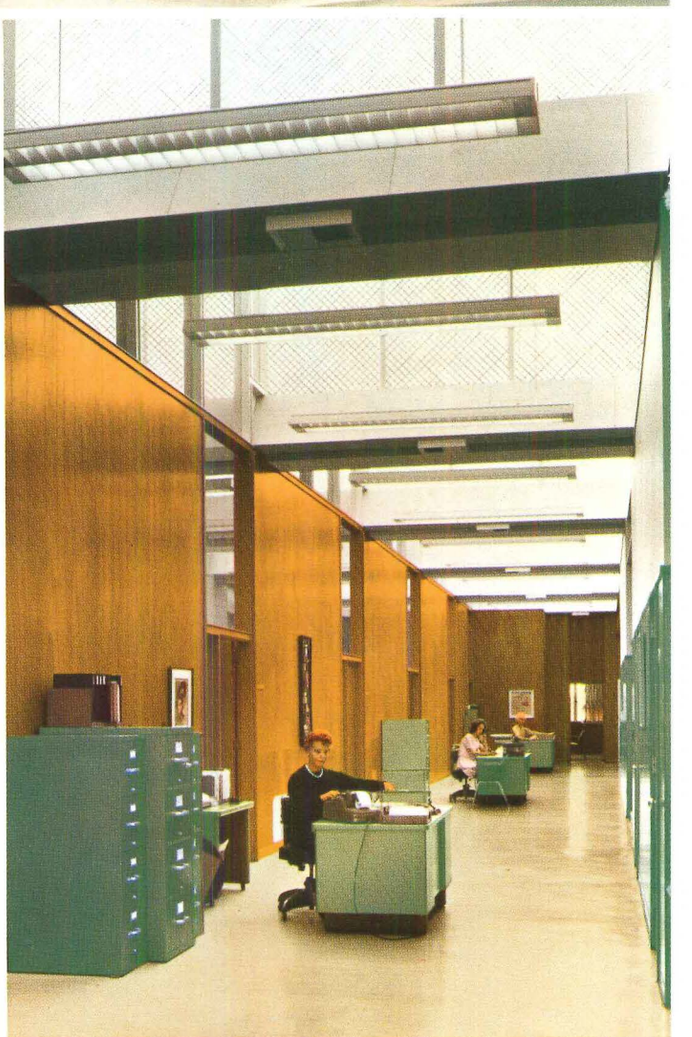

BUILT TO BE BRIGHTER— INSIDE AND OUT

Extensive glazing of translucent light diffusing Smooth Rough Misco floods working areas in this modern environment with great quantities of natural illumination . . . provides shadowless daylight that makes seeing tasks easier and accomplishes a feeling of spaciousness. And MISCO, the diamond-shaped welded wire netting in the pattern, capably performs its function as an approved fire retardant. Specify glass by Mississippi. Available in a wide variety of patterns, wired and unwired, at better distributors of quality glass.

Architect: Clark, Stromquist, Potter & Ehrlich, Palo Alto, California

Contractor: Barrett Construction Company

Glazing: Ful-Trim Division of Texas Aluminum Company

MISSISSIPPI GLASS COMPANY

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Largest Domestic Manufacturer of Rolled, Figured and Wired Glass

NEW CATALOG

Contains pattern descriptions, light distribution charts, transmission data. Send for your free copy today.

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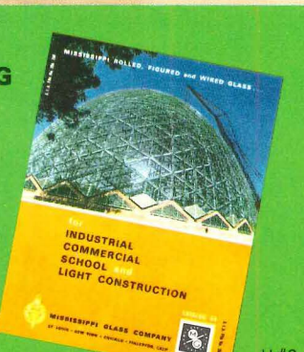
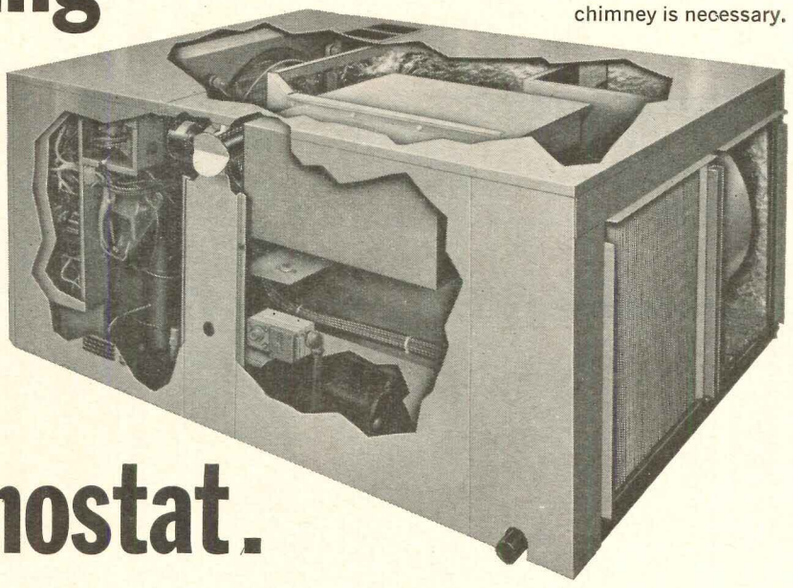


H #2-64

New!
Climatrol® roof top heating-cooling unit.
Deliver it.
Connect it.
Set the thermostat.
Flip the switch.
And forget it (no call backs)*.

New low profile (less than 2 feet). And look! Thanks to new power vent—no chimney is necessary.



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Fill out the coupon and slip it in the mails.

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Please send me complete descriptive literature on the new 760 Climatrol Roof top unit.. I am interested in the (check one or more).

_____3-ton unit _____5-ton unit

_____higher. (Up to 15 tons)

NAME_____

COMPANY_____

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WORTHINGTON/*CLIMATROL*
AIR CONDITIONING

*The new 760 Climatrol units are as trouble-free as any combination heating/cooling unit can be. They require only minimum maintenance attention. They are engineered, designed and manufactured to conform to Climatrol standards—the industry quality criteria for more than 100 years! Contact us for any heating or air conditioning need . . . from package units to engineered systems.

For more data, circle 210 on Inquiry Card

Citations for Product Data Are Announced

Awards for outstanding building products literature directed to architects have been announced in the 1964 Building Products Literature Competition, sponsored by The American Institute of Architects and the Producers Council, Inc.

This 13th annual competition drew 289 entries and was judged by a five-man jury composed of R. Lloyd Snedaker, A.I.A., D. Kenneth Sargent, F.A.I.A., C. Herbert Cowell, A.I.A., LaVern J. Nelsen, A.I.A., and Tom A. Windrom, A.I.A.

A special classification for maintenance literature, Class III, was added to this year's competition and emphasis was given to literature giving recommended uses of the products and limitations of their use.

The judges commented on the high quality of the technical manuals entered in Classes I and II, indicating that manufacturers have greatly improved their presentations of technical material to the architect. The jury felt there was a need of more maintenance literature, Class III, and that it would be of most value in standard 8½ by 11 size, with perforations for binding and the A.I.A. File Number appearing on the cover. Some concern was expressed over the promotional material, Class IV: visual presentations are fine, but specification information on new products is equally important. In Class V, Space Advertising, the jury felt there was improvement, noting ads which were uncluttered and to the point.

Following is a complete listing of the award-winning firms and literature:

Class I: Building product literature concerned primarily with basic technical information relating to a class or type of product where the emphasis is upon the product rather than on the merits of a particular make, and the literature is distributed generally to the architectural profession by associations of producers.

Exceptional Merit:

SOLUTIONS TO NOISE CONTROL PROBLEMS. *Owens-Corning Fiberglas Corporation, The Communications Corporation.*

Certificate of Merit:

PERFORMANCE DATA OF ARCHITECTURAL ACOUSTICAL MATERIALS. *Acoustical Materials Association.*

TECHNICAL NOTES ON BRICK AND TILE CONSTRUCTION. *Structural Clay Products Institute.*

Honorable Mention:

QUALITY STANDARDS OF THE ARCHITECTURAL WOODWORK INDUSTRY. *Architectural Woodwork Institute.*

METAL CURTAIN WALL DESIGN PRINCIPLES. *National Association of Architectural Metal Manufacturers.*

CONCRETE PIPE HANDBOOK. *American Concrete Pipe Association.*

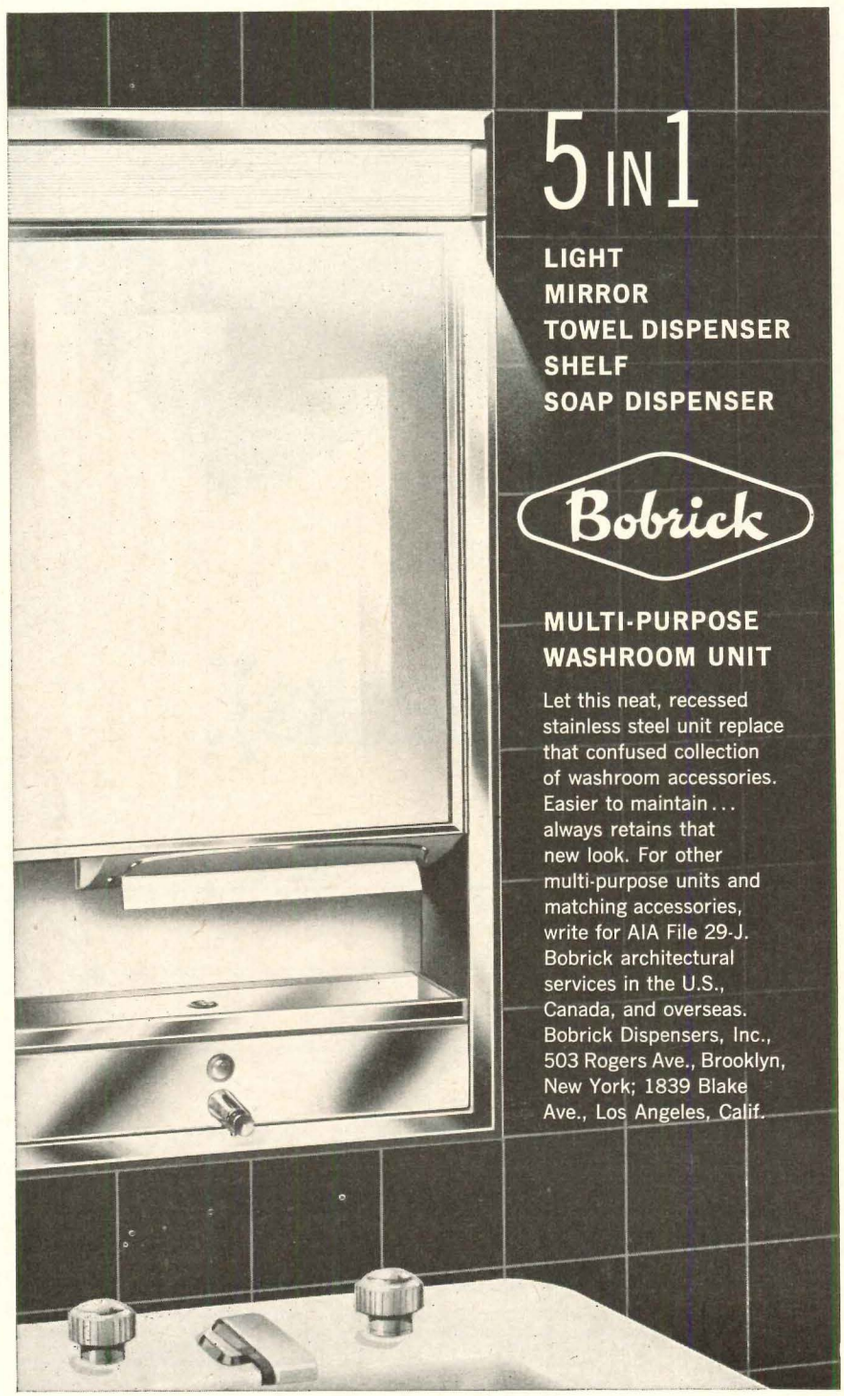
BRICK AND TILE ENGINEERING. *Structural Clay Products Institute.*

PANELYTE TECHNICAL DATA. *St. Regis Paper Company. Agency: Lavery and Topp, Inc.*

ARCHITECTS' REDWOOD FILE. *California Redwood Association.*

Class II: Literature offering technical information concerning the building products or equipment of a sin-

continued on page 396



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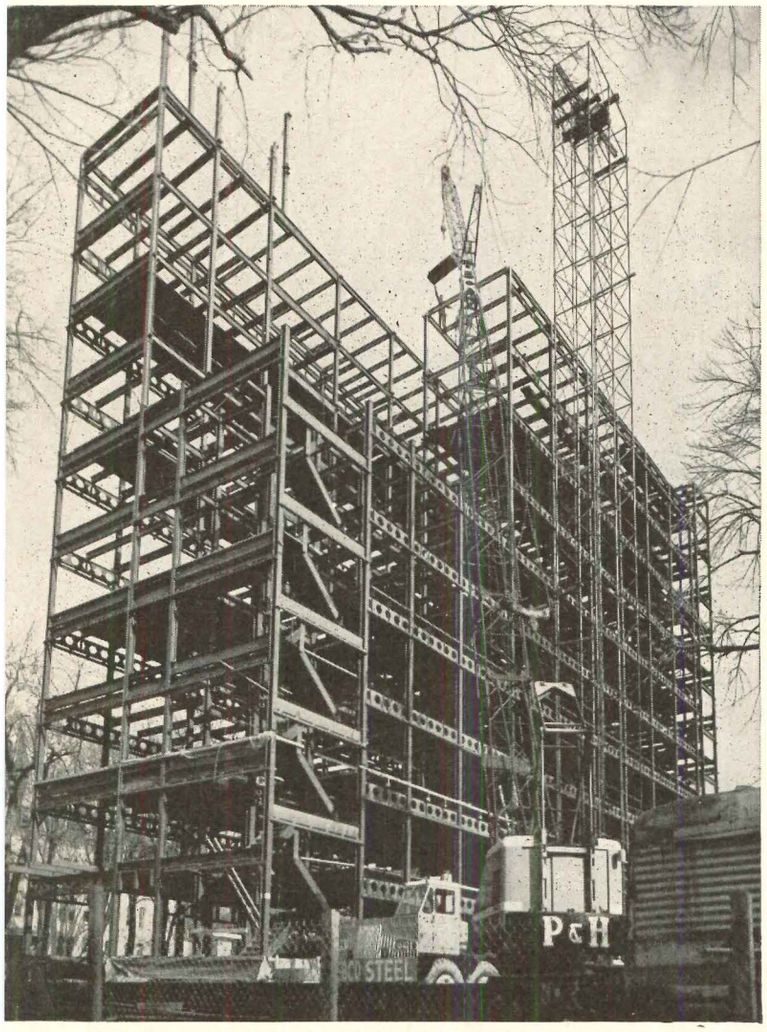
Steel framing chosen for all six new buildings at D'Youville College

Architects: Foit & Baschnagel, Buffalo



Castellated beams are Bethlehem 16-in. wide-flange "expanded" to 21 in. to save weight and provide additional strength for wind bracing. Bethlehem supplied 183 tons of H-piles, as well as 600 tons of structurals. General Contractor: J. Migliore Construction Co., Buffalo. Steel Fabricator and Erector: Rebco Steel Corp., Niagara Falls, N. Y.

81,189 sq ft residence hall houses 265 students, mostly in two-student rooms. Exterior is buff-colored brick, with piers of grey stacked Norman brick. Continuous strip windows of the corner study lounges provide a panoramic view of parks, the Buffalo harbor, and the Peace Bridge. Basement contains student laundry, recreation room, and canteen.

D'Youville College's 10-story residence hall, to be occupied in September, is the first of six new buildings in a $10 million expansion program which will permit an increase in the student body from 850 to 1,500. All six buildings for this private Buffalo college will be steel framed.

Erection of the 600-ton structural steel framework of the $1,762,000 residence hall was completed in 24 working days by the structural steel fabricator.

How construction was speeded, costs kept low

- Use of seven-story column sections of A441 high-strength steel without splices, which permitted erection in one piece.
- Three-story bents—four story at penthouses—18 feet wide were pre-assembled and erected as a unit.
- Castellated beams were used in outside 156-ft-wide north and south walls, at a saving of 22 tons of steel.
- Steel deck and concrete fill were placed immediately to eliminate the cost of temporary planking.

New steels and new design criteria make steel framing more economical than ever before. Composite, continuous, and plastic design, as well as new products such as Bethlehem's low-cost, high-strength V Steels offer other ways to save. Remember, you may call on us or your steel fabricator for technical assistance. Bethlehem Steel Company, Bethlehem, Pa. *Export Sales:* Bethlehem Steel Export Corporation.

Steel for Strength

BETHLEHEM STEEL

BETHLEHEM STEEL

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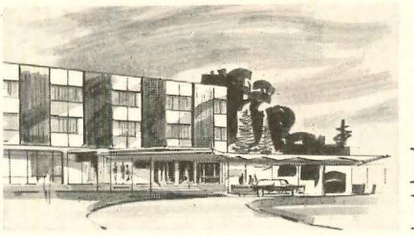
The place:



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The man:

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For the Dining Room, 1300 square yards of specially designed Wilton Carpet. 1250 square yards of closely woven Margate for the Lobby. Kutsher's is 100% Bigelow-carpeted, with 2000 square yards of our special Velvet Tweeds in guest rooms and corridors.

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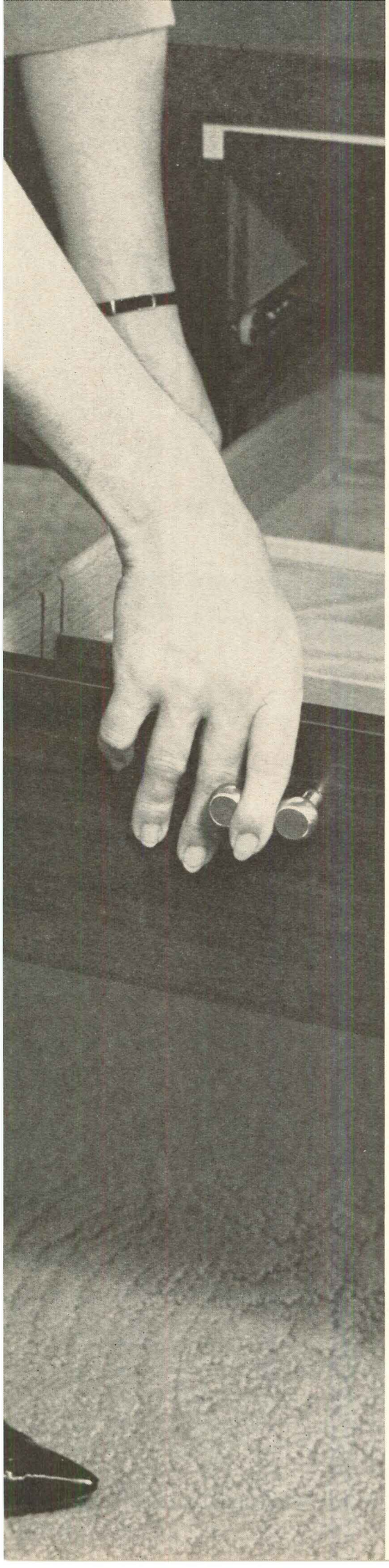

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Now — even secretaries can rearrange desk drawers instantly and without tools! Take the deep file drawer for instance: It can be moved to any one of four positions in a Leopold Template desk . . . bottom left, top left, bottom right, top right . . . whichever is most convenient for personal working requirements. This is possible because Leopold's modern woodworking production techniques allow such close working tolerances that each drawer is precisely dimensioned. See for yourself. Visit your Leopold dealer. Ask him to rearrange the drawers in a Template desk. Then, do it yourself! That's right — in your Leopold dealer's showroom, *you* rearrange the desk drawers to suit your own working desires. Then, sit at *your* Leopold desk. See how the expert application of a special oil brings out the beauty of the grain pattern . . . Sense the warmth of the fine American walnut wood. And best of all, Leopold's 88 years of experience makes it possible for every office to have the dignity and beauty of wood, the function and flexibility you need . . . at a price to fit your budget. Look up your Leopold dealer now. He is eager to show you the Template desk shown below. If you prefer a conventional or a traditional style, Leopold builds the finest. Ask to see them too . . . or write for specific literature.

THE LEOPOLD COMPANY

914 Osborn Street • Burlington, Iowa • Since 1876

NEW YORK SHOWROOM: 25 West 43rd Street, Suite 320

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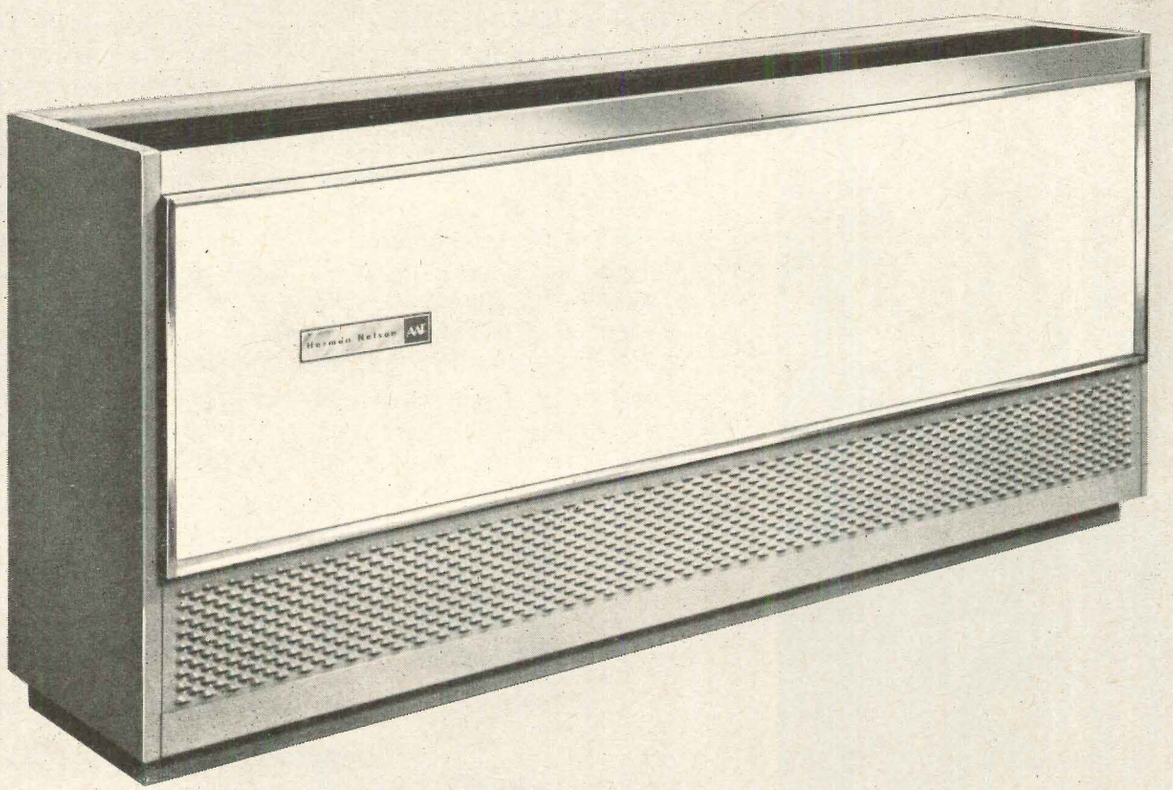


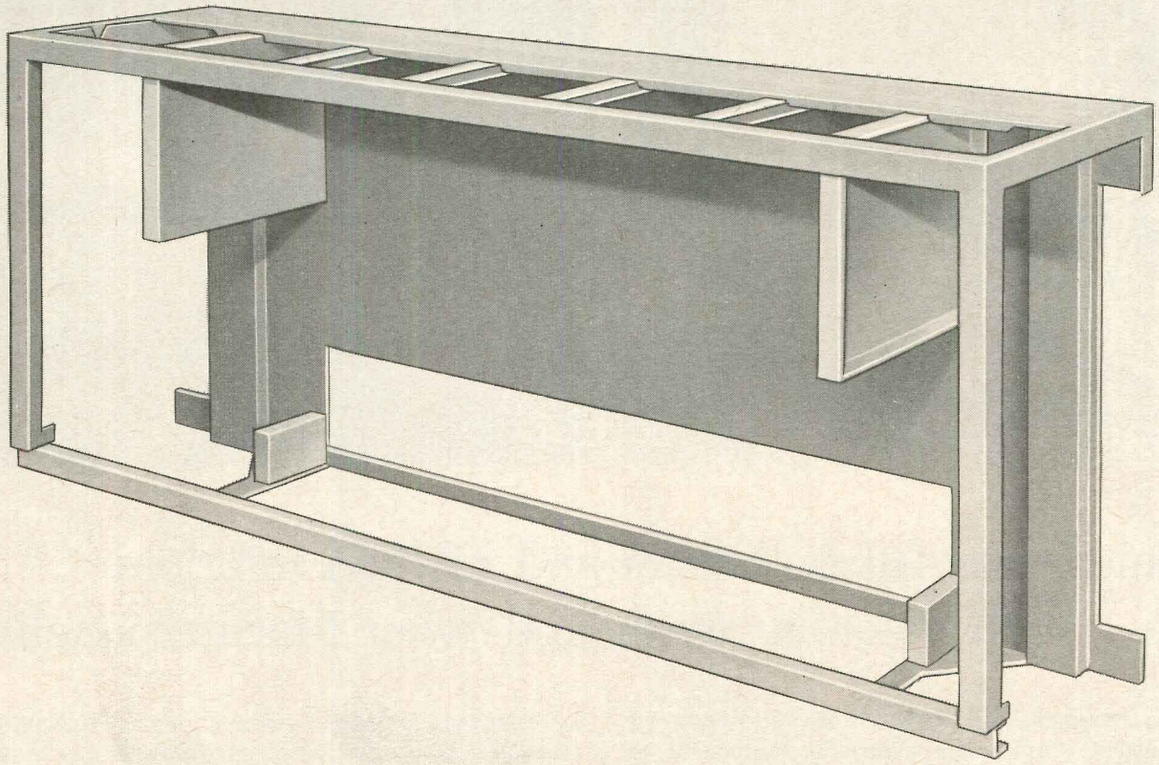
THE FRAME on Herman Nelson's classroom unit ventilator is one piece, all-welded construction —no screws or bolts. It puts the strength where it belongs—*on the inside!*

It's also immersed in primer for protection against corrosion and rusting.

It's just one of the many reasons why we can afford to offer a full five-year written warranty that covers both parts and labor.

The bricks and mortar in your new school are *real.* The unit ventilator equipment is *real. The money that pays for it all is real.* Vague assurances from local sources simply won't back up all this reality; a real, nationally published warranty will.

...for one thing, they all don't have this one-piece frame.

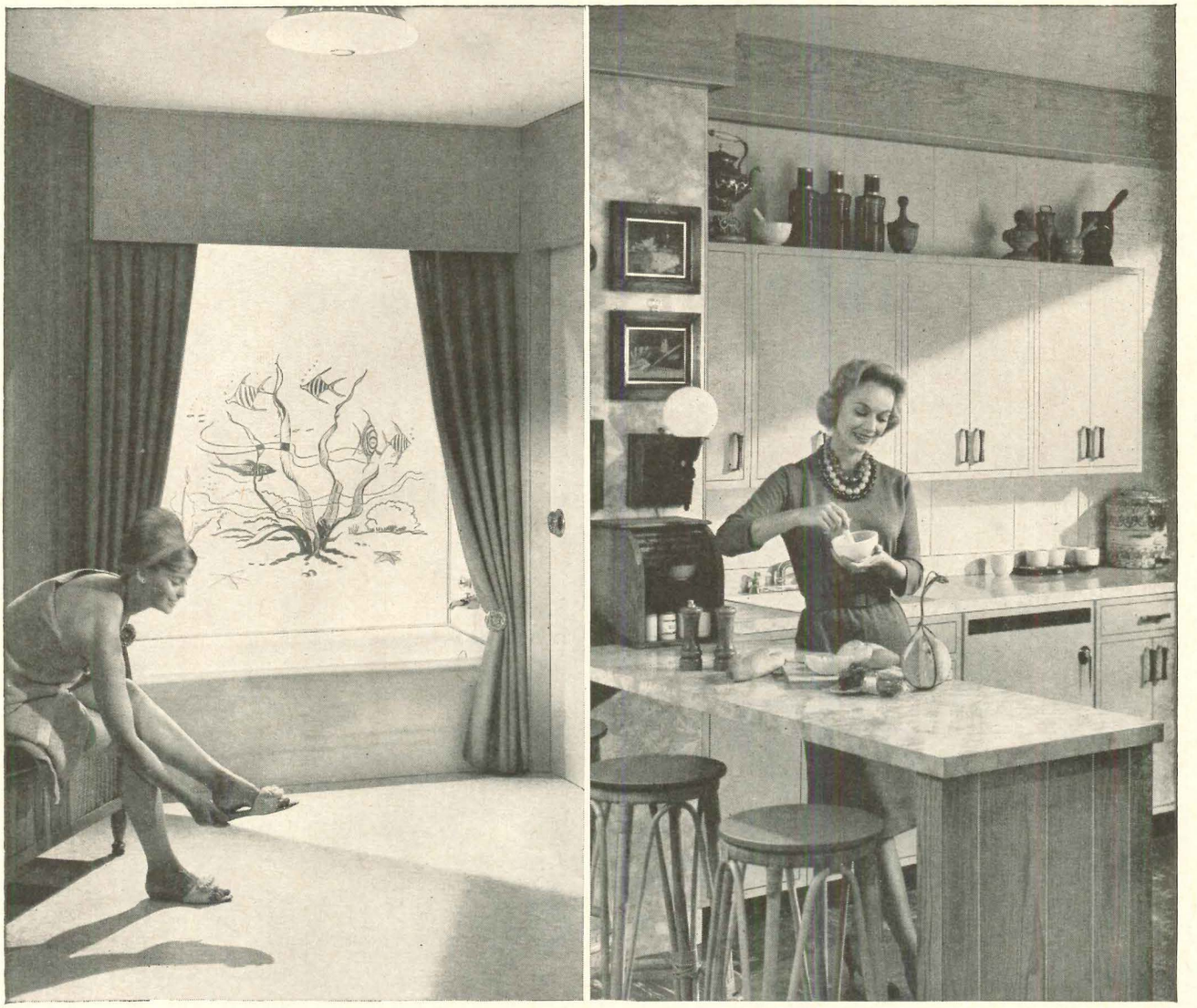


Read the Herman Nelson warranty.

Write for a copy of the Herman Nelson warranty (clearly marked "specimen only"). Compare its clear, simple provisions with all the verbal "promises" you've ever heard. Address: School Products Department, American Air Filter Company, Inc., 215 Central Avenue, Louisville, Kentucky.

Herman Nelson AAF
SCHOOL PRODUCTS DEPARTMENT

For more data, circle 215 on Inquiry Card



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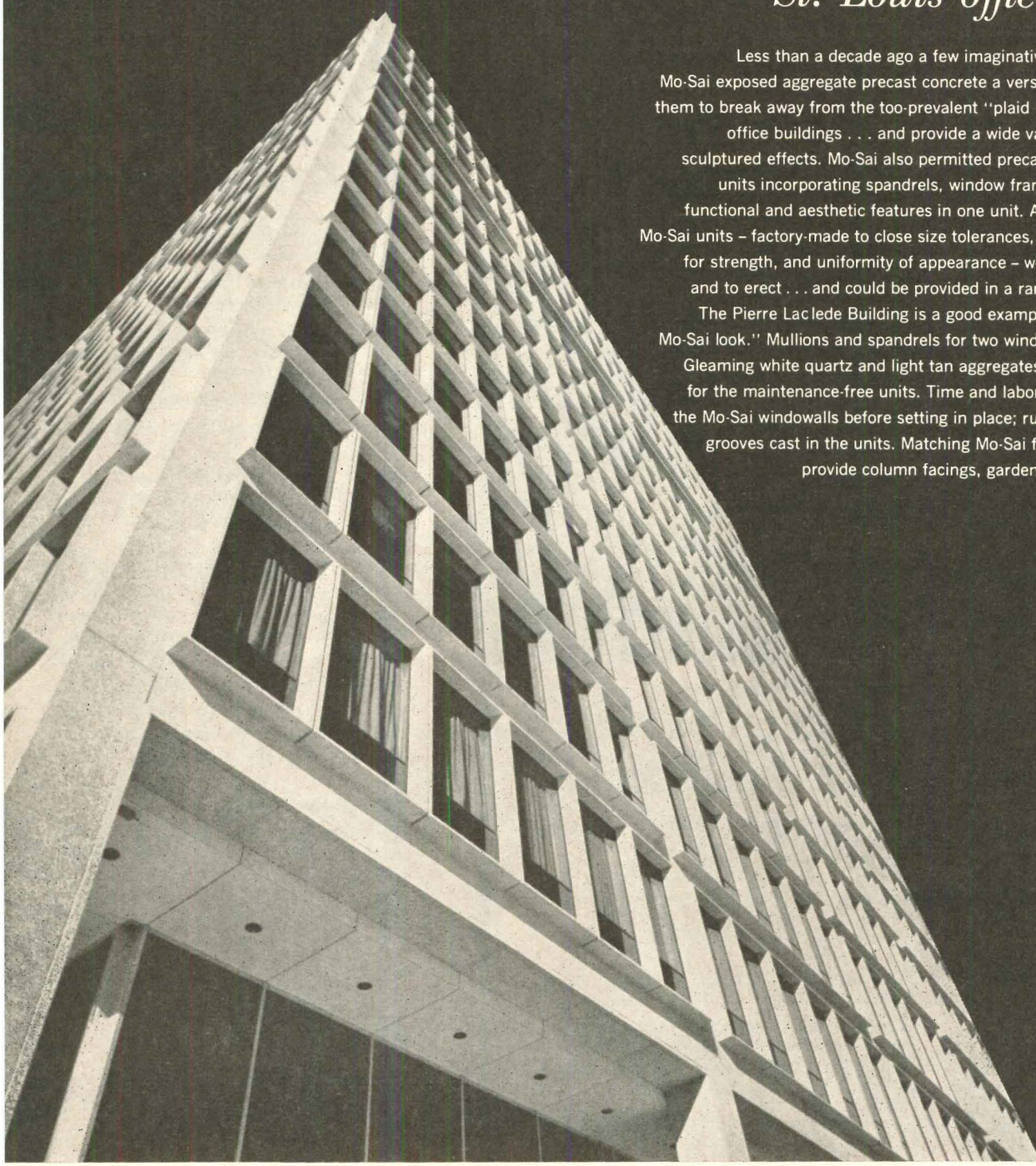
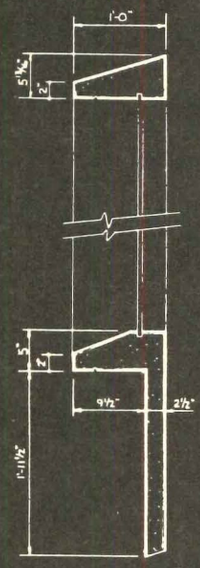
The "sculptured look" of genuine Mo-Sai® windowalls for St. Louis office building



Less than a decade ago a few imaginative architects recognized in Mo-Sai exposed aggregate precast concrete a versatile medium that enabled them to break away from the too-prevalent "plaid look" of post-war high-rise office buildings . . . and provide a wide variety of three-dimensional sculptured effects. Mo-Sai also permitted precasting of large combination units incorporating spandrels, window frames, sunshades, and other functional and aesthetic features in one unit. At the same time, the large Mo-Sai units – factory-made to close size tolerances, high quality specifications for strength, and uniformity of appearance – were economical to produce and to erect . . . and could be provided in a range of colors and textures. The Pierre Laclede Building is a good example of this bold "sculptured Mo-Sai look." Mullions and spandrels for two windows were cast in one unit. Gleaming white quartz and light tan aggregates provide color and texture for the maintenance-free units. Time and labor were saved by preglazing the Mo-Sai windowalls before setting in place; rubber gaskets hold glass in grooves cast in the units. Matching Mo-Sai facing and decorative units provide column facings, garden retaining walls, and urns.

Mo-Sai Windowall Section



Rubber Gaskets and Glazing Done at Job Site Before Erection of Precast Units

Pierre Laclede Building, St. Louis, Missouri / Architects and Planners: Smith and Entzeroth, Inc. / General Contractor: Fruin-Colnon Contracting Co. / Project Developer: G. J. Nooney and Co.

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P.O. Box 80, St. Boniface,
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TEXAS INDUSTRIES, INC.
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THE RACKLE COMPANY OF TEXAS
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WAILES PRECAST CONCRETE CORP.
11240 Peoria Street, Sun Valley
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WILSON CONCRETE CO.
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P.O. Box 208, South Omaha, Neb.

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Products Literature Awards

continued from page 388

gle manufacturer. This information should include physical properties, test data, installation instructions, specifications and details, recommended uses, methods of application, maintenance and limitations of use.

Exceptional Merit:

ARMSTRONG TECHNICAL DATA (SOFTBOUND EDITION). *Armstrong Cork Company.*

Certificate of Merit:

UNITRON COMMERCIAL CARRIERS & REZITRON RESIDENTIAL CARRIERS. *Josam Manufacturing Company. Agency: Allied Advertising Agency, Inc.*

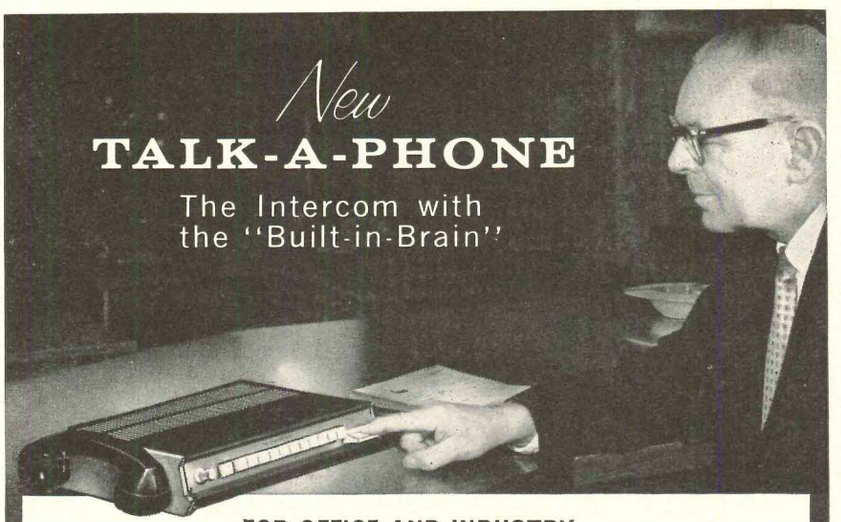
UNIT—1964 MANUAL OF DESIGN. *Koppers Company, Inc., Forest Products Division.*

BUILDING DESIGN DATA USS. *United States Steel.*

ARCHITECTURAL SPECIFICATION MANUAL. *Pratt & Lambert, Inc.*

ARMSTRONG TECHNICAL DATA (DELUXE HARDBOUND EDITION). *Armstrong Cork Company, Floor Divison.*

GRANCO A-E FLOOR. *Granco Steel Products Company.*



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MARCO CAST ALUMINUM LIGHTING CATALOG. *Marco Cast Aluminum-Devine Lighting. Agency: Studio Seven.*

Honorable Mention:

CATALOG NUMBER 9. *Julius Blum & Company. Agency: Seery & Company.*

KAWNEER/RAILCRAFT ALUMINUM RAILING SYSTEMS. *Kawneer Company.*

KAWNEER ALUMINUM SEALAIR WINDOWS. *Kawneer Company.*

STYROFOAM PERMANENT INSULATION FOR BUILDINGS. *Dow Chemical Company.*

ACOUSTI-CELOTEX ARCHITECTURAL DATA MANUAL. *The Celotex Corporation.*

SANYMETAL PRODUCTS LITERATURE CATALOG. *Sanymetal Products Company, Inc. Agency: Belden & Frenz & Lehman.*

USS STAINLESS STEEL ARCHITECTURAL DESIGN DETAILS. *United States Steel.*

FLUID ROOFING SYSTEMS OF NEOPRENE AND HYPALON. *Elastomer Chemicals Department, E. I. DuPont de Nemours & Co., Inc.*

WELDWOOD DOORS. *United States Plywood.*

INLAND FLOOR SYSTEMS. *Inland Steel Products Company.*

BENEKE SEATS. *Beneke Corporation. Agency: Christopher Advertising Counsel.*

PLEXIGLAS. *Rohm & Haas Company.*

Class III: Literature offering information concerning the maintenance and care of building products and equipment. This information would be directed to architects for use by building owners and managers and other individuals with the responsibility of maintaining a structure after it has been completed.

Exceptional Merit:

TECHNICAL NOTE 20—CLEANING CLAY PRODUCTS MASONRY. *Structural Clay Products Institute.*

ROMANY-SPARTAN DIRECTIONS FOR STAIN REMOVAL FROM CERAMIC TILE. *United States Ceramic Tile Company.*

Certificate of Merit:

A GUIDE TO THE ARMSTRONG FLOOR MAINTENANCE SYSTEM. *Armstrong Cork Company, Floor Division.*

STAINLESS STEEL FOR ARCHITECTURE, ITS CARE AND CLEANING. *Armco Division, Armco Steel Corporation.*

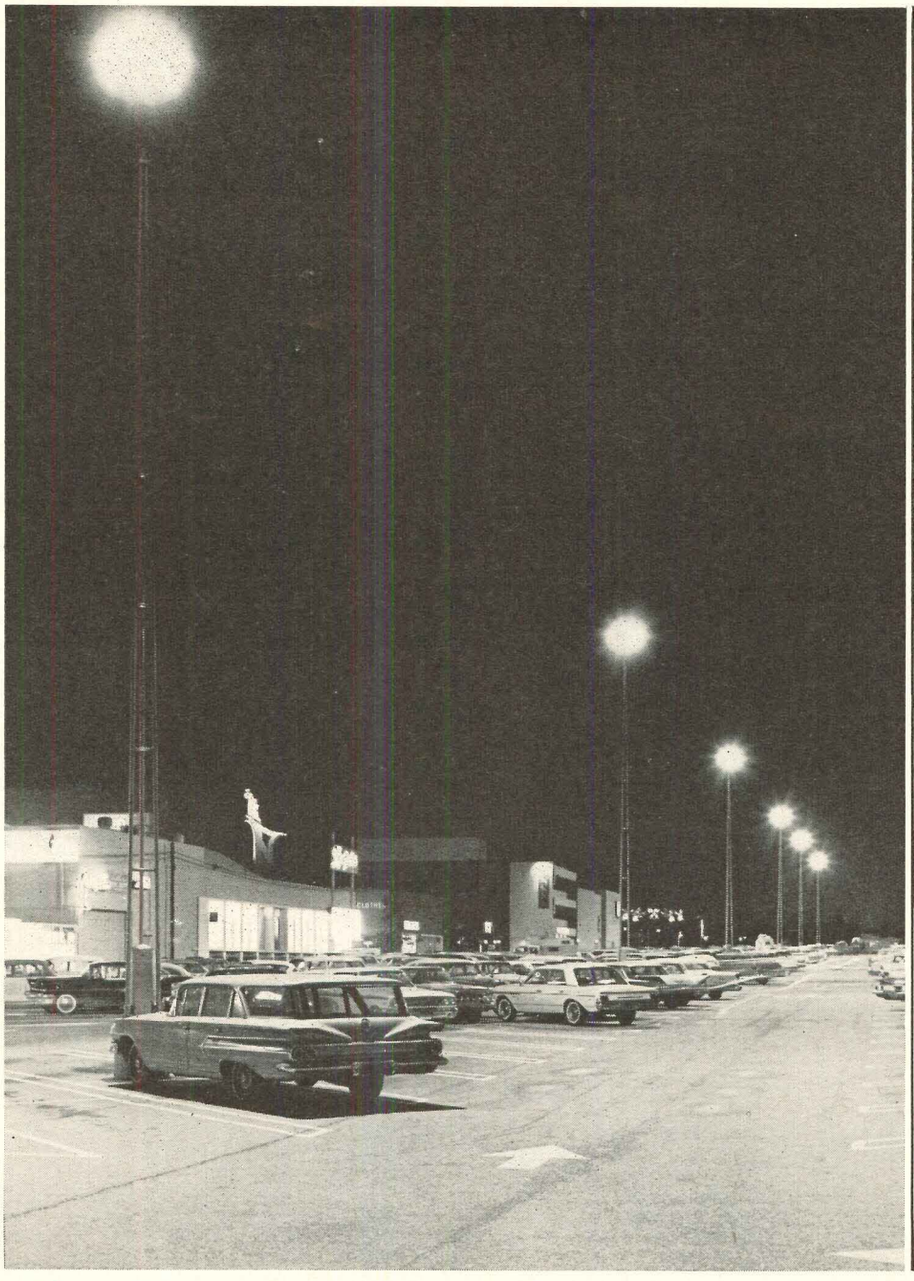
CARE, ADJUSTMENT AND MAINTENANCE BOOK. *Russell & Erwin Division, The American Hardware Corporation.*

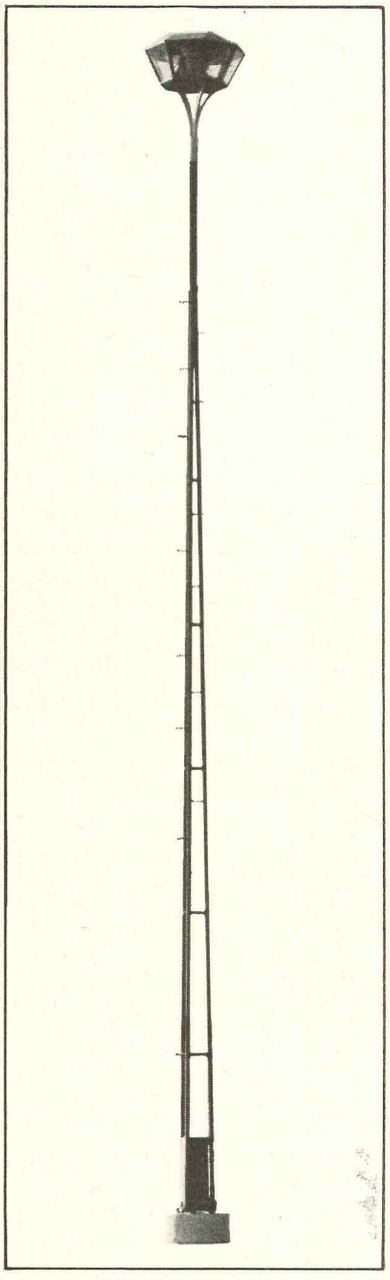
Honorable Mention:

FINISHING DOUGLAS FIR & OTHER SOFTWOOD PLYWOODS. *American Plywood Association.*

CARE, CLEANING & MAINTENANCE OF ARCHITECTURAL ALUMINUM. *Kaiser Aluminum & Chemical Corporation. Agency: Young & Rubicam, Inc.*

continued on page 406





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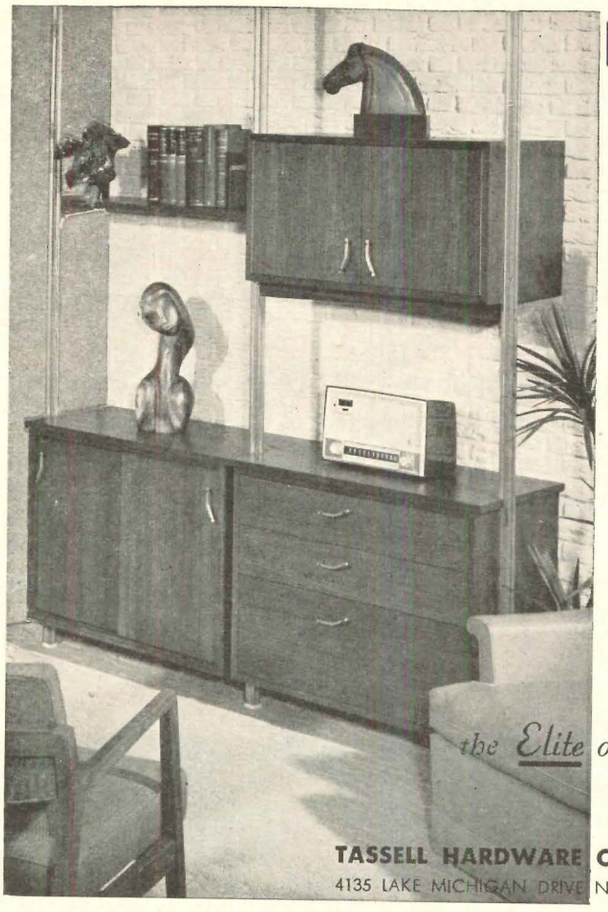

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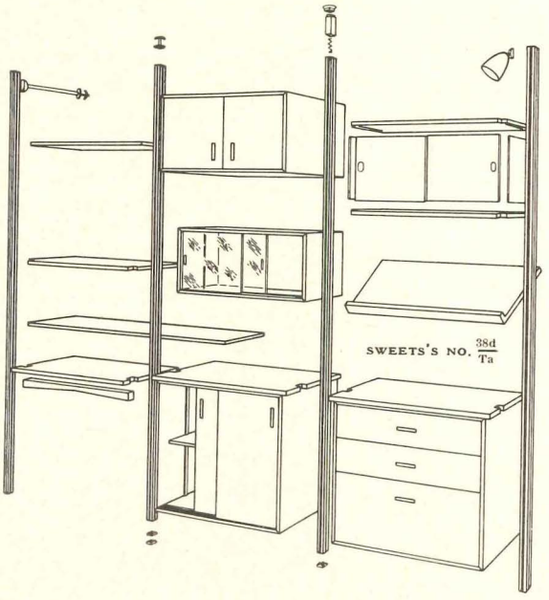

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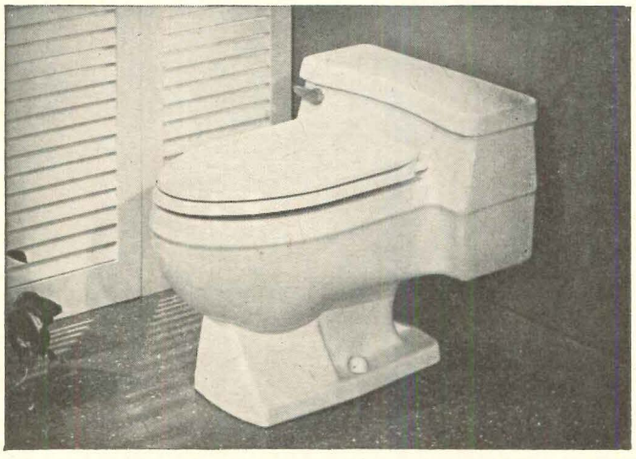

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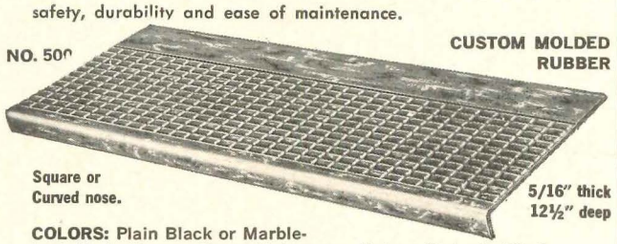

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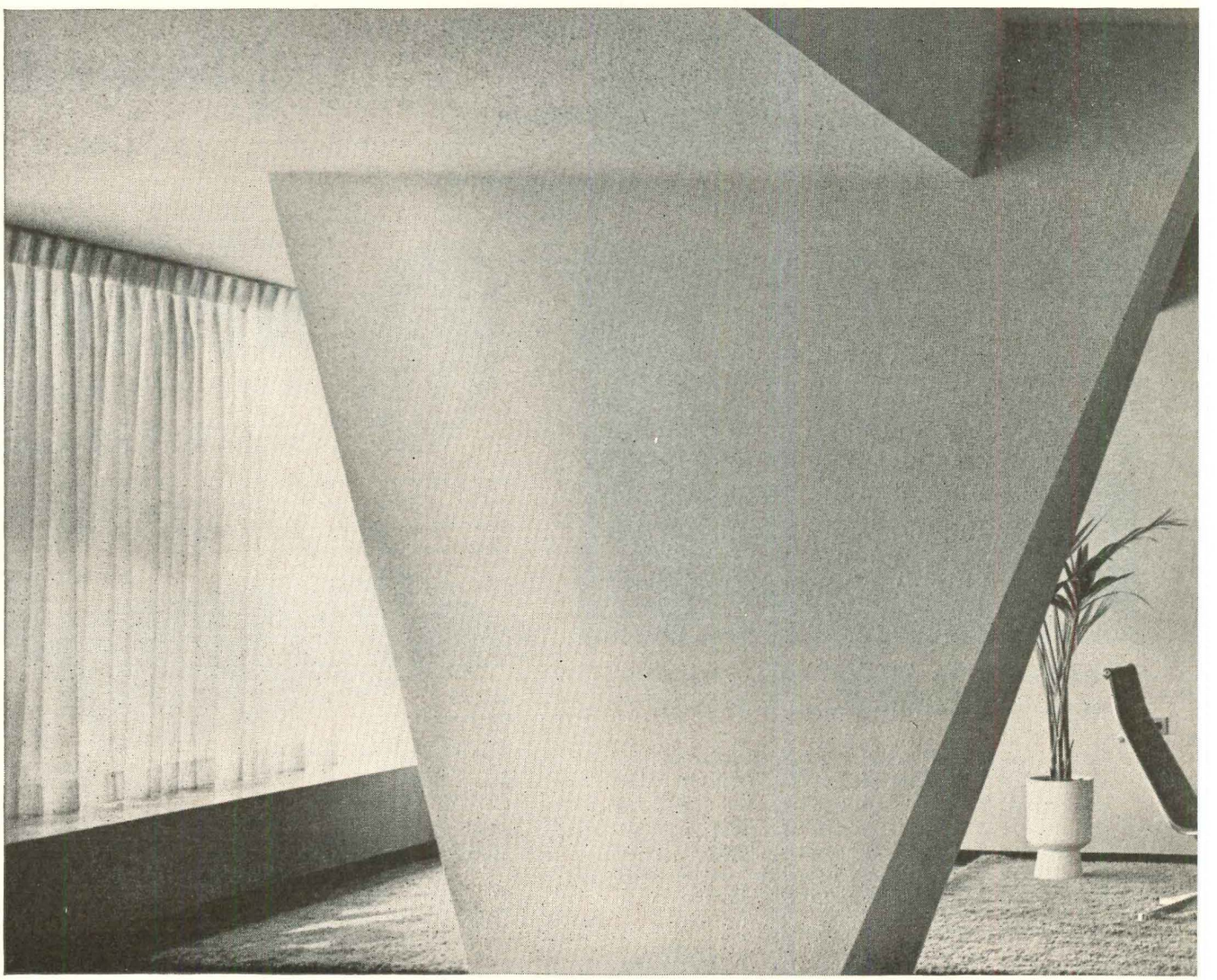
When something new happens in building...

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.



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6-63

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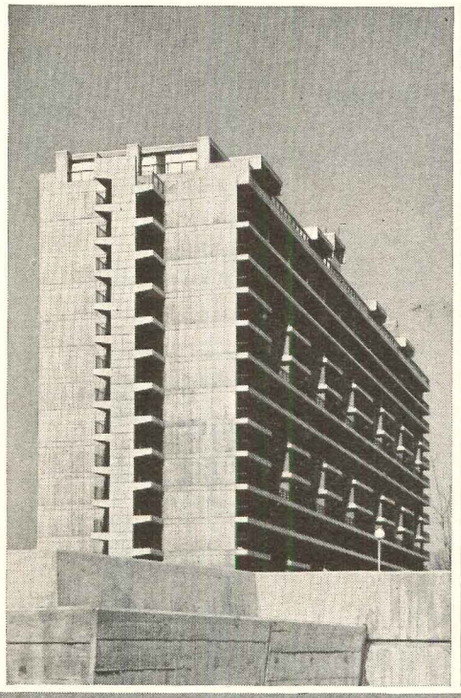
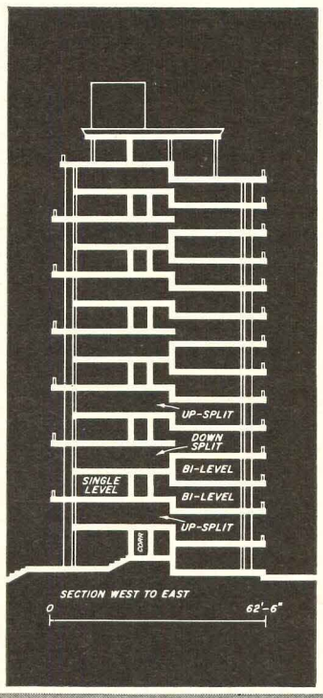
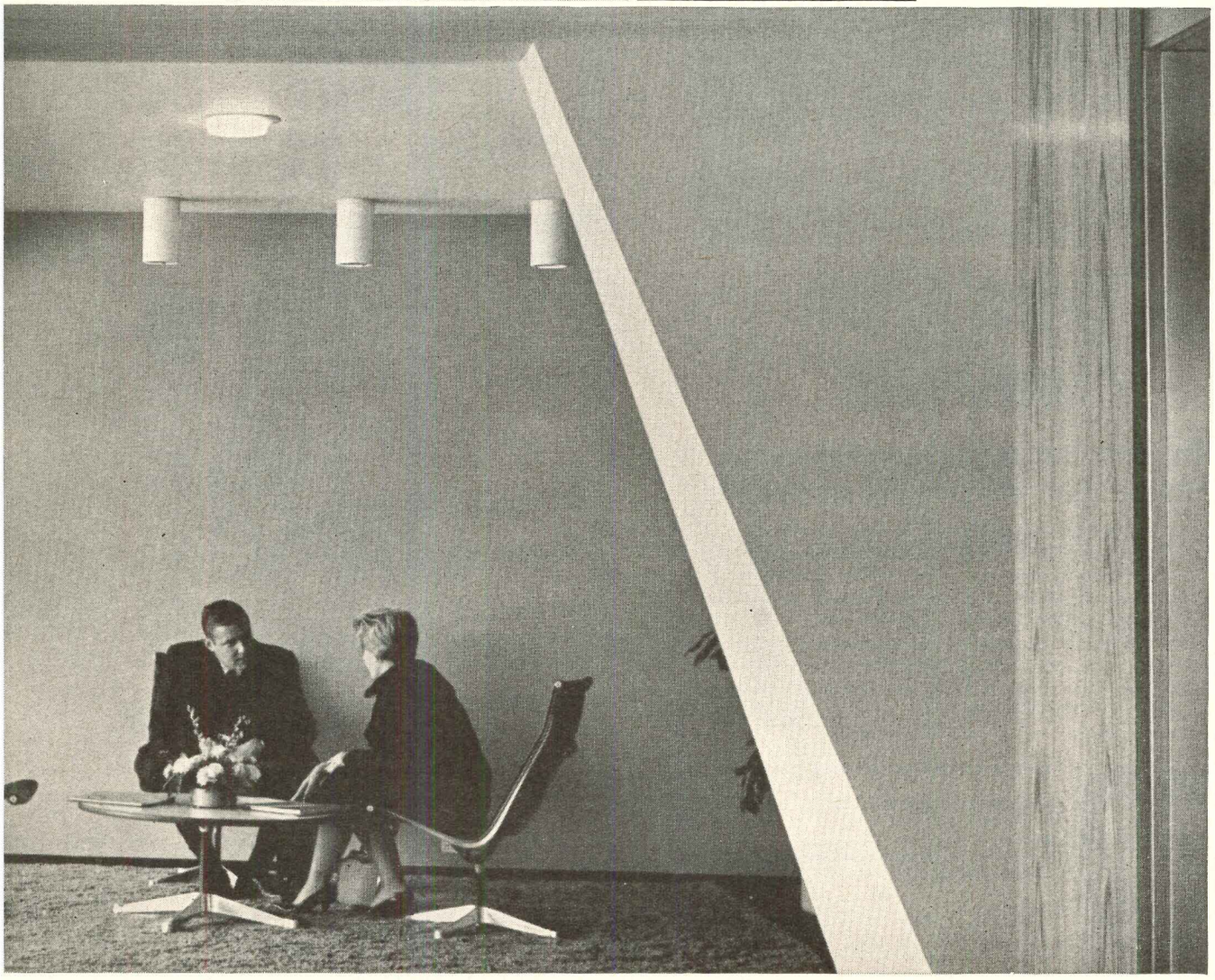


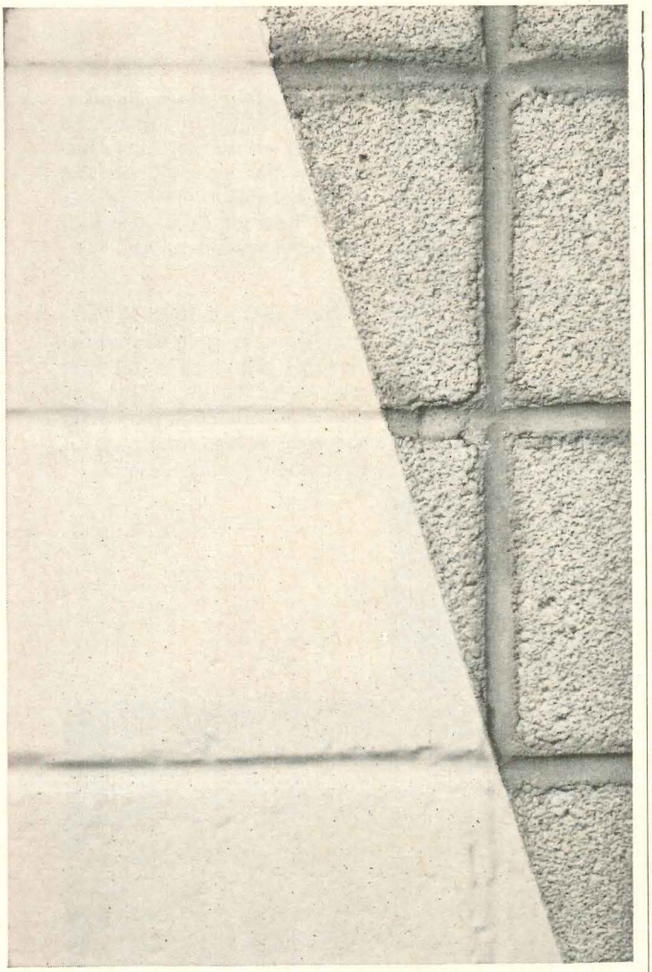


In the Horizon House, all apartments run the width of the building with living areas overlooking the Hudson River. The transverse section drawing shows the unique split-level design of the individual apartments.

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



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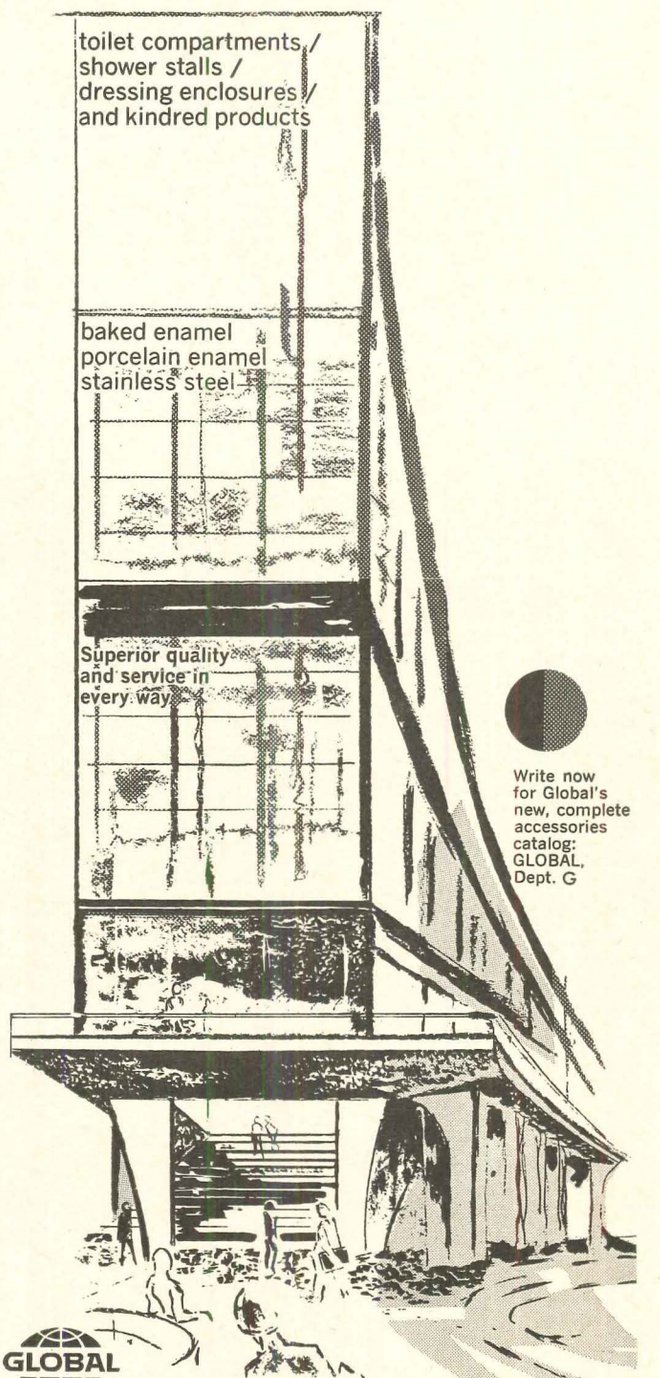

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THERM-O-PROOF insulating glass is available in over 200 colors, types, patterns and in most sizes, shapes and materials. It's made more ways to fit more ideas.

The next time you want insulating glass, turn to our Catalog 7a/Th in Sweet's Architectural File and consider THERM-O-PROOF for your specifications. Every unit carries the new THERM-O-PROOF 10 year warranty.

Thermoproof Glass Company
4815 Cabot Avenue—Detroit, Mich. 48210

Subsidiary of Shatterproof Glass Corporation
World's largest independent manufacturer
of automobile safety glass.

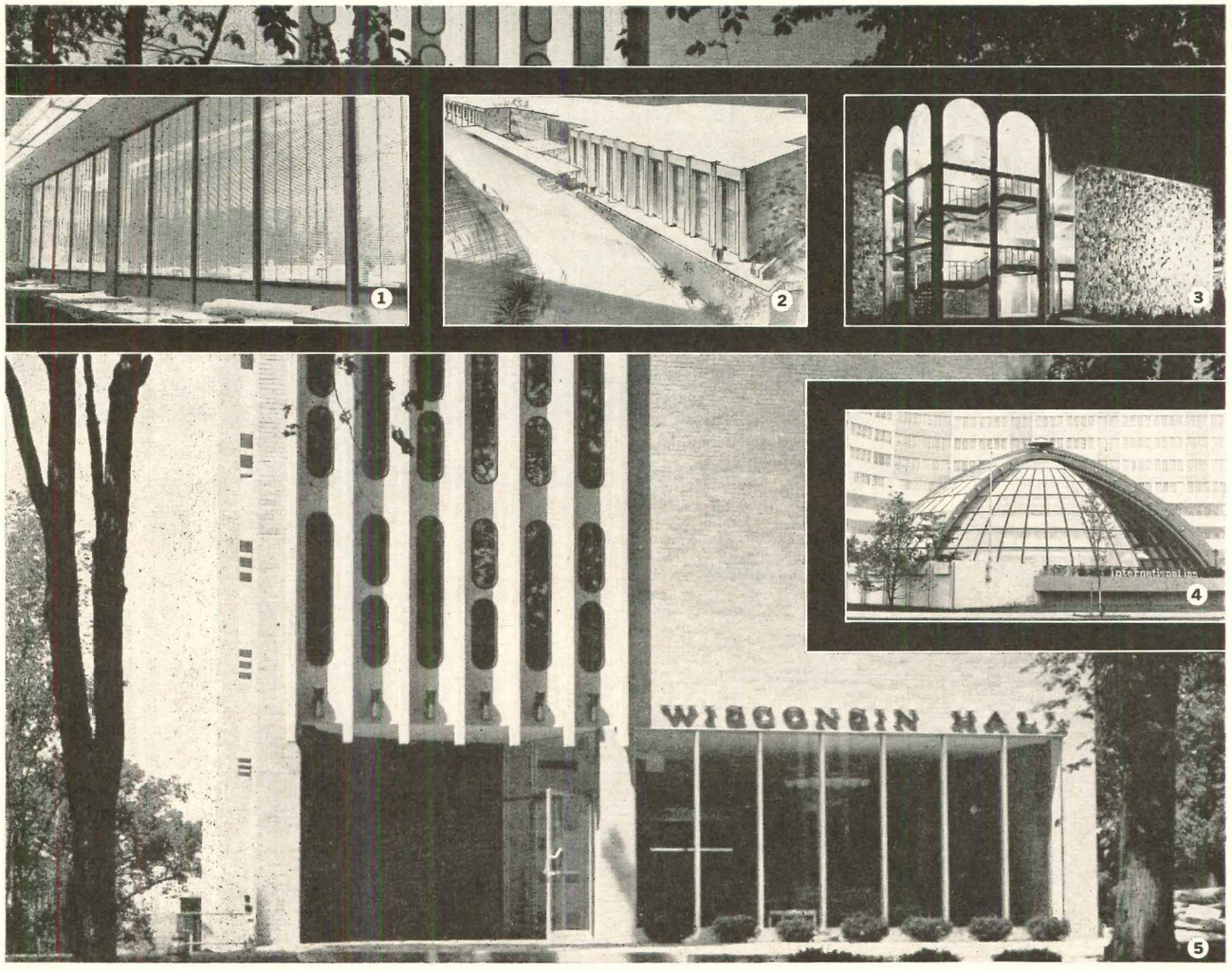
1. UNUSUAL TYPE
THERM-O-PROOF units with aluminum sun louvers by Unit Products Corp., designed for Braun Engr., Inc., Detroit, Mich.
Architect: Campbell Engr., Inc., Detroit, Mich.

2. UNUSUAL COLOR
Bronze polished plate units reduce glare in Western Michigan Univ. Student Center, Kalamazoo, Mich. (Completion: Fall 1964).
Architect: Ralph R. Calder & Associates, Detroit, Mich.

3. UNUSUAL SIZE
Huge 69" x 109" THERM-O-PROOF units add stature to stairwell of Imperial House Apts., Kenosha, Wisc.
Architect: Sheldon, Segel, AIA, Milwaukee, Wisc.

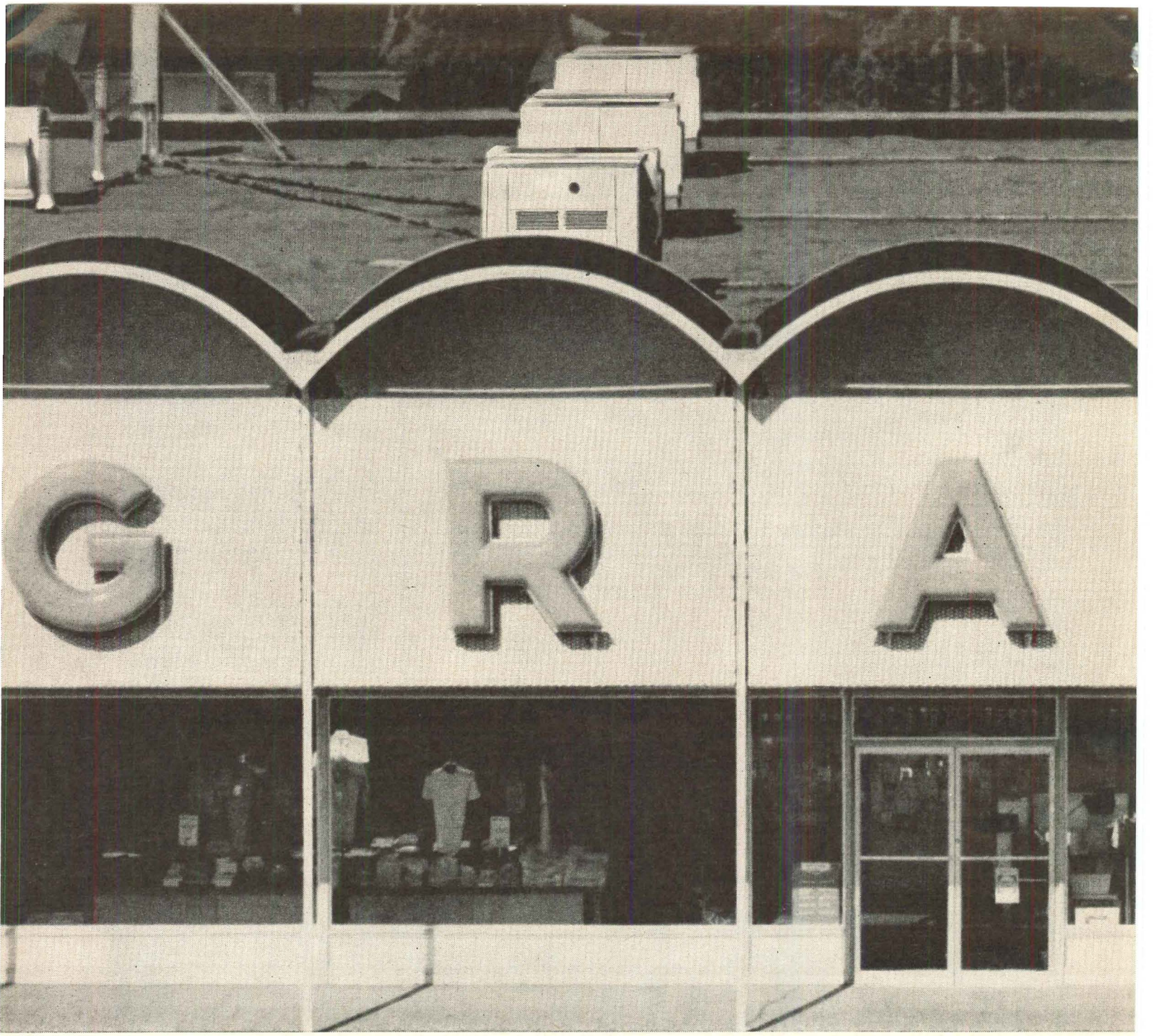
4. UNUSUAL MATERIAL
Rohm & Haas Plexiglas, in THERM-O-PROOF units, forms entire dome over International Inn Swimming Pool, Washington, D. C.
Architect: Morris Lapidus, AIA, N.Y., N.Y.

5. UNUSUAL SHAPE
Double radius units, glazed on short axis, add style to Wisconsin Hall Men's Dormitory, Madison, Wisc.
Architect: Eugene Wasserman, AIA, Madison, Wisc.



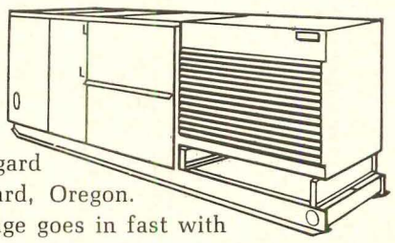
SEND FOR YOUR COPY OF 10 YEAR WARRANTY AND TECHNICAL "POCKET GUIDE"

For more data, circle 222 on Inquiry Card



They put the heating and air conditioning on the roof
to save money.
They used multiple units
to save money.
They specified Janitrol
to save money.

Saving money has always been part of the "specs" with us at Janitrol.



Case in point: Eight roof-mounted Janitrol Skyliners at the W. T. Grant Company, Tigard Shopping Plaza, Tigard, Oregon.

The Skyliner package goes in fast with less labor. Equipment is shipped completely factory assembled, tested, charged, wired, ready to install. No water cooling towers, refrigerant piping or equipment rooms needed. Not a single cubic foot of usable inside space taken up. Conditioned air is circulated through a ceiling diffuser located beneath the unit or into a ducted system.

One or more Skyliner units can be used to provide zone-controlled comfort, with each Skyliner controlled by its individual thermostat.

A wide range of models fit the demands for each zone . . . allows more efficient utilization of heating and cooling capacity; cuts operating costs.

The Skyliner is completely enclosed in a weather-proof, insulated, low silhouette, aluminized steel cabinet.

Detailed information on Janitrol's complete line of heating and cooling equipment is available through your local Janitrol district manager or franchised Janitrol dealer. The name's in the Yellow Pages.

JANITROL DIVISION
Midland-Ross Corporation
Columbus, Ohio Phoenix, Arizona

Janitrol gives you more to work with

For more data, circle 223 on Inquiry Card

Products Literature Awards

continued from page 396

REPAINTING AND MAINTENANCE RECOMMENDATIONS. *Armstrong Ceiling Systems, Armstrong Cork Company, Building Products Division.*

Class IV: Promotional literature, including direct mail type, supplemental to Classes I and II, of technical and inspirational value to the architect. It includes information on new developments, new uses for existing products, new and stimulating design ideas, visual presentations and recommended specifications.

Exceptional Merit:

No Award Given in this Class.

Certificate of Merit:

CUSTOM SKYDOME DAYLIGHTING FOLIO. *American Cyanamid Company. Agency: Bresnick Company.*

COMSTO. *Mutschler Brothers Company. Agency: Juhl Advertising Agency, Inc.*

DESIGN WITH COLOR & LIGHT. *Barrett Division, Allied Chemical Corporation.*

THE CONTEMPORARY BEARING WALL. *Structural Clay Products Institute.*

Honorable Mention:

INTAGLIO (DIRECT MAIL CAMPAIGN). *Pittsburgh Corning Corporation. Agency: Ketchum, MacLeod & Grove.*

DESIGN UNLIMITED WITH USG EXPANDED METALS FOR ARCHITECTURE. *United States Gypsum Company. Agency: Fulton, Morrissey Company.*

RUGASOL. *Sika Chemical Corporation. Agency: Lang-Lawrence Advertising.*

COMPACT DOOR CLOSER. *LCN Closers. Agency: Harris, Wilson & Brauer, Inc.*

CONCRETE MASONRY PICTORIAL. *National Concrete Masonry Association.*

TONE. *Armstrong Cork Company, Building Products Division.*

REDWOOD COMMERCIAL STRUCTURES. *California Redwood Association.*

PLEXIGLAS IN ARCHITECTURE. *Rohm & Haas Company.*

THE NEW LOOK OF ELEGANCE IN FIRE EXIT BOLTS. *Russell & Erwin Division, The American Hardware Corporation. Agency: Kenyon & Eckhardt, Inc.*

Class V: Space Advertising should include presentations directed primarily to the architect which have appeared in paid space in regularly published news media or magazines.

Exceptional Merit:

COR-TEN ARCHITECTURAL—TAKE A CLOSE LOOK. *United States Steel. Agency: Batten, Barton, Durstine & Osborn.*

ARCHITECTURAL DETAIL SERIES (*black & white*). *Marble Institute of America, Inc. Agency: Chambers, Wiswell & Moore.*

Certificate of Merit:

THE BEST IDEAS ARE MORE EXCITING IN CONCRETE. *Portland Cement Association. Agency: J. Walter Thompson.*

GOOD COMMERCIAL PROPOSITION. *Red Cedar Shingle & Handsplit Shake Bureau. Agency: Baker & Stimpson Advertising.*

ARMSTRONG CEILING SYSTEMS. *Armstrong Cork Company, Building Products Division. Agency: Batten, Barton, Durstine & Osborn.*

DOORS ARE TO OPEN (CLOSE). *Russell & Erwin Division, The American Hardware Corporation. Agency: Kenyon & Eckhardt.*

Honorable Mention:

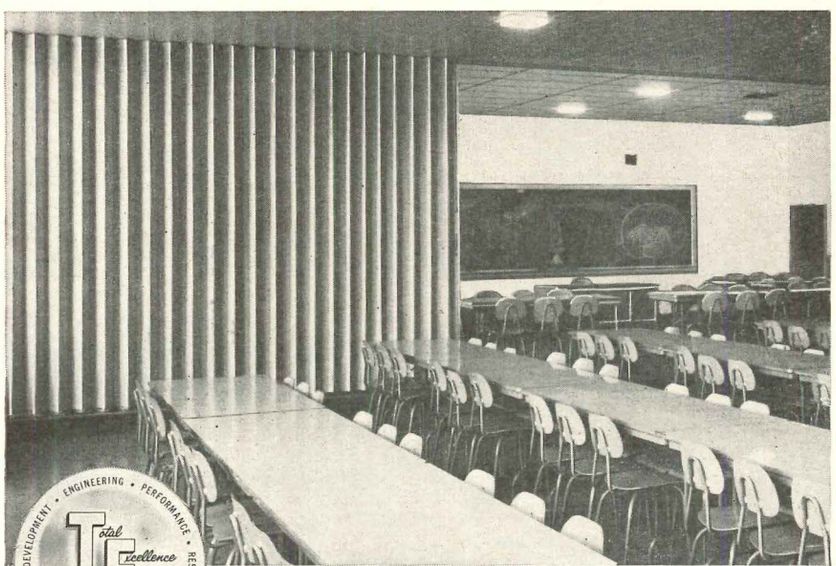
LYTESPAN. *Lightolier. Agency: Sudler & Hennessey.*

MODERN DOOR CONTROL. *LCN Closers. Agency: Harris, Wilson & Bauer, Inc.*

GATEFOLD AD SERIES. *Inland Steel Products Company. Agency: Hoffman-York, Inc.*

MODERN DESIGN USES WEST COAST LUMBER. *West Coast Lumbermen's Association. Agency: Cole & Weber, Inc.*

URBAN SCHOOL ARCHITECTURAL INSERT. *The Philip Carey Manufacturing Co. Agency: Farson, Huff & Northlich.*



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FolDoor's very high sound-retarding capabilities now make many different multi-purpose arrangements completely practical. The Super Soundguard X24 boasts an STC rating* of 44 . . . highest ever achieved by such a partition; higher even, than some more cumbersome types of folding walls costing up to twice as much.

Teamed with a new Traveling Chalkboard, which rolls along its own track to the desired spot, FolDoor partitions contribute to increased freedom and adaptability in the planning and use of educational facilities. And FolDoor's Total Excellence of quality and service is backed by the strongest warranty program in the industry.

Send for informative brochure, FOLDOOR for Educational Systems, which explains the role of folding partitions in providing academic flexibility.

*Sound Transmission Class, in accordance with ASTM E90-61T.

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FiliGrille—A unique concept in decorative styrene grillework for space dividers and screens . . . factory fabricated with customized framing. ® FiliGrille

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1545 CALHOUN ST. • DEPT. E35 • INDIANAPOLIS, IND. 46207

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Turn to Sweets 8h/Am Page 4

Copper for concealed flashings at only 12¢/sq. ft.! That's possible only with Copper Armored Sisalkraft®... a bond of pure electrosheet copper and reinforced Sisalkraft in 1, 2 and 3 oz. weights of copper per sq. ft. ■ This means — for just a few pennies difference — you can upgrade every flashing specification — providing **lifetime protection** against water and moisture penetration. Contractors like Copper Armored Sisalkraft, too, because it is extremely flexible, conforms easily to contours, cuts with shears, and bonds with mortar. ■ Send for your "Bookmark Sample" to put in Sweets 8h/Am — where you'll find all the concealed flashing and waterproofing specifications needed to give your clients the added value of **lifetime protection** for mere pennies. Write: American Sisalkraft, 73 Starkey Avenue, Attleboro, Massachusetts. Branches at Cary, Illinois and Tracy, California.

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St.Regis PAPER COMPANY

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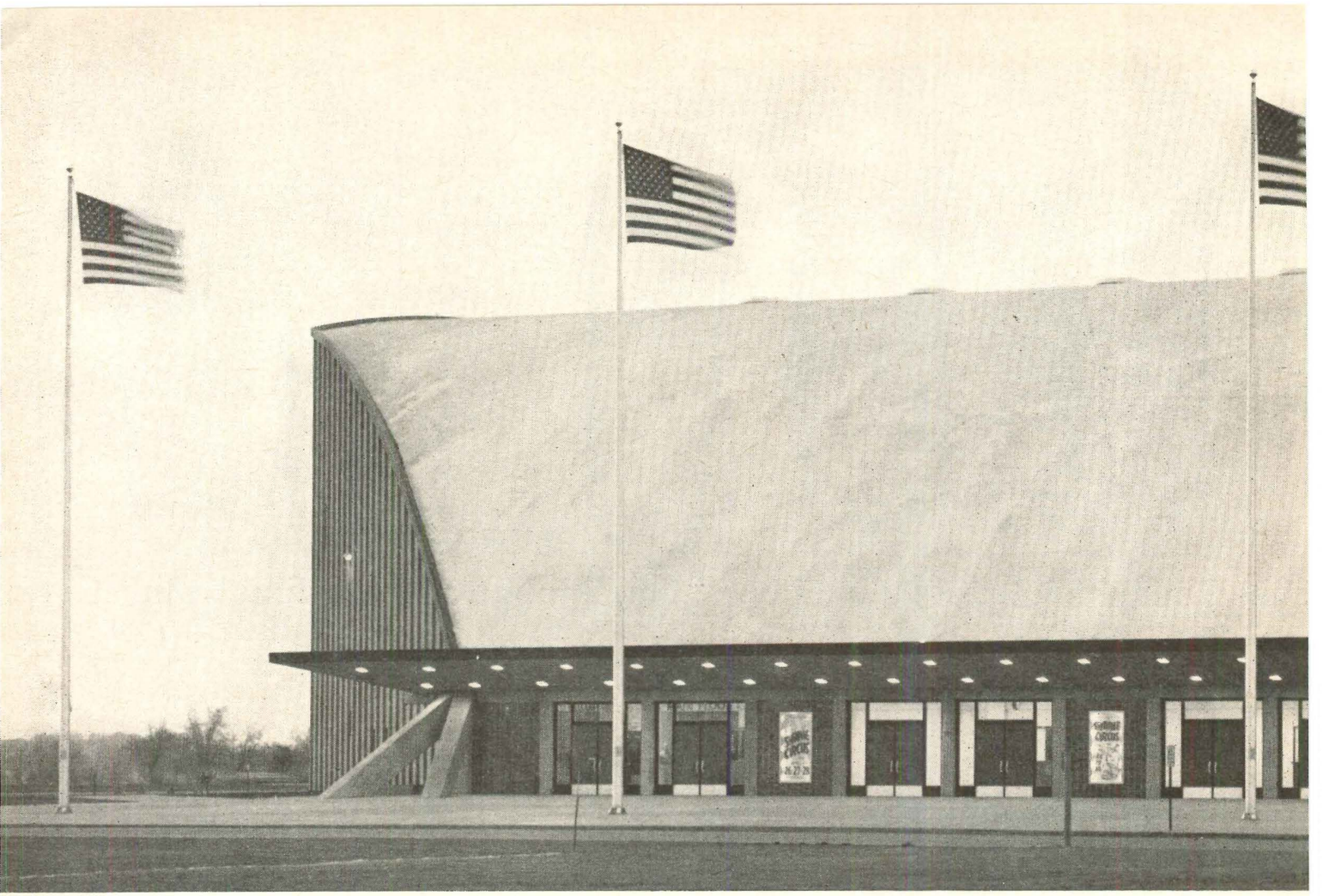
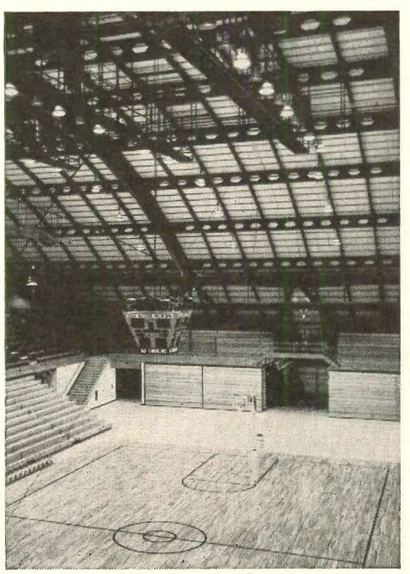


This arena has 10,000 good seats. Guess how much it cost?



Steel arch construction of USS A36 Steel provides unobstructed view for 10,000 spectators.

Steel . . . for architectural achievement

$1,500,000 complete! Here's how it happened. Sioux Falls, South Dakota, is a great basketball town with two high school and two college teams. Fans multiplied, but the size of the existing local gym didn't. So Sioux Falls wanted a new arena.

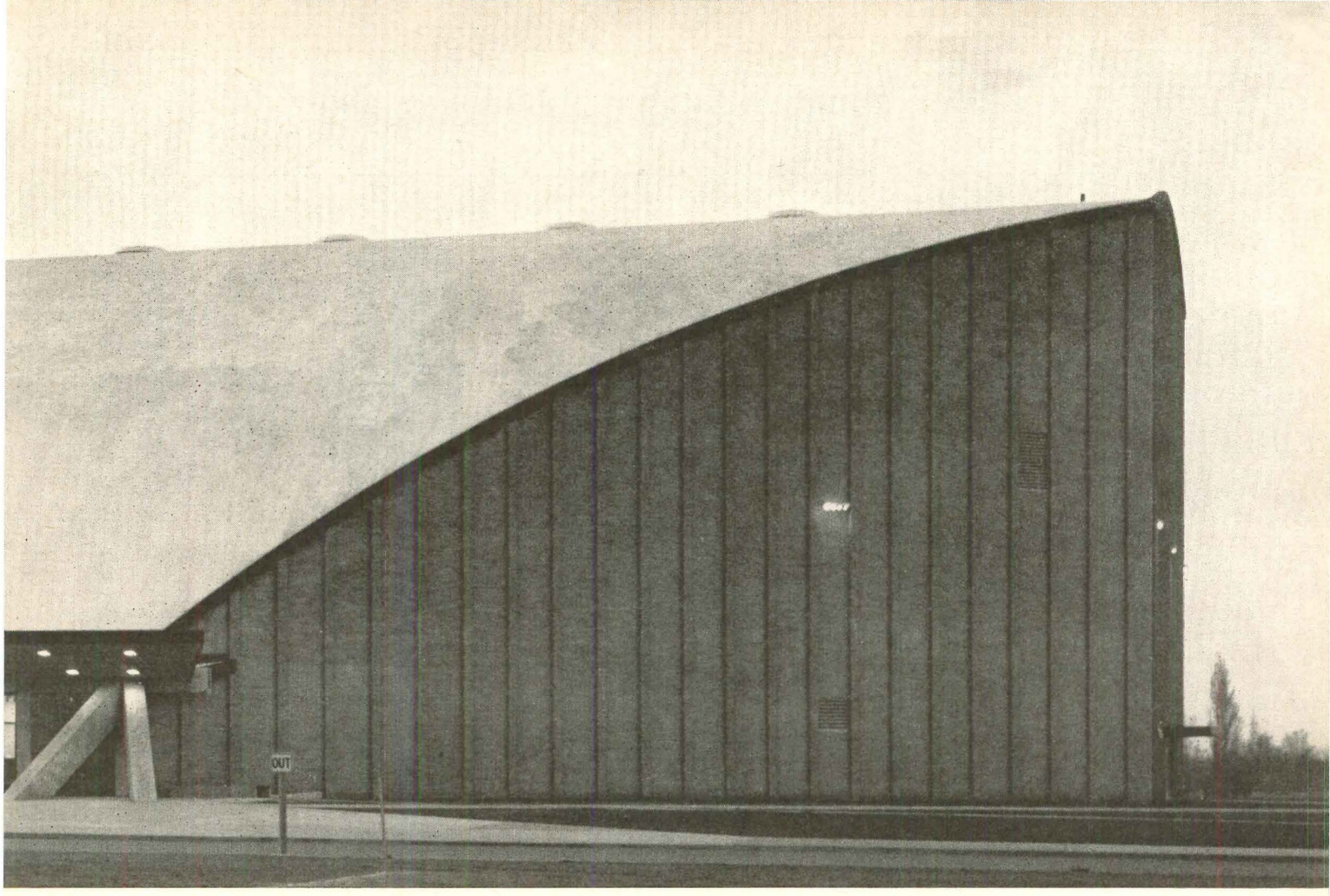
The first proposal called for an arena costing $3,500,000 for 12,000 seats. It was turned down. The next proposal—$2,500,000 for 10,000 seats—was also voted down. Finally a bond issue for $1,500,000 and 10,000 seats was accepted—without a design!

Now it was up to Sioux Falls to build a completely enclosed arena with offices, concession stands, a moveable floor system, a 2,500-car parking lot, and capable of accommodating several different sports and activities—at a cost of about $150 per seat.

The challenge was given to Harold Spitznagel & Associates, architects and engineers, of Sioux Falls. They met it—with plans for a steel arched structure the shape of an elongated octagon. With close cooperation between the designer and the fabricator-constructor, the arena was built within the budget figure. There were no short cuts on quality or accommodations, either. The town is justly proud of its spacious new arena—a remarkable example of imagineering in steel.

How economy was achieved

1. The long octagonal shape reduced material requirements since it elim-



Sioux Falls, South Dakota sports arena · Architects and Engineers: Harold Spitznagel & Associates, Sioux Falls · Steel Fabricator and Erector: Egger Steel Company, Sioux Falls

inated the need for a lot of extra—and unusable—wall and floor construction that an oblong or circular structure would have involved.

2. Rejecting a more expensive dome, they settled on a simpler four-arch structure supported 12 feet above ground on giant 35′ deep steel trusses at either side. The arches span the floor and main side stands, providing 10,000 good seats with no inside supports to obstruct views.

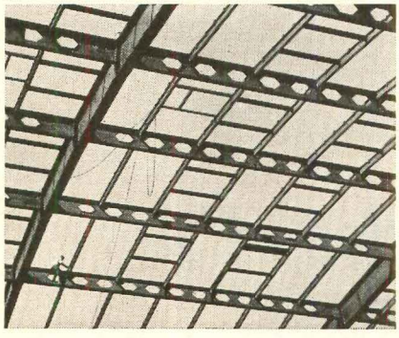
3. The four arched girders are polygonal curves comprised of a series of straight 18′ segments.

4. Small variable length lugs were welded onto the level top flanges of the girders and purlins. The roof is built up from these lugs, making it a true arc.

5. The upward thrust of the arches is taken by two 8″ square fabricated box struts tying each truss to the foundation.

6. A saving of over a dollar a foot was achieved in the design of the beams which tie the girders together and carry part of the roof load. 24″ beams were castellated to increase depth to 32″, also increasing their carrying capacity.

7. Savings in freight and erection costs were also realized because the castellated beams were about 30 pounds per foot lighter than the conventional beams that would have been necessary.



Castellated beams between arches save about $55 on each beam—$1 a foot.

The Sioux Falls Arena is an excellent example of how designers use the flexibility of steel to keep building costs down—and achieve functional, imaginative structures. For more information on the complete Family of USS Construction Steels, call your nearest USS Sales Office or write United States Steel, Room 7567, 525 William Penn Place, Pittsburgh, Pa. 15230.

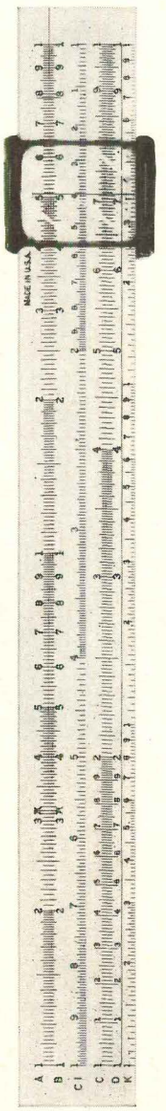
United States Steel USS

TRADEMARK

No matter how you figure it:

With your heart . . . Consider that the objective of your United Fund or Community Chest is not just to raise money—but also to raise human hopes. That the objective is not simply to get a red line to the top of a cardboard thermometer, but to get people back on their feet. That the objective is really not to meet quotas, but to meet your responsibilities as a member of the community. It's this simple: the children you give health and hope to today could be the ones who will give vitality to your town and your firm—tomorrow.

PHOTO BY P. DUNN



With your head . . . The United Way's once-a-year appeal supports the health, welfare and recreation services that make your community a better place to live, work and raise a family. It operates on business principles. Through regular audits of budgets and services by local citizens, current community needs are fulfilled; through planning, future needs are programmed. Help your company's standing in the community by your own leadership, a generous corporate gift and an employees' payroll payment plan.

Your company should give full support to this year's United Way Campaign!

Space contributed as a public service by this magazine.

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Gently filtering a flood of daylight, these plastic panels let you light up big areas without glare.

They won't support combustion because they're made of self-extinguishing Hetron polyester resin reinforced with glass fibers. Like all Hetron-based panels, they qualify to carry the Factory Mutual seal of approval and the U/L label.

Neither vandals, hail nor high winds can shatter them—another important safety and economy benefit.

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You can specify Hetron-based panels as translucent or opaque, corrugated or flat, for exterior or interior use, in any of more than 20 different colors, for high, medium or low light transmission.

They are also available integrally bonded to "Tedlar"* PVF film for maximum resistance to weather.

For more information on the properties of fire-retardant Hetron and a list of fabricators who can supply the panels, please write us. Durez® Plastics Division, Hooker Chemical Corporation, 8009 Walck Road, North Tonawanda, N. Y. 14121.

*Du Pont registered trademark

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DUREZ PLASTICS DIVISION

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NEW from YORK!

Air conditioning with odor control!

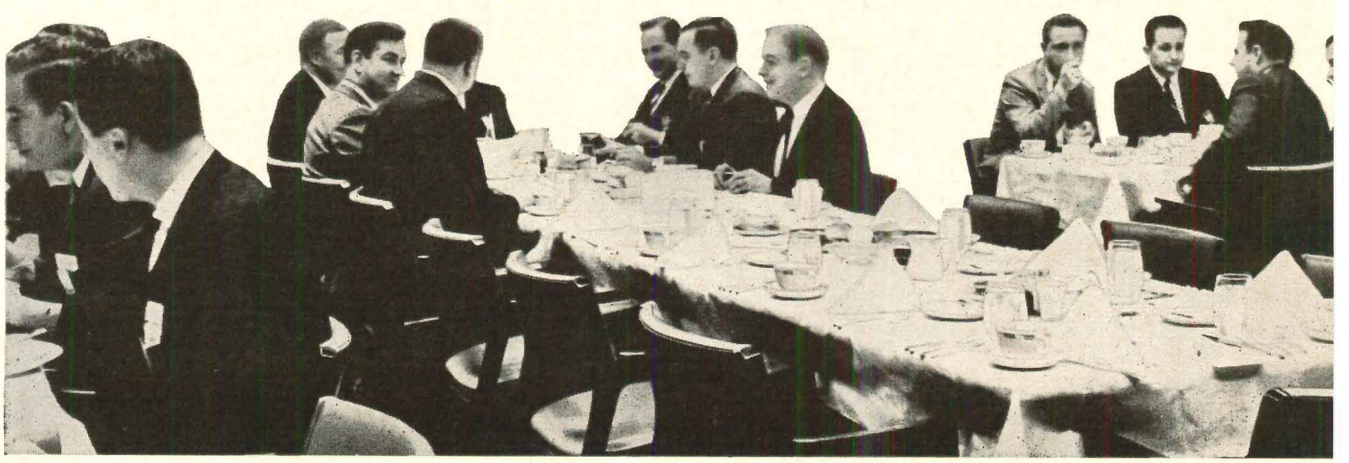
Here's the latest advance in air conditioning, from York! It's the Yorkaire Purifier—an exclusive system for destroying many common odors present in office buildings, hotels, restaurants and stores. This major step forward in air conditioning is made possible by a revolutionary method of air purification that destroys many annoying odors on contact. Available only from York!

Here's how it works: the Yorkaire Purifier contains a chemical element called *Purafil*. When the Purifier is placed in the air conditioning system, odor-causing contaminants are brought in contact with the chemical and are destroyed . . . not merely masked or covered up.

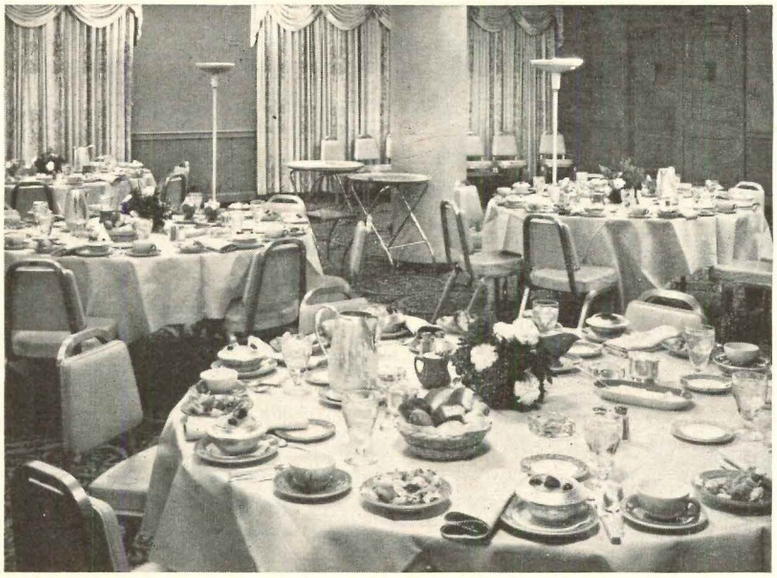
Performance tested! Yorkaire Purifiers have been installed in leading hotels, restaurants and other commercial buildings. Owners report striking results in eliminating odors from cooking, cigar and cigarette smoke, and other sources. Easy to install in almost any type of commercial air conditioning system, the Yorkaire Purifier will assure cleaner, fresher air for every building!

Want more facts? Just ask your nearby York Sales Representative for complete information on the Yorkaire Purifier; you'll find his name in the Yellow Pages. Or write York Corporation, Subsidiary of Borg-Warner Corporation; Grantley Road, York, Pennsylvania.

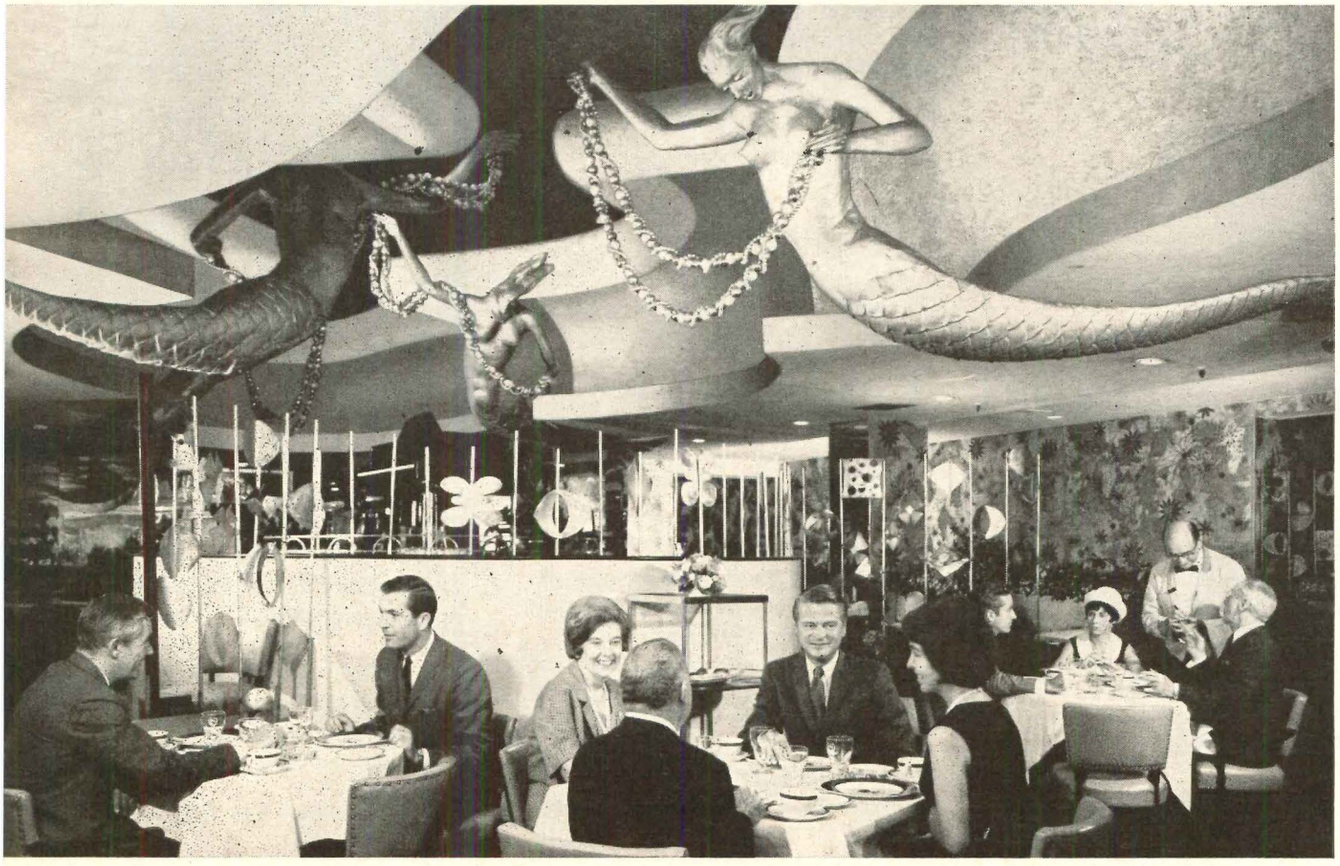
General Dynamics/Electronics Plant, Rochester, New York. Odor control in the executive dining room of this plant is provided by two York packaged air conditioners with Yorkaire Purifiers. Food preparation odors are effectively prevented from being circulated into the dining area.



The Juleon Wiggery, Pikesville, Maryland. Liquids used to clean and set hair pieces gave off a strong odor that was being circulated into the customer salon. A Yorkaire Purifier was installed in the air conditioning system, and the odors were eliminated.



Sheraton-Cleveland Hotel, Cleveland, Ohio. A 6,000 sq. ft. parlor area in this hotel had a troublesome odor problem that was solved in June, 1962 by installing a Yorkaire Purifier in the air conditioning system.



Park-Sheraton Hotel, New York. In this leading hotel's Mermaid Room restaurant and bar, odors were eliminated with a Yorkaire Purifier that was installed in the existing air conditioning system.

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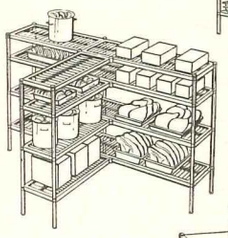
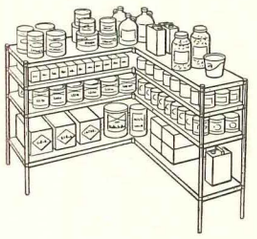
FOR EVERY PURPOSE

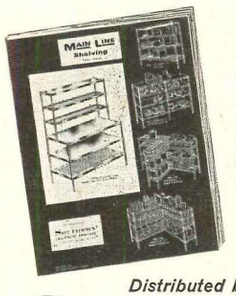
Main Line louvered single unit shelving.


Main Line wire shelving for "T" shaped installation.

Main Line solid stainless steel shelving connected to form double unit.


Main Line solid vinyl coated shelving for "L" shaped installation.

Over 385 possible models and styles of shelving are offered by Main Line. This wide selection is possible thru combining any of five standard widths with seven standard lengths and eleven different height uprights—available in six various finishes.


Send for this new 12 page, two color catalog, illustrating many models, assembly instructions and construction features.

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On the Calendar

September

8-11 Third Conference on Fundamental Research in Plain Concrete, Structural Division, American Society of Civil Engineers—Allerton House, University of Illinois, Urbana, Ill.
20-25 Tenth Annual Convention, Prestressed Concrete Institute—Mayflower Hotel, Washington, D.C.
22-25 Second Institute for International Engineering, sponsored by Consulting Engineers Council in cooperation with the University of Colorado, Boulder, Colo.
22-25 43rd Annual Meeting and Chapter Presidents' Conference, Producers' Council—Royal Orleans Hotel, New Orleans
27-30 1964 National Planning Conference of the Community Planning Association of Canada—Hotel London, London, Ont.
30ff 1964 Northwest Regional Conference of the American Institute of Architects—Hilton Hotel, Portland, Ore.; through October 3

October

7-11 Annual exhibit of architectural products, California Council convention, American Institute of Architects—Hotel del Coronado, Coronado, Calif.
19-23 Annual Meeting and Structural Engineering Conference, American Society of Civil Engineers—Statler Hilton Hotel, New York City

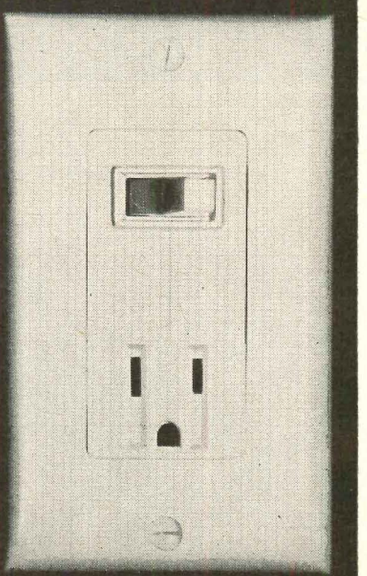
November

4-7 Board of Directors Meeting, Consulting Engineers Council—Fort Hotel, Des Moines, Iowa
9-11 International Symposium on Flexural Mechanics of Reinforced Concrete, American Society of Civil Engineers—Miami, Fla.
10-12 International Symposium on inelastic flexural behavior and mechanics of reinforced concrete, including limit design and analysis, sponsored jointly by the American Concrete Institute, the American Society of Civil Engineers, and the Engineering Experiment Station of the University of Florida—Miami
11-13 Fall convention, American Concrete Institute—Dupont Plaza Hotel, Miami, Fla.
30ff 1964 Winter Meeting of the

continued on page 422

MEDALIST

the only architecturally styled combination devices



Designed to complement the clean, crisp look of today's interiors. Available in a full range of duplex specification grade heavy duty devices including receptacles, pilot lights and combinations with A.C. quiet switches.

This is only one of many exciting new features of the Medalist line of wiring devices that is setting a new standard of excellence in the industry.

Write for complete specifier's catalog.

MEDALIST: A PRESTIGE PRODUCT LINE OF SLATER ELECTRIC INC., GLEN COVE, N. Y.

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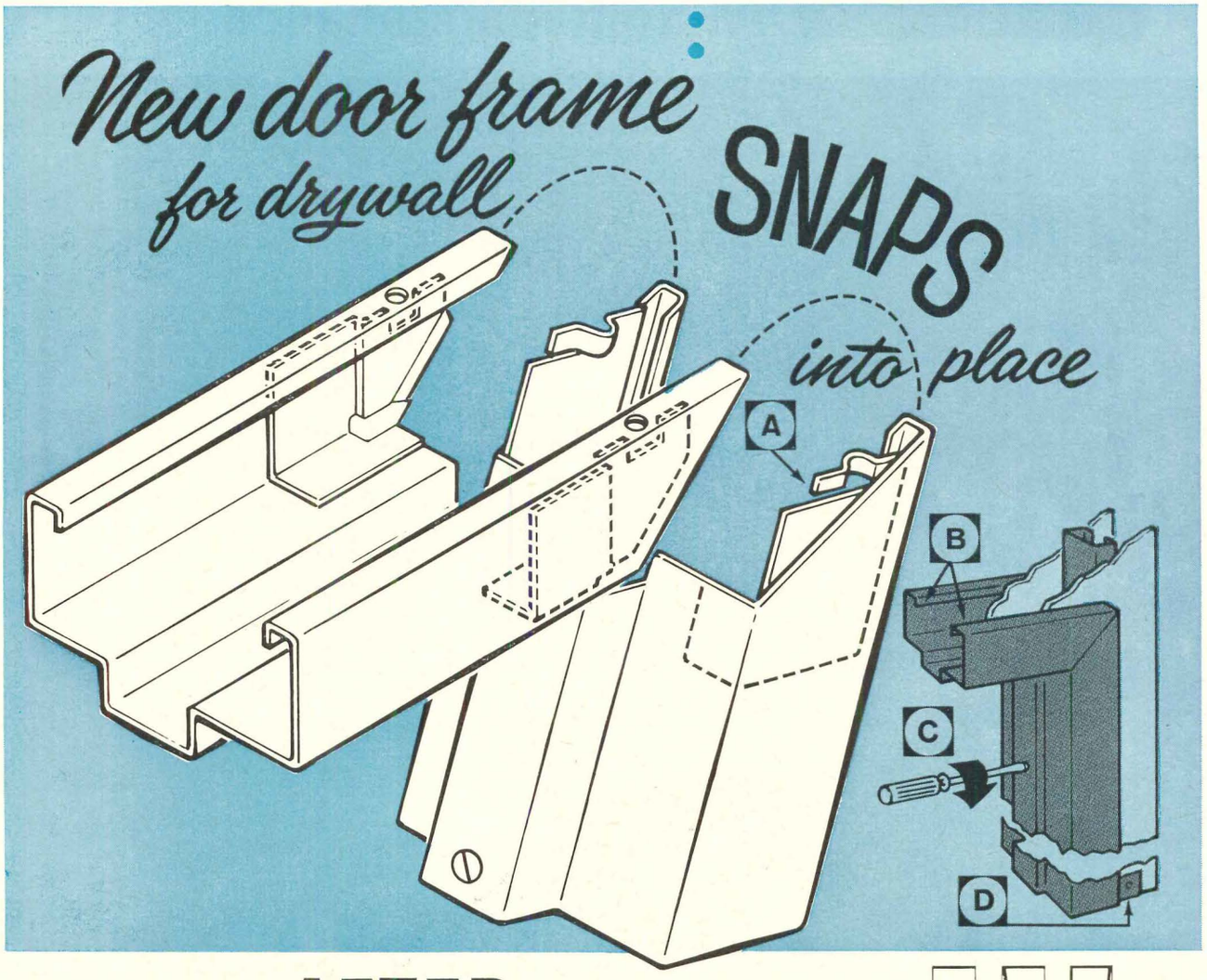
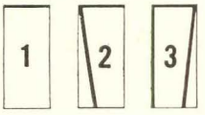
steelcraft metal door frame idea no. 14 in a series

New door frame for drywall SNAPS *into place*



...AFTER THE WALL IS UP



A Locking tabs,* in precision-mitered joints, lock jambs to header without screws.

B Frame sections, with double return backband, fit snugly over wall without marring it.

C Adjustable jamb anchors* permit easy plumb alignment by screw driver.

D Base anchor attaches frame tightly to base runner for solid installation.

*Patents applied for in U. S. A. and Canada.

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finest name in metal doors and frames

This is another of the many advantages gained from the use of Steelcraft metal doors and frames. Write for other ideas . . . and the name of your technically trained Steelcraft distributor.

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The Steelcraft Manufacturing Company, 9017 Blue Ash Road, Cincinnati, Ohio 45242, U. S. A.

The Steelcraft Manufacturing Company of Canada, Ltd., 3425 Derry Road, East, Malton, Ontario (Greater Toronto).

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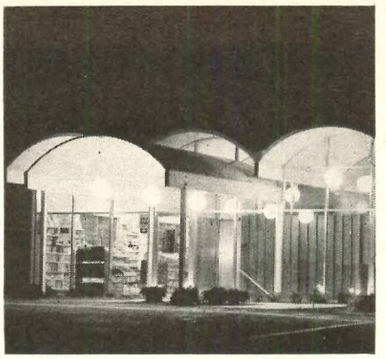
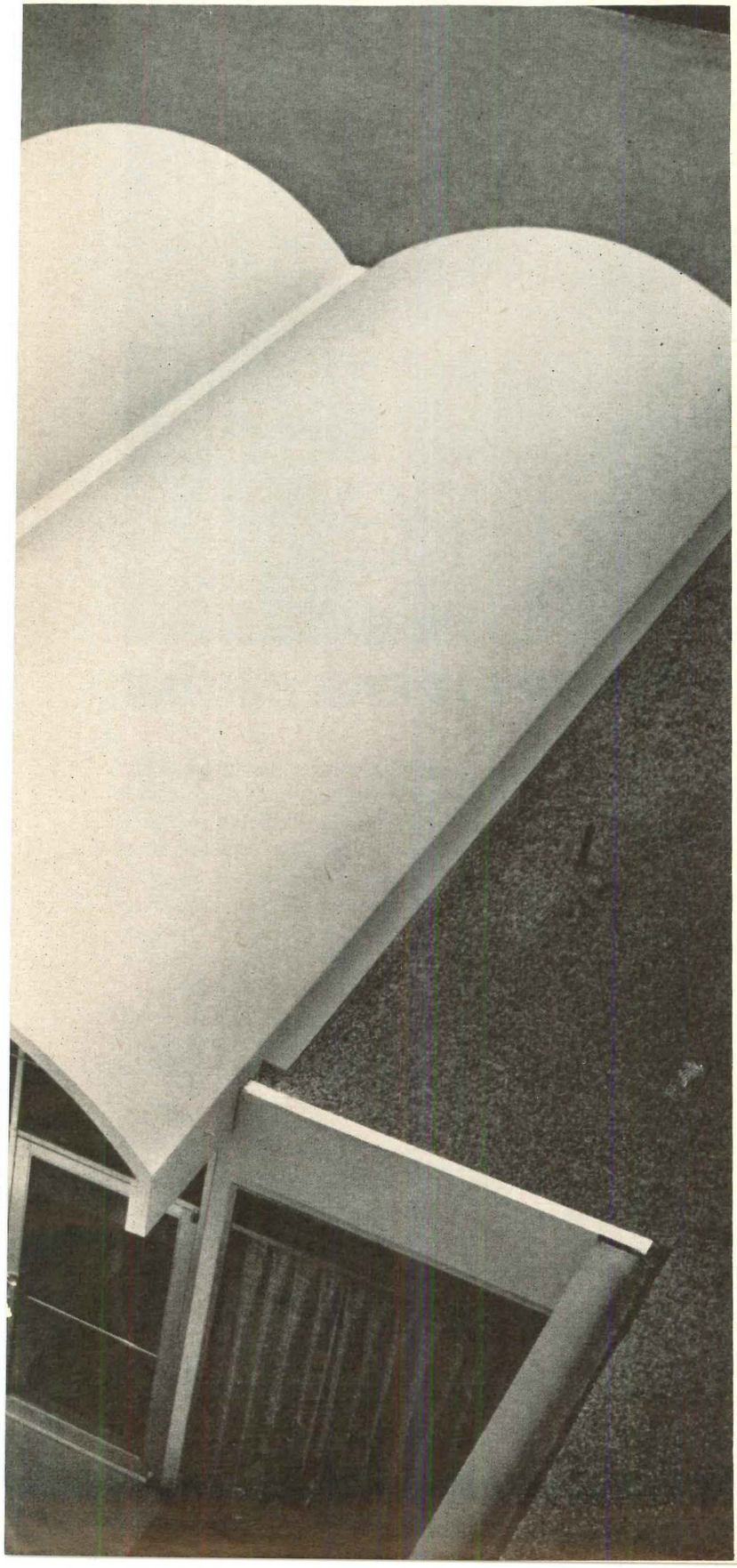


Roofing surfaced with Du Pont TEDLAR® keeps this clinic roof brilliantly white— without maintenance



A SINGLE PLY OF ROOFING GIVES LASTING WHITENESS to the dominant architectural feature of this medical clinic—its barrel-vault roof. The surface of Du Pont TEDLAR* PVF film will remain a brilliant white, even after years of exposure.

The roofing is Ruberoid T/NA 200†. T/NA 200 was easily installed with conventional roofing techniques. It will fit any roof, no matter what its shape or angle.

The lasting whiteness of the surface of TEDLAR gives high reflectivity (it has less than half the solar absorptance of crushed stone or marble), which lowers under-roof temperatures and air-conditioning loads.

The whiteness stays white because TEDLAR is a tough, inert, flexible film that's too smooth to trap dirt. The roofing stays tough and flexible from minus 50° to over 250° F. Maintenance is negligible.

More and more architects are specifying TEDLAR as the finish on roofing and siding for their new designs. Du Pont Film Dept., Box 903A, Wilmington, Delaware 19898.

Berg Medical Clinic, Thornton, Colorado
Architect; Frenchie Gratts, Denver, Colorado
General Contractor: Mariska Construction Co., Denver, Colorado
Roofing Contractor: United Materials, Denver, Colorado

*Du Pont's registered trademark
†Ruberoid's registered trademark

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BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

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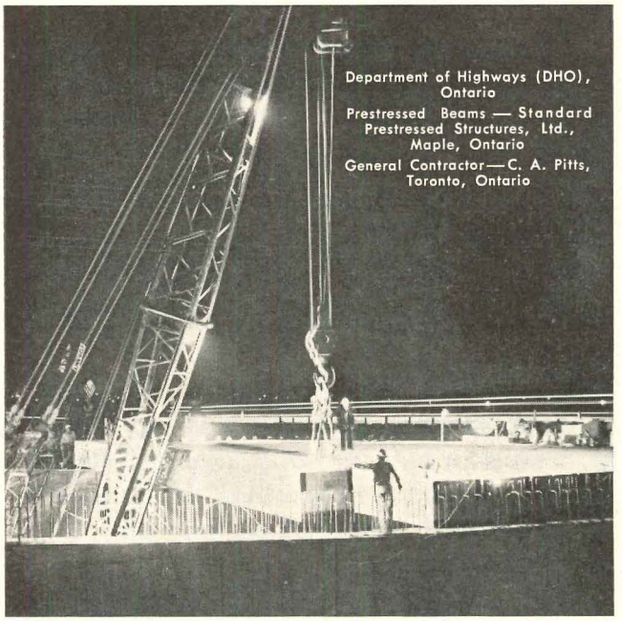
MARACON*

SAVES TIME / CUTS COST OF PRESTRESSED BEAMS FOR

$600,000,000

DEPARTMENT OF HIGHWAYS, ONTARIO, PROJECT



"BETTER BOND OF CONCRETE TO STEEL . . . NO COLD JOINTS . . . BETTER CONTROL OF MIX . . . DESTRESS 5 TO 6 HOURS SOONER . . . "

"Beams were destressed in 10 - 11 hours with strengths of 4000 p.s.i. — a saving of 5 - 6 hours — resulting in faster production and lower costs. The strength required to destress is 3900 - 4000 p.s.i. With MARACON the 10-hour strength was 4500 p.s.i.; at 13 hours, 5300 p.s.i. and at 16 hours, 6300 p.s.i. The 28-day strength exceeded 8500 p.s.i."

Beams are 87½ ft. long and each weighs approximately 44 tons. Specifications provided for a 7½ bag cement factor, a non-chloride water reducing admixture, 5000 p.s.i. at 28 days and air at 3½ - 4½%. Technical design and service were supplied by Concrete Control Chemical Company, Ltd., Kitchener (Marathon's Ontario distributor). MARACON-A water reducing admixture was used.

*MARACON is the registered trade name for a series of concrete admixtures manufactured by Marathon Division of American Can Company.

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Please attach to your company letterhead. H-94

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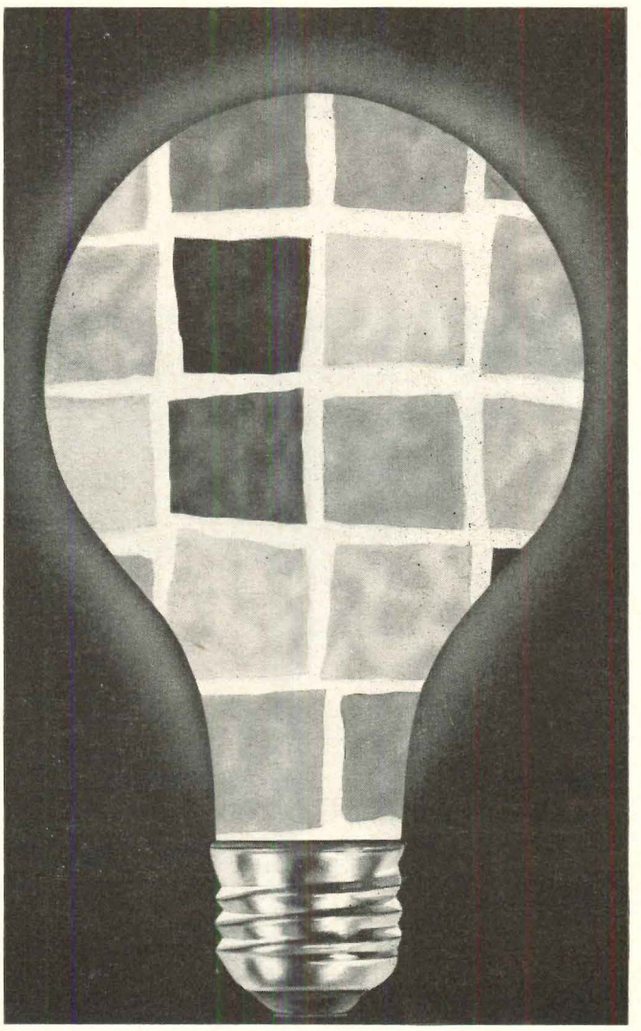

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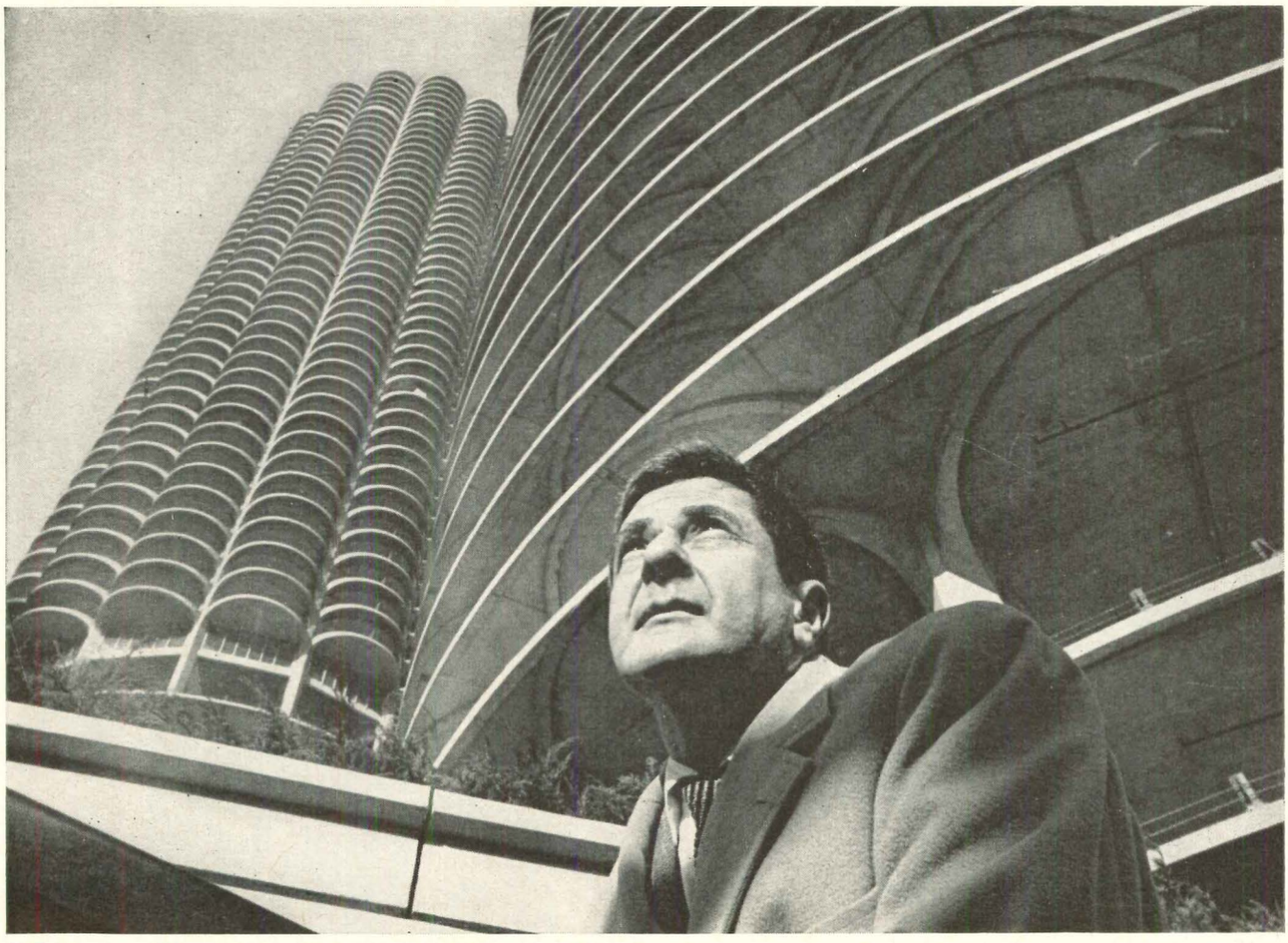
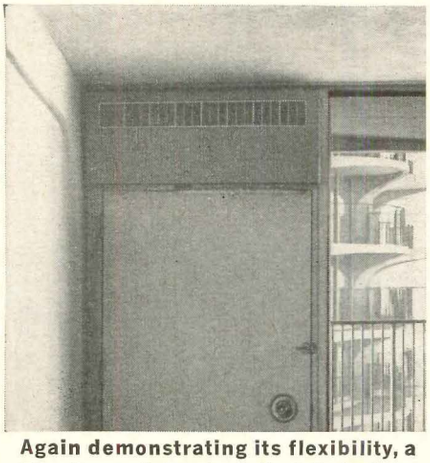


How Bertrand Goldberg used General Electric Zoneline Air Conditioning to design Marina City "for the varying needs of the individual tenant."



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 234 on Inquiry Card

Drenched, deluged and wind-whipped

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

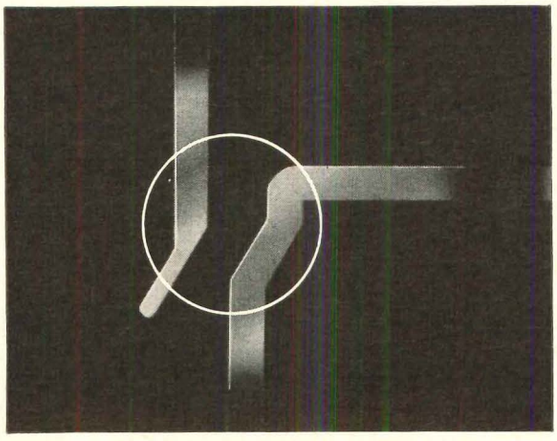
Independent Laboratory Tests Prove Kawneer Sealair Windows* Solve Weathering Problems!

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.

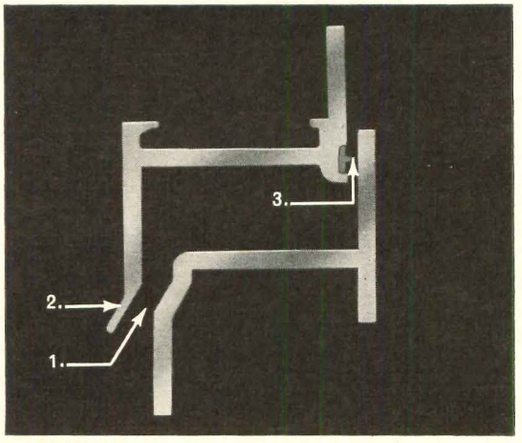
In these tests, the Sealair was installed in a weather test chamber. The window was water drenched as inside pressure was lowered to represent severe weather conditions. Sealair did not leak even when the static load reached 25 p.s.f. Many conventional windows leaked at 3 to 7 p.s.f. The superior weathering 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

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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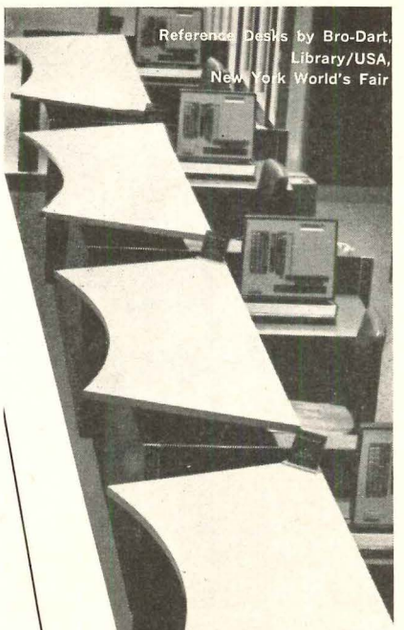

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Bro-Dart INDUSTRIES

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Los Angeles, Calif. 90025

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On the Calendar

continued from page 414

American Nuclear Society, through December 3—San Francisco Hilton Hotel, San Francisco

30ff Annual Conference of the Atomic Industrial Forum, through December 3—St. Francis Hotel, San Francisco

Office Notes

Offices Opened

Keeling, Washington, Washington and Associates, Architects and Engineers, have announced the opening of offices at 419 West 21st St., Norfolk, Va., 23517.

New Addresses

Hirsch and Cassetti, Architects, M.C.I. Building, College Ave. at West Church Street, Elmira, N.Y.

Wray G. Succop Associates, Architects-Engineers, successor to the **Edwin T. Reeder Associates,** 1100 Ponce de Leon Boulevard, Coral Gables, Fla.

New Firms, Firm Changes

Gunnar Anderson and **James E. Palmer** have announced that they are principals in the San Francisco architectural firm, **Anderson and Palmer, A.I.A.,** and that the firm has moved to 400 Pacific Street, San Francisco, Calif.

Carl W. Ernst Jr., A.I.A., and **Edwin T. Pairo, A.I.A., F.C.S.I.,** are new partners in the firm of **Chatelain, Gauger and Nolan, Architects and Engineers.**

Richard C. Hein and **August D. Rath** have announced the formation of a new firm, **Hein and Rath,** located at 158 West Blithedale Ave., Mill Valley, Calif.

Lutes and Amundson, Architects and Community Planners, have announced the appointment of **Donald L. Smith** as an associate in the firm.

John R. Myer and **Fletcher Ashley** have announced the formation of a new firm, **Ashley, Myer & Associates, Architects,** located at 19 Story St., Cambridge, Mass.

Ralph Pierce and **Anthony J. Wolf** have announced the renaming of the firm, **Levin, Pierce and Wolf,** as **Pierce and Wolf,** Consulting Engineers.

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E. Todd Wheeler and The Perkins & Will Partnership

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SPECIFICATIONS WRITING FOR ARCHITECTS AND ENGINEERS

Just Out. Shows principles and techniques of writing clear and accurate specifications that you can apply to almost any building project. **By D. Watson. Pasadena City College. 304 pp., 104 illus., $8.50**

ARCHITECTURAL ENGINEERING—NEW STRUCTURES

Just Out. A complete treatment of structural systems; thin shells, space structures, rectilinear frames, suspension structures, and component systems. **Ed. by R. Fischer,** Architectural Record. **230 pp., 675 illus., $10.00**

DESIGN OF CONCRETE STRUCTURES

Just Out—7th Ed. Brings you recent advances in reinforced and prestressed concrete design. By G. Winter, L. C. Urquhart, C. E. O'Rourke, & A. Nilson; all of Cornell Univ. 672 pp., 307 illus., $10.50

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- ☐ Winter, et al—**Design of Conc. Struc.,** $10.50

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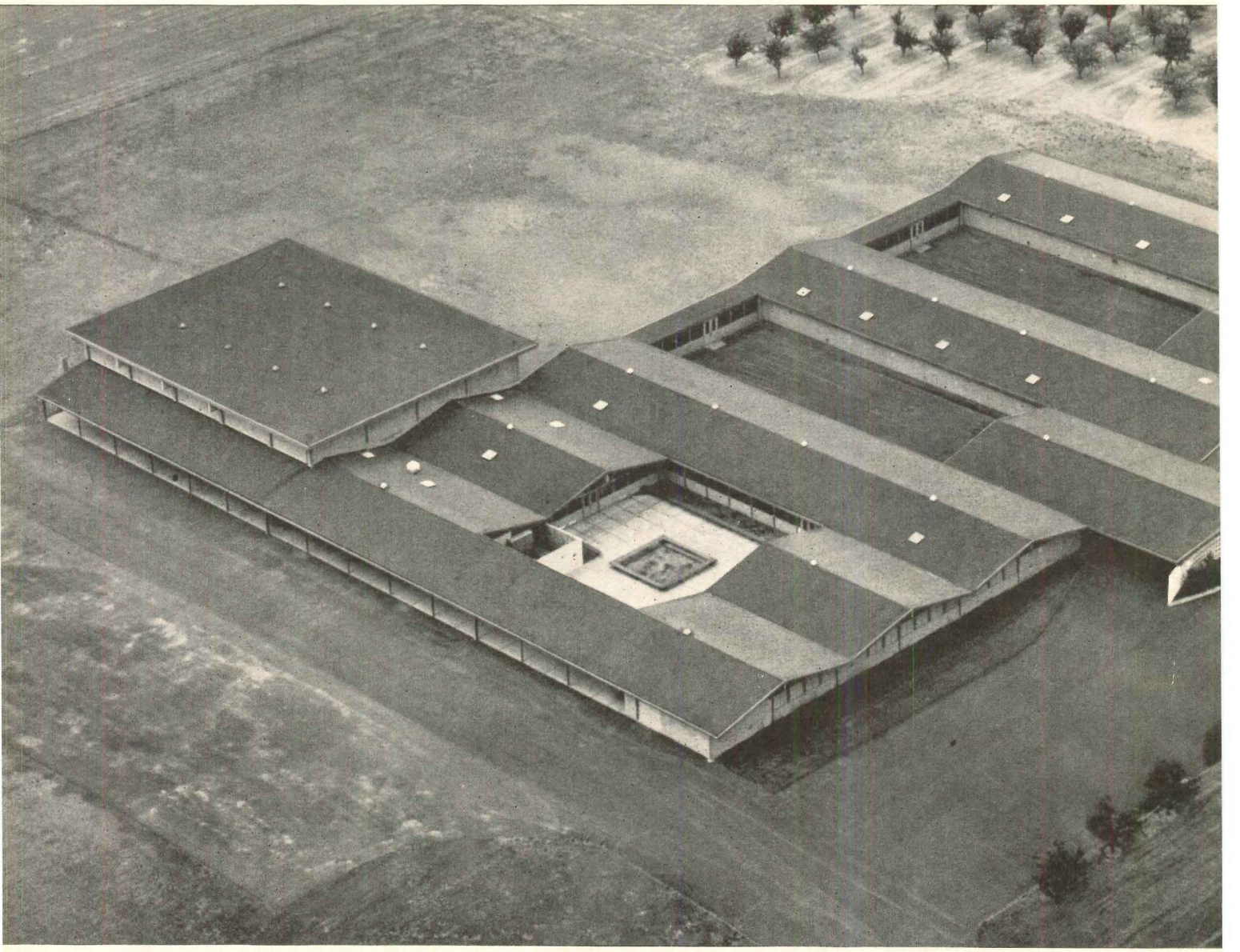
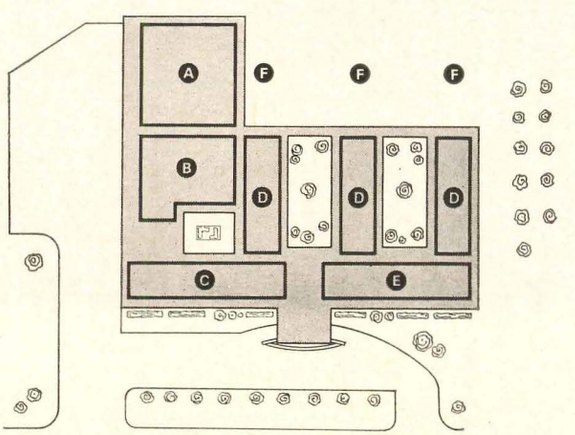
Why architects talk to total school air



Mabel Rush Elementary School, Newberg, Ore. Superintendent of Schools: Loran A. Douglas. Architect: James C. Gardiner, A.I.A., Portland, Ore. Consulting Engineer: Omer T. Jacobson, Portland.



A. Auditorium and Gymnasium
B. Dining Room
C. Administrative offices
D. Classrooms
E. Library and special facilities
F. Future Classrooms

How a Trane Heat Pump and Unit Ventilators heat, cool and ventilate an all-electric school

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Classrooms are equipped with TRANE Air Conditioning Unit Ventilators with Kinetic Barrier Action, the exclusive feature that provides continuous, powered ventilation and heating or cooling from room-wide air outlets. Result: a Unit Ventilator system that works with full effectiveness whether it's heating or cooling!

A central TRANE Heat Pump provides the heated or chilled water circulated to these Unit Ventilators.

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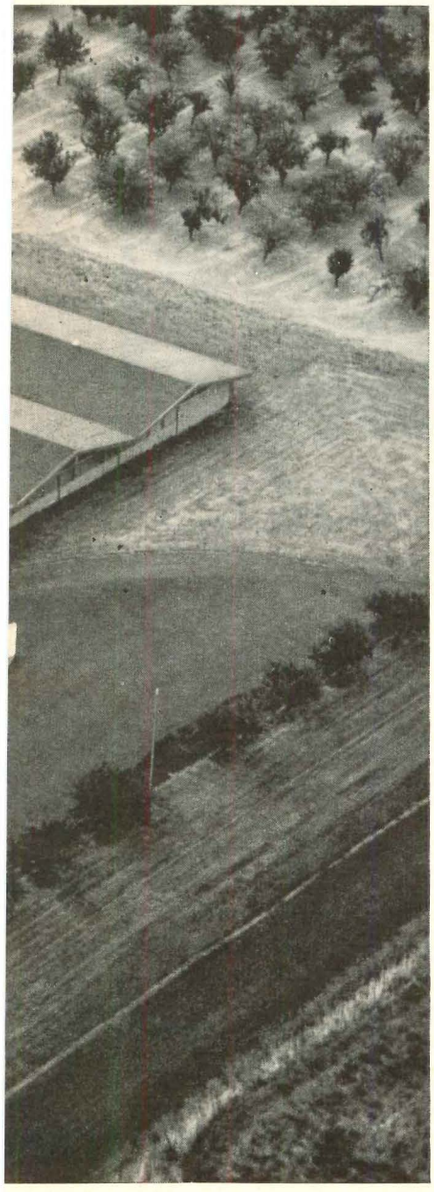

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TRANE is one of the very few organizations of manufacturing engineers with depth of experience in all the related fields of total air conditioning . . . in heating, cooling and ventilating.

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Lighting Division

WAKEFIELD CORPORATION
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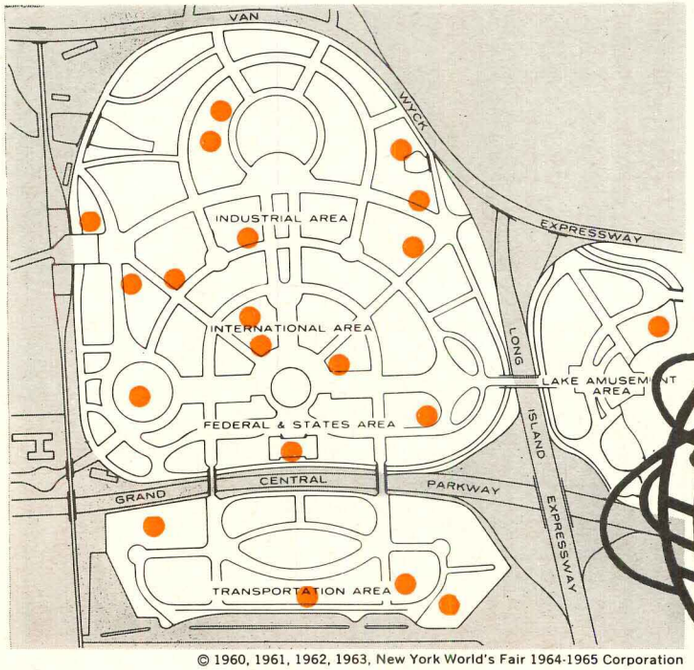

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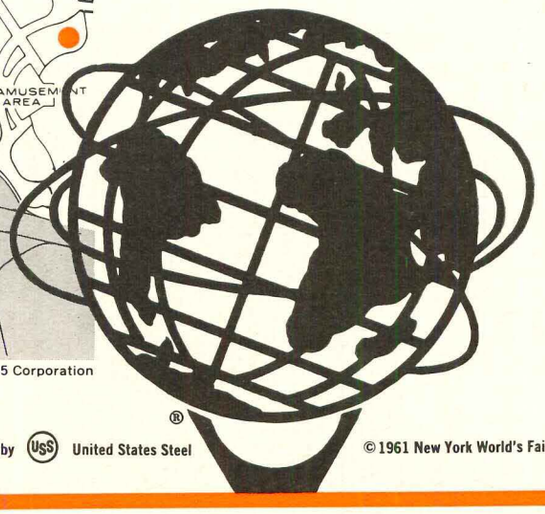

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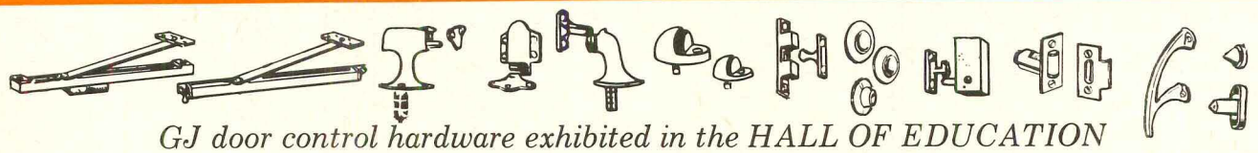

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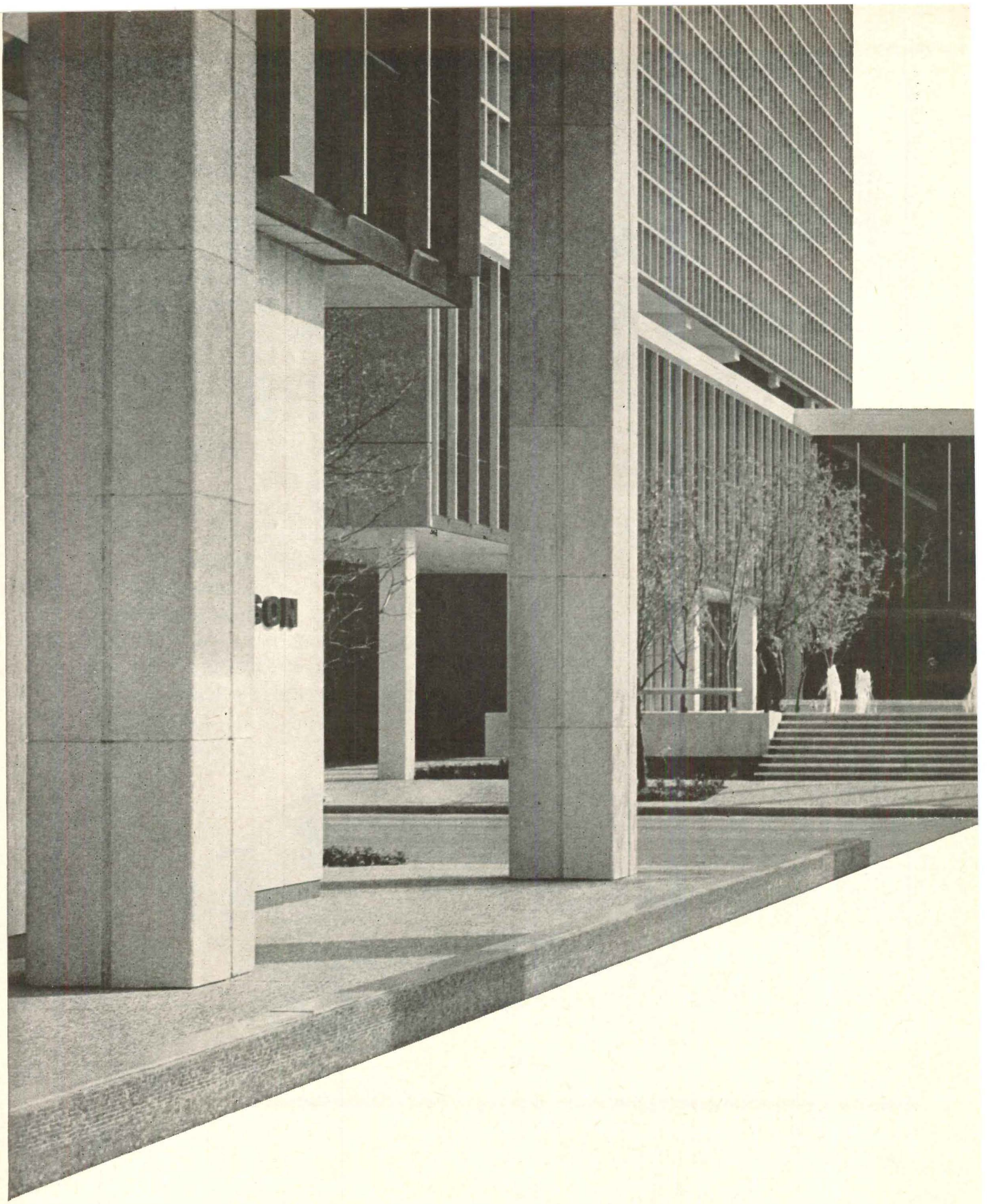
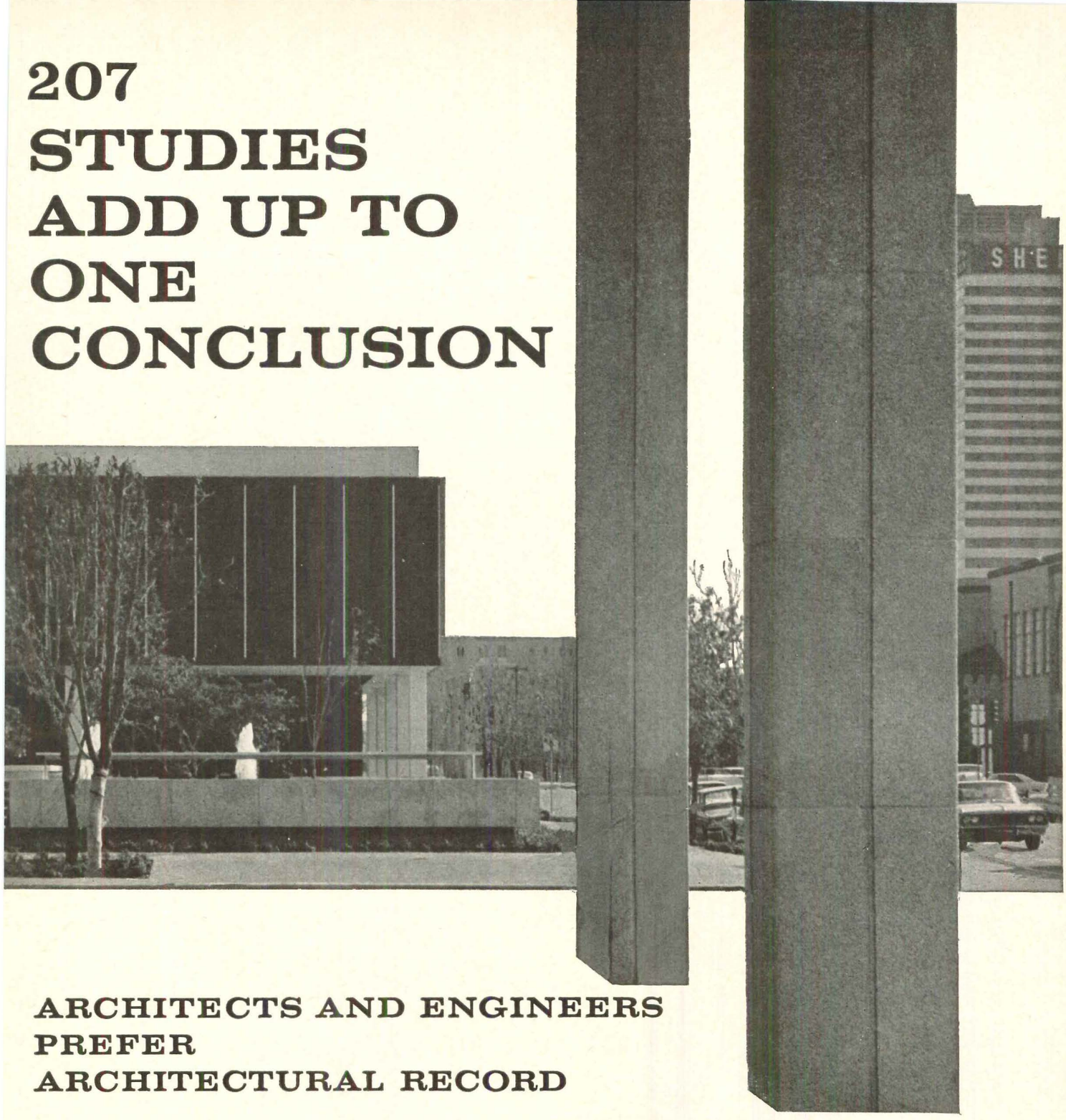


500 Jefferson Building, Houston, Texas
Architect: Welton Becket and Associates
Balthazar photos

207 STUDIES ADD UP TO ONE CONCLUSION



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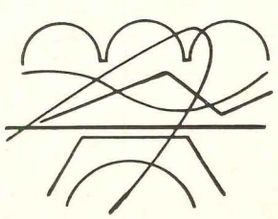

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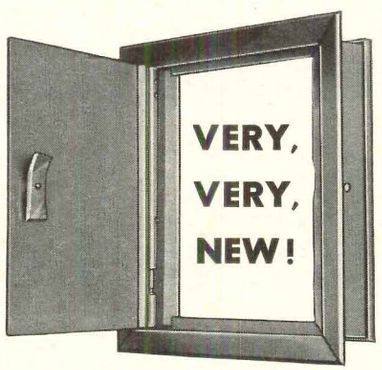

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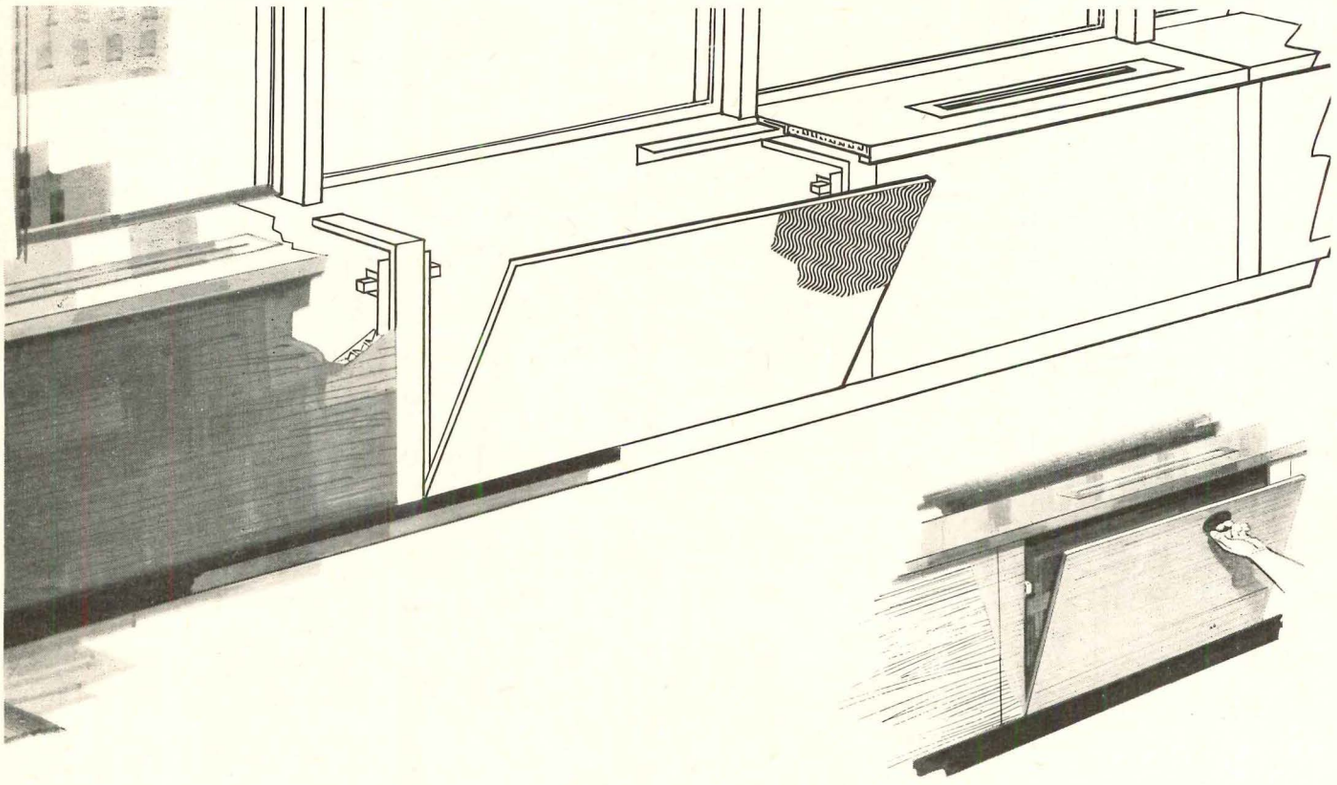

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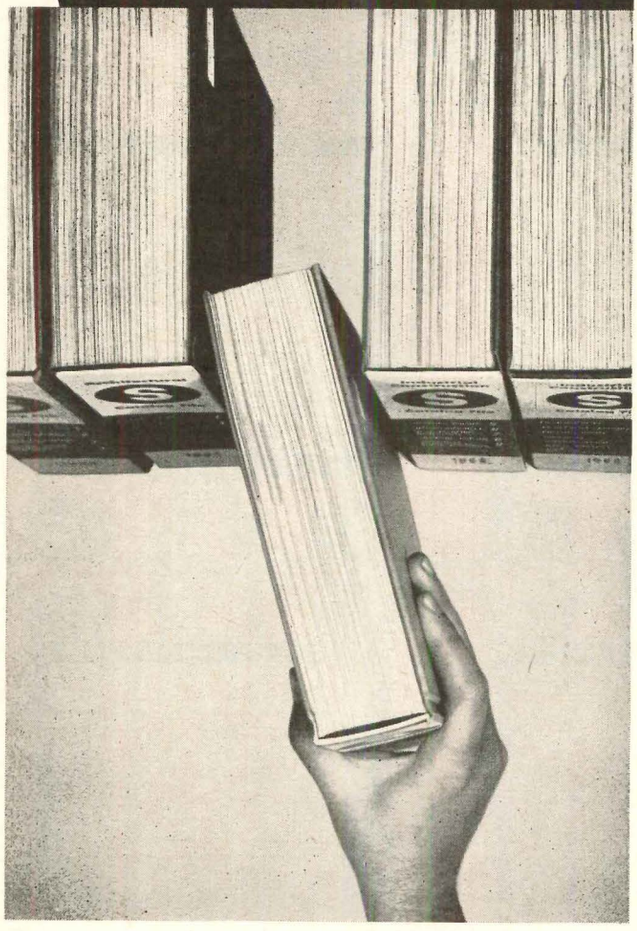

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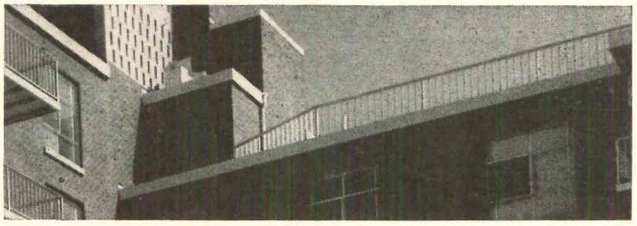

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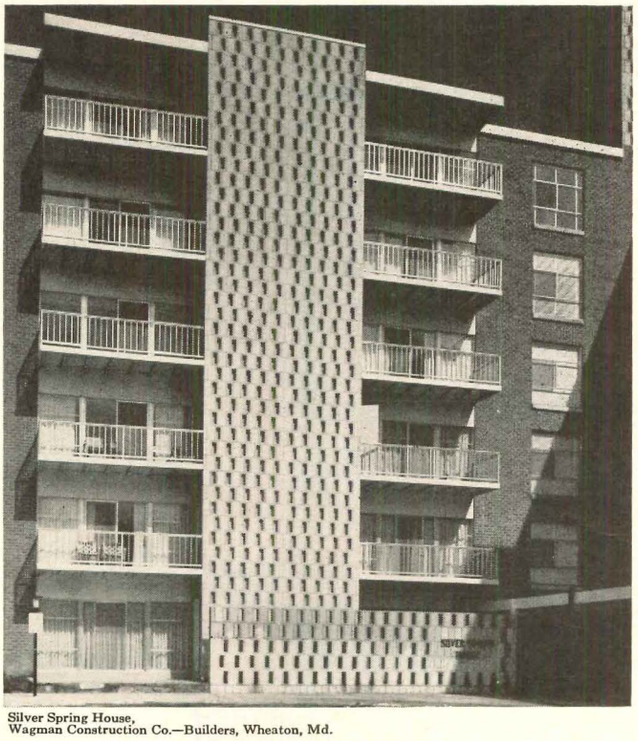

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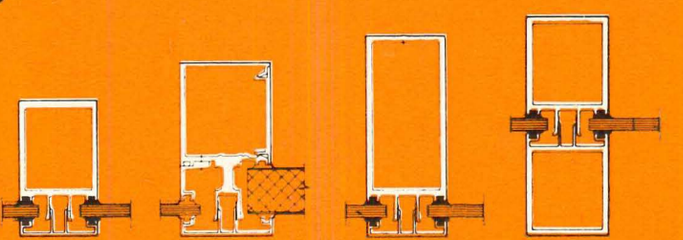

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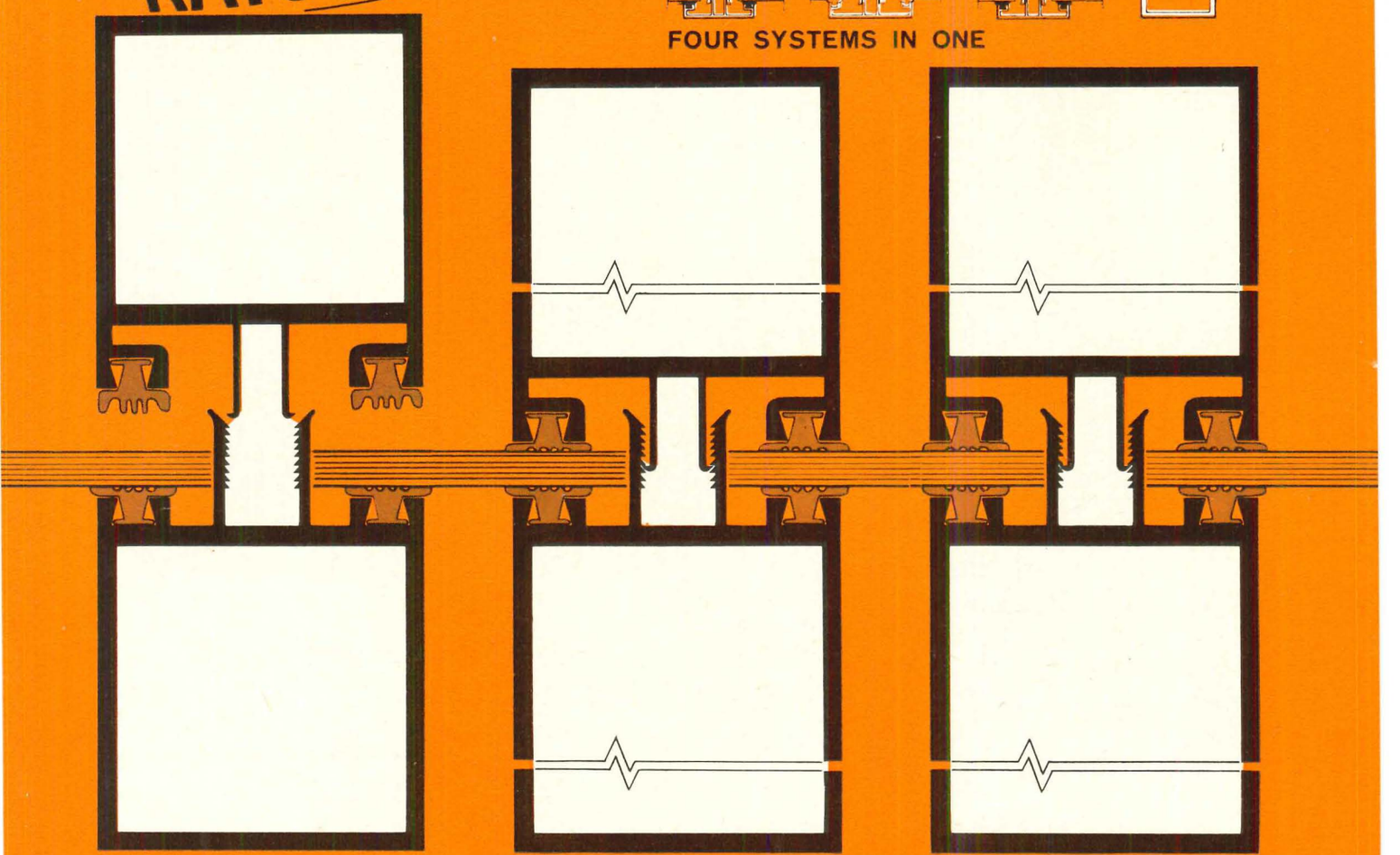

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