ARCHITECTURAL RECORD

8 *August 1958*

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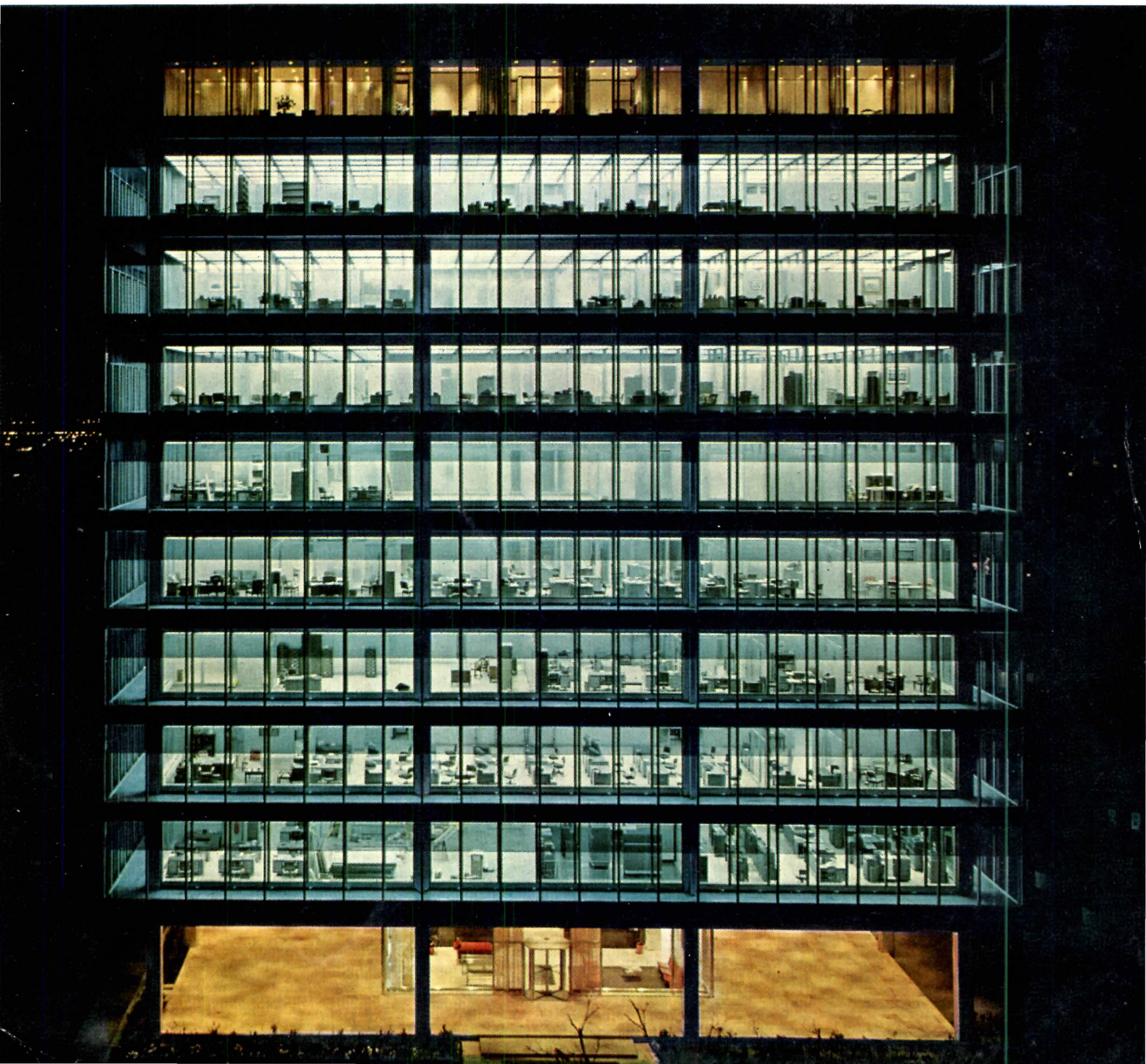


without Sprinklers

Fire struck at night in this large, unsprinklered, one-story department store. By the time fire apparatus arrived, the blaze was completely out of control. Loss: estimated at $1,000,000.00.

Fighting Fire...

with Sprinklers

A flash fire occurred over a weekend in basement of J. C. Penney Company, Sacramento, California. Fast action by Grinnell Sprinklers was credited with saving this $3,500,000.00 department store.

There's small chance of fire ever gaining real headway in a Grinnell-protected building. Today's Grinnell Spray Sprinklers give more effective protection in extinguishing fire than ever before available . . . the result of years of research, design improvement, and careful manufacture.

Whenever possible Grinnell Systems are *engineered* and *prefabricated* to simplify and speed installation. They are erected quickly, expertly — with minimum disruption to normal routine.

Grinnell Sprinklers also make possible big insurance savings — with reductions in insurance premiums of between 50% and 90%.

Remember, there *is* a difference in sprinkler performance and service. For complete facts, write Grinnell Company, Inc., 277 West Exchange St., Providence, R. I.

GRINNELL

PROTECTION AGAINST EVERY FIRE HAZARD

MANUFACTURING, ENGINEERING, AND INSTALLATION OF AUTOMATIC SPRINKLERS SINCE 1878

ARCHITECTURAL RECORD (Vol. 124, No. 2, August 1958) is published monthly, except May 1958 when semi-monthly, by F. W. Dodge Corporation, 10 Ferry Street, Concord, N. H. **Editorial and executive offices: 119 West 40th Street, New York 18, New York**
(Western Edition) $5.50 per year in U. S., U. S. Possessions and Canada: *Second-class mail privileges authorized at Concord, N. H.*

Biggest advertisement ever to dramatize concrete masonry!

4 consecutive full pages, full color, in the nation's top "home" magazines!

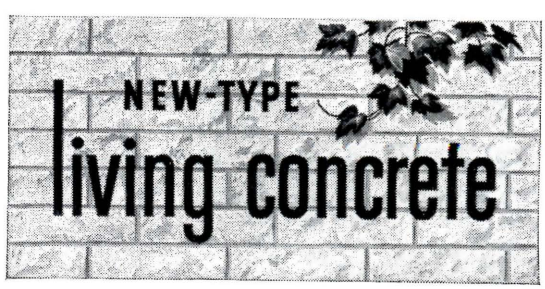
Next month, in Better Homes & Gardens, House Beautiful, and in House & Garden, millions of Americans will see concrete masonry in its modern role—beautiful, appealing, designed for gracious living.

An impressive 4-page folio tells the story of today's new forms of concrete masonry . . . its new patterns, textures and colors . . . how it fits every taste, any home style or locale.

All the versatility of today's concrete masonry, all its warmth and charm for modern living, the advertisement projects into a descriptive, promotable idea—*new-type Living Concrete*. You'll be hearing more about this idea. For nationwide, *Living Concrete* is gaining favor with important architects, builders, financial people, as well as with home buyers.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete



GRANCO RE-DESIGNS OFFERS NEW ECONOMY

"New-pattern" Tufcor is 25% stronger . . . 50% longer! Completely re-styled tough-temper steel deck for insulating concrete offers greater economy in roof construction.

TUFCOR sheets enable you to space purlins farther apart, help you save on structural framing costs. Longer sheets speed building erection and lower field costs. Tufcor deck with insulating concrete offers a better roof system to designers, builders and owners. Here's why:

GREATER STRENGTH—Fabricated from 80,000-psi steel, new Tufcor supports greater loads, takes construction abuse. Galvanized Tufcor chemically bonds with insulating concrete to form a structural composite deck assembly, has a safety factor of 5 to 10 times live load.

Tufcor roofs are so strong they are approved by the International Conference of Building Officials as diaphragms to resist *earthquake* forces.

LIGHTWEIGHT—Tufcor plus insulating concrete weighs about 7 psf, which is *4 to 6 psf less than many deck systems!* Incorporating the dead load of a Tufcor system in your building design offers savings in cost of framing.

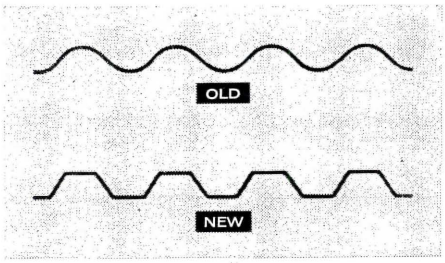
EFFECTIVE INSULATION—Insulating concrete provides excellent resistance to heat. To obtain desired "U" factor, you merely vary the thickness of concrete fill. Slopes for drainage are easily provided. Tufcor's vapor barrier action keeps moisture out of fill, keeps insulation effective.

FIRE-RESISTANT—Exposed deck has UL fire resistance rating. Neither Tufcor nor insulating concrete supports combustion. System saves on insurance rates and on cost of sprinkler system.

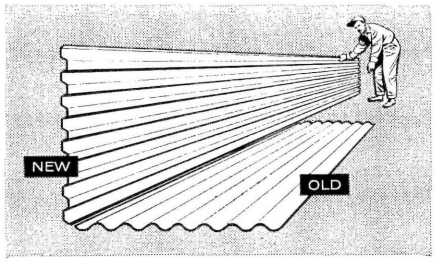
AVAILABLE COAST TO COAST—Investigate Tufcor *now!* For more facts, consult your Granco district office or mail coupon.

TUFCOR® ROOF DECK, IN ROOF CONSTRUCTION!

Our catalogs are filed in Sweets!



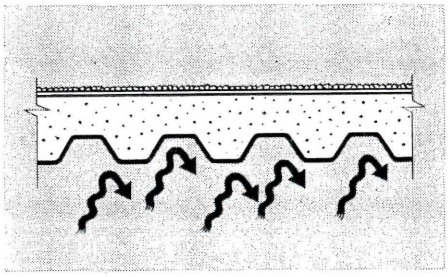
STRONGER CORRUGATION—New angular Tufcor pattern increases sheet strength 25%, and, with longer length, ups effective span range from 7′ to 10′.



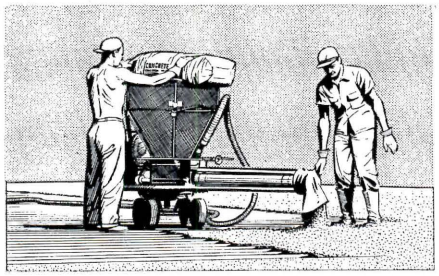
LONGER SHEETS—Now up to 21′6″ long! Sheets cover greater area—up to 56 sq. ft. per sheet. Fewer laps, fewer welds mean faster construction!

GRANCO®

GRANCO STEEL PRODUCTS COMPANY
6506 N. BROADWAY, ST. LOUIS 15, MO.



POSITIVE VAPOR BARRIER—By preventing penetration of warm, moist air, Tufcor keeps insulating concrete dry and effective, reduces heating costs.



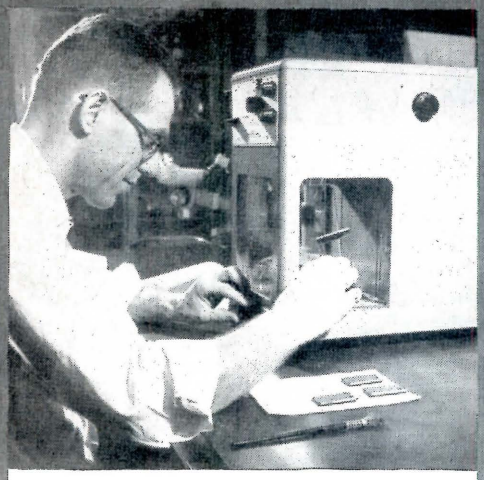
LOWER COSTS—Comparing "U" values, dead load savings, maintenance, and vapor barrier action, Tufcor is the lowest-cost roof system available.

A Subsidiary of
GRANITE CITY STEEL CO.
Granco Distributors in 86 Principal Cities

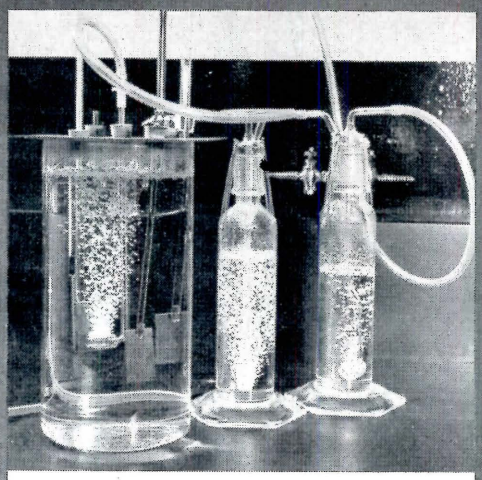
SINCE GRANITE CITY STEEL 1878

FREE! NEW TUFCOR PRODUCT MANUAL!

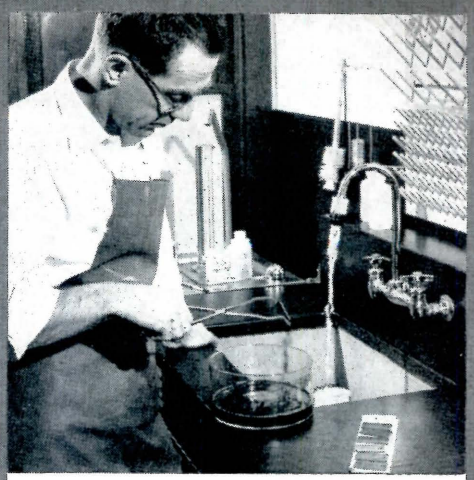
Just sign this coupon . . . clip it to your company letterhead . . . and mail to Granco address shown above. Attention: Department R-88.



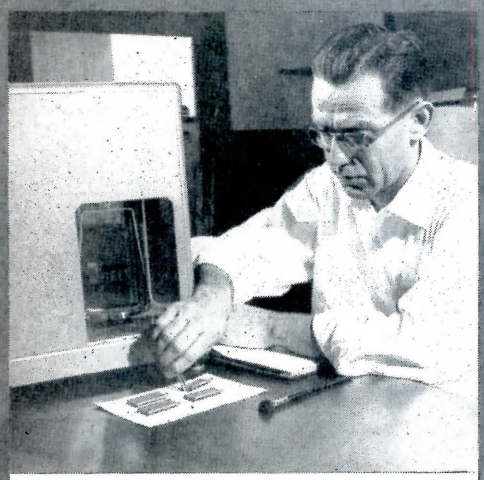
1 Analytical weighing of specimens prior to testing



2 Steam condensate corrosion test

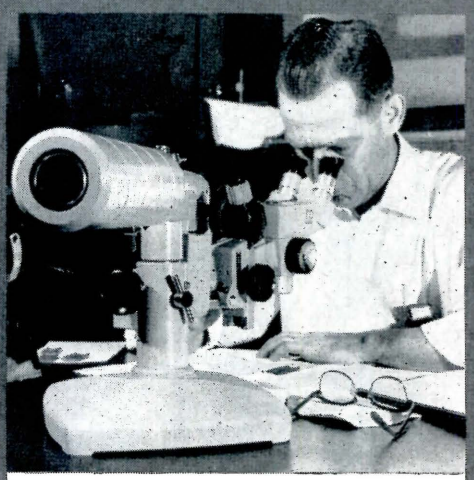


3 Cleaning specimens with inhibited hydrochloric acid



4 Second analytical weighing to determine corrosion weight loss

5 Calculation and statistical analysis of laboratory test results



6 Final examination of specimens under low power magnification

Extensive testing program proves new 4-D Wrought Iron more corrosion-resistant than ferrous substitutes

Test results from the Byers Research Laboratory lend documentary support to the superiority of new 4-D Wrought Iron—over standard Wrought Iron as well as ferrous substitutes.

Convincing case-history service records are now further substantiated by the conclusive findings of our metallurgical staff. Some typical results of this testing program are presented in the chart at right.

The Byers field service representative will be pleased to relate these test results to your corrosive applications. Write us for helpful literature on new 4-D Wrought Iron. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

BYERS WROUGHT IRON

Comparative Analysis of 4-D Wrought Iron Corrosion Tests

Tests	4-D Wrought Iron	Standard Wrought Iron	Ferrous Substitutes
Severe industrial atmospheric continued exposure 17 years	Corrosion weight loss 540 grams/sq. ft.	Corrosion weight loss 655 grams/sq. ft.	Not included in test
Steam condensate return line	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures 10 years (still in service)	Complete failure after 2 years
Aerated salt water—5 weeks (Short term test—points indicate 4-D Wrought Iron curve flattening out at much lower rate of attack)	Corrosion weight loss 146 mg/sq. in.	Corrosion weight loss 170 mg/sq. in.	Corrosion wt. loss 226 mg/sq. in.
Brine piping	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures 23 years (still in service)	Complete failure after 7 years
Salt water, Gulf of Mexico ¼ inch plate—17 years	Corrosion weight loss 4 mills/years (minimum plate thickness now 3/16") Still in excellent condition	Not included in test	Corrosion weight loss 30 mills/years; plate badly pitted, perforated
Downspout	*At least 25% greater corrosion-resistance than standard Wrought Iron	No failures in 29 years (Still in service)	Complete failure after 18 years

*In this application no long term test data yet available on 4-D Wrought Iron. Results shown are derived from short term tests.

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August 1958

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The Warren Petroleum Building, Tulsa, Okla. Skidmore, Owings & Merrill, Architects.
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August 1958 Vol. 124 No. 2

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Berkeley 8, California.

Coming in the Record

BUILDING TYPES STUDY: HOSPITALS

Next month's study will be largely taken up with a current report on what's new in operating suites. This critical element in the hospital has seen many forward steps in recent years. The most notable suites in a dozen new hospitals will be evaluated.

SPACE FRAME ET CETERA

A new industrial building for Transistor manufacture, done by O'Neill Ford and Richard Colley, has several points of engineering interest, such as space frame construction, the space in the frame serving as duct space, hyperbolic paraboloid roof umbrellas to give open spaces, and so on.

PARKING GARAGES

The ubiquitous problem of parking downtown leads to further and further construction of parking buildings, and to further refinement of design for best operation. How to design the garage is described in detail by experts at the National Parking Association.

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

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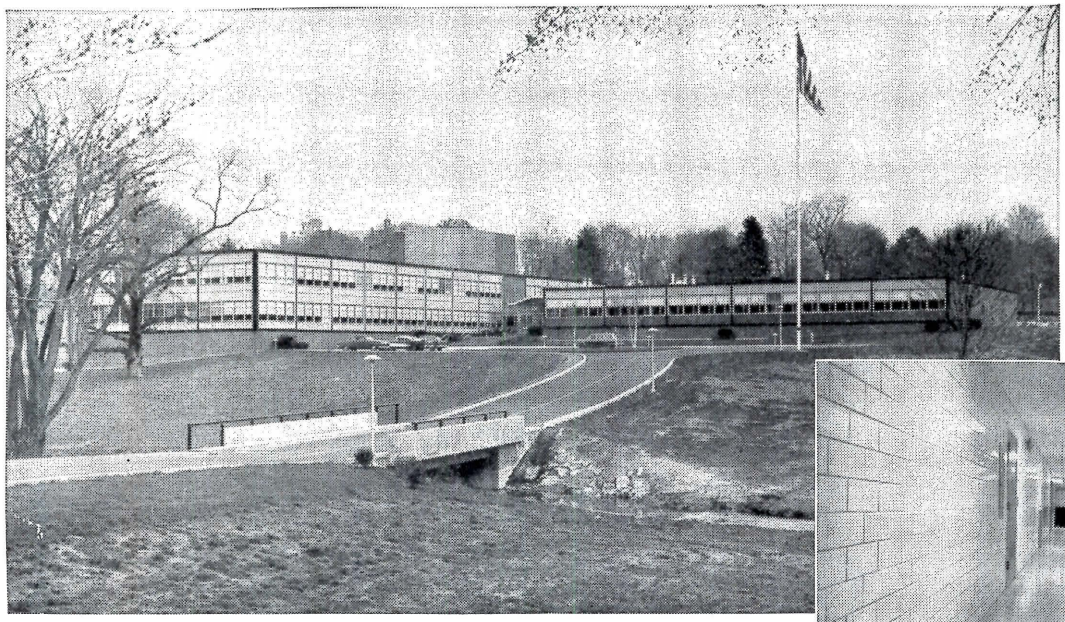
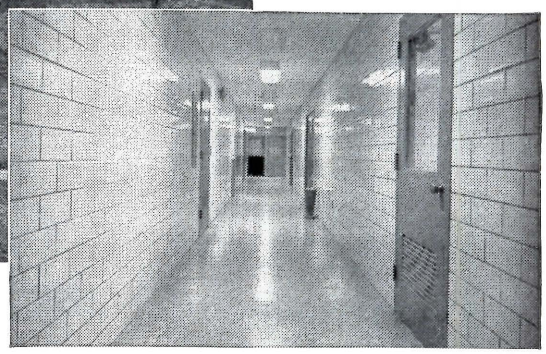
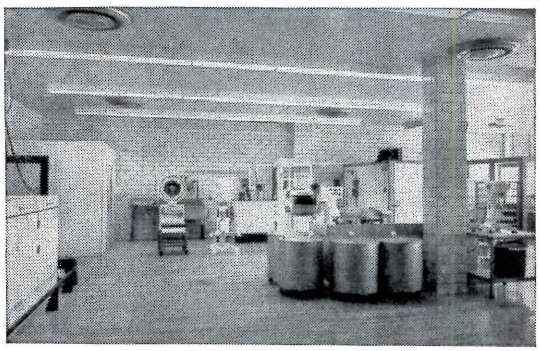
Works of Wonde_

Wonder Bread Builds For Tomorrow With Erection of Distinctive Office-Research Laboratories



WONDER-LAND of Continental Baking Company is situated on 25-acre tract near New York City. Note below the gleaming walls which add clean, efficient look to product development laboratories.





● Continental Baking Company's leadership finds new expression in the streamlined construction of its million dollar headquarters and research laboratories in Rye, New York.

This nerve center of the nation's leading baker is as fresh in appearance and wholesomely-modern as the products it sends to market.

Essential to the attractiveness, economy, and quality of the structures was Lone Star Masonry Cement, used throughout all of the masonry work. It combines all the properties needed to make outstanding performance a certainty, and to satisfy Owner, Architect, and Mason:

1. High water retention, assuring excellent workability, plasticity, bond.
2. Adequate strength.
3. A ready-to-use masonry cement that means one less material to handle on the job.
4. Low shrinkage.

For the highest standards of dependable performance . . . for wonderful quality masonry construction that lasts and lasts . . . use Lone Star Masonry Cement—every time!

The inherent water repellency and low absorption of Lone Star Masonry Cement make the addition of any waterproofing material unnecessary.

Owner: **CONTINENTAL BAKING COMPANY**
Rye, New York

Architect: **LATHROP DOUGLASS**
New York, N. Y.

General Contractor
HEGEMAN-HARRIS COMPANY, INC.
New York, N. Y.

Mason: **AULETTA CONSTRUCTION CORPORATION**
Yonkers, N. Y.

Lone Star Masonry Cement Supplied by
ARROW BUILDERS SUPPLY CORPORATION
New York, N. Y.

LONE STAR CEMENTS COVER
THE ENTIRE CONSTRUCTION FIELD

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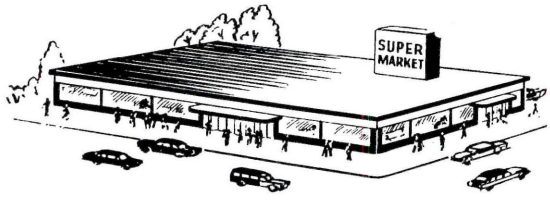
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 21 MODERN MILLS, 48,900,000 BARRELS ANNUAL CAPACITY

NEW DATA SHOWS HOW TO SAVE

$5,000 ON AIR-CONDITIONING EQUIPMENT
$2,500 ON INSULATION, and up to
$300 *ANNUALLY* ON ELECTRIC BILLS
in a 20,000 sq. ft. 1-Story Building

ROOF HEAT GAIN *SLASHED* 86% or 268,000 Btu's per hour

Simple roof heat gain calculations just compiled reveal that by installing scientific multiple aluminum Type 4S-LL insulation between either wood or steel ceiling joists of



a typical 20,000 sq. ft. store or other 1-story building, there is obtained:

An unprecedented 9-2/5" roof insulation value in summer against heat flow downward.

This reduces roof heat gain from 310,000 Btu/hr. to 42,000 Btu/hr.—a slash of 86%.

This means less mechanical cooling capacity is needed; smaller ducts and compressors. With equipment cost at approximately $550 a ton, a 10-ton reduction saves $5500. Add a saving up to $300 a year for electricity. Type 4S-LL insulation costs 8¢ sq. ft. installed, material with labor, between wood joists; (2¢ sq. ft. more between steel joists).

An illustrated THERMAL VALUE CHART AND DATA SHEET is available which lists thermal factors in ceilings, walls, and floors, winter and summer, of over 40 odd thicknesses of non-metallic insulation, and over 30 types of scientific multiple aluminum insulation.

It enables you to select easily and quickly the insulation required to meet a given "U," "C," or "R" factor, or "inch equivalent." It shows the "C," "R" or thickness needed to attain a desired "U"; and what "U" will result from an insulation with a given "C," "R," or thickness.

Send coupon for above thermal chart and for a sample of this remarkable Type 4S-LL insulation.

CHART OF BTU ROOF HEAT GAIN CALCULATIONS FOR 20,000 SQ. FT. 1-STORY BUILDING

Assume typical design conditions 2 P.M. August 1. Slag on tar roof on 1" wood deck. 12" masonry walls, furred inside, gypboard finish.

Btu per hour HEAT GAIN for 20,000 sq. ft. ROOF

ROOF with NO INSULATION	With ROOF INSULATION of 1", (*k* value .36)	With 9⅖" ROOF INSULATION VALUE of TYPE 4S-LL INFRA INSULATION
310,000 Btu's	182,000 Btu's	42,000 Btu's

Per cent REDUCTION of Roof Heat Load by Type 4S-LL INFRA	86%
Per cent REDUCTION of Roof Heat Load by Type 4S-LL INFRA over 1" (*k* .36) Insulation	76%

Infra Insulation Inc., 525 Bway., N. Y., N. Y. Dept. R-8
Please send new Thermal Value Chart and Data Sheet. ☐
☐ Type 4S-LL Infra Insulation.

NAME_____

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ADDRESS_____

CALL TO PRACTICE: A.I.A.'S CLEVELAND CONVENTION

Architectural practice—the business of architecture—was the real theme of this year's annual convention of the American Institute of Architects, July 7-11 in Cleveland. Not as big or as exciting as last year's Centennial convention, but still surprisingly big—over 2000 registered, compared with 4200 in Washington last year and 1800 in Los Angeles in 1956. And if some were wistful after last year's note of high dedication to the great purposes of Architecture, most seemed to be worrying harder about how the architect meets the everyday challenge of serving his everyday client in a world forever more complex, forever wanting him to know more, more, more than he will ever have time to learn. The hunger for information, the yearning for some panacea to solve the desperate problems of communication and assimilation that assault the architect as he confronts increasing responsibilities and ever sharper competition: these made the context and—in a highly acute stroke of timing on the part of the Institute—the program and the more serious off-the-record chatter of the convention.

Richards Named President

John Noble Richards of Toledo became the thirty-seventh president of the Institute in an election in which there nearly were contests for every office for the first time in anybody's memory. It didn't quite happen, because one of the two candidates for treasurer withdrew before the voting. Mr. Richards' opponent was Alexander C. Robinson III of Cleveland. Philip Will Jr. of Chicago was elected first vice president in a contest with Albert S. Golemon of Houston; Henry L. Wright of Los Angeles second vice president after a three-way contest with Austin W. Mather of Bridgeport, Conn., and Herbert C. Millkey of Atlanta as his opponents; Edward L. Wilson of Fort Worth (the incumbent) secretary, over Louis L. Scribner of Charlottesville, Va.; and Raymond S. Kastendieck of Gary, Ind., to succeed himself as treasurer.

1

2

3

BIG MOMENTS ON THE AGENDA

1. New president John Noble Richards (right) of Toledo takes over from retiring president Leon Chatelain Jr. of Washington, D. C. 2. A.I.A.'s highest honor, the Gold Medal, is bestowed on John Wellborn Root of Chicago. 3. Allied Professions Medal—new award this year—goes to structural engineer Fred N. Severud of New York. 4. The "old Board" introduced by President Chatelain at the opening session (left to right) Donald J. Stewart of Portland (Northwest); John H. Pritchard of Tunica, Miss. (Gulf States); Bryant E. Hadley, Springfield, Ill. (North Central States); Sanford W. Goin, Gainesville, Fla. (South Atlantic); Bradley P. Kidder, Santa Fe (Western Mountain); Raymond S. Kastendieck, Gary, Ind. (treasurer); Austin W. Mather, Bridgeport, Conn. (New England); Matthew W. Del Gaudio, New York (New York); Edward L. Wilson, Fort Worth, Tex. (secretary); Philip Will Jr., Chicago (second vice president); Mr. Chatelain; Bergman S. Letzler, Louisville (Great Lakes); I. Lloyd Roark, Overland Park, Kan. (Central States); J. Roy Carroll Jr., Philadelphia (Middle Atlantic); U. Floyd Rible, Los Angeles (California-Nevada-Hawaii). The new president, first vice president on the old Board, is hidden by Mr. Chatelain in this picture. All but Mr. Chatelain and directors Del Gaudio, Kidder, Hadley and Mather are also on new Board (see page 16). 5. Major speakers (left to right) Vincent G. Kling, A.I.A., Philadelphia, convention keynoter; Dr. Margaret Mead, anthropologist, and William B. Tabler, A.I.A., of New York. 6. Newly advanced Fellows pose after investiture at annual dinner. 7. Scene at Debate on extension of the East Front of the Capitol. Delegates voted to reaffirm Institute's opposition.

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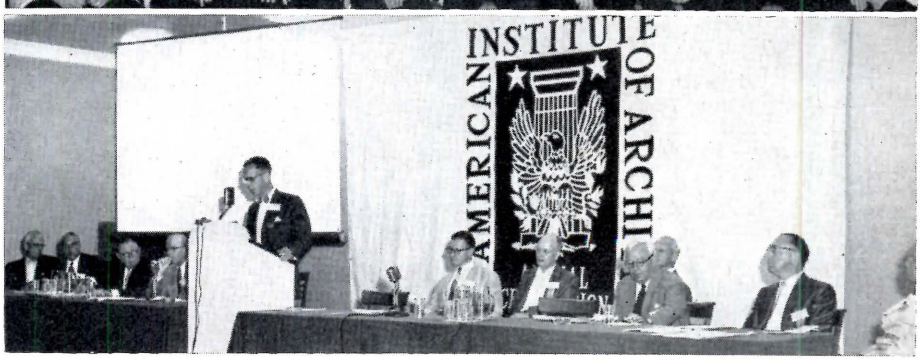

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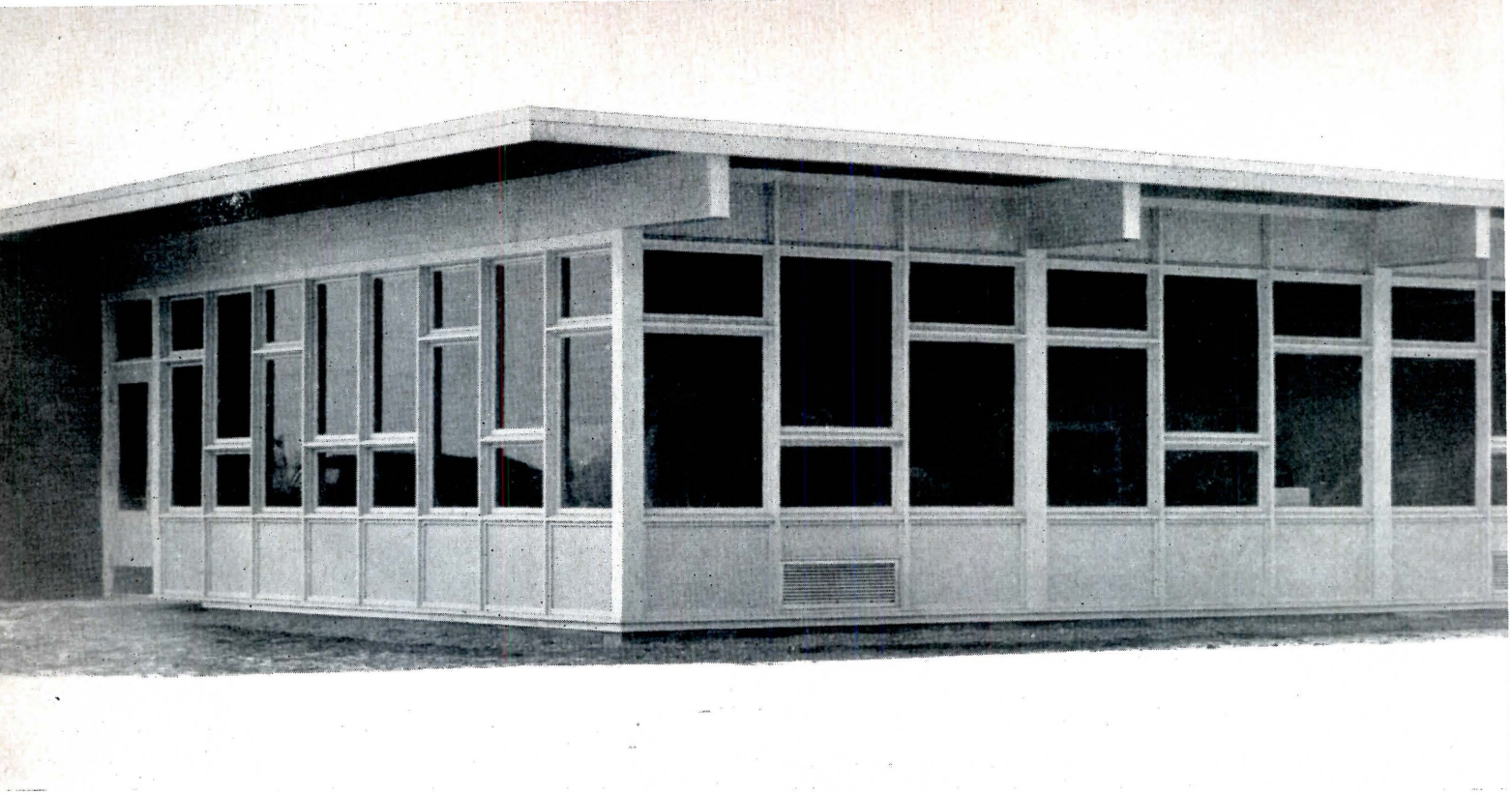

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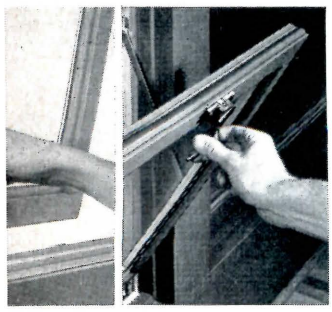

Easy to open. Andersen special design and engineering make Flexivent Windows open smoothly. Choice of underscreen operators optionally available.

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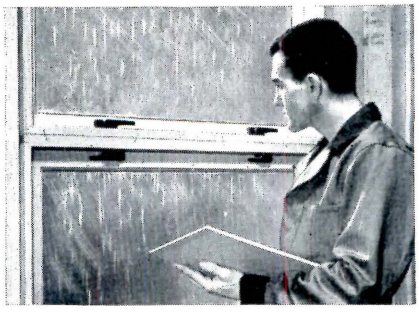

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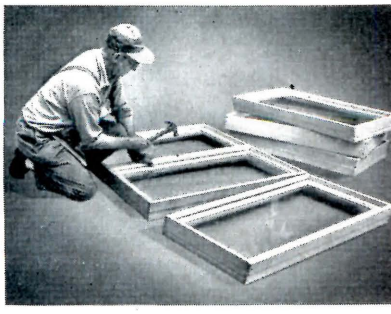

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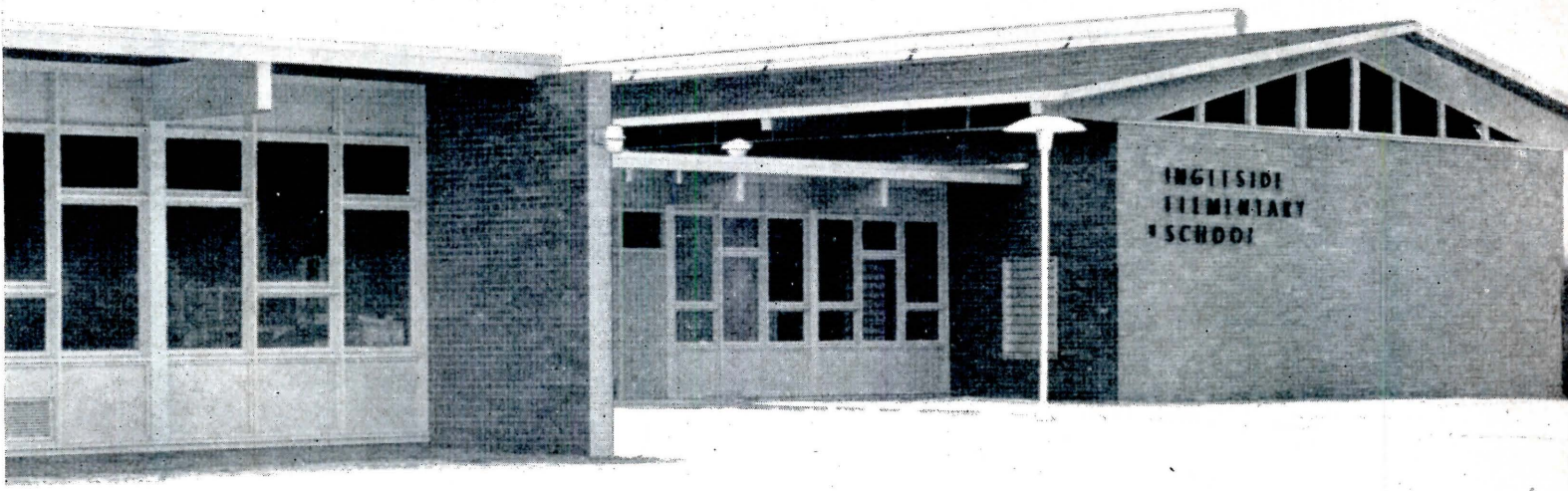

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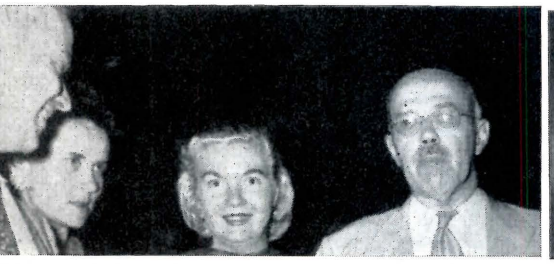
Clinton Brush of Nashville, Gulf States' next regional director, with Mrs. Clair Ditchy of Detroit, A.I.A. Past President Ditchy and

Mrs. Brush. . . . Student group's president and vice president, Paul J. Ricciuti, Kent State, and Gene Burr, Alabama



Edwin B. Morris Jr., Assistant to the Executive Director of the A.I.A., Mrs. Morris, Mrs. Walter Taylor and A.I.A. Education

and Research Director Mr. Taylor. . . . Industrial Arts Medalist Merle Armitage with Regional Director Floyd Rible, Californians

Charles Kelly of Montgomery, Ala., John T. Kelly and John J. Carr of Cleveland. . . . A.I.A. staffer Marvin Mayhew, assistant to

Administrative Secretary, with Second Vice President—now first vice president—Philip Will Jr. of Chicago

Robert Elkington, St. Louis; Henry Wright of Los Angeles (new second vice president); John Carl Warnecke, San Francisco; Robert

Little, Miami; Dean Arthur Gallion, University of California. . . . Dean Henry Kamphoefner of N. C. State

Above: the then president-to-be, John Richards, with Mrs. Richards and Mr. and Mrs. George Vernon Russell of Los Angeles. . . . Above right: Cleveland Chapter President R. Franklin Outcalt and Fine Arts Medalist Viktor Schreckengost. . . . Right: this year's edition of the most special session of any A.I.A. convention—Pittsburgh's (and Carnegie's) Bob Schmertz, with banjo, singing his songs (of architecture and many things)—Mrs. Harris Armstrong of St. Louis is one of his enthralled listeners in upper photo; below—Marvin Mayhew and Clinton Brush in background; Mr. and Mrs. Jack McKee of Pittsburgh, Mrs. Carl Feiss of Washington, D. C., and Mrs. Emerson Goble; and (foreground) Carl Feiss and James Hornbeck of the RECORD

Four new regional directors also were elected, all without contest: Harold T. Spitznagel of Sioux Falls, S. D., *North Central States;* Frederick H. Porter Sr. of Cheyenne, Wy., *Western Mountain;* Trevor W. Rogers of Buffalo, *New York;* and Alonzo J. Harriman, Auburn, Me., *New England.*

Business and Sentiment

The business of the convention—with one exception—was quickly and expeditiously accomplished. The annual report of the Board of Directors, mailed to the membership in advance of the convention, constituted the basic agenda for the business meetings, and this year it evoked very little discussion. The one point on which there appeared to be some soreness, the reorganization of many of the Institute's committees into "General" (five-man) committees from the prior "Vertical" (12-man) setup which gave each A.I.A. region a representative on each committee, was covered in a rather mild resolution instructing the Board "to reconsider its recent action which eliminated full regional representation of some committees after discussion of the effects of such action with the chairmen of all committees." The delegates also passed resolutions reestablishing an Institute Committee on Fees and Contractual Relations and establishing a Committee on Building Codes. Of the three amendments to the by-laws proposed by the Board, the convention approved one which authorizes the Board to establish additional regional districts (there are now 12)—this in connection with probable establishment of Florida and California as separate regional districts; referred back to the Board for further study one providing for "Withdrawals of Corporate Memberships when Members are no Longer in Practice of Architecture or Closely Related Professional Activities"; and disapproved one which would have made transfer of corporate membership contingent on the applicant's prior registration in the state or territory of the chapter to which he seeks assignment.

If all of these matters were settled with little or no excitement, the drama surrounding the passage of a resolution reaffirming the Institute's "traditional position" in opposition to extension of the East Front of the U.S. Capitol more than made up for it. This took an entire morning session, the most crowded by far of the convention; it began with a solemn charge by the presiding officer to the assemblage to remember that the

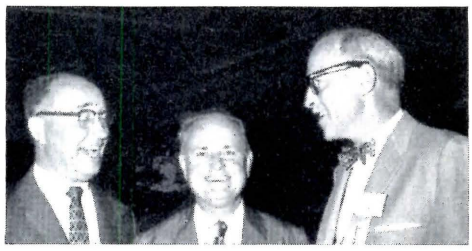
eyes of the nation were upon them and—in effect—that they were architects and gentlemen; and it continued with 45 minutes by the clock assigned to each of the two "sides" to present their views. The vote on the resolution, which was overwhelmingly for opposition, provided the convention with its moment of high suspense. In a later action, the convention resolved "that this action of the convention is in no way to be considered a reflection on the professional integrity and competence of the architects commissioned for the work" and "that the American Institute of Architects has complete confidence in the ability of these firms to successfully carry to completion any revised program that may be developed to provide the necessary facilities without sacrificing the East Front of the Capitol."

Wanted: Information

The convention program was a busy one, with major speeches and business sessions scheduled for mornings and three concurrent panel sessions for each afternoon—not to mention the usual array of tours, exhibits and traditional and special social occasions. The panel sessions were fairly well attended, considering each had two competitors, and taken together they offered a short course in common professional concerns—"How to Set Up an Office"; "Education—Relative Responsibilities of the Profession and the Schools"; "New Fields of Architectural Research"; "Where to Find Construction Money"; "Developing Today's Building Program"; "Working with the Home Builder"; "How to Make Better Cost Estimates"; "Professional Status—Your Most Valuable Asset"; and "Chapter Affairs."

Probably the most provocative of the panel sessions was the one on architectural research, at which Herbert H. Swinburne, A.I.A., newly appointed to the A.I.A. Committee on Research, proposed that the Institute undertake a broad new program of research employing the resources of the behavioral sciences to strive toward a true understanding by the architect of his changing client and its needs.

In his keynote address, Vincent G. Kling, A.I.A., of Philadelphia put the question, "Shall we be architects or technicians?" and suggested the answer is "in knowing, and acting on, the difference. The technician is a man highly competent in a given field, applying himself to one aspect of a larger problem or a larger goal without respect to its broadest dimensions. The architect, on the other



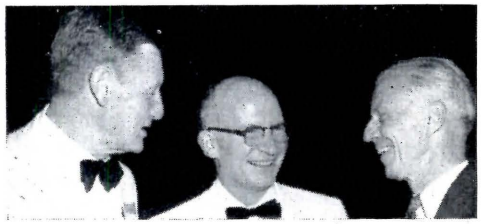
Left: (top to bottom) Harris Armstrong of St. Louis and Mario Ciampi of San Francisco. . . . West Virginia's Cyrus E. Silling with James Edwards of Atlanta and Henry Wright of Los Angeles. . . . RECORD Publishing Director H. Judd Payne (center) and Mr. and Mrs. Ditchy of Detroit

William Stanley Parker of Boston and Samuel Lunden of Los Angeles. . . . Richard Aeck of Atlanta, A.I.A. Research Secretary

Eric Pawley and the new A.I.A. regional director for New England, Alonzo Harriman of Auburn, Maine

Mr. and Mrs. James T. Lendrum of Florida and Herbert L. Smith Jr. of the RECORD. . . .

Charles Porter of New Jersey with Mr. and Mrs. Robert Alexander of Los Angeles



A.I.A. Executive Director Edmund R. Purves; Joseph Ceruti of Cleveland, convention chairman; and Arthur Holden of New

York. . . . Emerson Goble, editor of ARCHITECTURAL RECORD, with John Carl Warnecke of San Francisco and Mrs. Goble

Mrs. Raymond Kastendieck of Gary, Ind., with John Richards and J. Roy Carroll, Philadelphia. . . . Howard Barringer, presi-

dent of the F. W. Dodge Corporation; Mrs. Barringer; and Thomas S. Holden, vice chairman of the Board of F. W. Dodge

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Says J. Gordon Carr, A.I.A.

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"The canted walls use an ashlar arrangement of Minaboard and are held away from the floating ceiling to create an additional plane.

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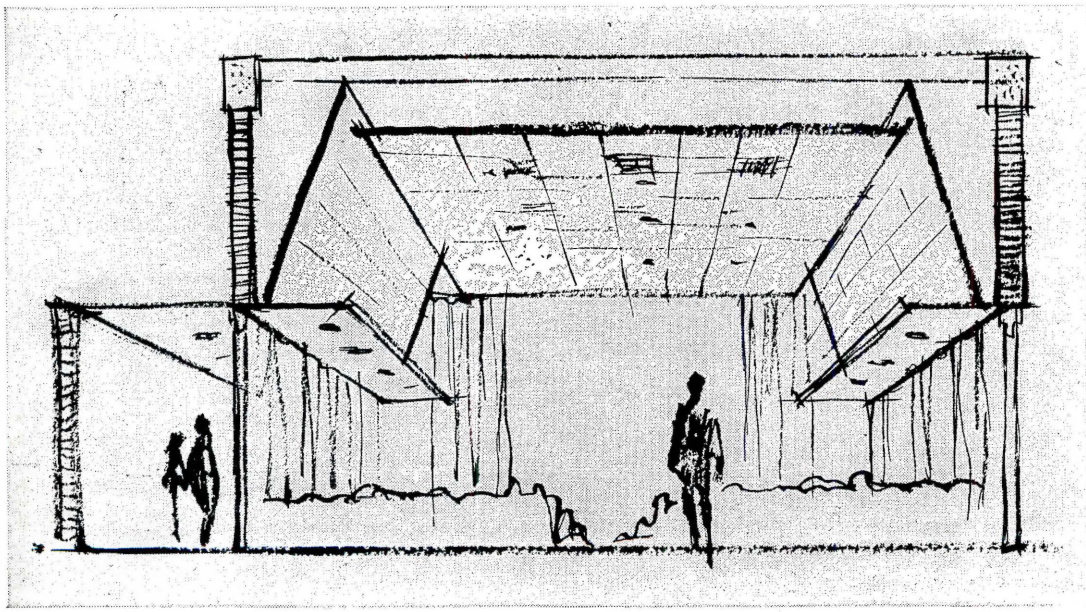

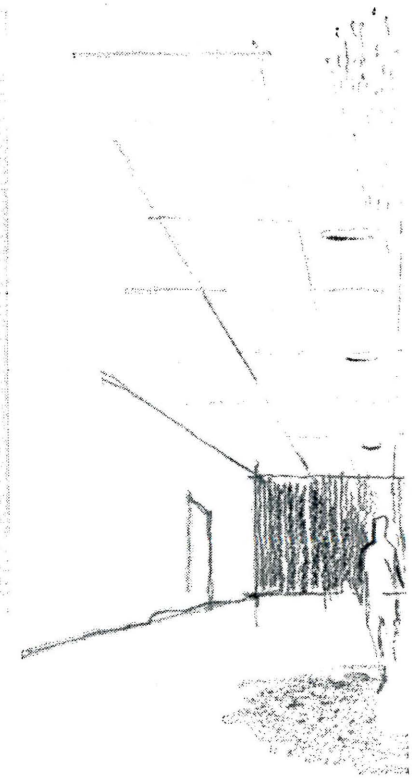

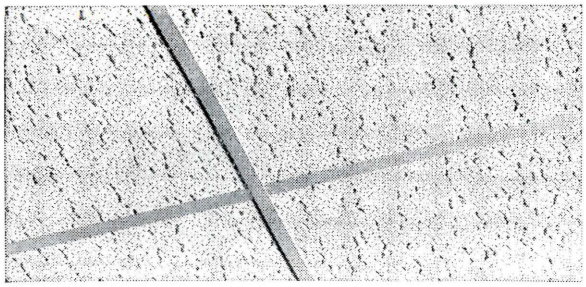

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Harrison Salisbury of The New York Times (above left) addressing annual dinner; welcome to Cleveland from Chapter President Franklin Outcalt (center); President Harlan Hatcher of the University of Michigan addressing the opening luncheon

Top: President Chatelain receives the new "President's Medal" from its initiator, Past President Ralph Walker of New York. Above: the new A.I.A. Board holds its organization meeting following the convention

Three of the liveliest convention panels: (top) research—Walter E. Campbell, chairman of A.I.A. Committee on Research, A.I.A. research secretary Eric Pawley, Herbert H. Swinburne and Samuel Lunden; (center) "How to Set Up an Office"—C. F. Bauersfeld, tax attorney, Daniel Schwartzman, Howard Eichenbaum and Douglas A. Russell of Daniel, Mann, Johnson & Mendenhall; (above) "Education—Relative Responsibilities of the Profession and the Schools"—William Wilson Wurster, Alex Cochran (chairman, A.I.A. Committee on Education), Dr. Edwin Burdell, president of Cooper Union, and Cecil A. Alexander

hand, we have come to think of as something quite different. It's no longer a question of being different, it's a question of being *more*. If we combine our proud professional heritage, our traditionally high standards, and a broad sense of service with a technician's mastery of the intricacies of practical life in the modern world, we will be good, I think, for another century at least."

Another major speaker, William B. Tabler, A.I.A., of New York, pleaded for building code reform, with the A.I.A. taking the lead, so that "buildings could illustrate what we can do instead of, as today, what we can't do."

It was the anthropologist Dr. Margaret Mead who made the simplest and most vivid definition of the modern architect's problem: "how to plan in a way that takes account of change consciously and how to bring into one's consciousness all the things that were once carried on by tradition."

First Report on C.S.I. Sessions

There were strong signs at the annual Construction Specifications Institute convention, July 5-9 in Cleveland, that C.S.I. is determined to accept the responsibilities of a mature professional society. Having mushroomed from 825 members in 1956 to 3000 this year, C.S.I. is having some growing pains which it hopes to solve by these steps:

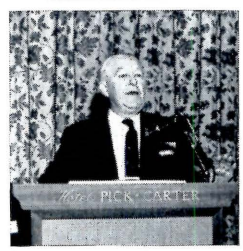
1. A full-time executive director will be appointed with headquarters in Washington.

2. The nation has been divided into 12 regions, with a director for each. The board of directors will consist of these 12 plus three alternates, and the three top officers.

3. An executive committee replaces the former administrative affairs committee which will carry out policies established by the board.

The site for next year's convention is Chicago. (A fuller report on the C.S.I. convention and its program will appear next month.)

C.S.I. notables (above at Institute's annual dinner, held in connection with its Cleveland convention. Standing (left to right) Past President Lester Burn of Washington, D. C.; Rolf Retz, director, Sacramento, Cal.; Frank Crouch, director, Detroit; Frank Crimp, director, Boston; R. Redmond Coghlan Jr., director, Los Angeles; J. Stewart Stein, president, Chicago; Harry Plummer, secretary-treasurer, Washington, D. C.; Willard Barrows, vice president, New York City; Glen Abplanalp, director, New York City; and Norvell Hill, director (and convention chairman), Cleveland. Below left: President J. Stewart Stein; below right: President Stein with Secretary-treasurer Harry Plummer. Bottom left: Vice President Willard Barrows; bottom right: Carl Mann, C. S. I. publications; Robert E. Fischer of ARCHITECTURAL RECORD; and Director R. R. Coghlan of Los Angeles



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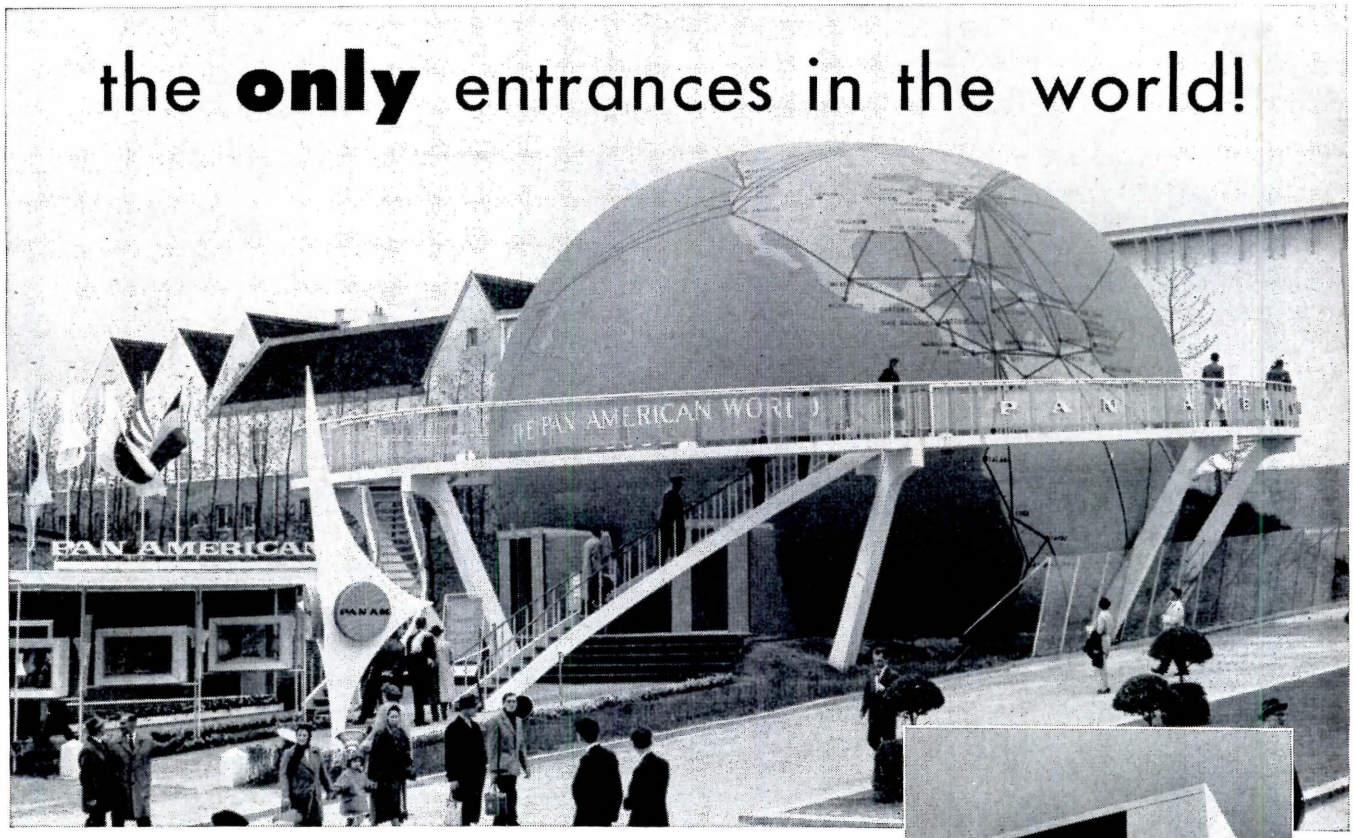

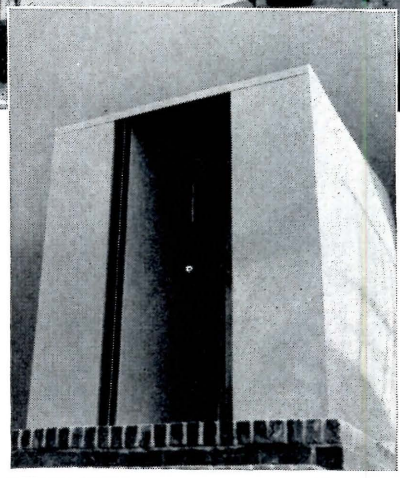

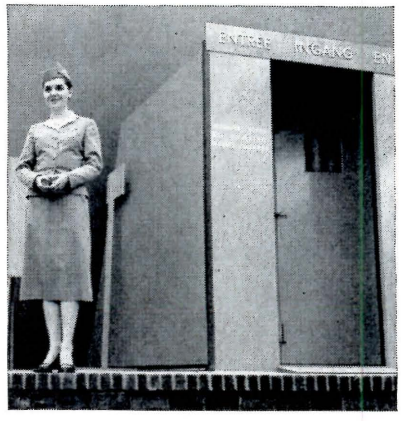

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in the Pan American Air House Exhibit at the Brussels World's Fair provide proof positive of their effectiveness!

Among the hundreds of fascinating exhibits and buildings at the Brussels World Fair (April 17 to October 20, 1958), the "Pan American World," the first air-house to be seen in Europe, is proving to be one of the most popular.

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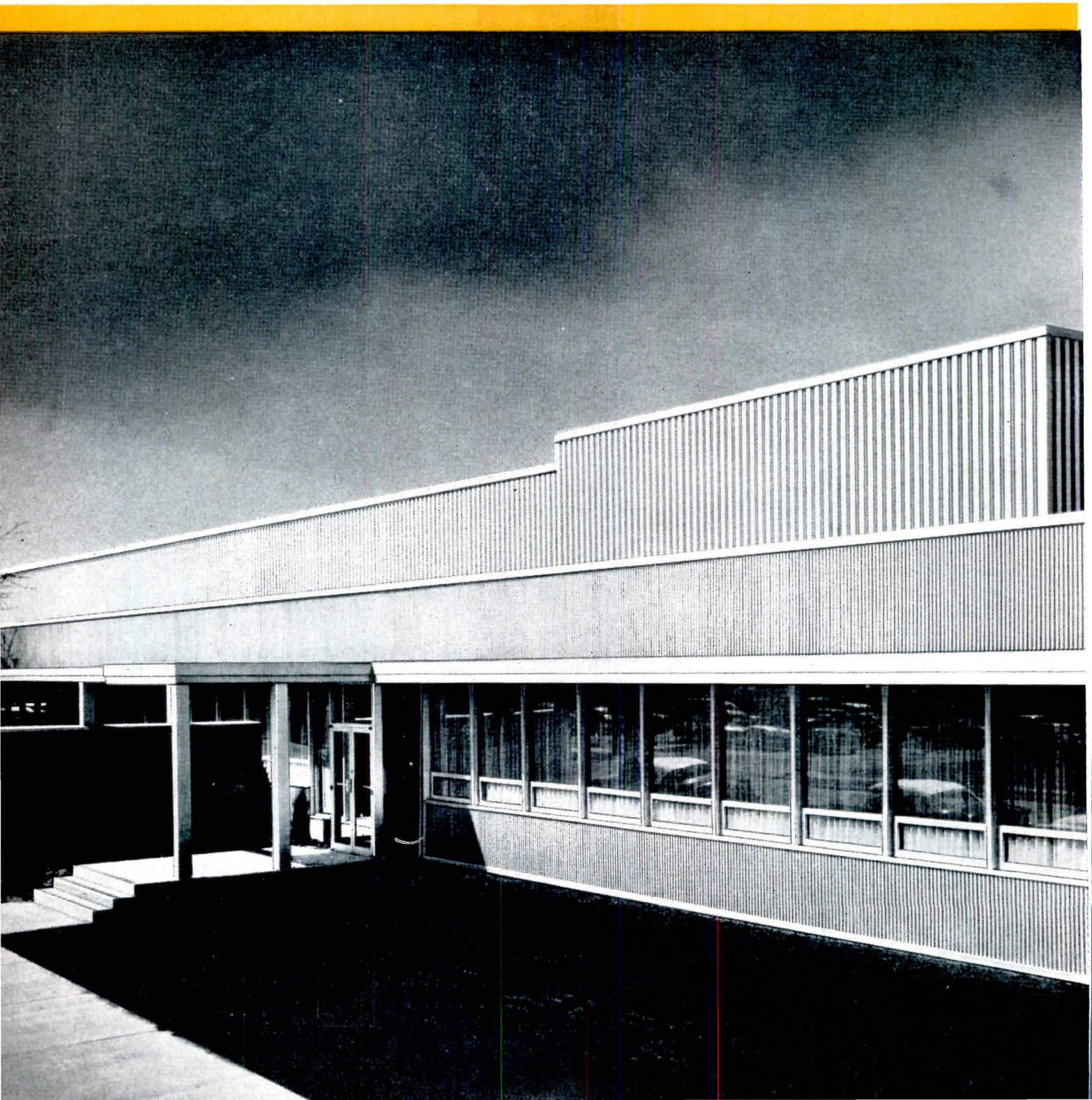

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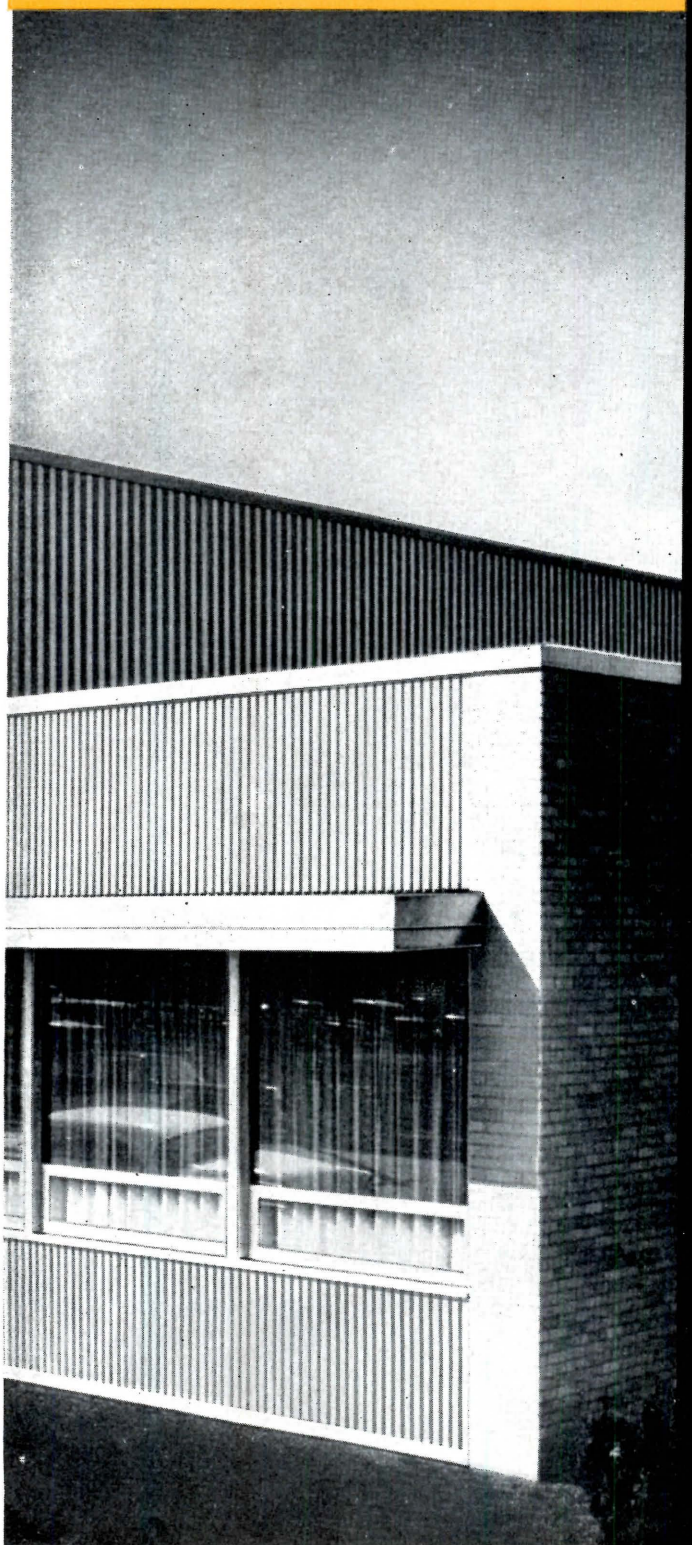
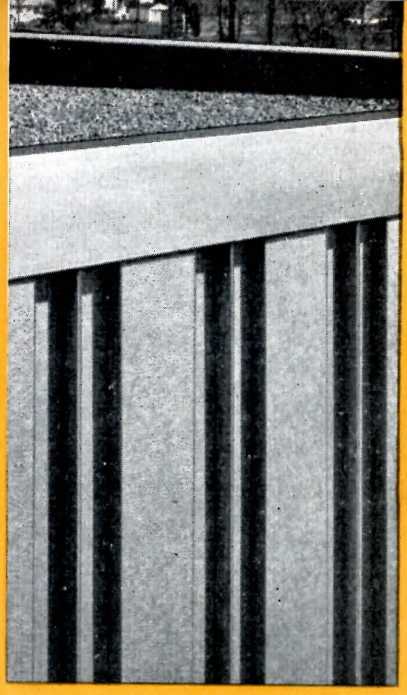
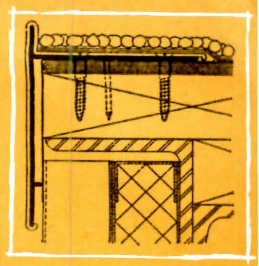
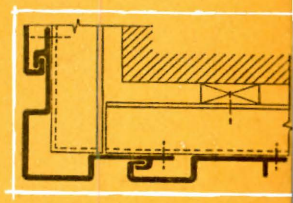


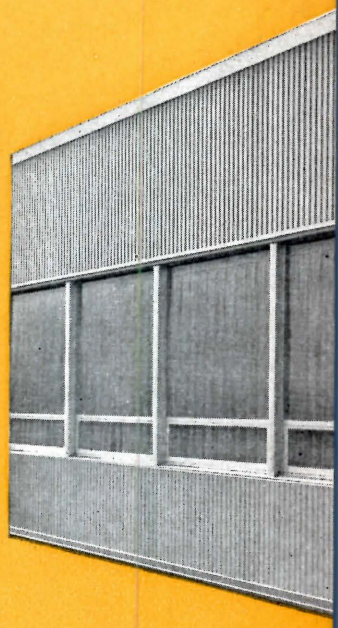




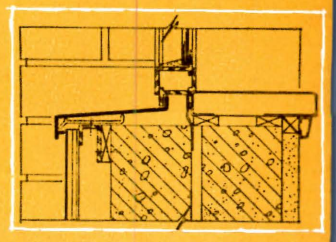
Typical detail and photo of Kaiser Aluminum's Type K-1 Gravel Stop. Note simplicity and pleasing shadow line that results from the straight drip edge feature.



Kaiser Aluminum's standard Facing System may be used for interior or exterior applications. Typical detail shows outside corner components in horizontal section. Photo shows pleasing texture effect of the configuration.



The straight drip edge feature of Kaiser Aluminum's Type K-1 Window Sill is shown in typical detail and photo. As in the Type K-1 Gravel Stop, this feature contributes to the structure's contemporary design. Standard sill widths range from 2⅛" up to 8¼" plus ⅜" drip overhang.



ENGINEERS AND ARCHITECTS: Giffels & Vallet, Inc., L. Rossetti

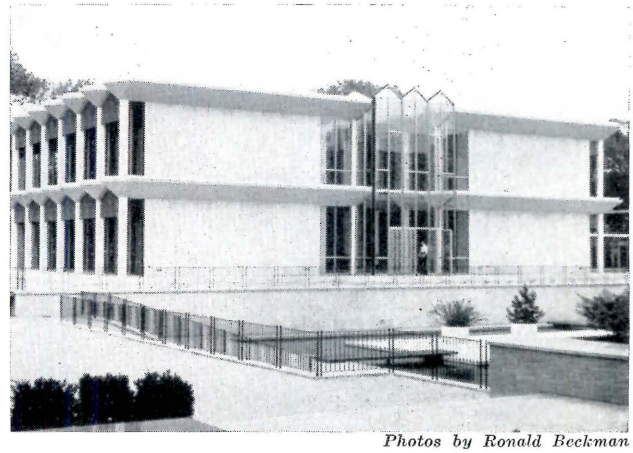
CURTAIN WALL FABRICATOR-ERECTOR: The R. C. Mahon Co.

GENERAL CONTRACTOR: Perron Construction Co.

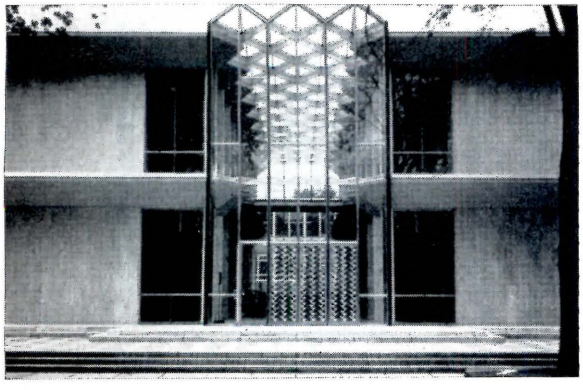
Copper & Brass Sales, Inc. (Kaiser Aluminum Distributor), Detroit, Michigan

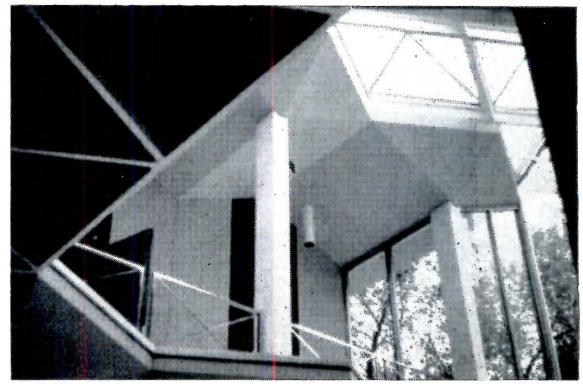
WAYNE CONFERENCE HALL DEDICATED

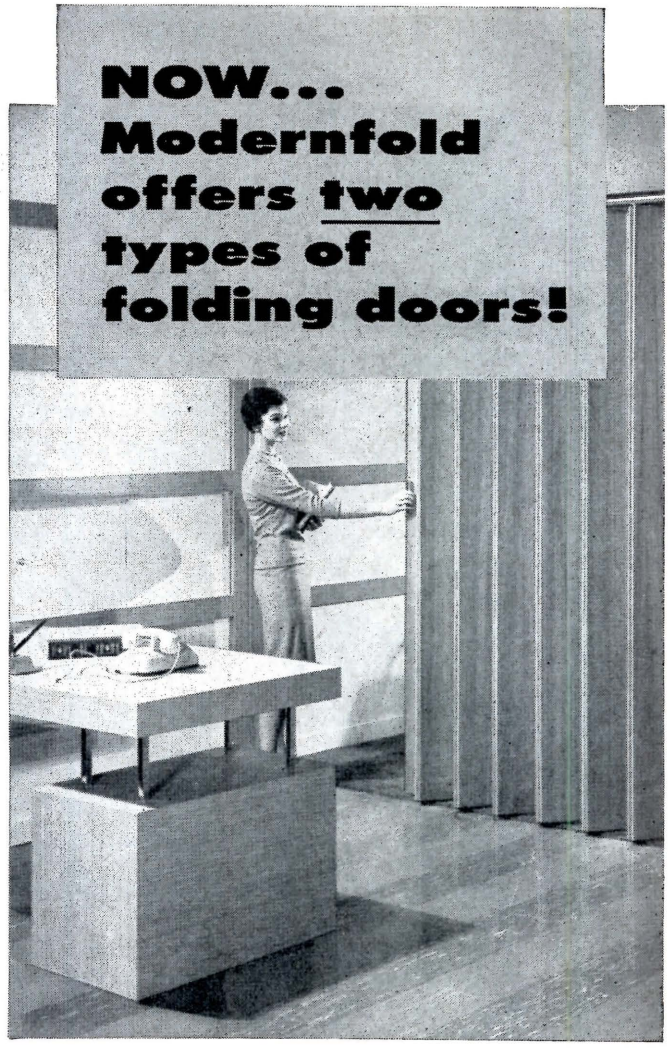
Five photographs of McGregor Memorial Conference Center at Wayne State University, Detroit, Mich.; Yamasaki, Leinweber and Associates, architects; Darrin and Armstrong Company, Incorporated, general contractors



Photos by Ronald Beckman







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NEW WOOD LINE—An "architect's choice" of selected, matched veneers laminated to a solid core for exceptional stability. Quiet, graceful, easy-gliding. And so rich in appearance.

FAMOUS FABRIC LINE—The MODERNFOLD look of luxury in fabulous fabrics and weaves, all washable. Exclusive, double-strength, all-steel inner frame for perfect balance, lifetime service.

NEW SOUND-RETARDING STANDARDS—An outstanding feature that may surprise you! Rigid and repeated tests prove that MODERNFOLD folding doors have set new standards in sound-retarding ability.

STUNNING HARDWARE—So beautiful! So practical! MODERNFOLD enhances the drama of folding doors with specially designed hardware in a choice of brass or satin chrome finish.

A SPECIAL FEATURE—Dimensional stability is vital to the life and appearance of folding-door fabrics. MODERNFOLD achieves this important "must" with an exclusive back-coating process (patent pending).

COLOR RANGE—The smartest of basic decorator colors...an inspired choice of natural and neutral shades for blending, matching or contrasting with any room's color-theme, modern or traditional.

MODERNFOLD takes the dullness out of doors by offering an almost limitless flexibility of use. Your MODERNFOLD distributor is listed under "Doors" in the yellow pages.

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NEW CASTLE PRODUCTS, INC., New Castle, Indiana
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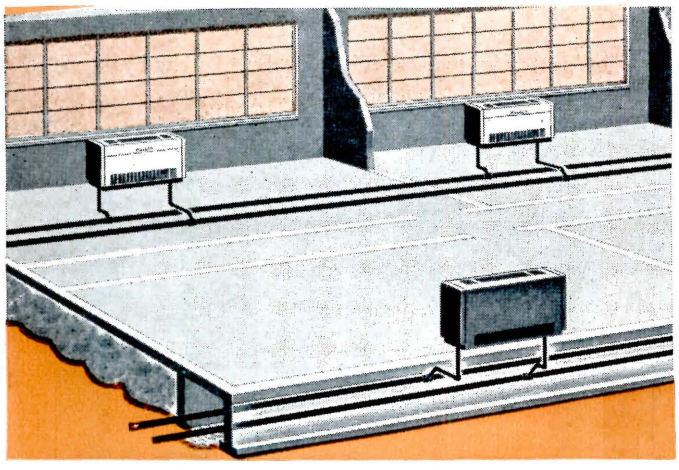
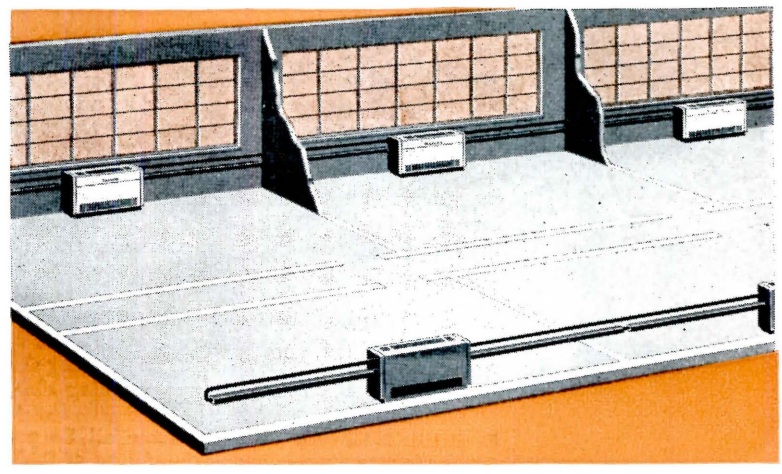
Shower Enclosures, Vinyl-coated Fabrics, and
Peabody School Furniture.
In Canada: New Castle Products, Ltd., Montreal 23.

▲ Teacher and pupils are comfortable in any weather . . . in every part of the room with this Nesbitt heating, ventilating and natural cooling system. It combines the use of a Nesbitt Syncretizer unit ventilator in each classroom with Nesbitt Wind-o-line radiation installed all along the window sill (see above). Radiant heat protects teacher and pupils against excessive loss of body heat; while convected heat along the sill warms chilling downdrafts. Three-way classroom payoff: outstanding comfort, operating economy, good appearance. Layout diagrams below help to show how the Nesbitt Series Hot Water Wind-o-line System provides protected learning environment.



▲ Conventional layout (showing how perimeter trenches are used to carry the supply and return piping under the floor), is used for both steam and hot water systems. As you can see, it calls for costly trenches or crawl space, mains, runouts and pipe insulation. All take a big bite out of your heating and ventilating dollar, and all can be dispensed with when you use . . .



▲ the Nesbitt Series Hot Water Wind-o-line System. The Nesbitt Syncretizer unit ventilator, installed in each classroom on this system, requires only about ⅓ as much hot water as do conventional systems. As a result, smaller pumps and pipes are used. The only supply and return piping you need in a classroom wing (see above) is the Nesbitt Wind-o-line Radiation itself.

Here are the figures that prove you can have a

Quality Heating and Ventilating System

. . . within a sound, realistic budget!

Nesbitt Systems are making possible savings of as much as 20% over conventional systems in typical schools all across the country.

Some of the Recent Low Costs for Quality Heating and Ventilating Systems:

IN NEW JERSEY $1.67 sq. ft.
Pennsauken High School,
Pennsauken, N. J.
Architect: Faint & D'Anastasio
Engineer: John Knecht
Capacity: 1800 pupils
Gross Area: 188,000 sq. ft.
Total Contract: $2,844,659
Heating and Ventilating: $314,986

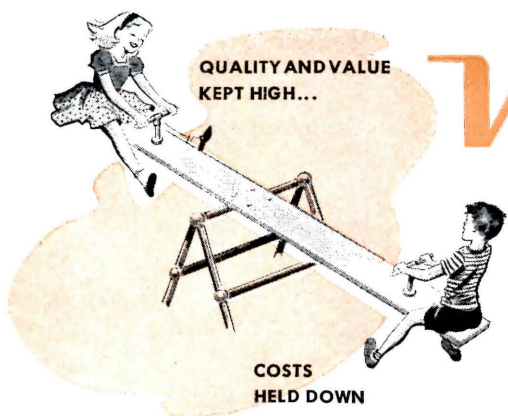
IN OHIO $1.91 sq. ft.
Young Elementary School,
Springfield Township, Ohio
Architect: W. B. Huff & Assoc.
Engineer: Paul Fleming
Capacity: 300 pupils
Gross Area: 22,000 sq. ft.
Total Contract: $335,071
Heating and Ventilating: $42,025

IN ILLINOIS $1.41 sq. ft.
Creve Coeur Elementary School,
Creve Coeur, Illinois
Architect & Engineer:
George Poppo Wearda
Capacity: 256 pupils
Gross Area: 11,800 sq. ft.
Total Contract: $156,124
Heating and Ventilating: $16,664

Compared with the installed costs of some other systems, the Nesbitt Series Hot Water Wind-o-line System saves you as much as 20% on construction, equipment and installation costs. Each classroom has its own Nesbitt *Syncretizer* unit ventilator for heating, ventilating and natural air cooling. And Nesbitt Wind-o-line radiation extends along the sill to protect pupils seated near windows from cold walls and window downdraft.

No other unit ventilator provides *controlled* heating, ventilating and natural cooling as effectively as the Nesbitt *Syncretizer*. When used in combination with Nesbitt Wind-o-line radiation, the result is healthful, productive comfort—free of physical distraction—for every pupil in the room whether he sits near the window or at the other side of the room. *Only the comfortable student can maintain maximum learning efficiency.*

Send for the big book on the value of controlled ventilation, **More Learning per School Dollar.**



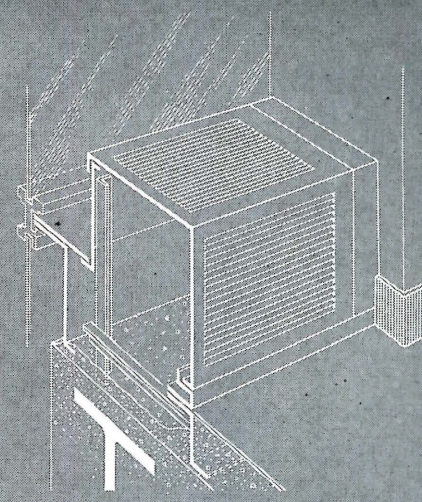
Nesbitt

THERMAL COMFORT ALL WAYS

Made and sold by John J. Nesbitt, Inc., Philadelphia 36, Pa.
Sold also by American Blower Corporation and American Standard Products (Canada) Ltd.

Styled

to match the decor of
The Seagram Building



ARCHITECTS: Mies van der Rohe & Philip Johnson ASSOCIATE ARCHITECTS: Kahn & Jacobs GENERAL CONTRACTOR: George A. Fuller Co.

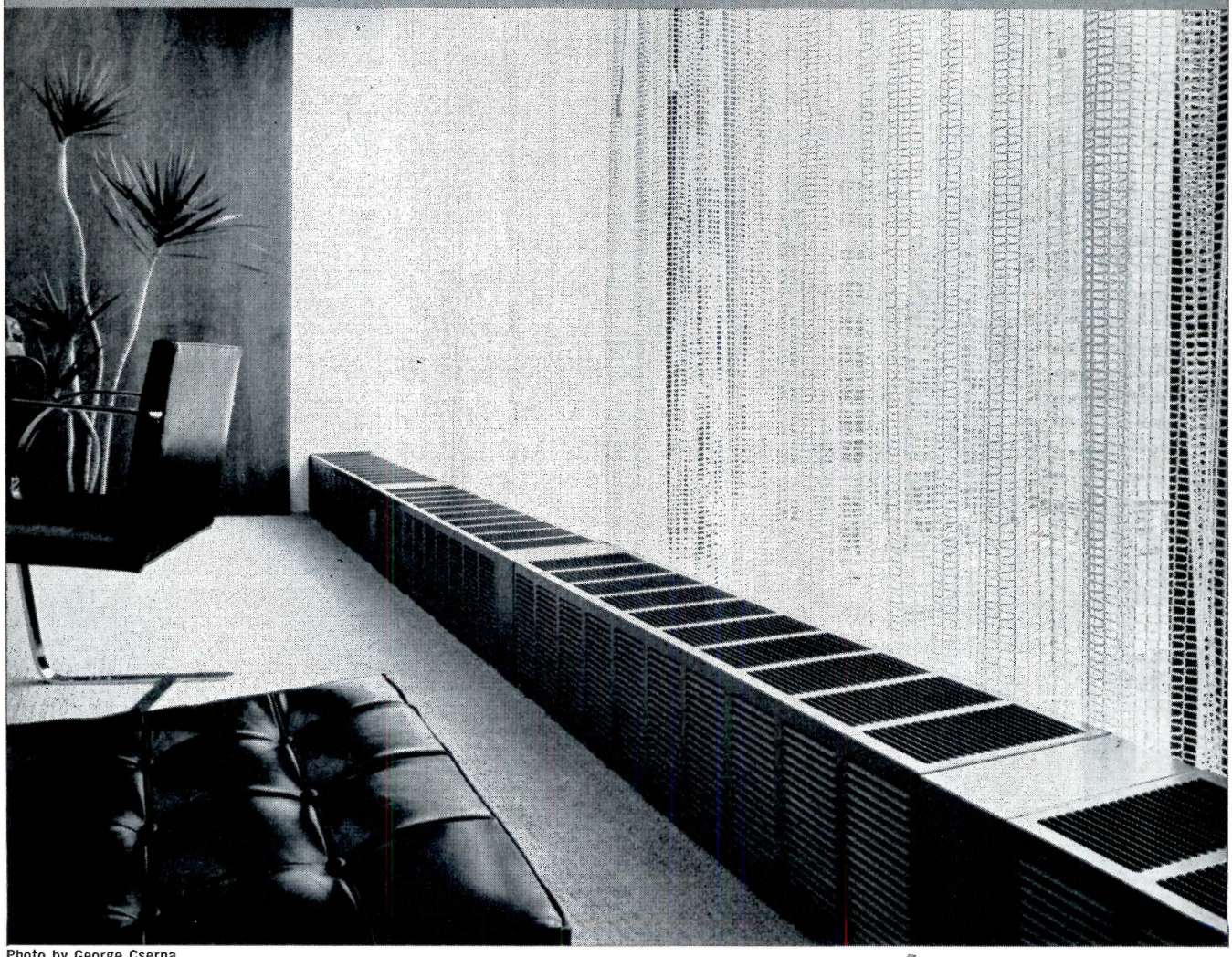


Photo by George Cserna

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1897

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DOUBLE-HUNG WINDOWS	360° REVERSIBLE WINDOWS	FIXED and HINGED WINDOWS	AIR CONDITIONING ENCLOSURES	CURTAIN WALLS	ACOUSTICAL CEILING SUSPENSION SYSTEMS

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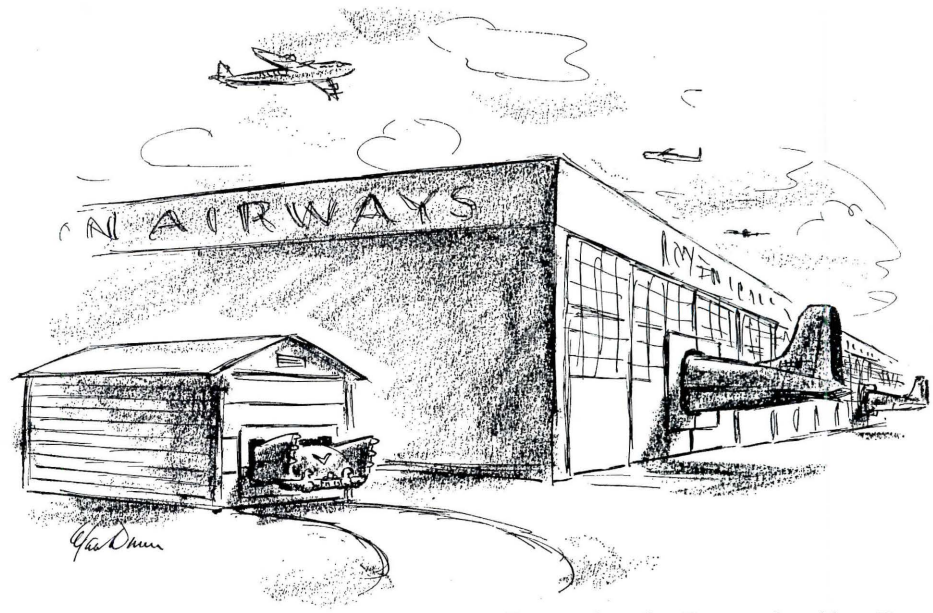
Meetings and Miscellany



—Drawn for the RECORD *by Alan Dunn*

Emerson Goble Named Editor

On June 24 Emerson Goble, since 1942 managing editor of ARCHITECTURAL RECORD, was named editor.

Mr. Goble's direct contributions to the building of ARCHITECTURAL RECORD as "the workbook of the active architect-engineer" have been constant and numerous over the years.

Major contributions include initiation and handling of the RECORD's philosophy articles, its series on health and old age facilities, its campaign to improve man-made amenities in our national parks.

An engineer by training, a journalist by profession, Mr. Goble has functioned almost as a gyroscope within the staff in keeping RECORD'S course steady and its sights high over many years.

Supporting Mr. Goble in the editing of ARCHITECTURAL RECORD is a staff composed of seven graduate architects, three graduate engineers, five experienced journalists, and three specialists in graphic arts design.

—Judd Payne, Publishing Director

The State of Construction

There was good news again in the June construction contract totals reported by F. W. Dodge Corporation: for the second consecutive month, the overall total set a new high record for any single month ever reported by Dodge. The June total of $3.8 billion was 12 per cent above the previous record set the month before and 18 per cent above the June 1957 figure. For details: page 338.

BRI Schedules Flooring Conference

Common problems in installing and maintaining resilient floors will be delved into at a workshop-conference to be held by the Building Research Institute on September 17-18. According to a survey made to assist in developing the conference program, failure of adhesive bond, nail popping, scratching and indentation of surface finish loom as major problems, with others close behind.

Sessions like this one and a similar conference on paints and protective coatings, scheduled for December 3-4, are now under examination by a special Policy Planning Committee appointed by recently re-elected BRI president Charles H. Topping. It is hoped that the committee's work will, among other things, help to determine the effect that expanding BRI's activity in coordinating basic building research might have on its present program policy.

Owings in Rome

Nathaniel A. Owings of Skidmore, Owings & Merrill is to be architect in residence at the American Academy in Rome from October through January.

Department Becomes School

At Clemson College, Clemson, S. C., the department of architecture became the School of Architecture on July 1. Harlan E. McClure, formerly department head, is now dean of the school; the architectural curriculum at Clemson became accredited in 1955.

"Women in Architecture" Meet

The Association of Women in Architecture recently held its national convention in Los Angeles. The national organization of women in architecture and allied arts elected the following officers for 1958-60: Mary Jane Fournier, St. Louis architect, president; Doris Danna, vice president; Jane Godfrey, secretary; Barbara Uthe, treasurer; Betty Lou Custer, administrative advisor; Jane Stuessie, public relations chairman, all from Missouri; Margaret Kinkead, Detroit, publisher; May Steinmesch, charter chairman; Lorraine Rudoff, expansion chairman; Rose Connor, information center chairman, all from Los Angeles.

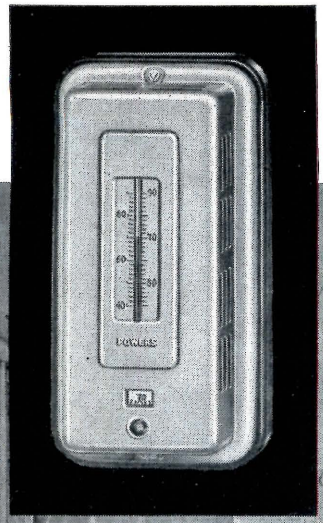
Whittemore Leaves Michigan

Harlow O. Whittemore, chairman of the department of landscape architecture at the University of Michigan since 1934, retired on August 1. Professor Whittemore joined the Michigan faculty in 1914.

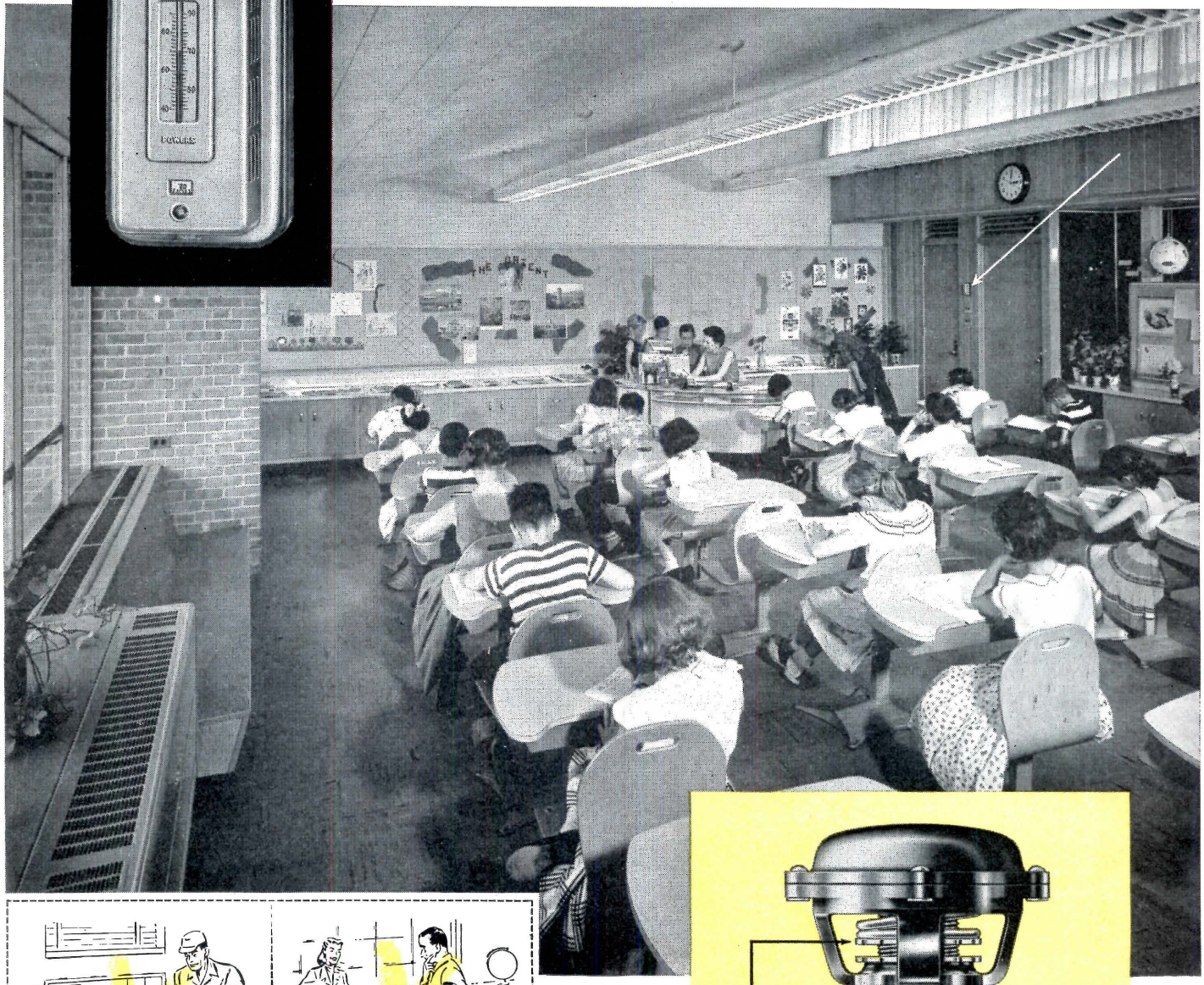
Honors

Otto R. Eggers, of Eggers & Higgins, New York, received the Building Stone Institute's 1958 award for "his long and distinguished career in the field of architecture and for his use of natural stone to create noble designs of beauty and durability." . . . The recent international competition for a monument to the Heroes of Warsaw resulted in 24 awards, but no first prize. Wojciech Jastrzebowski, chairman of the 25-man jury of members of the Association of Polish Architects and Union of Polish Plastic Artists, announced that 196 entries had been received. Twenty of the prizes (including the

How schools benefit from



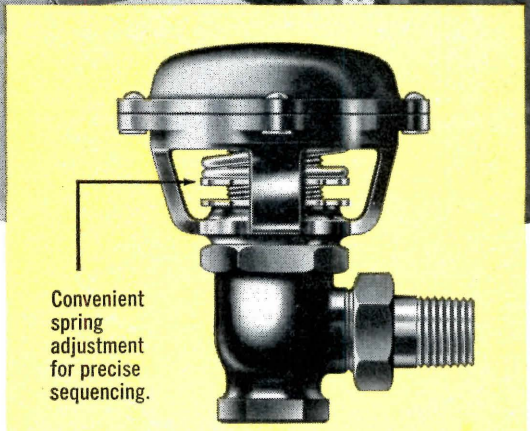
A truly gradual acting thermostat—controls unit ventilators and convectors.
Day-Night type thermostat available with automatic changeover.



Banish packing Maintenance and Leakage with—

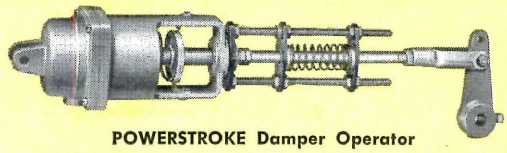
Powers PACKLESS Control Valves are standard for unit ventilators, convectors and unit air conditioners

They give more ACCURATE control—due to less valve stem friction.
SIMPLE, few moving parts with minimum vulnerability
to environmental hazards such as dirt, moisture, etc.



Powers PACKLESS Control Valve

Both Controls are specifically designed for Unit Ventilators.



POWERSTROKE Damper Operator

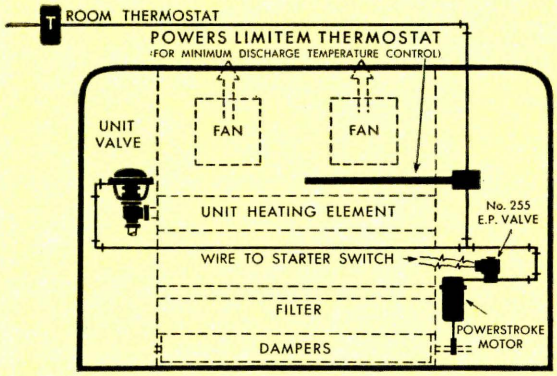
POWERSTROKE Damper Operator gives smooth gradual action of unit ventilator dampers. Accessible adjustment allows sequencing of dampers in accordance with A.S.H.A.E. unit ventilator control cycles.

QUALITY FEATURES provided by

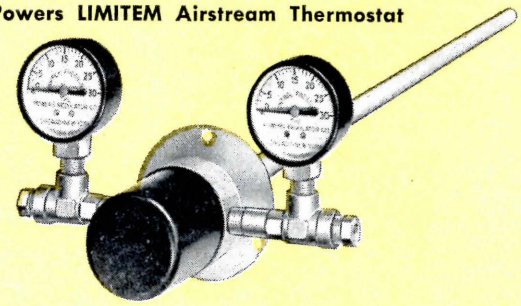
POWERS

MODERN pneumatic system of UNIT VENTILATOR CONTROL

Teachers, Pupils and Taxpayers all benefit when you specify POWERS *temperature control*



Powers LIMITEM Airstream Thermostat



A precision instrument with calibrated dial and adjustable sensitivity to give precise throttling range.

Greater **SIMPLICITY** of Powers **Direct Control** Prevents OVER-heated classrooms and cold drafts and insures Lowest Cost Maintenance

Powers LIMITEM Airstream Thermostat with its efficient direct control gives precise regulation of unit ventilator discharge temperature without using complicated auxiliary devices.

LIMITEM performance and reliability have been time tested and proven in thousands of schools. Valve and damper operator which it controls are shown on opposite page.

Powers Responsibility for correct installation and dependable operation is accomplished by directly employed Powers mechanics with years of unit ventilator control experience.

There is no extra charge for Powers Quality and year after year dependability. When you specify a Powers modern pneumatic control system for unit ventilators your client gets the best. There is no better.

Use Powers 65 years of Experience and engineering know-how to help you select the most efficient type of control for schools or other buildings.

A nearby Powers factory and field trained engineer will gladly assist you. There's no obligation. Call our nearest office.

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65 Years of Automatic Temperature and Humidity Control

second and third awards) went to Poles; four models from abroad, which won 10,000 zlotys each, were entered by Z. M. Vajar, Belgrade; Jerzy Jakubowicz and Andrzej Bobrowski, London; I. A. Zubin and A. G. Konstantinov, Moscow; and Wong Chi Chung and five teammates, Shanghai.

Worth the Winning

The Arnold W. Brunner Scholarship will provide $2400 during 1959 for advanced study in special architectural fields. Eligible are active American architects with advanced professional backgrounds, also members of the teaching profession on sabbatical leave. The closing date for applications, which must include choice of subject and outline of proposed studies, research, and travel, is November 15. Details from: N. Y. Chapter, A.I.A., 115 East 40th Street, New York 16. . . . The American Academy in Rome offers a limited number of fellowships for one year beginning October 1, 1959, with possibility of renewal (the Academy prefers two years). Fellowships, awarded on evidence of ability and achievement, are open to U.S. citizens capable of independent work in architecture, landscape architecture, fine arts, and classical studies. A fellowship carries $3000 a year (stipend: $1750; round trip, New York-Rome: $600; studio supplies: $150; European travel: $500) plus free residence and studio at the Academy. Applications and submissions of work, in prescribed form, are due at the New York office by December 31. Query: American Academy in Rome, 101 Park Avenue, New York 17.

R.I.B.A. Conference Held

By Jeffrey Ellis Aronin, A.I.A.

A total of 620 persons, including 356 architects (the remainder being the usual assortment of relatives, press and government officials), from throughout Britain and several overseas countries attended the Conference of the Royal Institute of British Architects from May 14 to 17 in Newcastle-Upon-Tyne. The subject of the Conference was "The Character of Towns," but more stress was laid on the problem of the automobile than on purely architectural matters.

Great Britain, which has not been spoiled by the automobile to the extent that the United States has been affected, seemed to be waking up to the fact that the motor car is here to stay and that architectural provision should be made for the car in architecture and town planning designs.

The thoughts were quite commemorable, and it is encouraging that the British architects are tackling the problem before it has reached the devastating proportions it has assumed in the U.S.A. But it is surprising to an American visitor to find that such phrases as "off-street loading," "expressways" and "flyovers" are only just now coming into the phraseology. One professor was heard to say: "My students are now showing great concern for the provision of car parks and they put them in almost every design."

The Conference opened Wednesday evening, May 14, with a pleasant informal reception in the Old Assembly Rooms. On Thursday morning the Inaugural meeting took place at the Literary and Philosophical Society Lecture Theatre with greetings from the Lord Mayor of Newcastle-Upon-Tyne, Alderman J. W. Telford; Kenneth M. B. Cross, president of the R.I.B.A.; and Donald McIntyre, president of the Northern Architectural Association.

Then the papers were "read." They were not actually read in the true sense of the word because printed copies of the talks were circulated beforehand, to be perused by the participants and to insure that enough time could be devoted to slide showing and question-answering. This is rather an interesting feature which might well be adapted to some Amer-

continued on page 286

Clinton E. Brush, III (left), Nashville, nominated as regional director, A.I.A. Gulf States District, being congratulated by the present director, John Pritchard, at a Tennessee Society of Architects meeting with President Zeno L. Yeates (right) presiding

Wanted: New Ideas on Housing

Urban renewal and the closely allied public housing effort came under close scrutiny as more than 300 gathered in Washington in June for the 27th annual meeting of the National Housing Conference. Reviewing the progress of national programs, the Conference turned bitter words on the 1958 housing bill.

Almost unanimously, the delegates opposed "the little effort" in slum clearance and urban redevelopment; they passed a resolution calling for a Federal department of Housing and Urban Development, with cabinet status, of course, to handle "the vastly enlarged programs which will be required to attain the essential goals for housing and community development." The Conference maintained that this betterment in hous-

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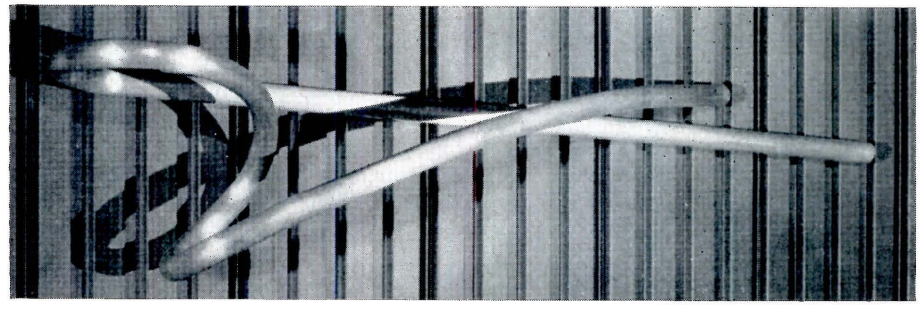
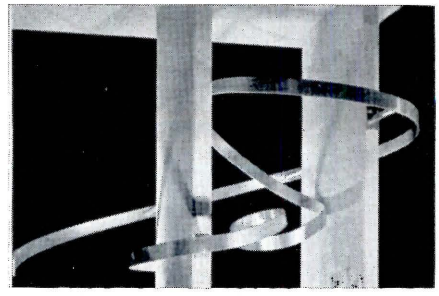
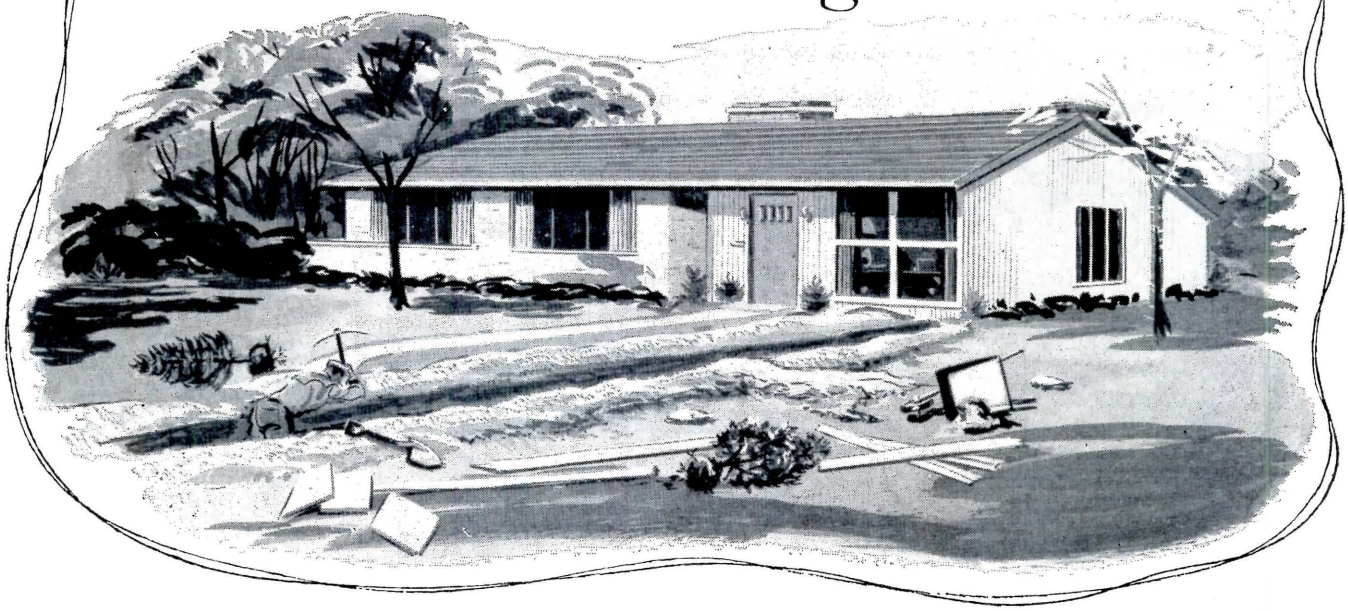


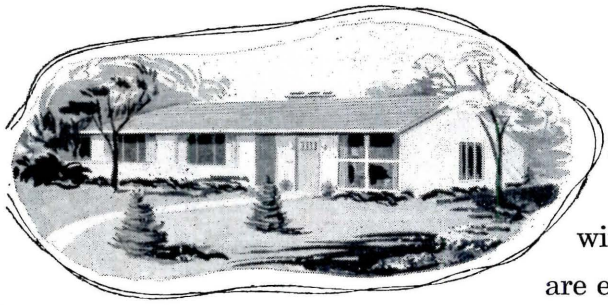


Two aluminum sculptures by Gertrude Barnstone for the U.S. Green Stamp Building, warehouse-showroom in Houston for a five-state trading-stamp company. The clients and Mrs. Barnstone agreed on nonobjective forms allied to the design of the building; Irving Klein was architect. Aluminum, chosen for economy, workability, and to harmonize with the showroom's aluminum trim, is used in two forms: 2¾-in. tubing and 1-by-5-in. flat bar. The pieces are highly polished to bring out sun effects. Total cost: $1500, including sculptor's fee, fabrication, alumiliting, installation

dream home or nightmare?



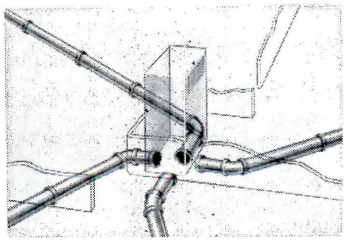
The sewer material you specify can make the difference!



Don't let *substitute* pipe material turn the homes you design into nightmares of sewer-line breakdowns.

Specify never-wear-out Clay Pipe—the only pipe with *all* the features you can trust! New longer lengths are equipped with the strongest joint ever developed . . . factory-made and ready to install . . . for a *tighter, longer-lasting* seal. And now, as always, Clay Pipe *is not* corroded by sewage acids and gases, detergents, garbage . . . *doesn't* squash out when subjected to hot liquids . . . *doesn't* rust, rot or disintegrate, even after years and years under the ground! Make your client's first cost the last.

Rely on today's modern Clay Pipe with research-developed, factory-made compression joints. *It never wears out!*



Clay Pipe is the best material available for heating and air-conditioning ducts in basementless homes. It does not collect soot and is odorless, dustless, vermin and rodent-proof.

Vitrified **CLAY PIPE** *Never Wears Out*

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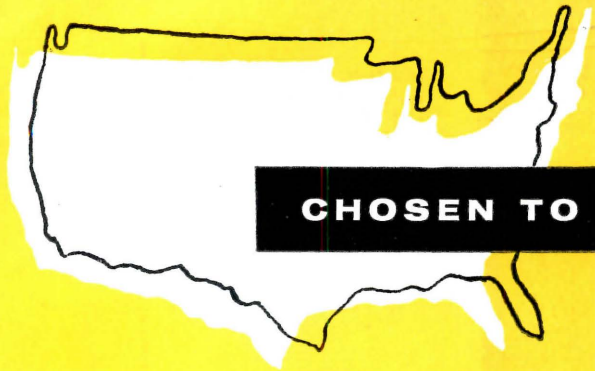

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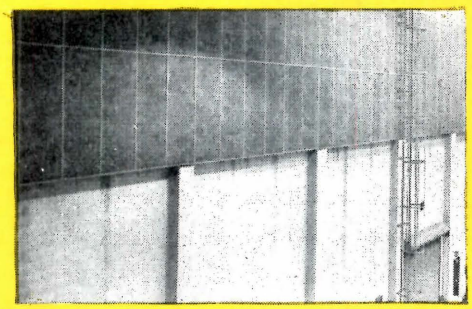

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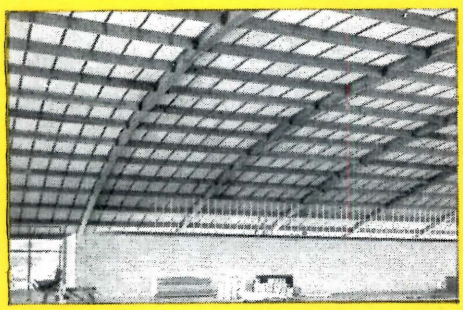

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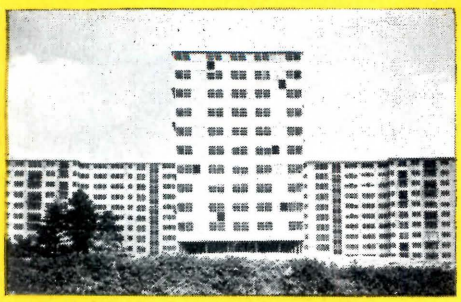

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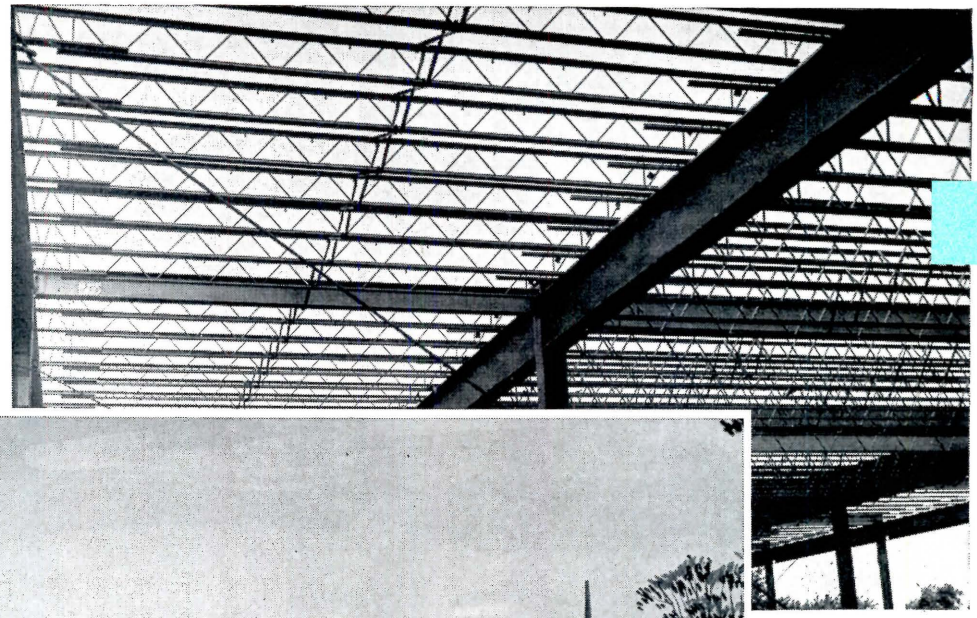

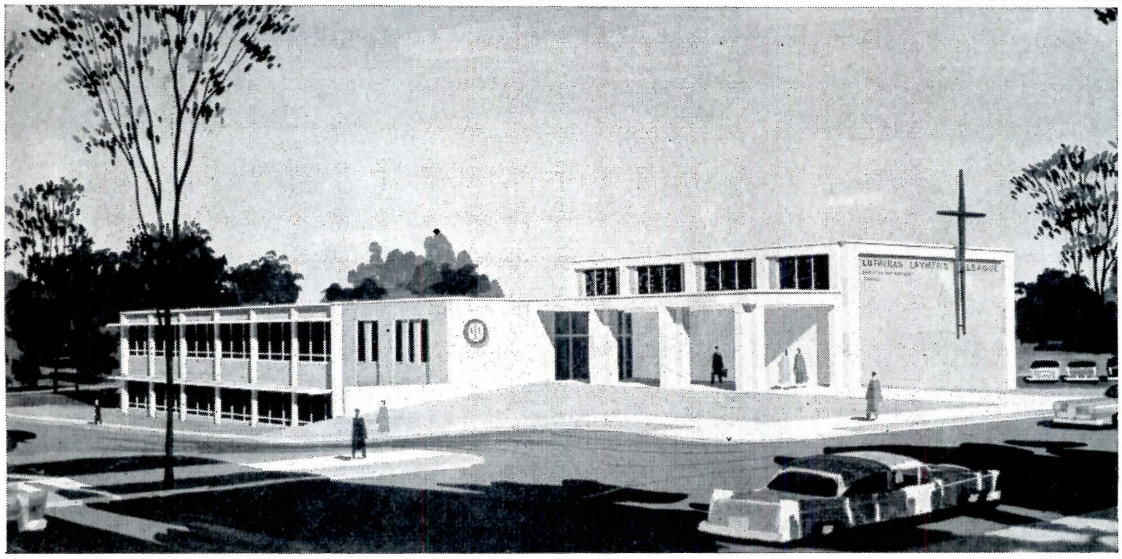

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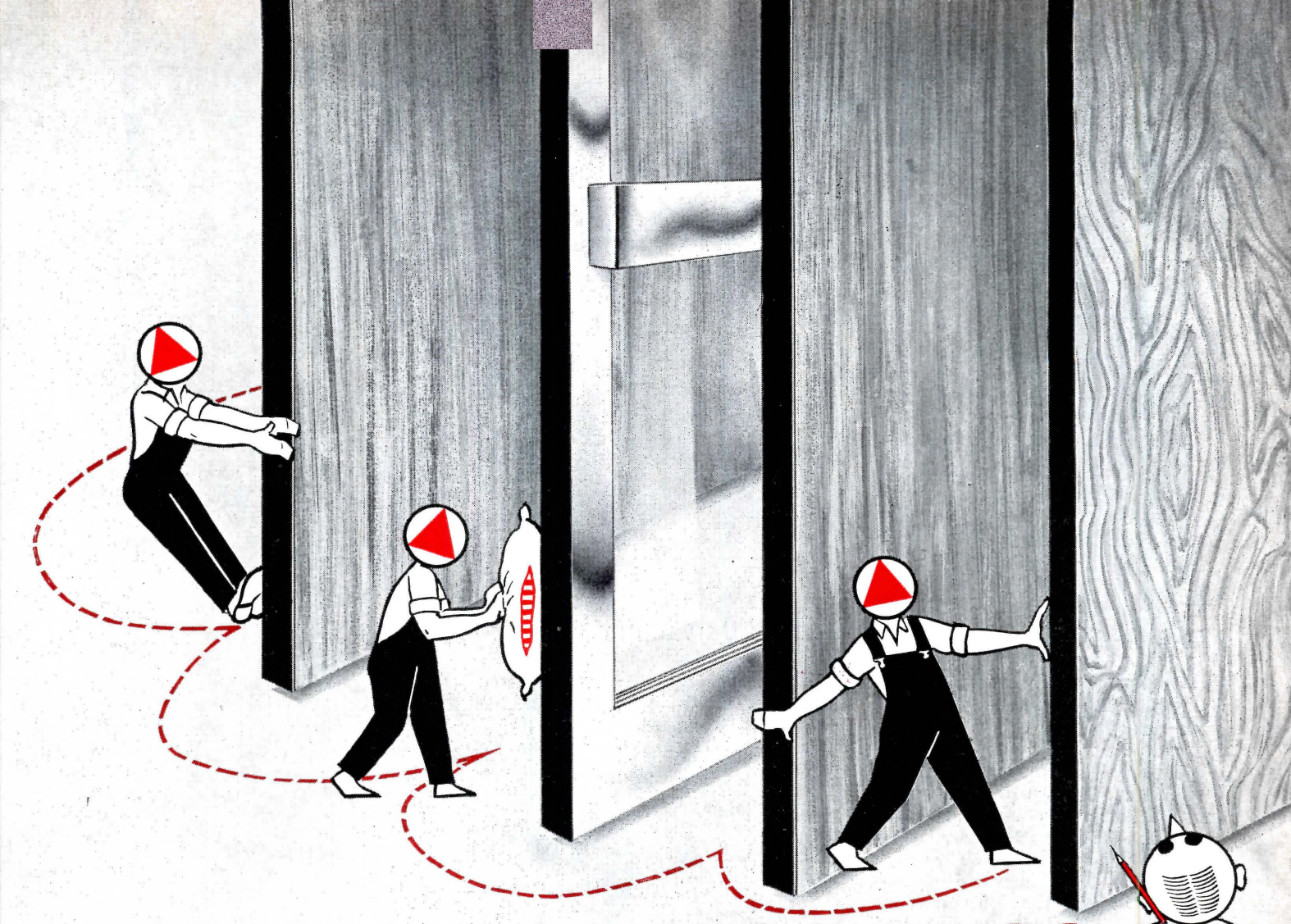

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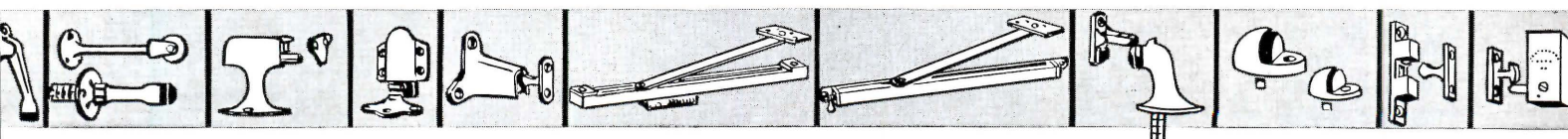

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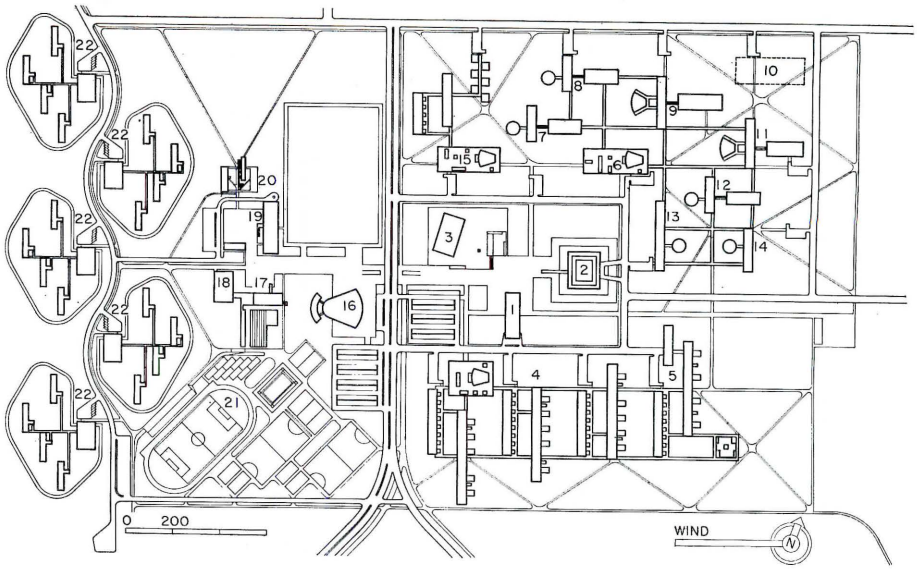


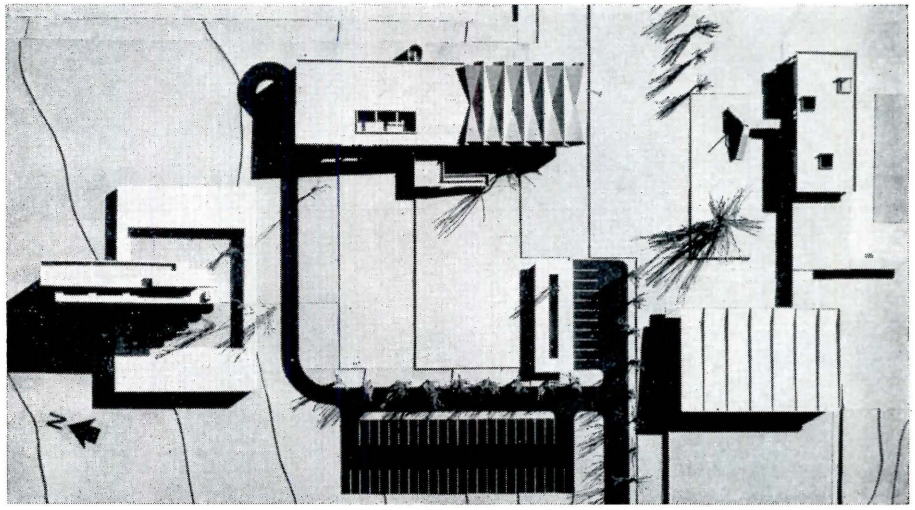
Campus Plan. 1. Secretariat; 2. Library; 3. Mosque; 4. Faculty of Arts; 5. Miscellaneous faculties; 6. Faculty of Sciences; 7. Zoology; 8. Botany; 9. Zoology; 10. Applied chemistry (future); 11. Physics; 12. Geology; 13. Mathematics; 14. Geography; 15. Faculty of Islamic Learning; 16. Auditorium (2,500 seats); 17. Sports Club; 18. Gymnasium; 19. Students' Union; 20. International Hostel; 21. Swimming, tennis, badminton, volleyball, soccer, hockey, basketball (cricket field is north of auditorium); 22. Residential unit for 200 students

FRENCH ARCHITECTS DESIGN PAKISTANI UNIVERSITY

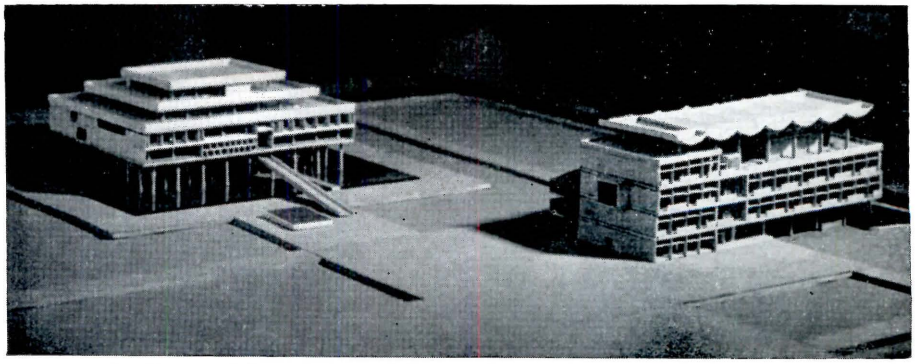
The new University of Karachi is rising on a 1200-acre site eight miles from the city in Pakistan. The architects who worked out the general program and designed all the buildings are M. Ecochard, P. Riboulet, and G. Thurnauer, partners, of Paris, with J. Renaudie as assistant and J. Coignet as representative. The end of the first construction phase in early 1959 will allow the University to start to move from its present overcrowded quarters in the city. The rest of the construction is planned on an eight-year schedule.

The architects list six primary principles that governed their solution of both planning and designing problems: *1) Flexibility for future use:* the scheme attempts to allow for either rapid or slow expansion. *2) Climatic protection:* double roofs and sunbreakers protect from tropical sunlight. The orientation, the same for all buildings (except the air-conditioned laboratories), takes advantage of the prevailing wind from the sea; also, most of the buildings are only one room wide. *3) Economy:* the architects reduced necessary surfaces and used local materials. *4) Separation of building groups:* the entrance avenue separates the studies group from the sports, recreation, and residence group. Buildings for common use are grouped along a pedestrian mall. *5) Separation of cars from pedestrians:* independent roads and paths lead to each building. *6) Landscaping:* the grounds, now desert-like, will be planted and irrigated.

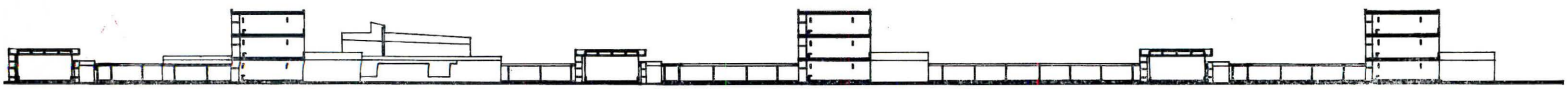
The four faculties shown in the plan are to have a capacity of 7,000 students. On final completion, the University is to consist not only of all facilities shown here, but also of a "university town," surrounding the central area, which will include 13 colleges, 280 houses for teachers, assistants, and clerks, housing for servants, additional student housing, and a 10,000-seat stadium.

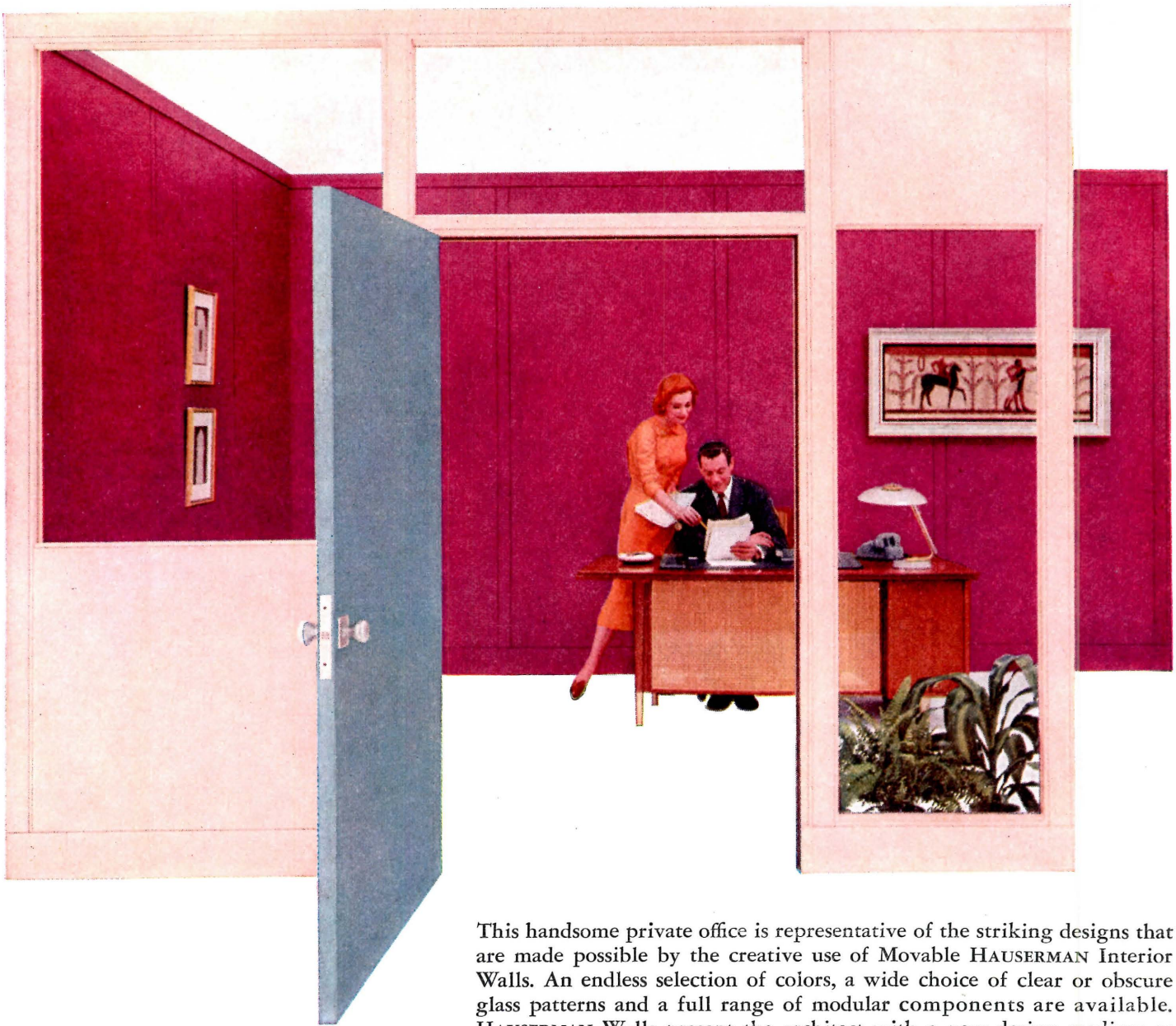


Model of the recreation group (above) showing, clockwise from north, International Hostel, Students' Union, Sports Club, Gynasium. One end of the swimming pool is at top right.



Model of the Library (above, left) and Secretariat, as they are to look from a point near the Mosque. Longitudinal section (below) of Faculty of Arts.





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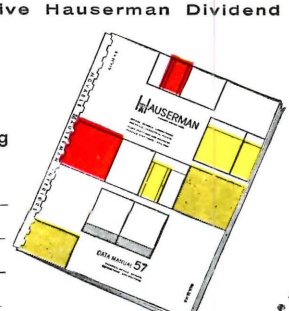
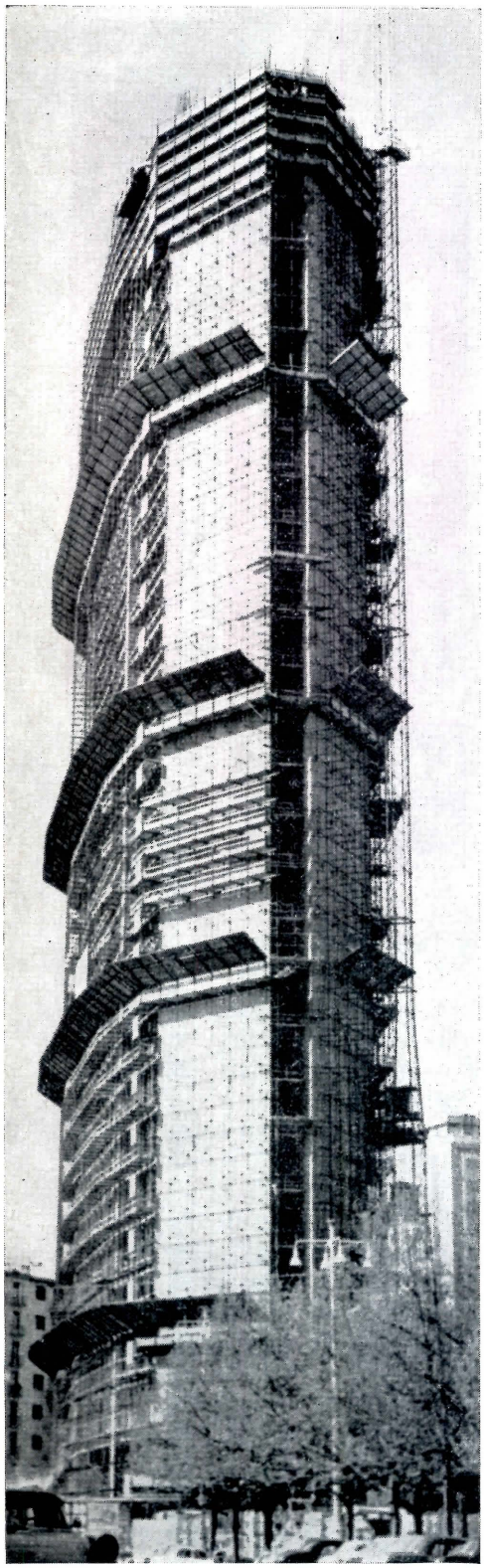
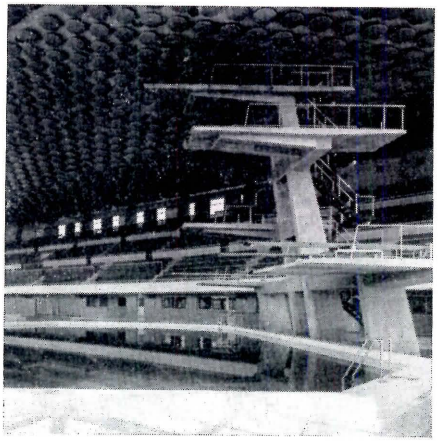


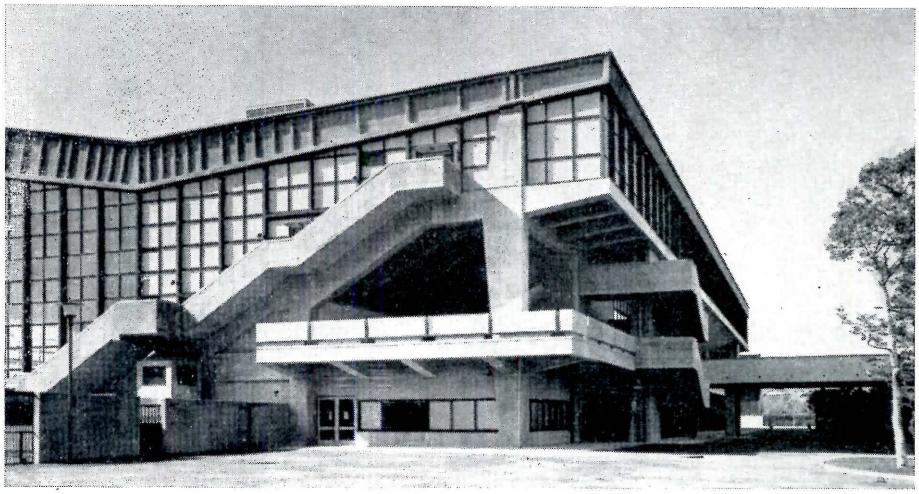
News of Architecture Abroad



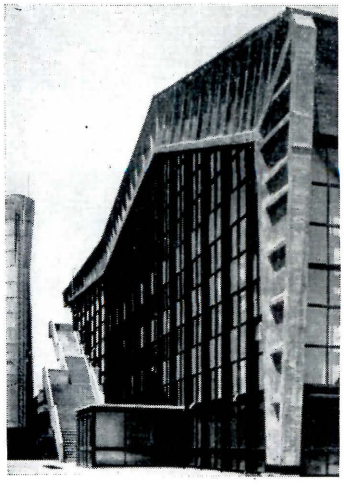
A combination hotel and air-terminal (at right) is being built in Copenhagen, Denmark, for Scandinavian Airlines System from Arne Jacobsen's design. The $4,300,000 building, the largest in Scandinavia, will be completed in 1960. It will contain a 275-room, completely air conditioned hotel, a passenger terminal for the airline, and a 300-car parking garage

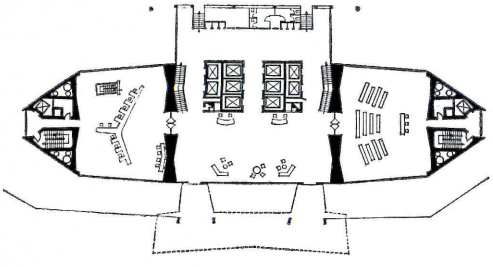


The Tokyo Metropolitan Indoor Swimming Pool, Masachika Murata and Associates, architects, is of reinforced concrete, with sprayed-concrete-coated steel roof trusses spanning 162½ feet. The building was completed this spring for the Third Asian Olympic Games. At left, 20- by 25-meter diving pool, 20- by 50-meter swimming pool, and grandstand seating 4000 people. Below, main entrance and offices.



At right, roof truss and fire stairs





The 32-story Pirelli building in Milan, Italy, is nearing completion. The skyscraper is the work of two Milanese architectural firms: Ponti, Fornaroli, Rosseli; and the Studio Valtolina dell'Orto, with whom Pier Luigi Nervi and Arturo Danusso, structural engineers for the building, worked. Since the four butterfly-shaped piers (see plan, left) diminishing in size toward the top, and the triangular utility stacks (acting as stiffeners), are the only columns in the building, a clear span of over 50 feet on each floor is possible.

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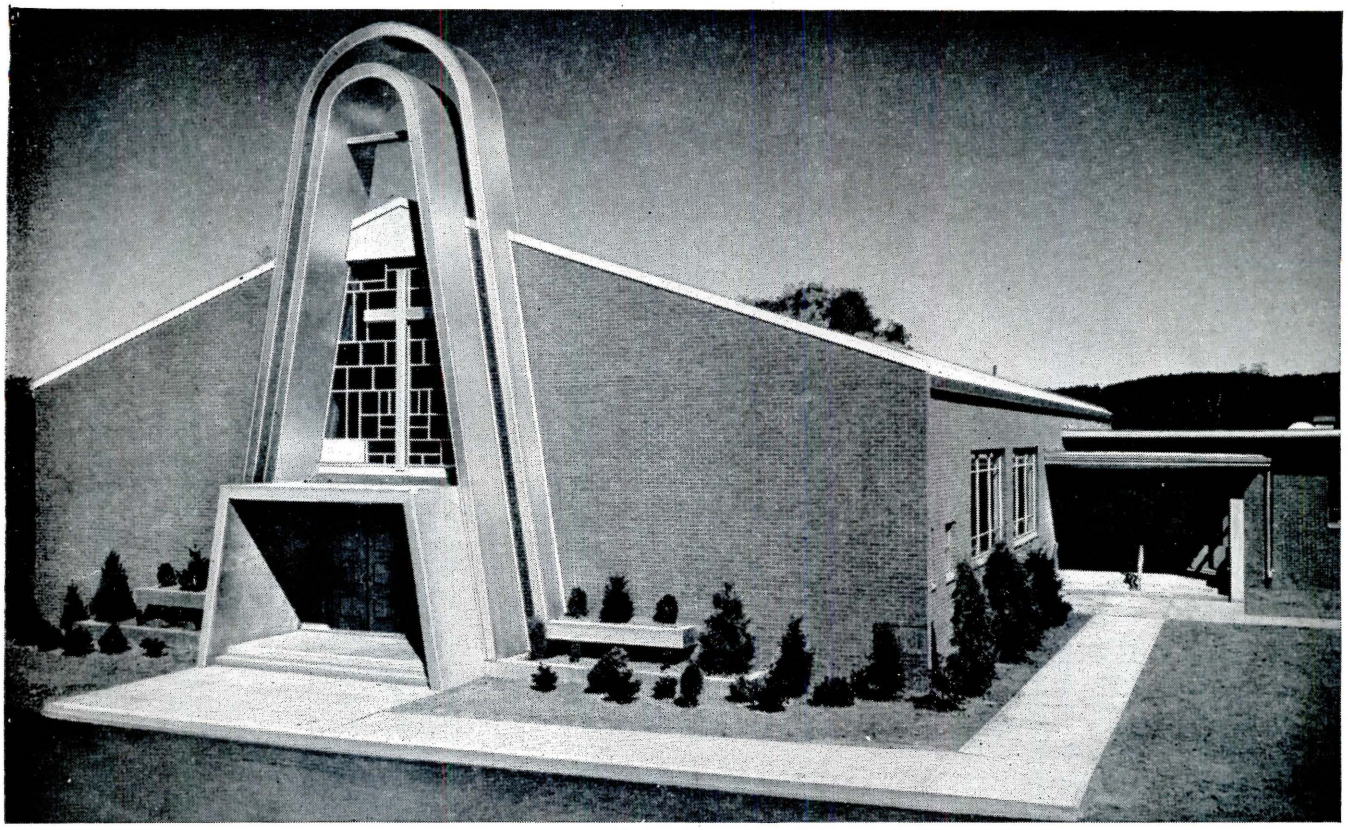
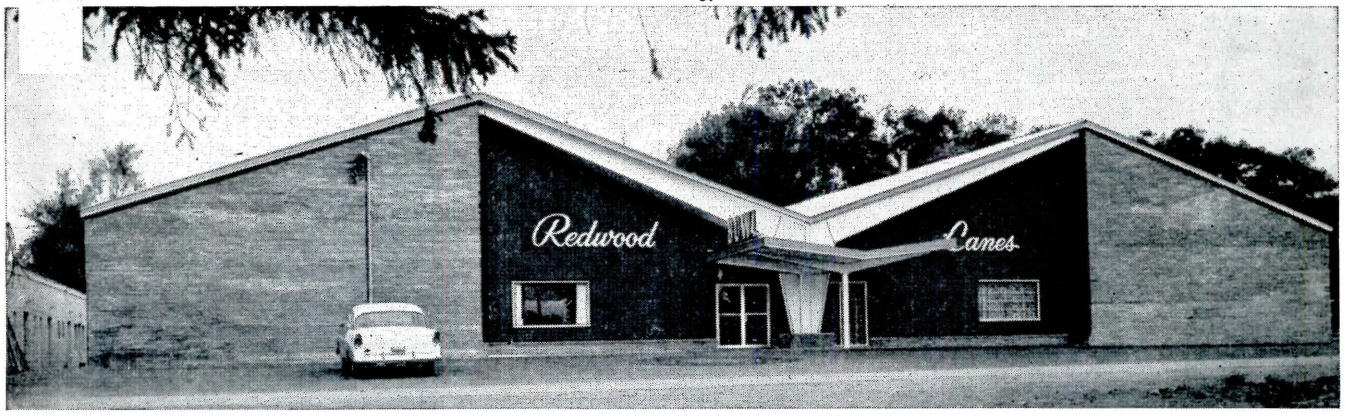


St. Catherine's social hall and gym, Blauvelt, New York



Redwood Lanes bowling alley, Latham, New York

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A Washington Report by Ernest Mickel

EIGHT PROJECTS COMPLETED, 18 UNDERWAY IN HHFA's DEMONSTRATION GRANT PROGRAM

Congress considered it wise in 1954 to begin spending substantial sums of Federal money on studies of urban renewal techniques.

The housing law of 1954 authorized the Housing and Home Finance Agency to make grants (up to two thirds of cost) to assist public bodies in developing, testing, and reporting methods and techniques, and carrying out demonstrations and other activities for the prevention and elimination of slums and urban blight.

Objectives of the program were outlined only generally in the law. The administrator must give preference to those undertakings which he judges can (1) contribute most significantly to the improvement of methods and techniques for the elimination and prevention of slums and blight, and (2) best serve to guide renewal programs in other communities.

This Federal effort now is known as the Demonstration Grant Program and is administered by the Housing and Home Finance Agency's Demonstration Program Branch under its Urban Renewal Commissioner.

In launching this part of the overall housing program four years ago, a continuing authorization of $5 million was established. This means that HHFA's branch can spend Title I funds at the Administrator's discretion for this work until the authority expires.

At present, approximately $2 million of the authorization has been spent on 18 projects in progress and the eight that have been completed. There are enough applications in the hands of agency personnel to devour another $1 million if they were all approved.

Expenditure of the full $5 million will, of course, generate $7.5 million worth of demonstration grant work since Uncle Sam is paying but two thirds of the final cost. Individual projects already in the works show individual costs ranging from $5000 (a reporting-only type job) up to as much as $650,000 where far more detailed study and actual brick and mortar work are involved. Completion can range from a few months to a few years.

These test projects, in execution and in contemplated form, range over a wide spectrum. Those completed and with reports already filed, for example, include new data on code enforcement, rehabilitation, methods for measuring deterioration in commercial and industrial areas, workable program development, and community organization and citizen participation.

For the foreseeable future, the approved demonstration grant projects in progress will stress rehabilitation. URA officials are convinced that this is an extremely important part of clearing and redeveloping American cities and that more should be learned, as rapidly as possible, of the better techniques involved. It leads the list of subjects for projects in progress and in application. And it will be uppermost in the considerations of new proposals.

Application for these demonstration grants can be made by any public body and for this purpose, the URA branch describes the term as including "a State, county, municipality, or other political subdivision, authority, or agency which is a public legal entity." It is explained that other interested public and private agencies may participate in and contribute to a project but responsibility for proper use of grant funds rests with the contracting public body.

In considering a proposal, HHFA officials in the demonstration grant activity are likely to ask themselves first if it is something new that will facilitate the urban renewal process; second, if it does not meet that qualification, does it refine and improve previous methods and techniques that already have been developed; and third, is it something that will be of real value to other communities on a regional or national level. Those bodies submitting proposals for projects that would be limited strictly to local application stand virtually no chance of getting their ideas into the program. The reason is obvious; HHFA is charged with spending public funds to the best advantage for the greatest number. Another test that proposals must meet is that of other financial arrangement. Should they be carried by other Federal aid programs or be financed entirely by the public body?

Important criteria for judging proposed projects are the readiness and suitability of the applicant; can the study contribute effectively to the reinforcement and improvement of urban renewal programs? And of course, the project cannot duplicate a demonstration previously accomplished.

The demonstration projects can take any of several suggested forms:

Rehabilitation—Its economics, feasibility, financing, cost, debt-carrying capacity, etc.

Programming for urban renewal—Involves development of a long-range program for community renewal; a statement of objectives, the deficiency gaps to be filled in, responsibility.

Coordination of urban renewal and highway programs—What are the problems, including land acquisition, and how should they be handled?

Small city or town expansion—Effects of a population explosion.

State organizations for urban renewal—Machinery and procedures. How can states help, particularly in smaller community development?

Municipal financing for urban renewal—This involves methods of financing the local contribution.

Relocation—Concerned with rehabilitation and how low-income families are re-housed.

University environment and medical institutions—Special problems in prevention or elimination of deterioration of neighborhoods near these urban universities and medical institutions.

Project administration—Involves preparation for and execution of an urban renewal job.

Small business—Aid for small businessmen displaced by urban renewal.

Project standards—General criteria for defining conditions that warrant use of rehabilitation, conservation, use of clearance and redevelopment.

General pattern of project development—Legal matters.

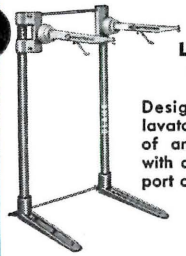
Distribution of the new information garnered in the execution of a demonstration grant project is left largely to the public body sponsoring the work and making the report. HHFA does have a mailing list of libraries, trade associations and others that get the finished volumes regularly, but the flood of inquiries coming into the agency in Washington is, for the most part, forwarded to the public group responsible for execution and report.

With eight undertakings completed, the URA is in a position to test the findings in going urban renewal projects. For example, St. Louis has measured criteria for obsolescence in judging industrial and commercial uses. A future Chicago urban renewal project will test the validity of the conclusions.

URA officials like to cite Puerto Rico's El Embalse demonstration

continued on page 302

1



L1830

LAVATORY CARRIER

Designed to support lavatories independent of any wall support, with all means of support concealed.

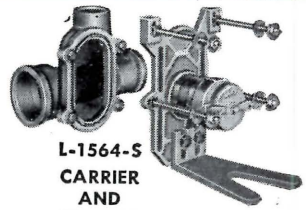
2

L-1380

SAFETY WASTE ROOF DRAIN

For wood and precast concrete flat roofs. Does not puncture roofing membrane

3



L-1564-S CARRIER AND FITTINGS

Supports wall type closets independent of wall.

4

L-1840

LAVATORY CARRIER

For support of lavatories using top panel arranged to accommodate hangers, or hanger plate furnished with lavatory.

5

L-570

SAFETY WASTE FLOOR OR SHOWER DRAIN WITH INTEGRAL TRAP

For shower or toilet rooms or areas where vertical adjustment of strainer and deep integral trap is required.

6

L-557

SAFETY WASTE FLOOR OR SHOWER DRAIN

For shower and toilet rooms or areas where vertical adjustment is required.

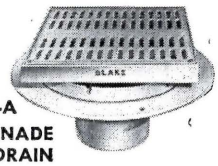
7

L-1850

URINAL CARRIER

Support urinals independent of any wall support. Bottom bolts provide thrust to maintain clearance between bottom of urinal and finished wall.

8



L-1480-A PROMENADE DECK DRAIN

For use on Promenade Deck or wherever dome or beehive strainer would be unsatisfactory.

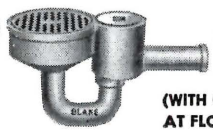
9

L-988

PALMER TYPE BACKWATER VALVE

Prevents backflow from main sewer lines. Safeguard against flooding conditions.

10



L-866 FLOOR DRAIN (WITH CLEANOUT AT FLOOR LEVEL)

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11

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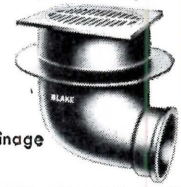
13

L-830 POOL DRAIN



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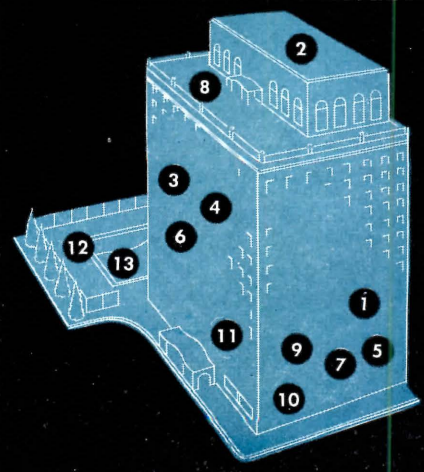

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R.A.I.C. HOLDS 51st ANNUAL ASSEMBLY IN MONTREAL'S NEW QUEEN ELIZABETH HOTEL

The 1958 conclave of what one program participant called "the most challenging profession in Canada" took place in the sumptuous setting provided by the new Queen Elizabeth Hotel, Montreal, June 11-14.

Keynote speaker was Stewart Bates, president of Central Mortgage and Housing Corporation. One of a long list of distinguished guests, Mr. Bates urged architects to play a more active role in the field. He said that, as a group, they should "examine the whole fabric of suburban growth, should find out how the architect can play a more effective role in the design of suburban housing, should examine the legislative and financial framework in which this housing is being built, should try to discover those things that have an adverse effect upon design."

The task outlined was one that the Institute might consider assuming, he suggested.

More Architects

Membership in the R.A.I.C. now stands at 1919, reported retiring president Douglas E. Kertland of Toronto. Enrollment in the five Schools of Architecture numbers 730.

"I feel sure," Mr. Kertland commented, "that our profession is destined to grow as Canada grows, and that we may face the future without pessimism."

Eight Fellows Installed

Architects taking their places in the College of Fellows at installation ceremonies held in conjunction with the assembly were Randolph C. Betts, J. Albert Larue and Pierre Morency, all of Montreal; Frederic Lasserre, Vancouver; John B. Roper, Ottawa; John Stevenson, Calgary; F. Hilton Wilkes and W. Ray Winegar, both Toronto.

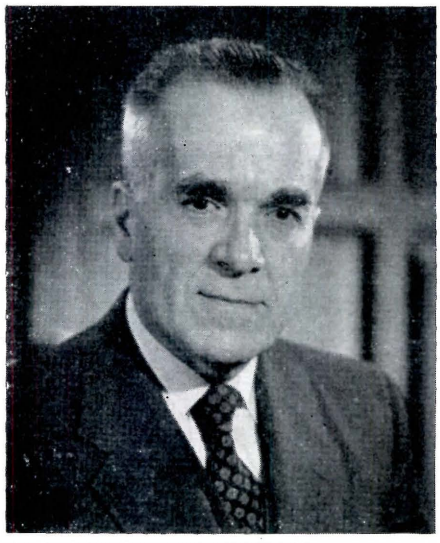
Registration at the assembly reached a new high this year with approximately 270 architects and 180 ladies in attendance.

Theme of the sessions was "Urban Redevelopment." Two symposia were devoted to the subject: one took the form of a talk, the other was a panel discussion.

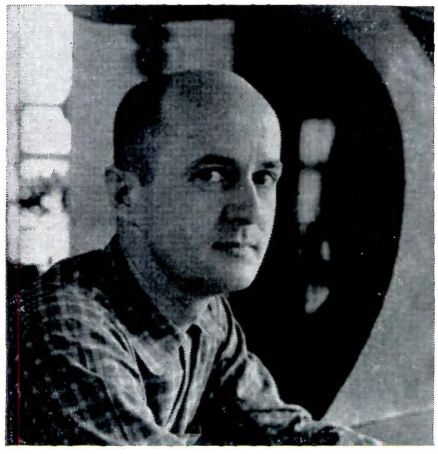
The assembly rejected a proposed national code of ethics. Instead, a brief statement on morals is to be prepared for use as a preamble to provincial codes of ethics.

Closing date for submissions for the next Massey Medals competition will be Nov. 3, 1958. Official opening of the exhibition of entries is scheduled for Ottawa on December 5.

The products exhibition, for which 35,000 complimentary tickets were distributed to building industry personnel, drew good crowds. Other features were photographs, drawings and models of slum clearance and urban rehabilitation projects, a modular coordination display arranged by the Division of Building Research, National Research Council, and the prizewinning entries in the Pilkington Scholarship competition.



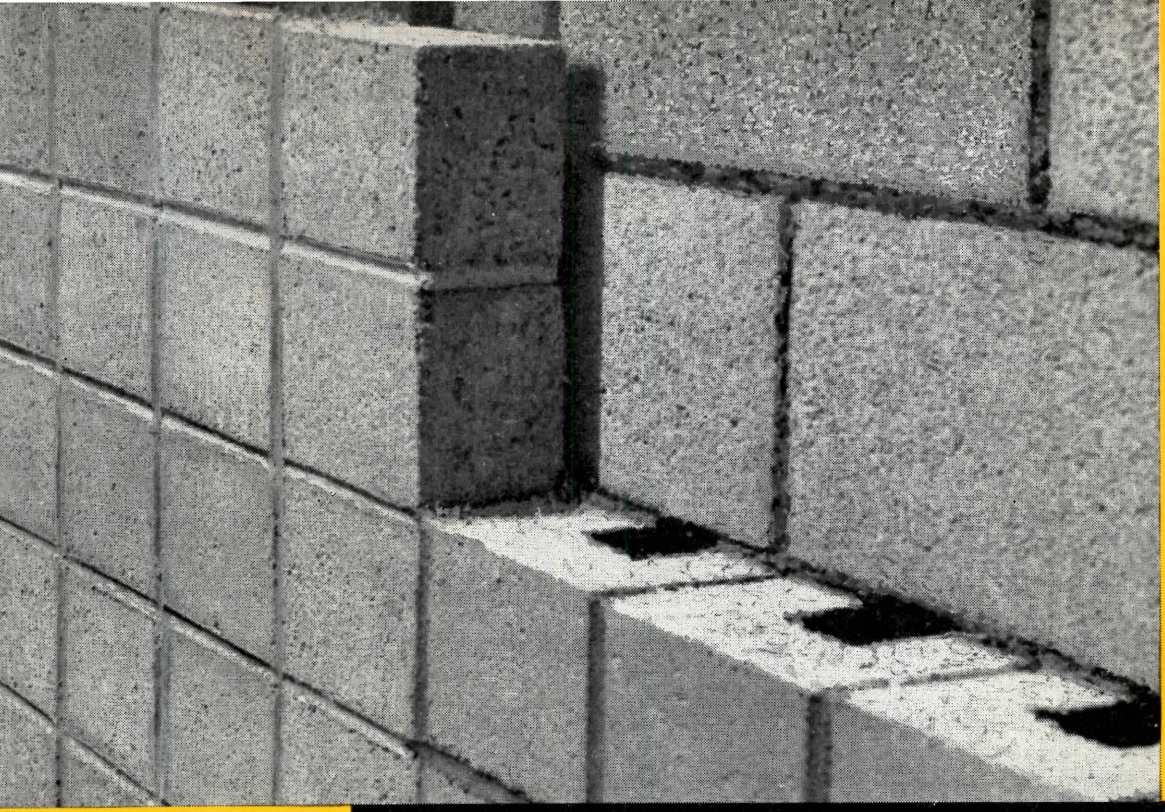
Right: Maurice Payette, of Montreal, was installed at the assembly as the Institute's president for the coming year. Mr. Payette, who has served as president of the Province of Quebec Association of Architects, received that organization's medal of merit in 1953. He succeeds Douglas E. Kertland in the office. Below: at the opening of the Urban Redevelopment Center and Manufacturers' Exhibition, Montreal's mayor, Sarto Fournier, doing the honors. He is flanked, on the left, by Paul Brassard and Gerard Venne, on the right by Mr. Kertland and Mr. Payette. Right: Louis Archambault, winner of this year's Allied Arts Medal; for views of Mr. Archambault's sculpture, see p. 48



Allied Arts Medal

This year's winner of the R.A.I.C.'s medal for outstanding achievement in an art related to architecture was Louis Archambault of St. Lambert, Que. A sculptor, he currently instructs at the Ecole des Beaux-Arts, Montreal.

New president of the R.A.I.C. is Maurice Payette, of Montreal, well



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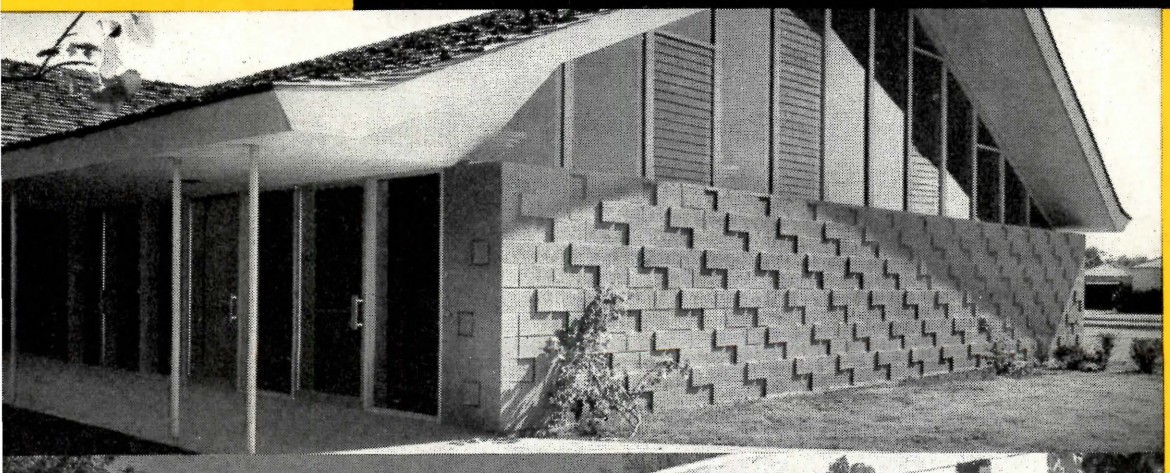

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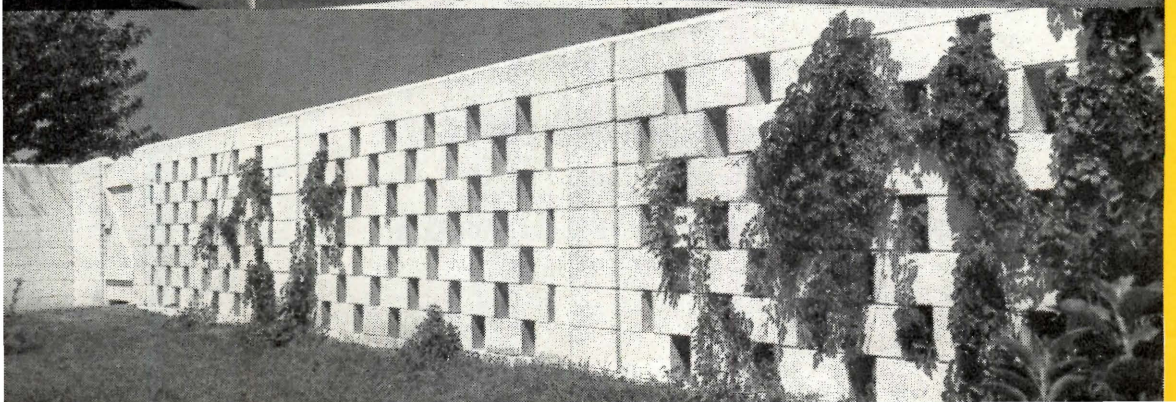

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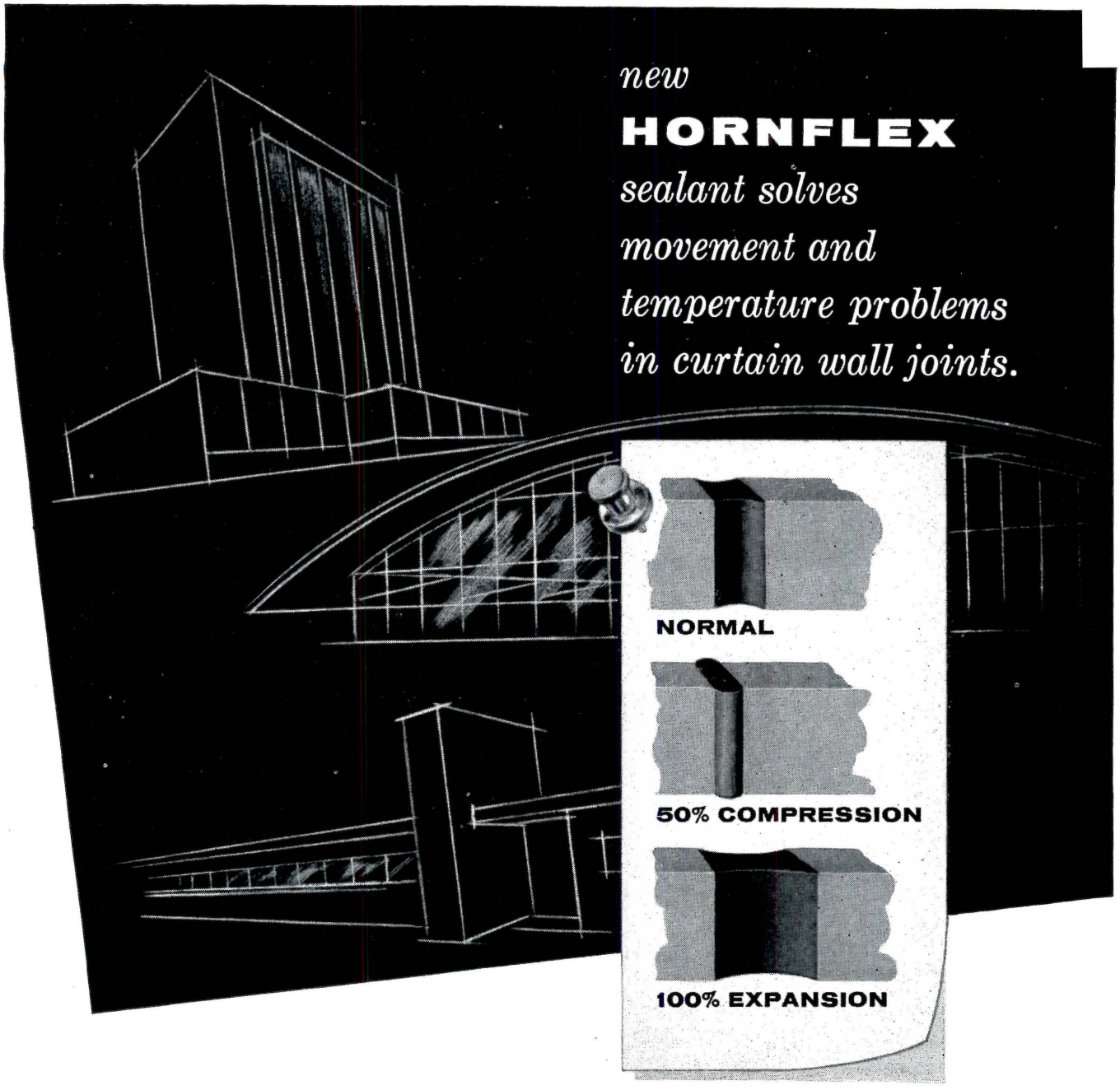

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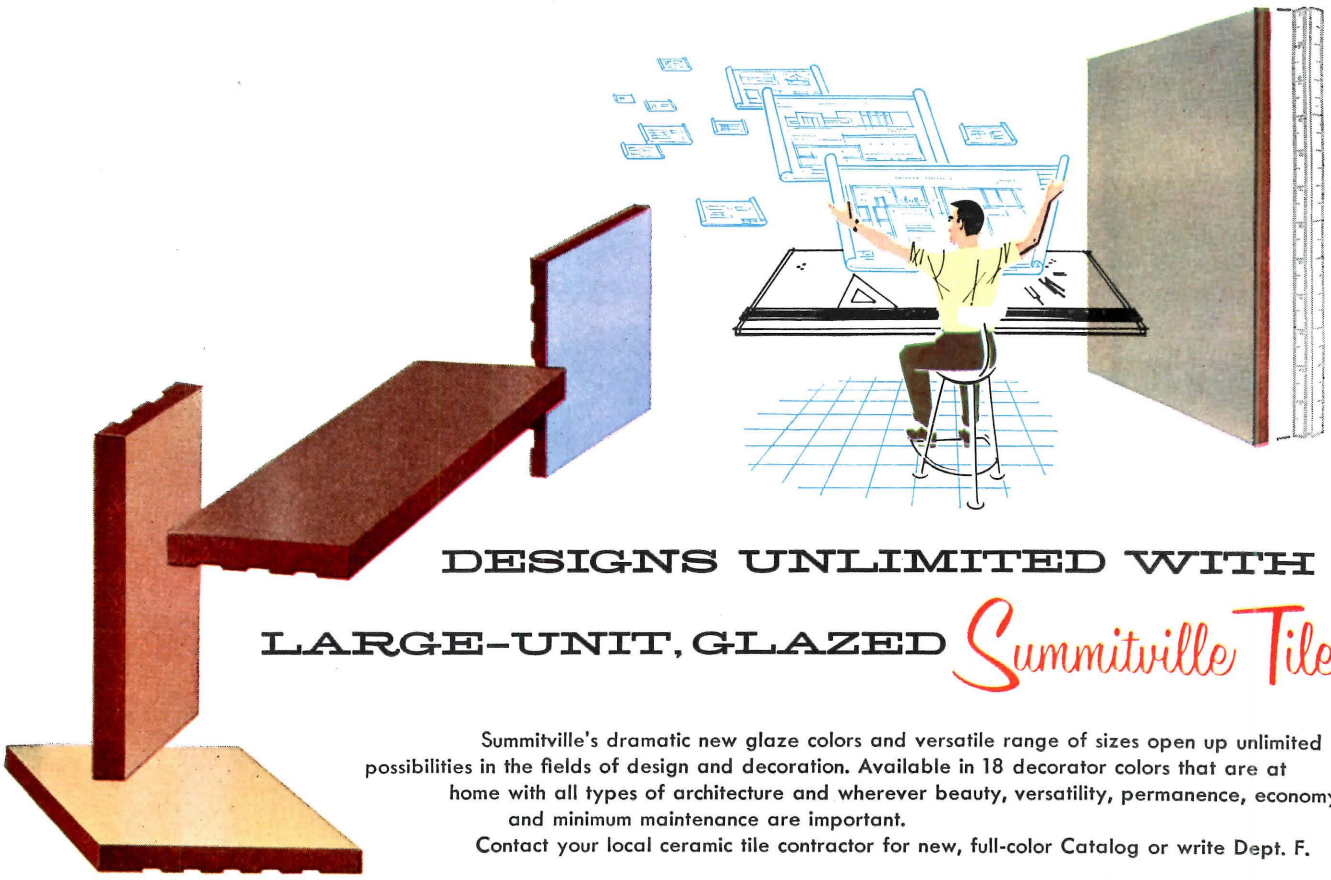

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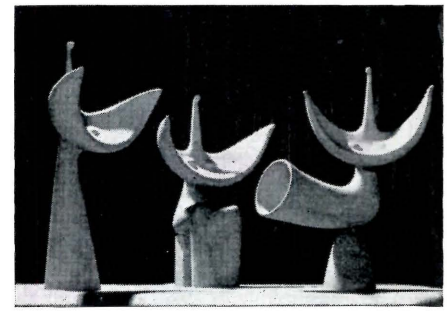
Date of the next assembly has not been settled, but the location is expected to be Windsor, Ont.

Design Competition Announced For Winnipeg City Hall

Architects in all parts of Canada have been invited to participate in the preliminary design competition for Winnipeg's new city hall. This stage will close December 8, and six finalists will then be chosen for the final competition which ends May 11, 1959. Each of the six will receive $5000, and the ultimate winner will be appointed architect of the new city hall.

A jury of five eminent architects has been chosen as judges. They are Pietro Belluschi, dean and professor of architecture at the Massachusetts Institute of Technology; Ralph Rapson, head of the school of architecture, University of Minnesota; Eric W. Thrift, director of the metropolitan planning commission of Greater Winnipeg; Alfred Roth of Zurich, Switzerland, distinguished architect, educator and author; and Peter M. Thornton of Vancouver, winner of a 1955 Massey Medal.



Two examples of the work which brought this year's Allied Arts Medal to sculptor Louis Archambault: above—*Vence*, 1954; below—*Les Dames Lunes*, 1955

Complete information can be obtained by writing to Winnipeg City Hall Competition, Box 254, University of Manitoba, Winnipeg, Man.

News Notes

Eight finalists have been chosen to proceed to the second and final stage of the TORONTO CIVIC SQUARE COMPETITION. David Horne is the only Canadian, others being: I. M. Pei and Associates, New York; Perkins & Will (Albert A. Hoover and James D. Lothrop), White Plains, N. Y.; Frank Mickutowski, and Florence Lane, South St. Paul, Minn.; William B. Hayward, Ann Arbor, Mich.; Vilijo Rewell, Helsinki; Halldor Gunnlogsson and Jorn Neilsen, Copenhagen; John H. Andrews, an Australian, now a graduate student at the Harvard School of Design. . . . Councils of the NOVA SCOTIA AND NEW BRUNSWICK ASSOCIATIONS OF ARCHITECTS met recently in joint session at Saint John. Mutual problems pertaining to professional practice and education were discussed. . . . D'Arcy G. Helmer is the newly elected president of

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Architect: Bain and Overturf,
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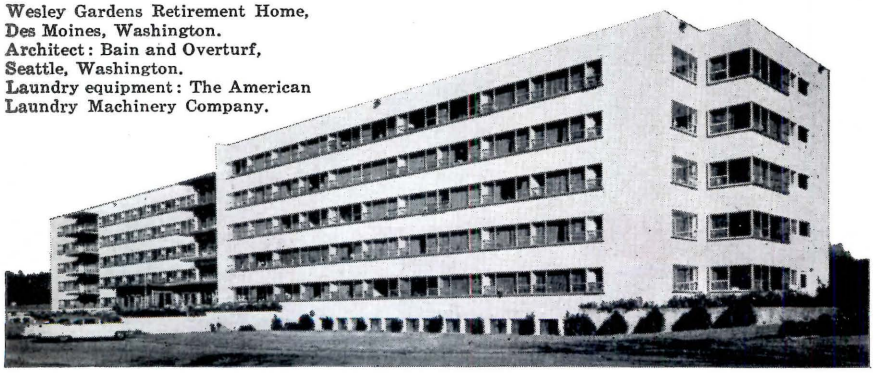

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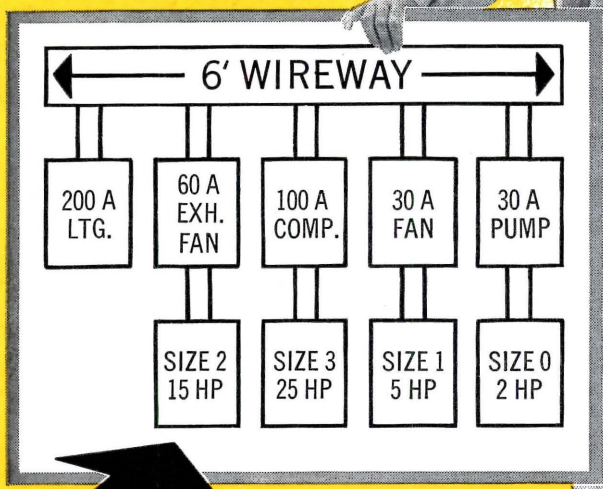

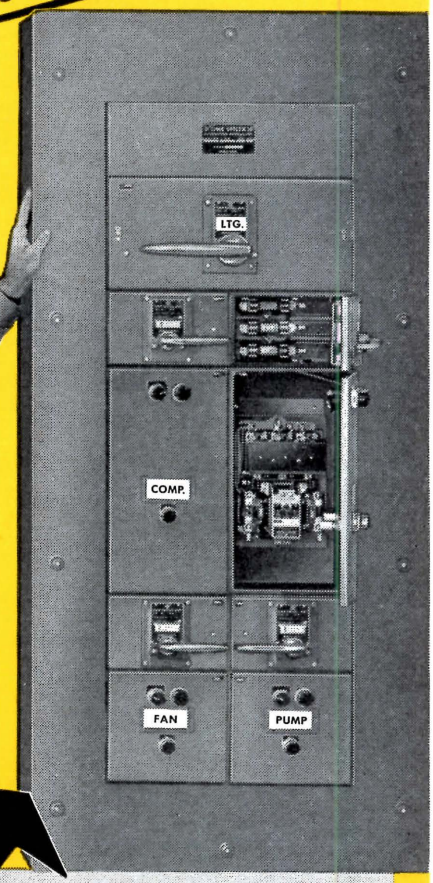

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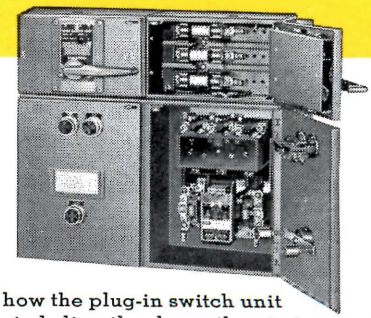
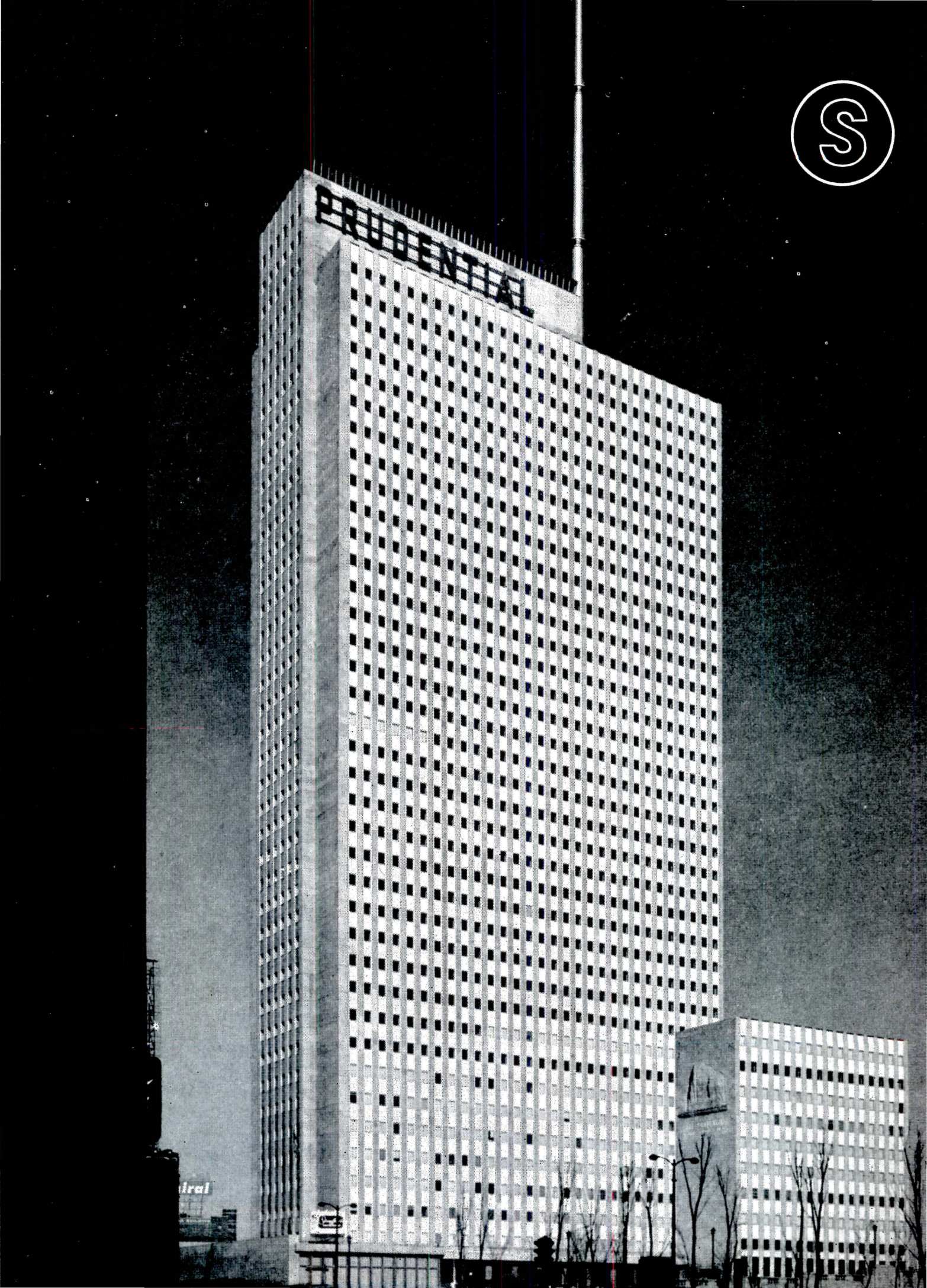


Notice how the plug-in switch unit is mounted directly above the starter, permitting interlocking. The starter cannot be opened when the switch is in the "ON" position.

It's easy to order these starter and switch units. See Page 57 in your Square D Digest and order from your distributor.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY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CHICAGO'S FABULOUS PRUDENTIAL PLAZA

...SERVED BY

THE "OVERHEAD DOOR" TRADE MARK

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CONTRACTOR: GEORGE A. FULLER COMPANY

OWNED BY: PRUDENTIAL INSURANCE CO.

The magnificent new Prudential Plaza was created to provide business firms in Chicago a better, more convenient location . . . offering the finest of today's service features.

Naturally, The "OVERHEAD DOOR" was selected for installation on the Prudential Plaza truck loading entrance. These aluminum doors seal out the powerful winds off Lake Michigan . . . yet each door glides swiftly up, over and out of sight at the touch of a button.

Installation of The "OVERHEAD DOOR" in the Prudential Plaza is another example of the confidence architects have in America's finest upward-acting sectional door. For three and a half decades, The "OVERHEAD DOOR" has met the exacting standards of quality, installation and service demanded by architects everywhere.

Today the Overhead Door Corporation produces The "OVERHEAD DOOR" in sizes to fit all standard door openings . . . and is pleased to cooperate on doors of unusual sizes and special problems. Architects and contractors need only call on us for our special services.

Available in wood, aluminum and steel, there is a type of The "OVERHEAD DOOR" to serve every need. As America's pioneer and leader in upward-acting sectional doors, the Overhead Door Corporation offers a complete line of doors—residential, commercial and industrial—with or without electric and Ultronic door operators.

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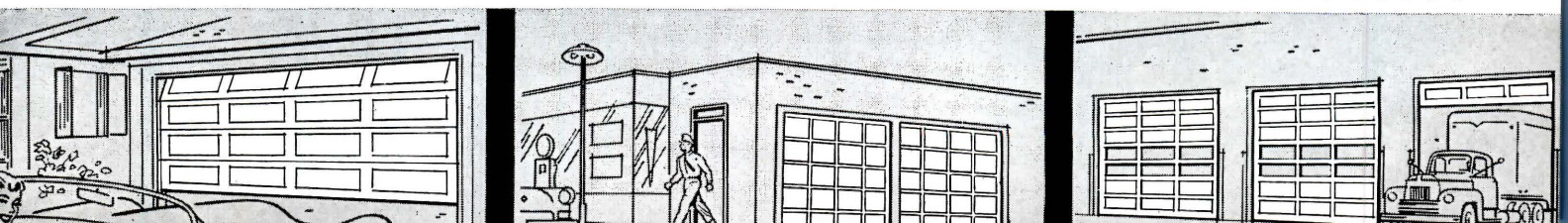
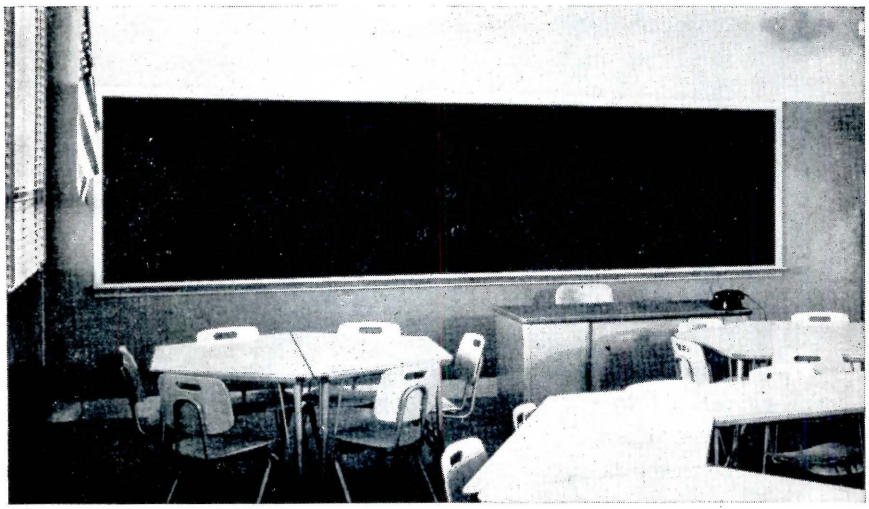
RESIDENTIAL COMMERCIAL INDUSTRIAL



the OTTAWA CHAPTER, O.A.A. Vice chairman is M. G. Dixon, secretary, Norman Sheriff and treasurer, George E. Bemi. Other members of the executive are Earl Ingram, Ian R. MacLennan and Antony Johnston. . . . Value of construction undertaken in Canada in 1958 will amount to $7.1 billion, an increase of 1.3 per cent over last year, estimates the Dominion Bureau of Statistics. By categories, industrial building will be down, commercial relatively unchanged, and housing, hospitals and public utilities up. . . . Montreal is assured that, at long last, it will get its badly needed concert hall. The St. Georges-Etienne Cartier Corporation, backer of the project, has begun to acquire the necessary land, and has named Affleck, Desbarats, Dimakopoulos, Lebensold, Michaud & Sise architects for the building. Raymond Loewy Inc. of New York is acting in an advisory capacity. . . . Prof. W. O. Richmond of Vancouver has been elected president of the 30,000-member Canadian Council of Professional Engineers. He succeeds C. N. Murray of Sydney, N. S. . . . Honorary degrees were awarded at the University of B.C. spring convocation to Charles J. Thompson, senior partner in the architectural firm of Thompson, Berwick and Pratt, and to Ralph C. Pybus, graduate of the School of Architecture, University of Manitoba, and current president of the Canadian Chamber of Commerce. . . . C. J. G. Carroll, former secretary of the R.A.I.C., has resumed architectural practice in Ottawa in association with Colin H. Copeman and C. M. Drewitt, Montreal architects. . . . 'Session 58', to be sponsored by the Alberta Association of Architects at the Banff School of Fine Arts, October 5-11, will have as its chairman Paul Rudolph, chairman of the Department of Architecture, Yale University. Details may be obtained from the association's secretary at 312 Northern Hardware Building, Edmonton, Alta. . . . Headed by Icaro de Castro Mello, chairman of the Sao Paulo Chapter, Brazilian Institute of Architects, eight ARCHITECTS FROM BRAZIL recently toured Toronto. . . . ROBERT F. LEGGET, director of the Division of Building Research, National Research Council, Ottawa, and an honorary member of the R.A.I.C., was scheduled to address a meeting of the U.S. Building Research Institute at Washington on April 21. . . . The council of the ARCHITECTURAL INSTITUTE OF B.C. will set up a special committee to improve specifications and standardization of windows. The committee will comprise window manufacturers and A.I.B.C. representatives. . . . Capital spending will be less in 1958 than in 1957, according to the ANNUAL FORECAST OF THE DEPARTMENT OF TRADE & COMMERCE, Ottawa. Amount involved is $8.5 billion, compared with $8.7 billion last year. Construction is expected to run about $5.9 billion, a slight increase.



West Springfield High School West Springfield, Mass. Arch., Warren H. Ashley West Hartford, Conn.

NATURAL SLATE CHALKBOARDS

. . . because young eyes deserve the best!

Trend setting in every detail! That's the new West Springfield High School. And blending perfectly with the contemporary feel of its classrooms are natural slate chalkboards. A wise choice because slate's neutral color provides the right balance with modern decor's strong, gay colors. But there's more to the choice of slate than mere color harmony. For of all chalkboards, slate communicates best. Only white chalk on slate produces the desired high contrast necessary to permit young eyes to see and grasp the written message instantly. Only slate is so easy to clean . . . durable . . . and so low in annual maintenance cost. That's why leading schools, like West Springfield, continue to specify natural slate . . . quarried in Pennsylvania.

for information on specific properties of slate, write:

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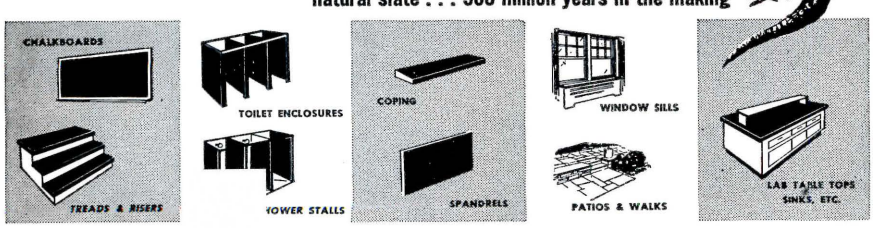
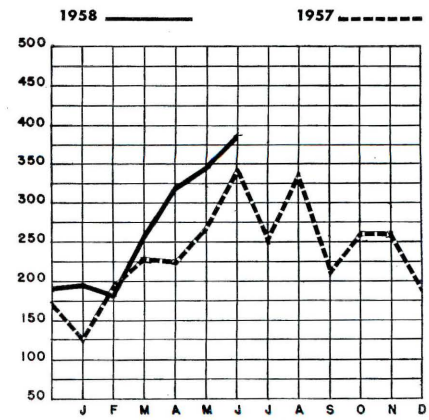
natural slate . . . 500 million years in the making



Contracts Awarded: Comparative Figures*

(in $ million)

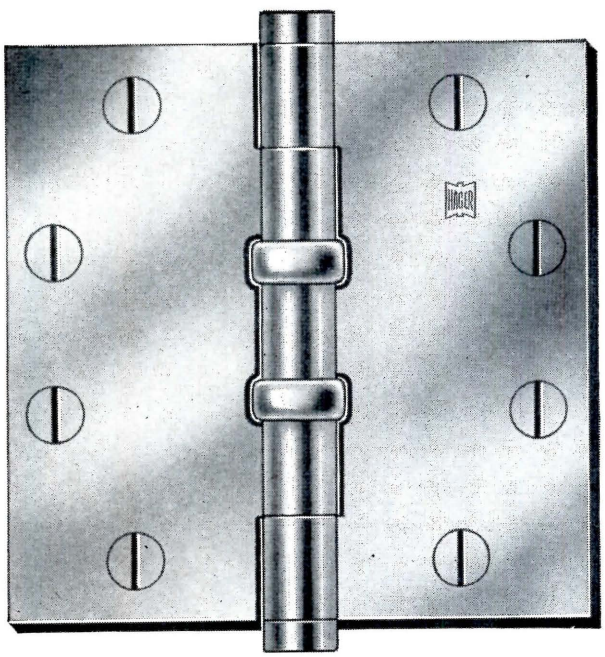


*Compiled by the Editor and staff of *The Building Reporter*, from information collected by Maclean Building Reports

speaking of 2-ball-bearing hinges . . .

ONLY A HAGER HAS THE EXCLUSIVE "Life-Time Bearing"

PERMANENTLY ANCHORED IN THE KNUCKLE WITH CASE HARDENED STEEL—NOT BRASS

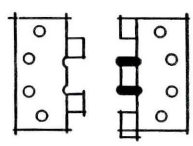


In the wear-away zone (zone of bearing anchorage) soft brass rubs steel in other leading hinges and they sometimes fail. Not so with Hager!

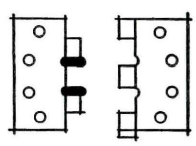
Hager's advanced, two-knuckle-bored construction puts steel against case hardened steel in this failure zone. The result is flawless ball bearing performance—life-time performance.

Yet you pay no premium for Hager's superior design and material. Compare and discover: Hager 2-ball-bearing hinges are unequalled in the industry!

These same life-time features are also a part of the Hager 4-ball-bearing hinges.

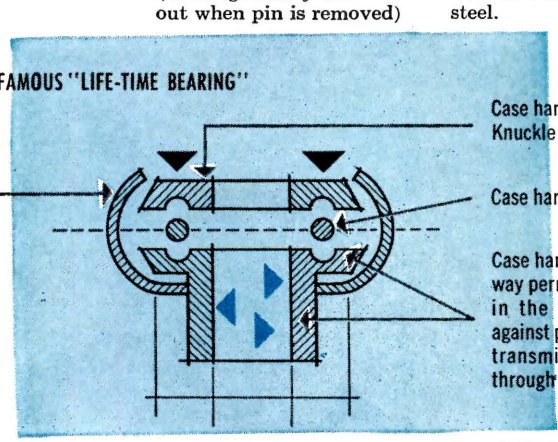


NOT THIS . . .
not one-knuckle-bored with wear-away brass to anchor the bearings. (Bearings finally fall out when pin is removed)



BUT THIS . . .
two-knuckle-bored construction with bearings anchored with case hardened steel.

EXPLODED CLOSE-UP OF HAGER'S FAMOUS "LIFE-TIME BEARING"



(Both stainless steel raceways and balls are available on stainless steel ball-bearing hinges.)

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EVERYTHING HINGES ON HAGER

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No other material you specify has to stand up to the day after day pounding that floors get. That's why so many architects specify durable, long-lasting Moultile Asphalt and Vinyl-Asbestos Tile. Moultile has proved its ability to "take it" in installation after installation across the country. Moultile delivers on upkeep, too. It is economical to maintain . . . requires a minimum of care. For your next project, be sure to specify colorful, low-cost Moultile.

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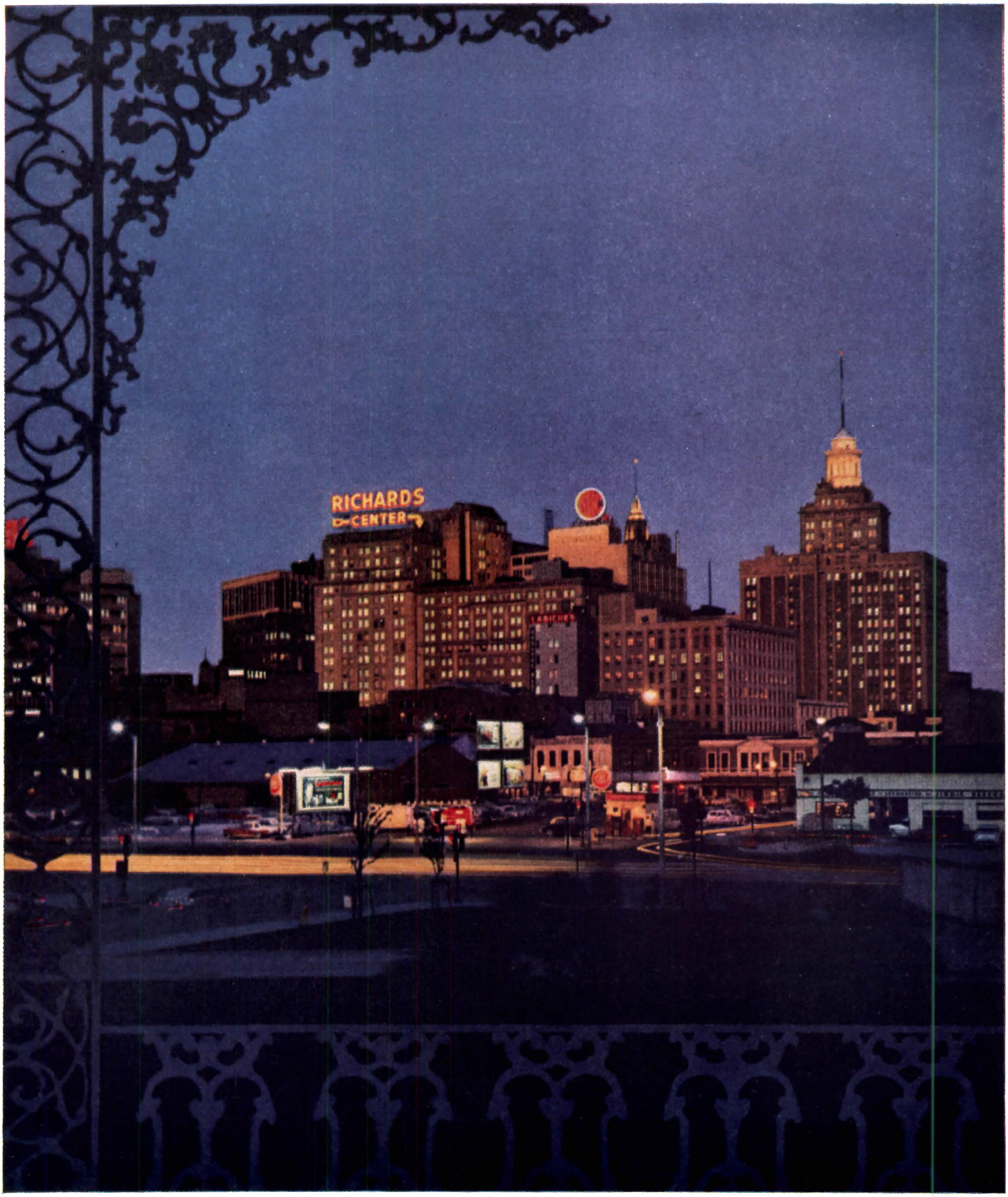

NEW ORLEANS, *Louisiana, a city long famed for its old world charm, is in a quandary. Can the native regional beauty of its architecture withstand the onslaught of the greatest commercial boom in its history? How to retain a city's historical character during urban renewal or expansion is a topic of widespread interest. Naturally, the answer lies with architects, civic leaders and industrialists. OTIS has an intimate knowledge of the elevator requirements of New Orleans. It has installed 67% of the elevators. OTIS is ready to work with planners to make it possible—for new and modernized buildings alike—to have the world's finest elevatoring.*

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Emphasis in Military Construction Shifts to Missile-Related Types

Architects, engineers and contractors whose interest lies primarily in the field of military construction are watching a profound change in the project mix. This is just beginning and will become more pronounced during the years just ahead, in the opinion of military construction experts in the Pentagon.

The shift in relative importance among types of construction in the Army and Air Force programs from conventional airport pavements, housing, and all the more familiar kinds of building to missile-related construction is something to be studied closely by material producers, said one high-placed Army Corps of Engineers official.

Some estimates of the proportion of fiscal 1959 funds to be apportioned to the newer types run as high as "nearly 60 per cent," while the outlook over a longer range—the years immediately beyond—is for a more decided boost in the allocations.

In fact, the entire concept in military construction is changing very rapidly, faster than many in the field realize. Some Air Force officials are predicting that the period of need for new airfield pavement construction is ending. These officers look for the requirements program in this type to be completed in a year or two as the emphasis shifts to missiles and related construction. All ranking Pentagon brass does not agree with this view, however. Some Corps of Engineers spokesmen look for the airport pavement era to extend indefinitely.

It is certain, however, that an increasing volume of construction money will pour into missile launching sites and similar building projects each fiscal year in the foreseeable future. Building for the missile age seriously is underway.

From now on, the larger share of attention will go to building structures to house detection equipment, for example, and the many other instruments connected with a highly technical missile age. These buildings housing delicate instrumentation must all be air conditioned, by the way; and for the most part they are not being built in populated areas.

Military construction men are beginning to talk in terms of greatly increased demand for the heavier materials—cement, structural steel, etc.—with less and less call in their programs for the more common items—plumbing equipment, conventional builders' hardware, etc.

Hill-Burton Hospital Program Gets Three-Year Extension

The Hill-Burton hospital construction act was given a three-year extension beyond its June 30, 1958, expiration, thus assuring its continuance at present financing levels.

A report from the House Committee on Interstate and Foreign Commerce, which handled the legislation in the House, indicated committeemen were well aware of a need for other amendments to the program, but they judged the simple extension to be most expedient at this time and said the other proposed changes would be taken up with Health, Education, and Welfare Department officials at a later date.

Nine House members spoke on the amendment when it was up on the floor, none opposing. As extended, the program would continue to provide (1) grants to states for surveys and comprehensive planning and (2) grants to local sponsors to assist in the construction of public and voluntary nonprofit hospitals, public health centers, and related facilities.

continued on page 320

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. . . at the top of the class

SCHOOL EQUIPMENT

Reports received from our many satisfied school customers indicate that METALAB merits a *TOP RATING*. Let us achieve these high ratings for your various school projects such as Science, Homemaking, Shop, Arts & Crafts, etc.

The listing below is representative of the complete METALAB line of Classroom Equipment:

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Combination Science Desks
Chemistry Tables
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- **HOMEMAKING, INDUSTRIAL ARTS, & DOMESTIC SCIENCE EQUIPMENT**

Unit Kitchens
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REPORT CARD
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	Grade
QUALITY	A
ECONOMY	A
SAFETY	A
MODERN DESIGN	A
VERSATILITY	A
DURABILITY	A
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PRECISION	A
FUNCTIONAL	A

Avail yourself of our FREE Planning Service to solve your schoolroom laboratory needs. Write for our Educational Catalog now!

LET OUR SALES ENGINEERS HELP YOU TO MAKE THE GRADE!

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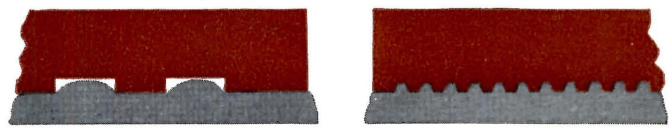
With 50% less bonding material

V-BAK is a MURRAY innovation in which the ordinary square grooves are replaced by triangular serrations increasing the surface exposed to the bonding material by 23.5%, thereby greatly increasing the strength of the bond. V-BAK at the same time requires 56.5% less bonding material, especially important in acid-proof installations. MURRAY V-BAK costs no more than conventional backing.



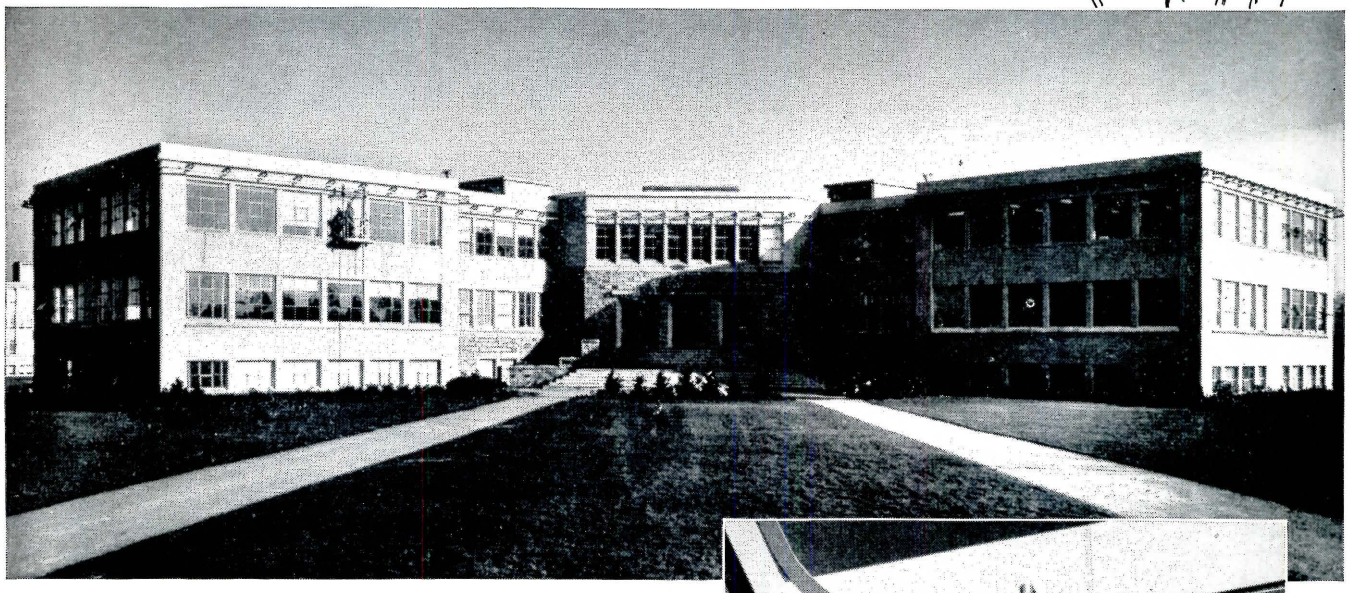
Old Style Corrugated *Murray V-Bak*

Efficiency and Economy are two most important product features and are the two good reasons why Progressive Architects specify, and successful Contractors use MURRAY V-BAK uniform sized Quarry Tile.

murray V-BAK® TILE COMPANY INCORPORATED

MANUFACTURERS OF QUARRY TILE CLOVERPORT, KENTUCKY

TRAMRAIL *Speeds*
Window Washing at University



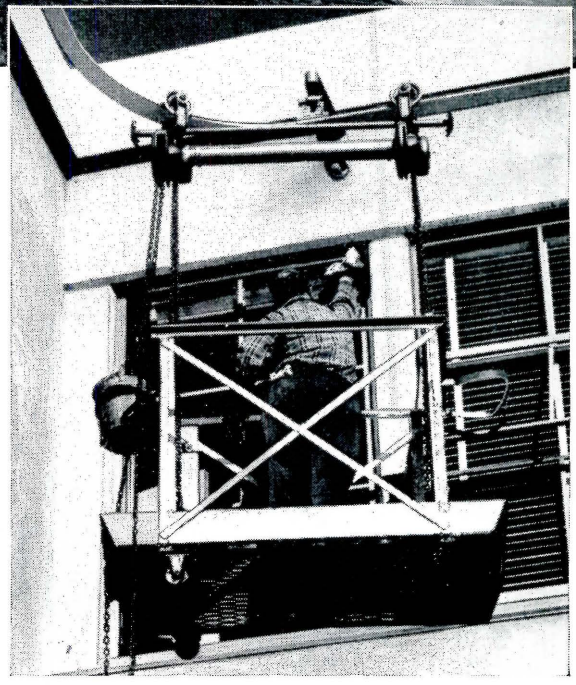
The Cleveland Tramrail window-washing system on this building is hand operated. When not in use the cage is detached and rolled inside. The track does not detract from the building appearance, in fact, it usually is not observed unless special attention is called to it.

THE track of a Cleveland Tramrail window washing system practically encircles the beautiful Biological Sciences and Pharmacy Building of the University of British Columbia, Vancouver, B. C. A hoist carrier supporting a special cage operates on the track. A man in the cage can travel laterally or vertically and thus quickly position himself at any window.

Obviously the equipment greatly simplifies the window washing job. It is not necessary to handle heavy ladders or work from dangerous window ledges. Nor do window washers have to track through busy offices and rooms to reach windows. The entire job of washing external window areas is done from the outside without disturbance to anyone.

Moving from window to window by means of the overhead track system eliminates a large amount of climbing, walking and carrying. Therefore, a man can wash far more windows per day with less effort. And of importance, he is much safer in a Tramrail cage which is provided with a sturdy guard rail.

Cleveland Tramrail window washing systems offer real advantages and are practically a "must" for air-conditioned buildings, because opening windows during washing is apt to unbalance a cooling system and cause widespread discomfort. For further details write for Booklet No. 2022-A.

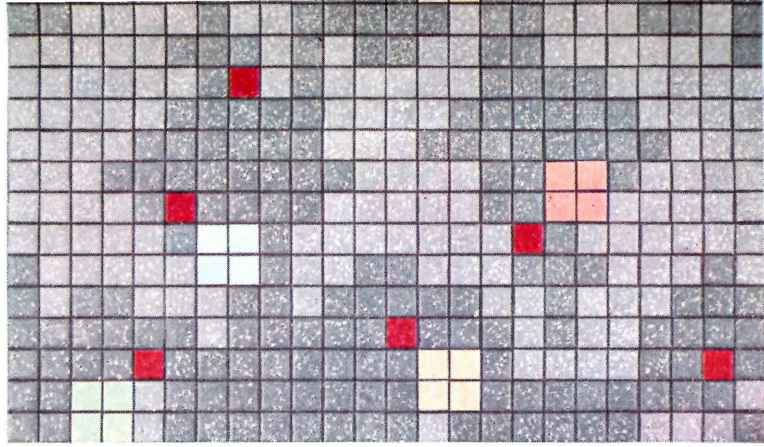


The cage will accommodate two washers. Buckets supports are provided at convenient heights on both sides. A washer can lower or raise himself with a chain hoist. Other Cleveland Tramrail window washing equipment is available with electric drives for both hoist and carrier travel.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 2528 E. 290 ST. • WICKLIFFE, OHIO



Designed with
Romany • Spartan

FAIENCETTE

Light Blue	1060
Suntan	1041
Lemon	1012
Ming Green	1050

DECORATOR

Tangerine Red	5035

ORSAN

Light Green
Dark Green

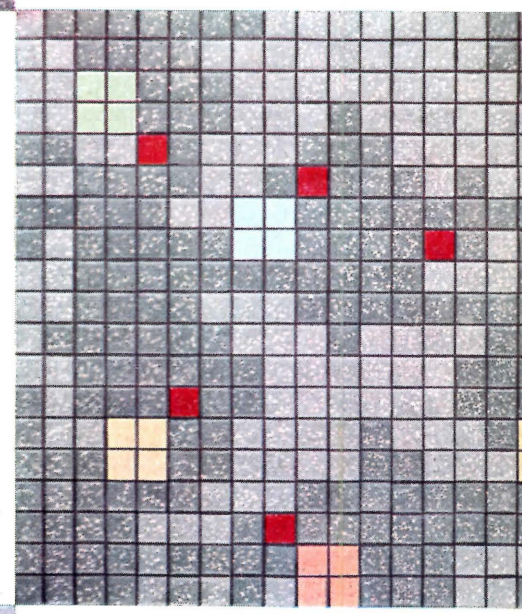
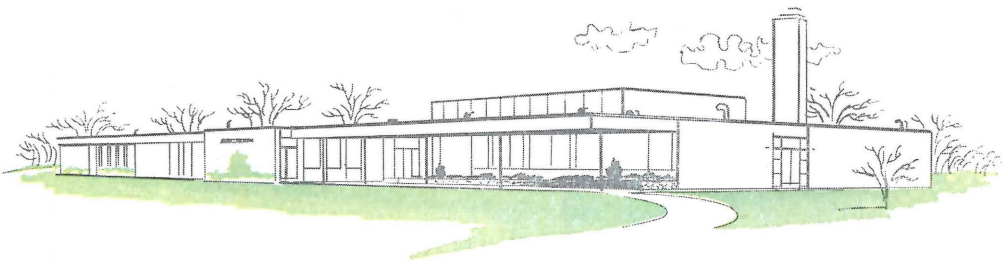


Plate No. 1057

School buildings can be made more practical, more attractive with Romany• Spartan ceramic tile indoors and out



While Romany•Spartan tile is well known as a superior floor and wall finish for use throughout school buildings, its versatility does not stop there.

For example: Bates Elementary School, Brownstown Township, Michigan, primarily a single-story structure, contains a two-story all-purpose room. On two of the walls extending above the main roof line, panels of Romany•Spartan "certified frostproof" tile, expertly designed and skillfully blended with surrounding materials, provide an interesting change of pace in exterior finish.

Here's just one of many ways Romany•Spartan's complete line of ceramic tile can be used in creating handsome, low-cost schools. For design help or information, contact your nearby Romany•Spartan sales representative. If you'd like a copy of "The Talents of Tile", a color brochure of Romany•Spartan school and college installations, write United States Ceramic Tile Company, Dept. R-22, Canton 2, Ohio.

BATES ELEMENTARY SCHOOL
Brownstown Township, Michigan

Architect:
WALTER J. ROZYCKI
Detroit, Michigan

Tile Contractor:
MICHIGAN TILE & MARBLE CO.
Detroit, Michigan

ROMANY SPARTAN®

Genuine Clay Tile

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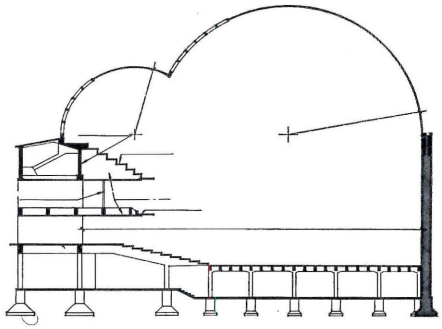
THE SPARTA CERAMIC COMPANY
MEMBERS: TILE COUNCIL OF AMERICA AND THE PRODUCERS' COUNCIL, INC.

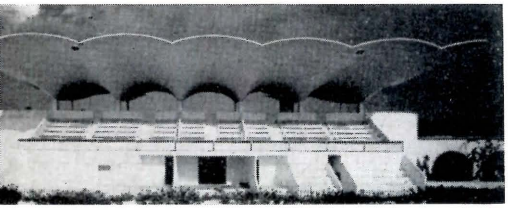
An Engineer Views His Own Work

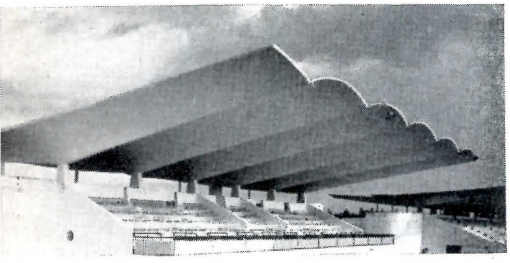
By Fred N. Severud

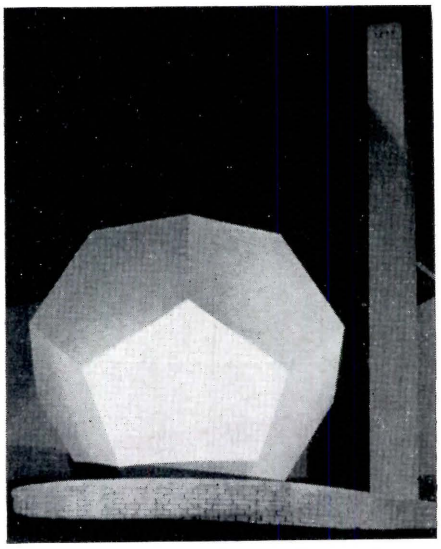


Fronton Recoletos (1935): stands and pitch for pelota spectators and players

Madrid Racecourse (1935): roof withstood bombardments during Spanish Civil War







Dodecahedral Coal Silo (1951): in use at Torroja's Costillares research institute

The Structures of Eduardo Torroja. *By Eduardo Torroja. Foreword by Mario Salvadori. F. W. Dodge Corp. (New York), 1958. 198 pp., illus. $8.50.*

This book is a clear and lucid expression of the personality of its author. He has had the advantage of having created and directed one of the world's outstanding testing laboratories. The results are felt throughout the book. He has acquired the capacity for a very sensitive "feel" of the actual stress flows and has usually applied it logically and simply.

His Madrid Racecourse is one of the modern classics. To follow his step-by-step development of this majestic structure is a fascinating experience. In expounding his line of thought he makes this remark: "To me it seems clear that the imagination can operate successfully only in conjunction with the basic principles that a long experience of technical creative work leaves in the unfathomable depths of our personality, so that these may later subconsciously condition our own intuitive thought. But those basic principles are not enough in themselves to create, critically and deductively, a new form. For this to emerge, a spark of imagination is required. Indeed, it often appears at the most unexpected moment, when we are least trying to create."

continued on page 64

Encyclopedia Of Building Has Many Authors

By Seymour Howard

Building Construction Handbook. *Edited by Frederick S. Merritt. McGraw-Hill Book Co. (New York), 1958. 906 pp., illus. $15.00.*

Each time a new handbook is published, an architect hopes that he will at last find the one book that will answer his encyclopedic need for information. Of course such an expectation can never be completely realized, but this book approaches it.

Frederick S. Merritt, senior editor of *Engineering News-Record,* has had the cooperation of many specialists to provide an unusually complete survey of present-day construction materials and theory. The information has been selected for its usefulness to a relatively large group —engineers and architects, of course, but also contractors, manufacturers, real estate managers, and clients.

Construction materials—including plastics, laminates, rubber, and bituminous products—are described and analyzed very competently; the incorporation of these materials into building elements is covered by chapters on walls, doors, lath and plaster, windows, floor coverings, roof coverings, and builders' hardware. There is a special section on water permeability of masonry.

The theory of structures is treated succinctly by the general editor, with easily understood analyses of arches, domes, thin-shell structures, and moment distribution methods for continuous beams and frames. Among other topics discussed by various authors are: structural materials, soil mechanics and foundations, acoustics, heating and air conditioning, insulation, water supply and waste disposal, plumbing and sprinkler systems, electric power and lighting, and vertical transportation. Each section is a good guide to its aspect of building construction.

There are a few important points which I would like to have seen included or strengthened. In the first section a much more positive plea for creative city planning should have been made. In the same section the reader is given the concept of a plan

continued on page 64

CUTLER Toilet Compartments

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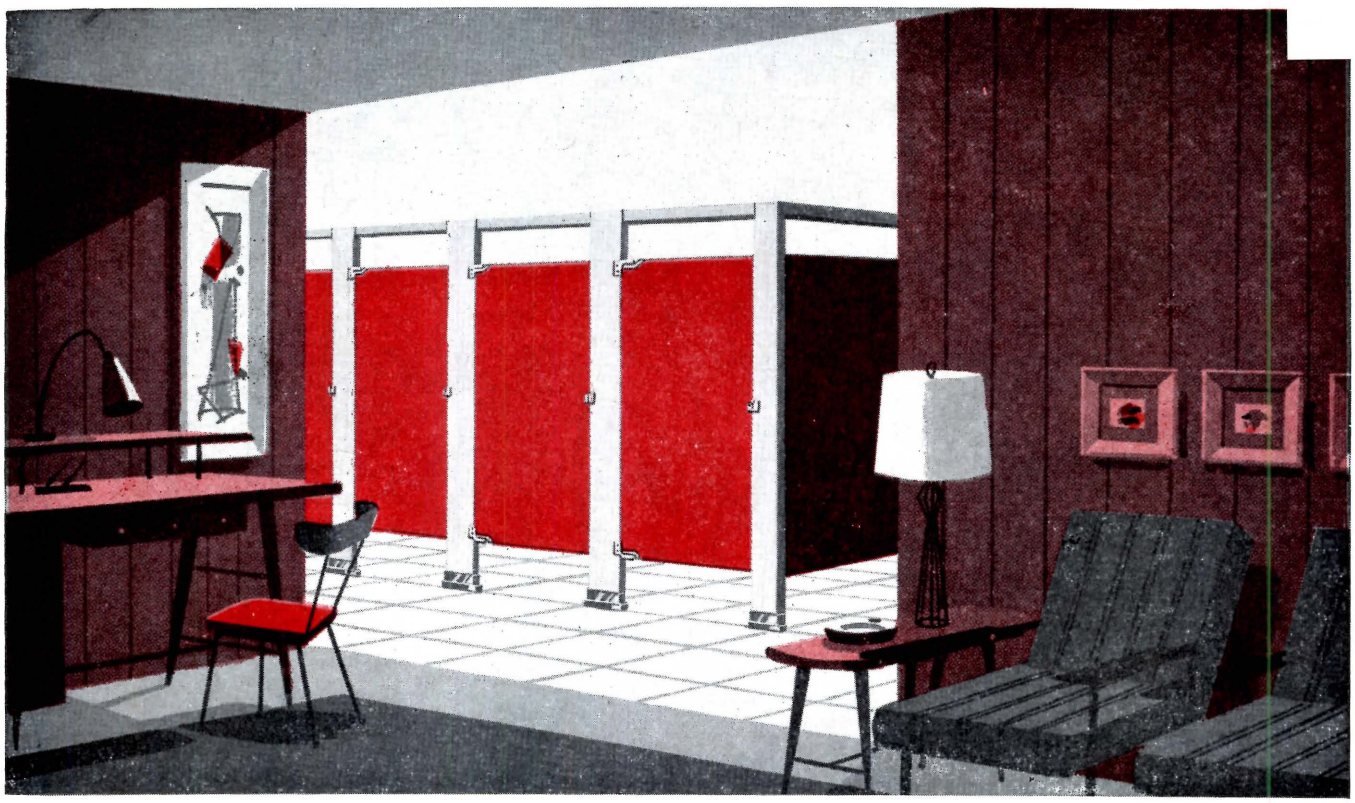

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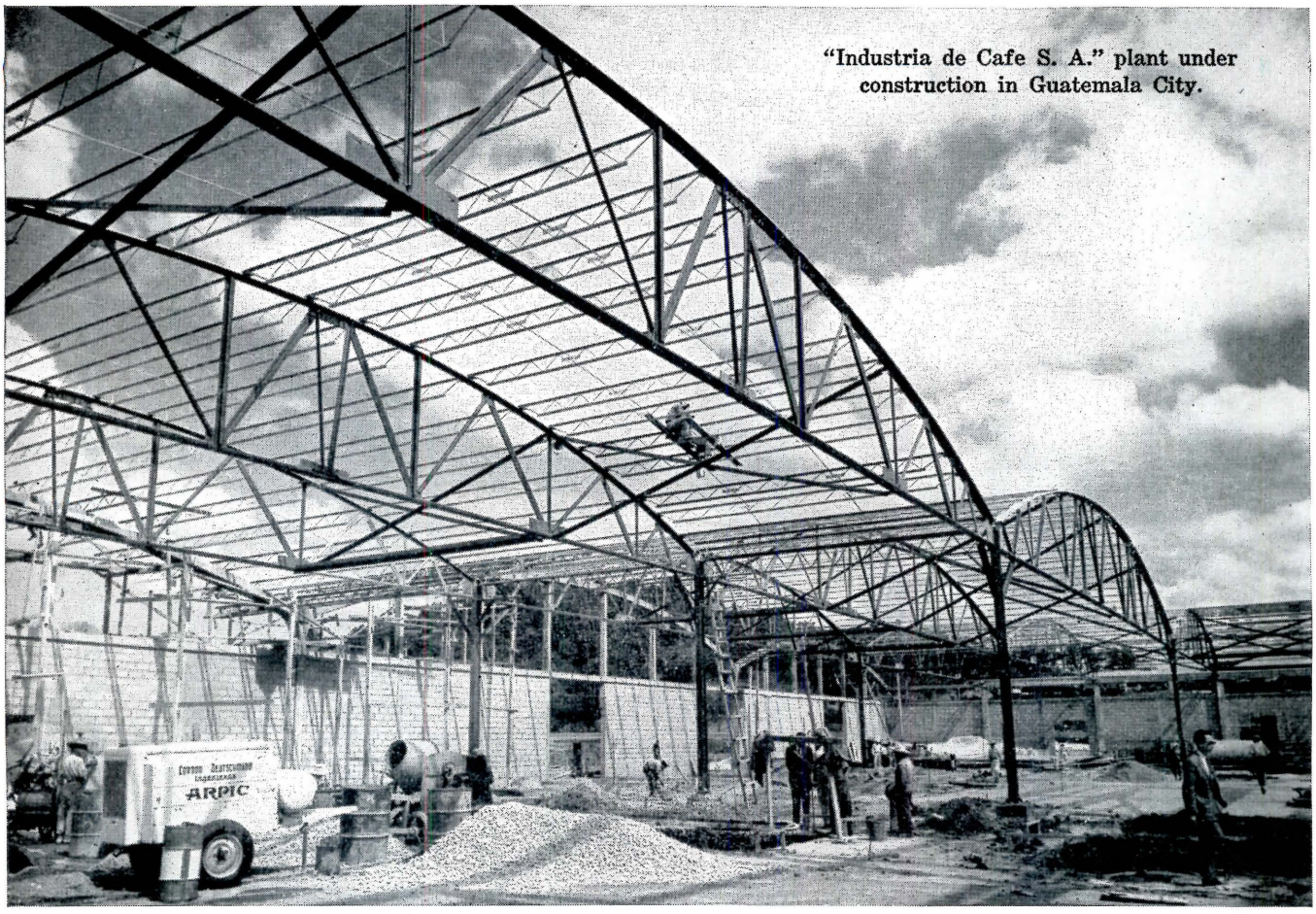
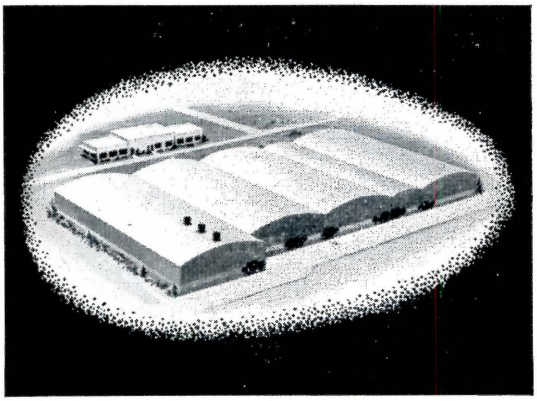


"Industria de Cafe S. A." plant under construction in Guatemala City.

Clear spans up to 110 feet, designed for hurricane wind loads with...



Completed Reynolds Aluminum Company of Cuba plant located near Havana.

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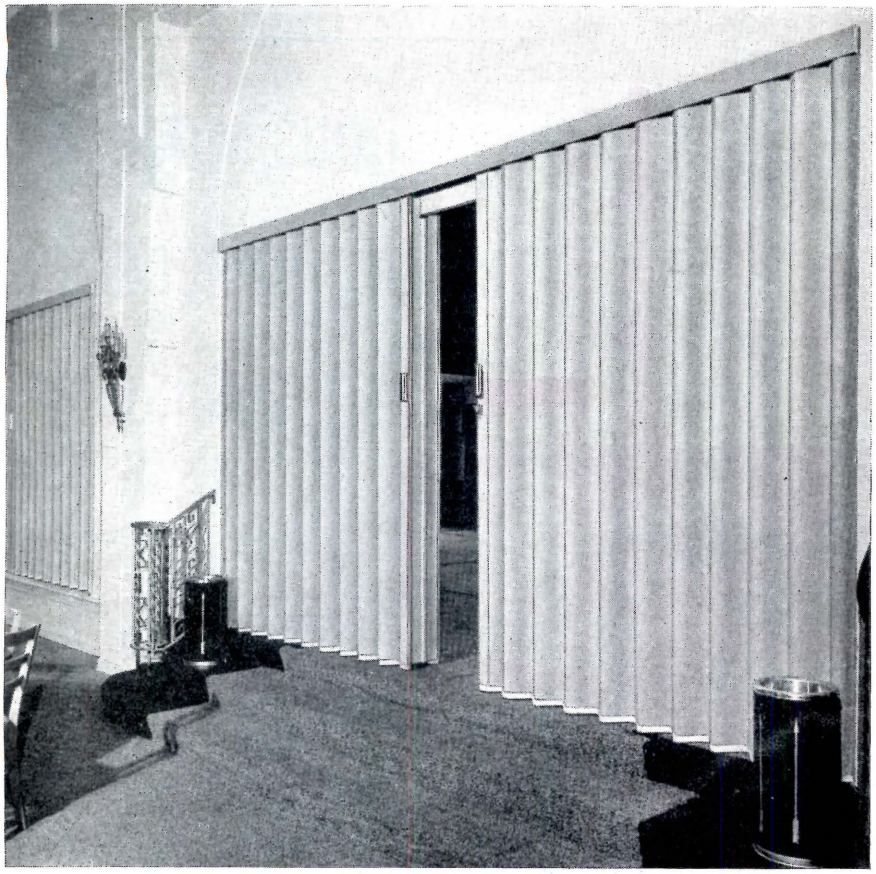

Ballroom, Empire Room, Dover Room—Hotel Monica, Santa Monica, Calif.
Contractor & Designer—Joseph Illig & Sons—Los Angeles

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Required Reading

continued from page 60

Torroja . . .

The Fronton Recoletos building is also followed through in progressive steps from the trite to the spectacular. The resulting shape of two lobes of greatly differing shapes, supported at their outer perimeters and intersecting without support in the center, makes one shudder a bit at the complexity of the stress flow. Add to this the tendency of the construction to span the short way as an arch with a kink in it, for which it is evidently not proportioned, and a maze of conflicting stress paths has resulted.

Although the forms created are impressive, the inherent conflict between three elements of such dissimilar behavior, which must live together for better or for worse, is, in my opinion, questionable. The selection of such a combination shows, however, that Torroja has rare courage. It is unfortunate indeed that the structure collapsed, presumably as the slow aftermath of a bombing raid, because a long-term observation of such an unusual structural combination would have been very interesting.

That Torroja is aware of the hypersensitivity of such a structure is evident from his remark that "Had I to build it again I should provide such reinforcement ribs," that is, in the direction of the arches. (I am not convinced these ribs would do the trick. It would increase the arch tendency and attempt to carry such great loads transversely that something might give way suddenly, throwing impact loads on the longitudinal barrel system.)

In his testing laboratory the dodecahedral shape of the coal silo stands out as one of his greatest contributions. It is an inspiring metamorphosis from a drab coal bin to beautiful sculpture. It makes one wonder how many similar opportunities one has missed. The playful pergola over the peripheral pathway is another example of a pleasing sculptural form.

In closing the book, you will be glad you have made the acquaintance of one of the truly great.

Building Construction . . .

efficiency ratio by which to compare the merits of various plans, but there is no list of the plan efficiency ratios of typical existing buildings. In the sections dealing with glazing compounds and with sealants for curtain walls the use of Thiokol-based compounds is unfortunately

continued on page 334

ARCHITECTURAL RECORD *Western Section*©

EDITOR: *Elisabeth Kendall Thompson, A.I.A.*
2877 Shasta Road, Berkeley 8, California

Lessons from a Backward Look

There may be a Ferry Park in San Francisco after all. But it won't be the beautiful open space that was envisioned two and a half years ago by the joint committee of architects and landscape architects of the Bay Area. Nor will it be the thing of joy planned by architect Mario Ciampi at the request of the city's planning department. Nor will it have state funds to help finance it, or as much land as once might have been available. For the proposed freeway has become an all-too-solid reality, and the dreamed of open area has shrunk to a small plot of grass and colored pavement around a fountain.

There is no simple, easy answer as to why all these things will be as they will be. In the end, too many groups were involved, too many interests—vested and otherwise—were implicated. But two things stand out clearly from the sorry story.

First, that it is not enough for architects to enter such frays *after* basic decisions have been made. And second, that the people wanted the park at the foot of Market Street; the people caught the vision that the architects belatedly offered, because for once the architects were talking in their own language: space for leisure use; vistas toward a familiar landmark; open land, with trees and plants; a rare chance to use the beloved Bay's waterfront for a recreational purpose.

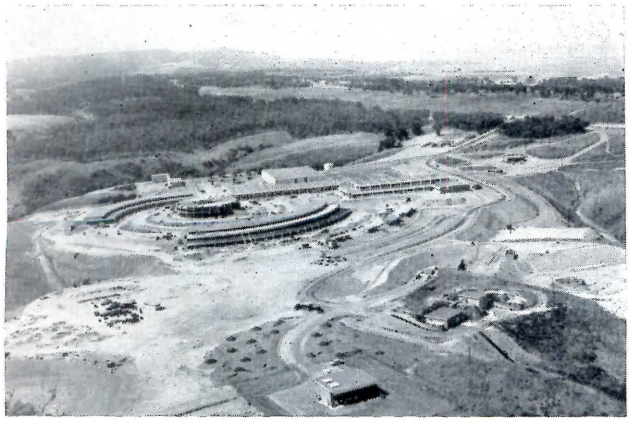
And now it will be the people who will finally determine whether there will be even a remnant of open space at the foot of Market Street. The ballot for San Francisco's November election will ask a vote on a $38,600,000 bond issue which will include $2,700,000 for planning and developing a four-acre park (considerably smaller than originally planned) which would be a part of the Golden Gateway redevelopment project.

The issue of Ferry Park is not just a local one for San Franciscans, or even for Bay Area residents who come and go, or for tourists. It is a case in point for any city, especially now when freeways and a trend to greater popular densities threaten the already small amount of open space in cities. What Rome did centuries ago, we have yet even to want to do—to make of city life a particular kind of experience, to give it delight as well as commodity.

But the most telling lesson that the debacle at Ferry Park teaches is that architects are going to have to show that they care about environment—in time to do something about it—before they are going to be entrusted with the design of environment. It is good that today we talk about the necessity for planning more than the isolated, single building; but we will have to prove that this is more than long-hair dream-talk before environmental projects reach the drawing boards of architects. Along with the dream will have to go the concern; and if the concern is real, it will include the practical means of accomplishment; and if the dream is practical, it must be presented early enough to have a chance of realization.

E.K.T.

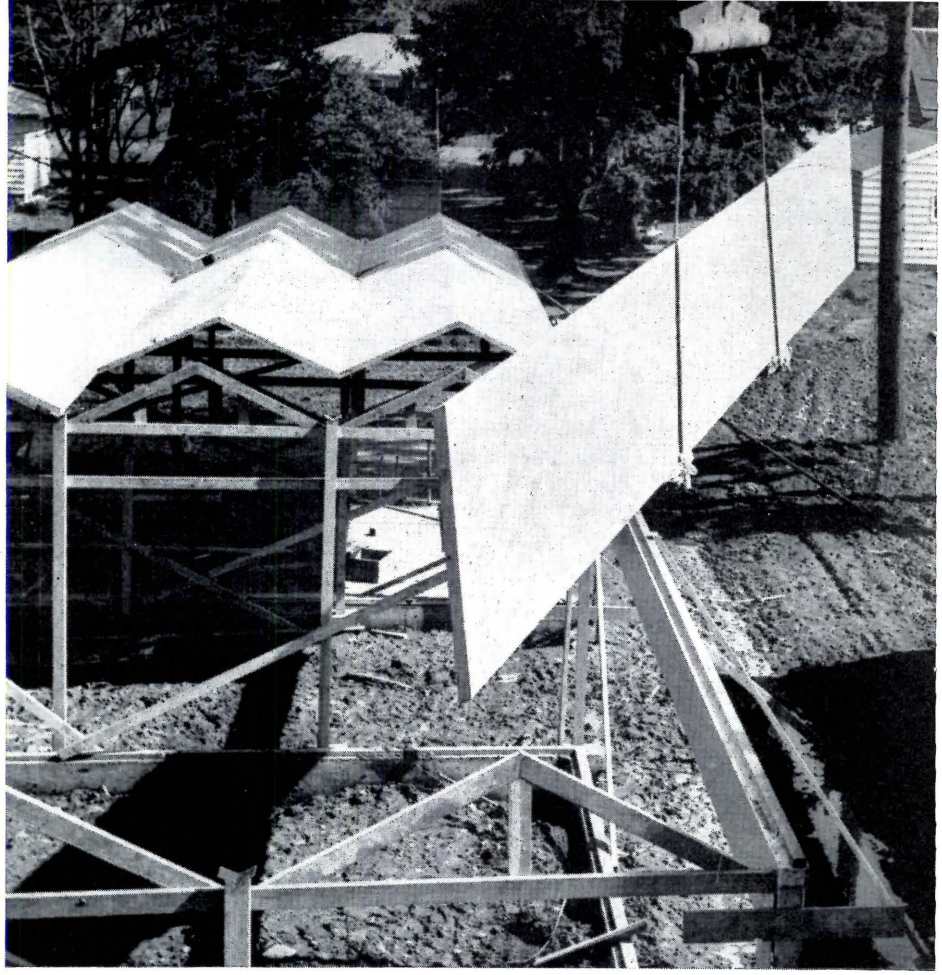
H. L. Van Pelt



At center, library and cafeteria; around it are curved laboratory buildings. At right, experimental labs and administration-engineering building (also shown)

Laboratories for Research in Nuclear Fission and Fusion

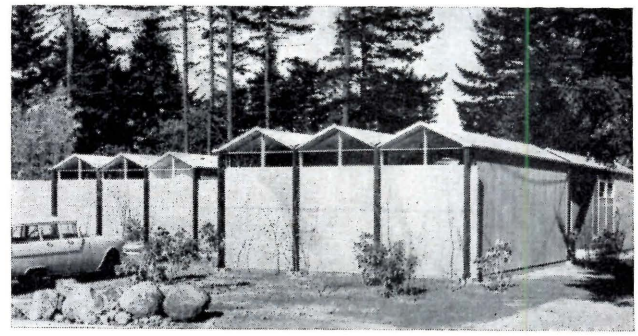
When the John Jay Hopkins Laboratory for Pure and Applied Science—a "thing for the mind and spirit, devoted to man's progress," as its dedication reads—is completed this month, it will house all of General Atomic's present nuclear research and development operations. Located at Torrey Hills Mesa north of San Diego, the laboratory includes General Atomic's prototype 10 kw TRIGA reactor, an electron linear accelerator, and facilities for controlled fusion experimentation. Besides these larger tools of research, there are 80 smaller labs, an administration-engineering building and, at the center of the complex, a library and cafeteria building. Construction was begun in January 1957 on the first of the $10,000,000 group of buildings for which Pereira and Luckman are architects and engineers.

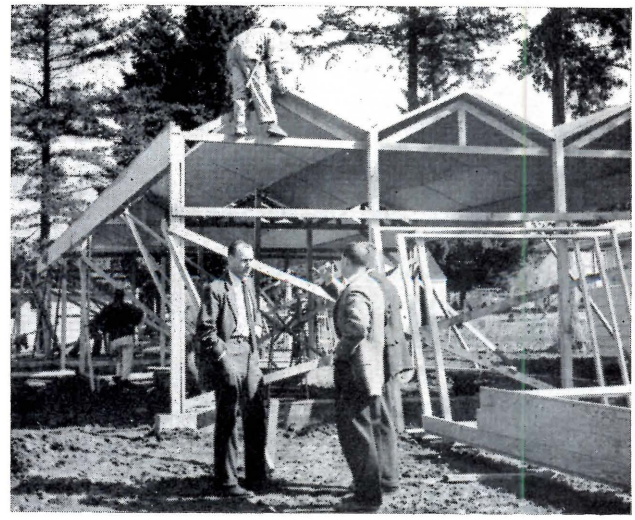


Epic Associates photos

Folded Plate Plywood Roof for Residence

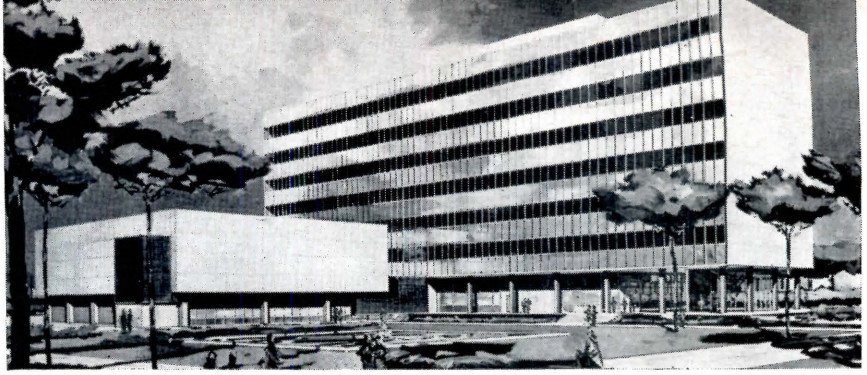
The wood and plywood folded plate roof on this house in Portland, Oregon, is the first application to the residential field of this kind of construction. The roof structure—a series of stressed skin panels 4 ft wide and up to 31 ft long—is carried on plywood box beams supported by wood posts spaced 15 ft in one direction, 7 ft 3 in. in the other. The plates function in pairs as inclined self-supporting diaphragms. The bottom skin of the panels acts as ceiling surface. Both folded plates and box beams were shop fabricated, and although cost for this prototype house was high—$2000 for beams and panels—further experience in component production is expected to reduce this amount considerably. The framing and roof were erected in 25 man-hours. Aluminum sheet siding with baked enamel finish was applied directly to the plywood wall panels as exterior surfacing. William L. Fletcher and Donald Blair of Portland were architects; Dwight Haugen was the builder. The roof was engineered in consulation with the technical department of Douglas Fir Plywood Association.



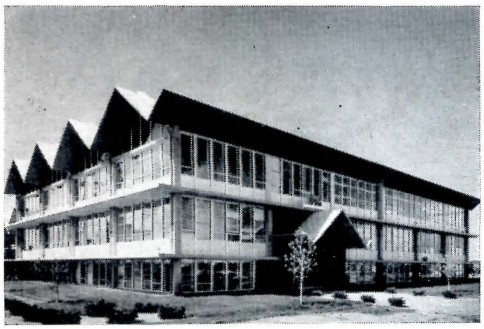


Plates for roof were positioned over temporary form during fabrication offsite. Box beams, up to 46 ft in length to span a maximum of 22 ft, were also shop fabricated. This system makes possible open, flexible plan with privacy. Below, architects Fletcher and Blair on job

WESTERN BUILDINGS IN THE NEWS

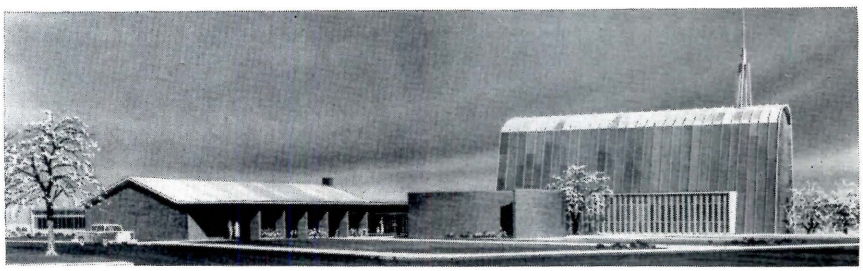


LONG BEACH, CALIFORNIA: Public Safety Building will be first major structure in a $30,000,000 modernization and expansion program for Long Beach's civic center. Six-floor building will contain administration offices for municipal services on first three floors, jail facilities on upper three. Two-story wing on west houses central fire station. Under construction now and due for completion early next year, building will cost $3,750,000. Francis J. Heusel, architect; Killingsworth, Brady and Smith, associated architects; Twaits-Wittenberg Company, constructors and engineers



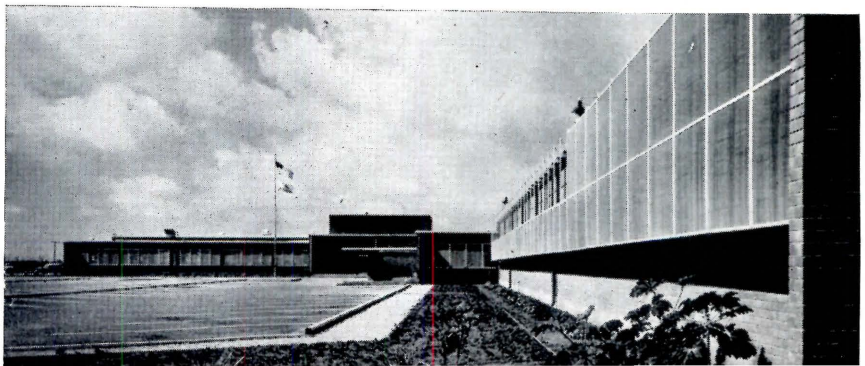
DENVER, COLORADO: Folded plate roof on Denver-Chicago Trucking Company's new office building is of thin-shell concrete. Toll and Milan, architects; Ketchum and Konkel, structural engineers

INGLEWOOD, CALIFORNIA: Five-inch folded plate prestressed concrete forms roof of Good Shepherd Lutheran Church. The $196,000 building will seat 672 persons. Gene Verge and R. N. Clatworthy, architects; John J. Driskell, structural engineer; J. Marx Ayres, mechanical engineer; J. F. Reardon & Associates, electrical engineer



YAKIMA, WASHINGTON: First Christian Church was designed by Durham, Anderson and Freed, Seattle architects

SANTA ANA, CALIFORIA: Awarded a Merit Award by Pasadena chapter, A.I.A., for "outstanding architectural achievement," the new building for BJ Electronics, Borg-Warner Corp., was designed to permit easy expansion as needed. Exterior walls of aluminum sandwich construction and temporary steel columns and sash can be moved without disturbing building's basic structure. John Kewell and Associates, architects and engineers



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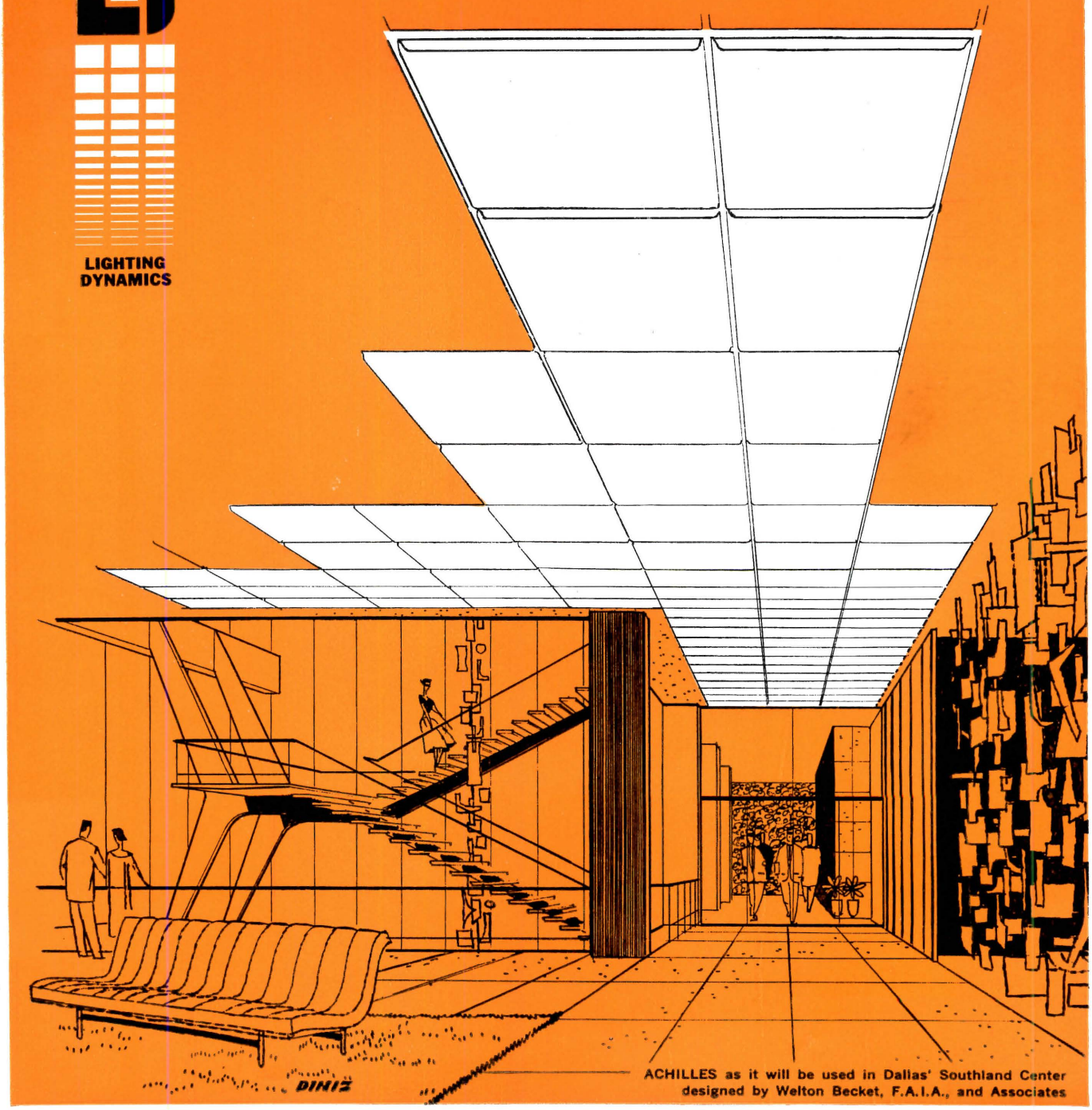

ACHILLES as it will be used in Dallas' Southland Center designed by Welton Becket, F.A.I.A., and Associates

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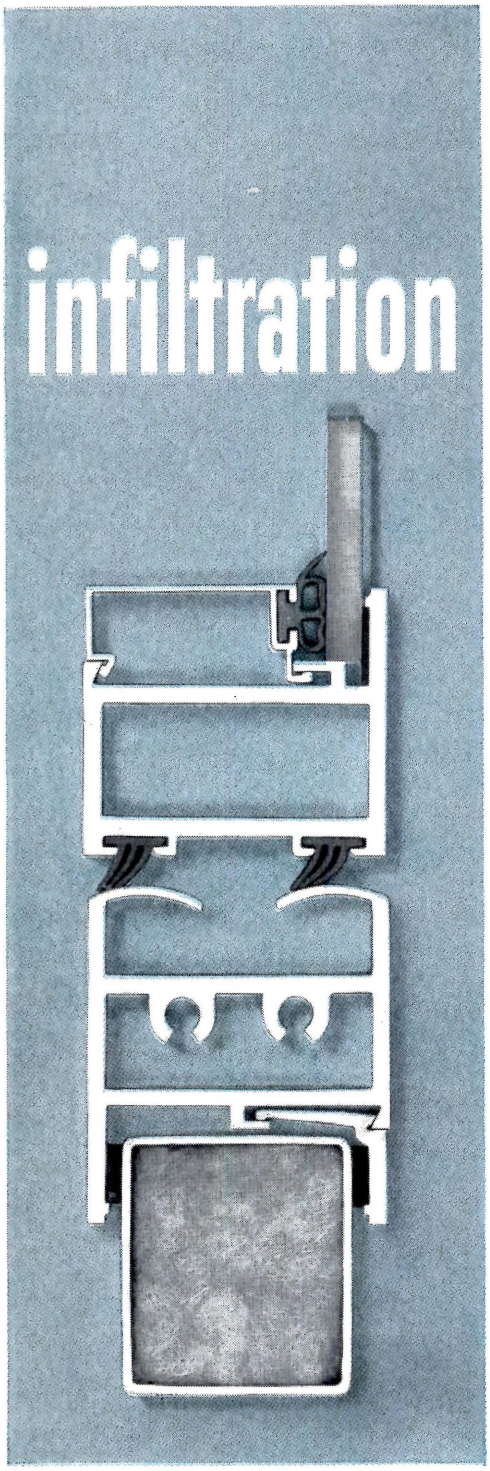

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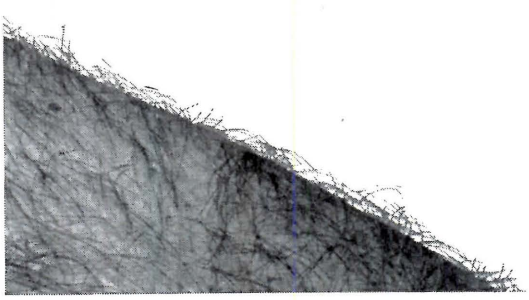

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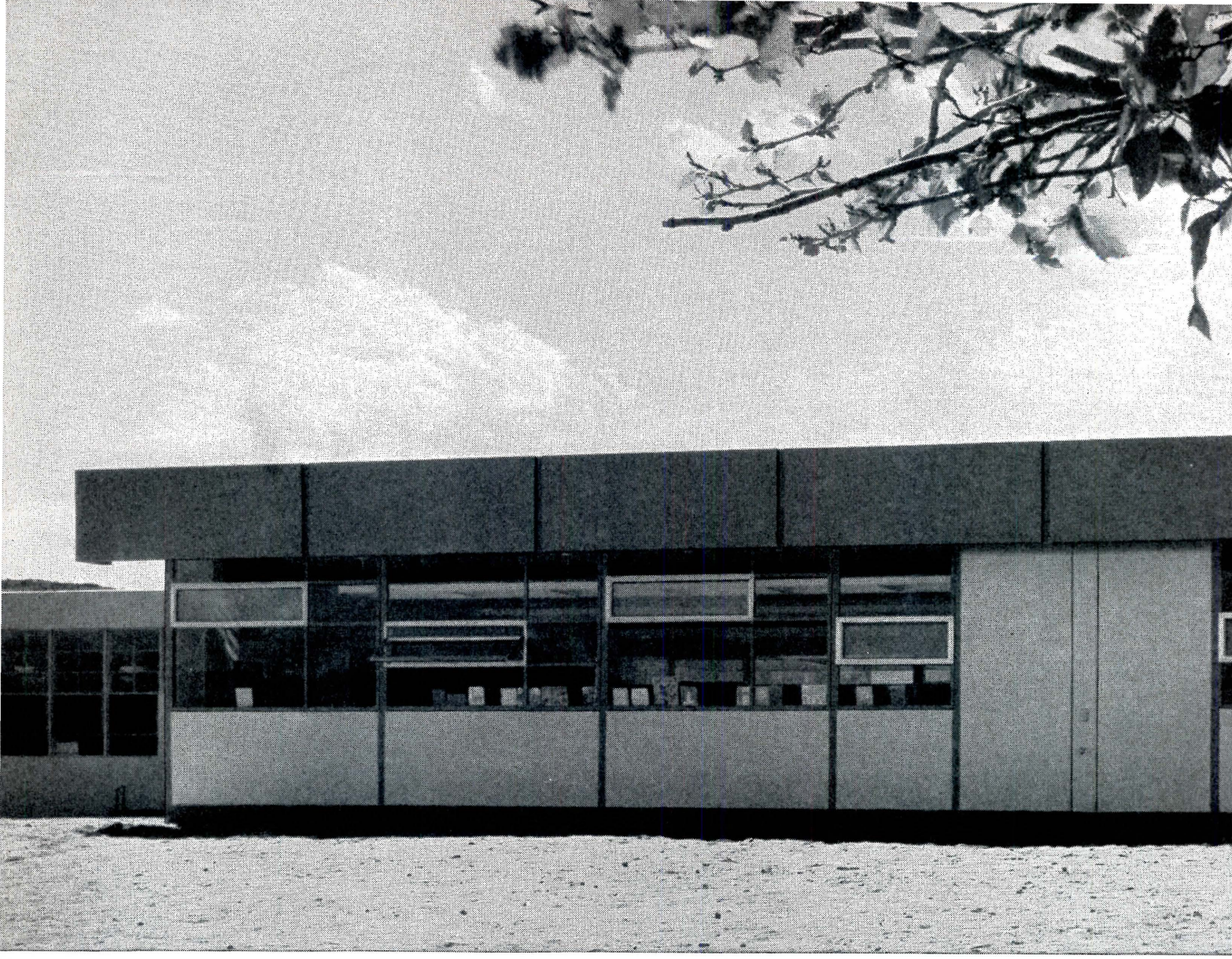

All-steel school blends beauty and versatility on the desert

IN THE SHADOWS of the San Jacinto mountains, southeast of Palm Springs, the simple, modular silhouette of this striking steel school stands in sharp contrast against the casual disorder of the desert terrain.

STEEL MADE POSSIBLE high-style design at low-level cost. Steel was fast . . . the frame (10″ WF 21 beams and 3″x3″ x 3/16″ columns of USS Steel) went up in a day! And the school bell summoned students into the finished building 89 days later! Steel met and mastered the varied building and maintenance problems of the desert. The walls, durable, double panels of USS Sheets, hide built-in sound-proofing and thermal insulation to minimize noise and heat. The roof, a corduroy pattern of steel decking, covers 35 feet, with a 10-ft. clear span between purlins. Standing seams richochet the sun's rays to help keep classrooms cool.

DESIGN VERSATILITY was all but limitless with steel. The 8-ft. module offers versatile arrangement of doors and windows. Classrooms may be expanded four or eight feet with minor framing changes. And all exposed steel is attuned to the desert site in warm tones of sienna, sand and umber.

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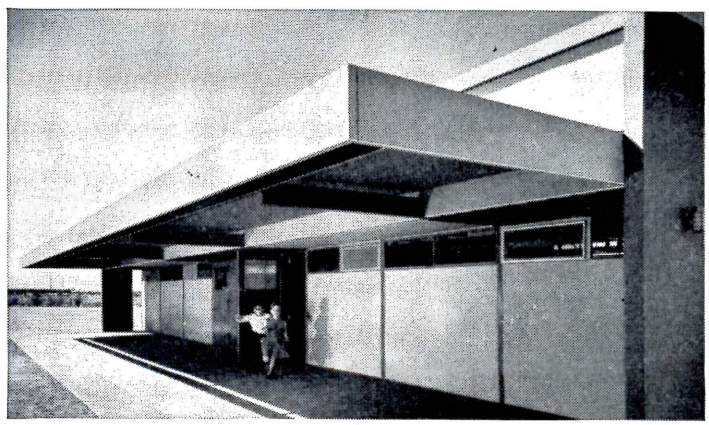

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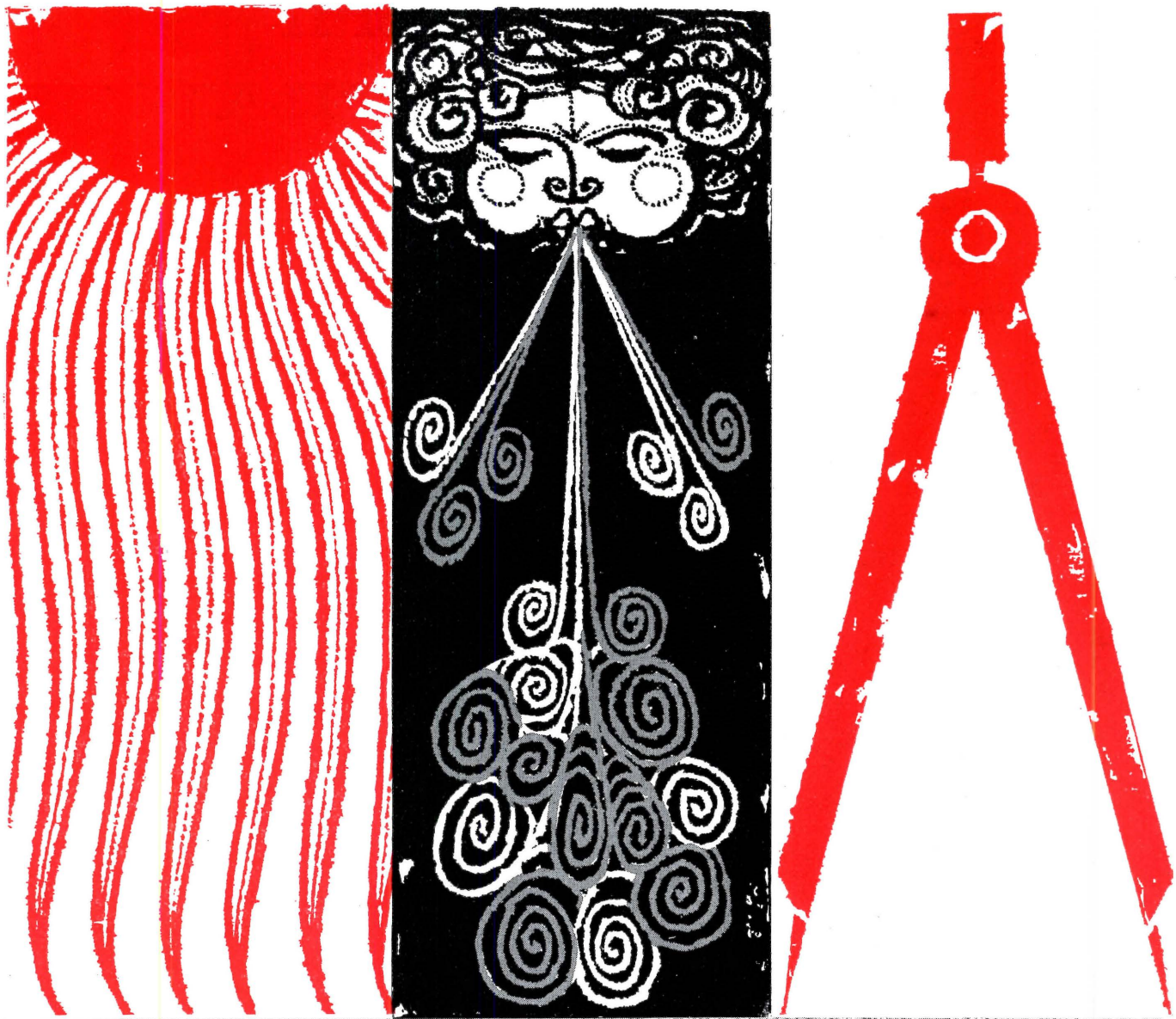

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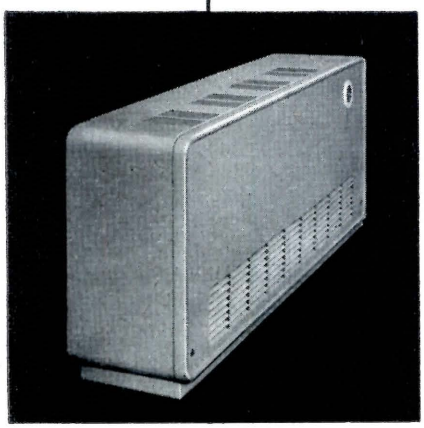

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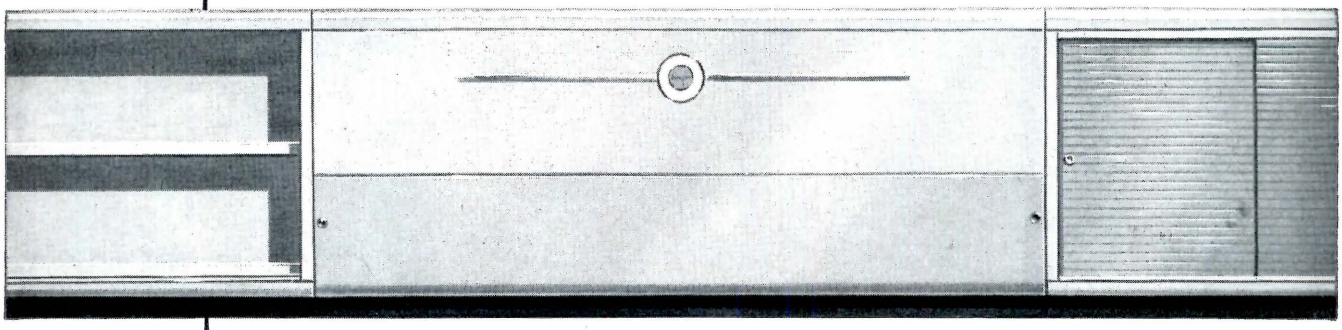

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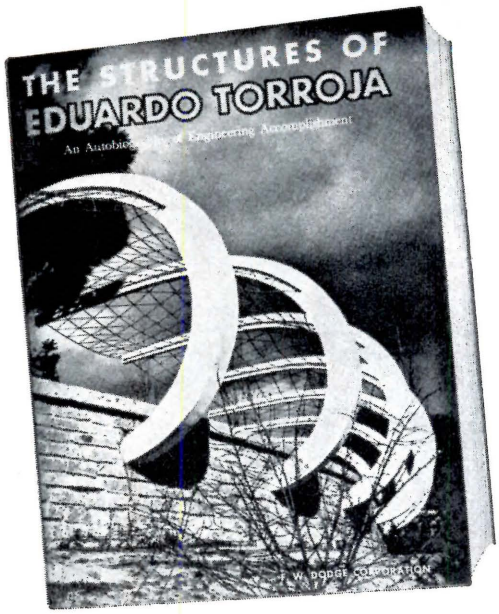

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"I feel that these exemplify best what I was searching for, and what I finally achieved."

The 30 structures shown are of many types — bridges, viaducts, dams, hangars, sports arenas, factories, churches. Many of them are of reinforced concrete — for Torroja's most unusual engineering feats are in prestressed and post-tensioned concrete — but wood, brick, and steel are used as well. All of them bear the strong mark of Torroja's brilliant design, sound engineering, and delicate sense of beauty.

ABOUT THIS BOOK

Written by Torroja himself, it follows his reasoning during the design of each of the 30 structures. Engineering details are given. In some cases, alternate designs which were later discarded are shown. The excellent photographs show models, projects under construction, details, and completed projects. The book contains a total of 275 illustrations.

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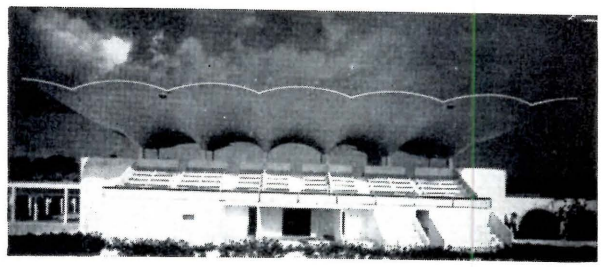
EDUARDO TORROJA was a pioneer in 1933, and he is a leader in design today. He is an architect, an engineer, and a teacher of structural engineering. He created, and directs, the Technical Institute of Construction and Cement at Costillares, Spain.

Inevitably, Torroja's works are compared with those of Pier Luigi Nervi. Like Nervi, Torroja is mathematically oriented, and steeped in theory of structures. Both know when to resort to experiment and model analysis. Torroja is also very much a humanist, with a flair for beautiful forms and lines, as the structures in this book will reveal to you.



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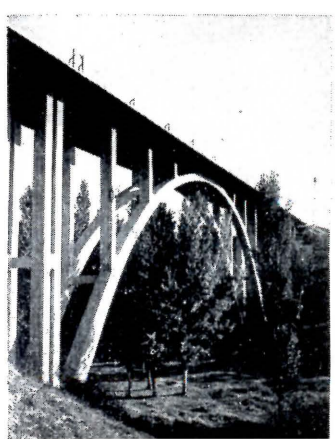

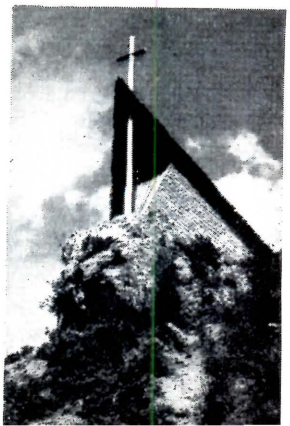

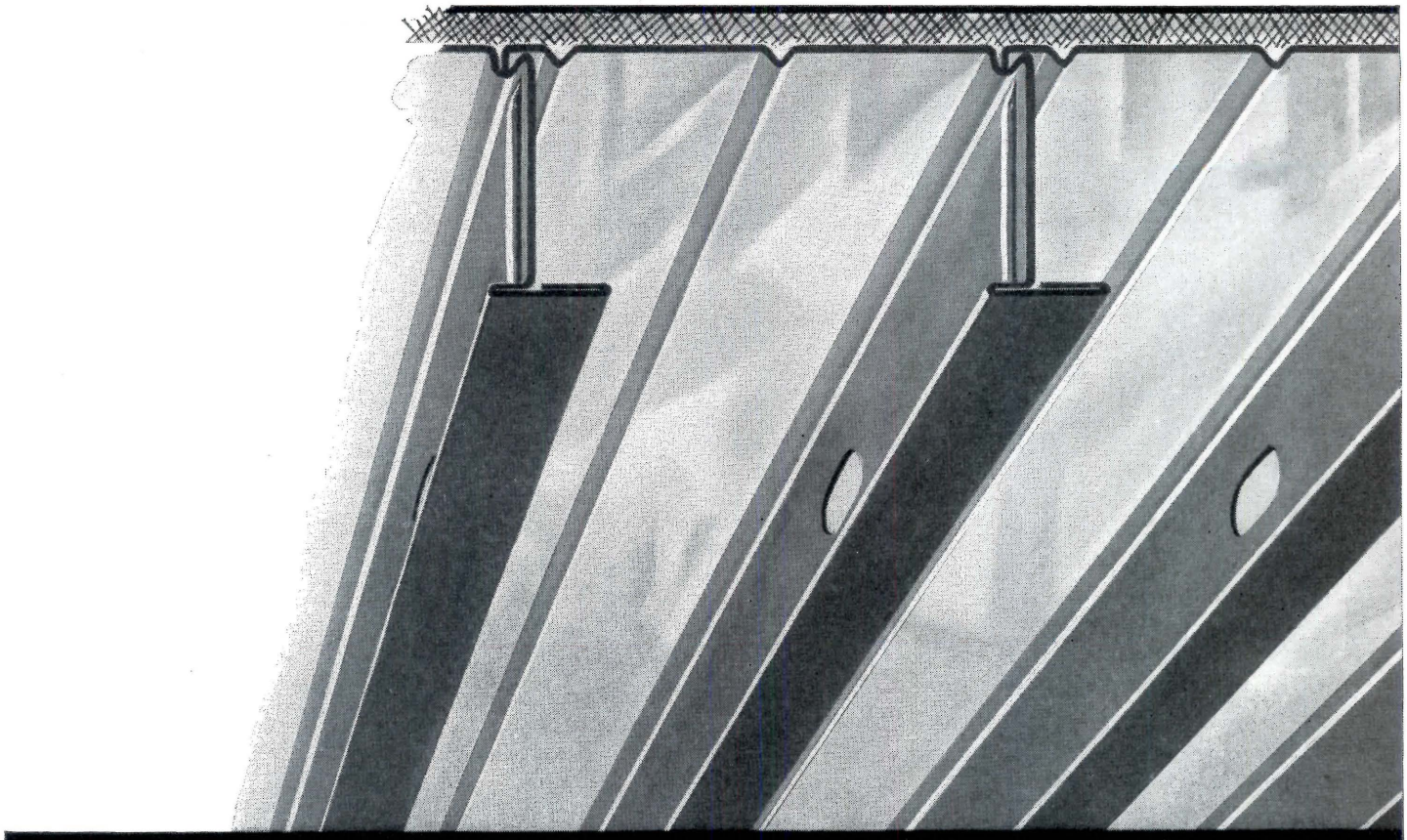

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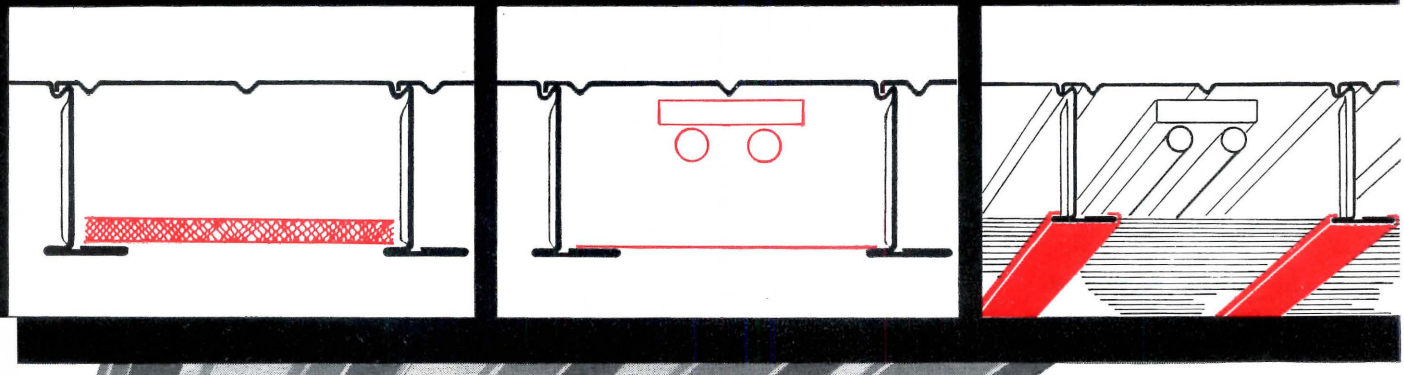

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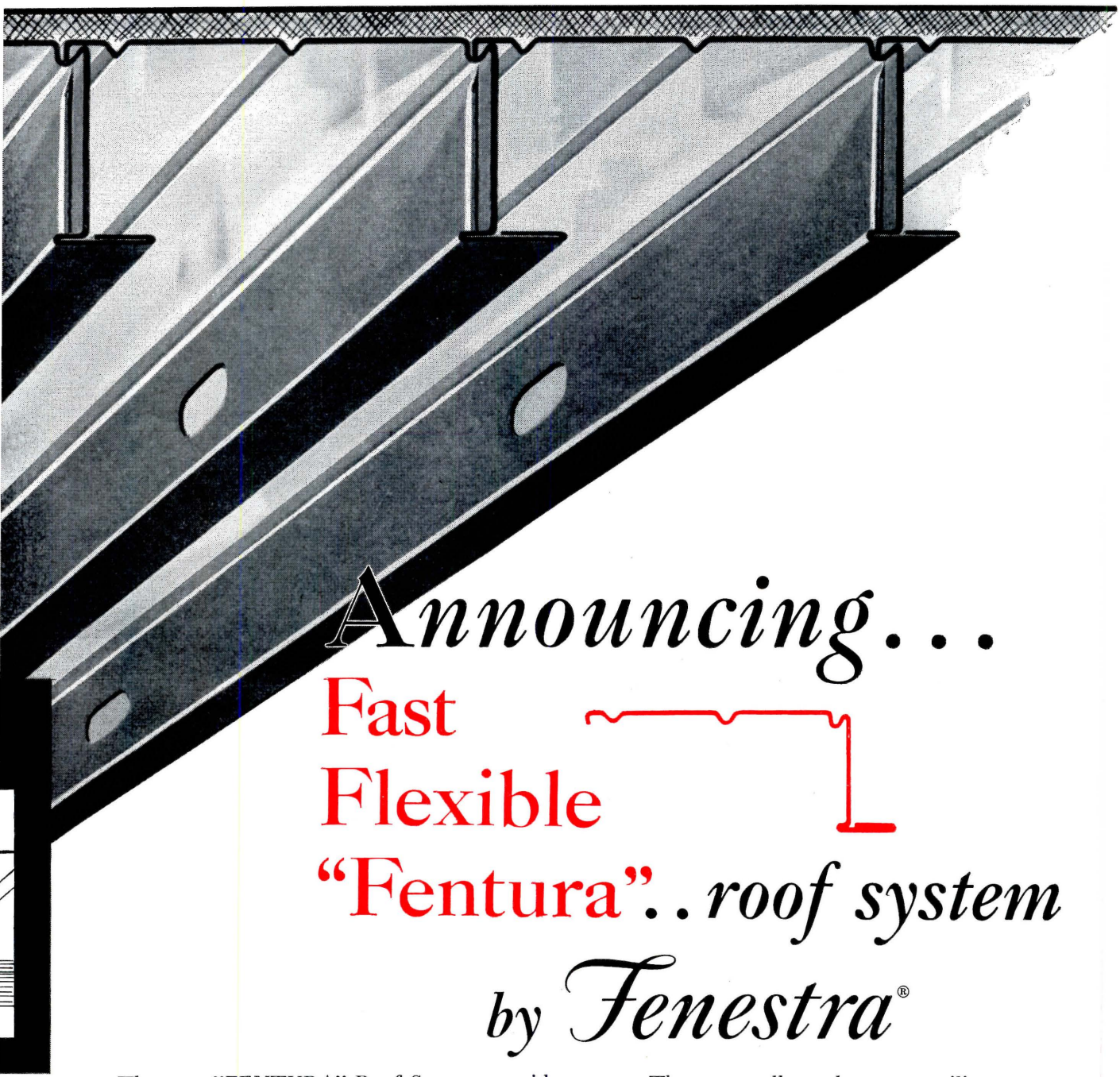

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What is this world? What asketh man to have?

No doubt of it: June and July were certainly "talky" months. It seems as if somebody was saying something every day—mostly at conventions, conferences or meetings. And though none of the meetings happened to be of architects or even for architects, a good deal of what was said could have pertained *to* architects and architecture.

Dr. Mortimer Adler, for instance, told the Design Conference at Aspen, Colo., that man has embarked on what is his second great revolution (the first was in 6000 B.C. when cities and civilizations began to develop) and that the big result of this revolution will be to make possible the good life for *all* people. The first revolution made the joys of city life and the pleasures of civilization available only to the few. But automation and scientific progress could eliminate all "service work" and this, he felt, would "make a better world." It may take a thousand years, he declared, but this is what he sees ahead for us.

Goodbye, old T-square; farewell, pencils, hard and soft, the boards over which I broke my back! Farewell? Is the good life a life where effort—especially individual effort—has no place? Adler says yes; but all that architecture has done for mankind through the ages denies his premise. The promised land for architects would not be a world in which there is no toil, but one in which meaningful toil is appreciated by an understanding people.

As if to refute Dr. Adler, though he spoke a thousand miles away from him, Professor Max Lerner of Brandeis University pointed up a problem (at a library conference in Berkeley, Calif.) which this country's librarians must deal with: "the terrible burden of leisure" now being laid upon large numbers of people "unprepared to cope with it." If no toil, more leisure; if more leisure, more necessity for occupation. But of what sort? Will all occupation be "recreation"? Dr. Lerner looked rather for a world in which there would be an "egghead renascence"—a movement he says has, like Adler's second revolution, already begun in this country. He pins his hopes for fostering of the movement on our educational system, urging that more and larger opportunities and greater help be given those whom he termed "carriers of promise." This would lead to a "democratic elite"—and he emphasized that to recognize and reward the especially gifted for their creativity rather than because of their "birth, position or money" is a completely democratic idea.

The same library conference brought forth other speakers bewailing the "harrassed humanities" and the "harassed and strained professional class." Mark Shorer, professor of English at the University of California and a writer in various literary forms, reminded the librarians that, although science and technology are in the forefront today because they seem to be the means to solve such pressing human problems as "recession and unemployment, cancer and leukemia, juvenile delinquency, mental health, political corruption, narcotics and alcoholism," when these problems are all solved the question will remain: For what end did you solve them?

And who would ask such a question? Not science; only the humanities could be concerned with such a question.

This, indeed, is a question with which architecture—standing at the crossroads between the humanities and technology, partaking so deeply of each—must be concerned. For who will care whether the structure does more than shelter from wind and rain, sun and snow? Who will say what man's soul needs when he has forgotten to ask, wrapped in a cocoon of technological comfort? Who? It had better be you. E.K.T.

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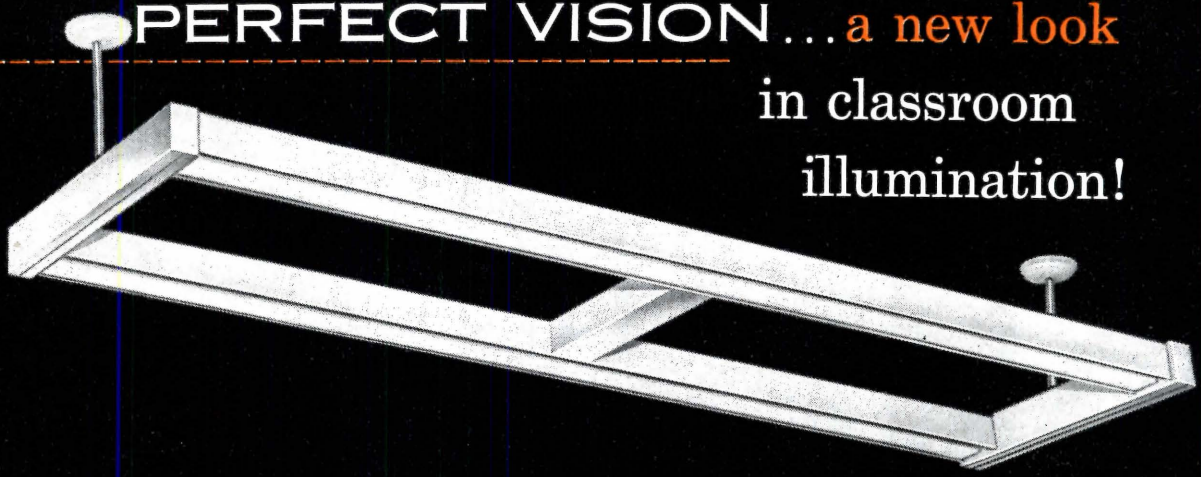

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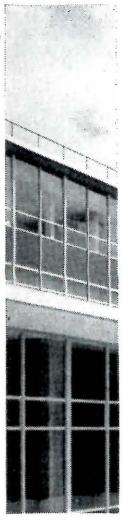

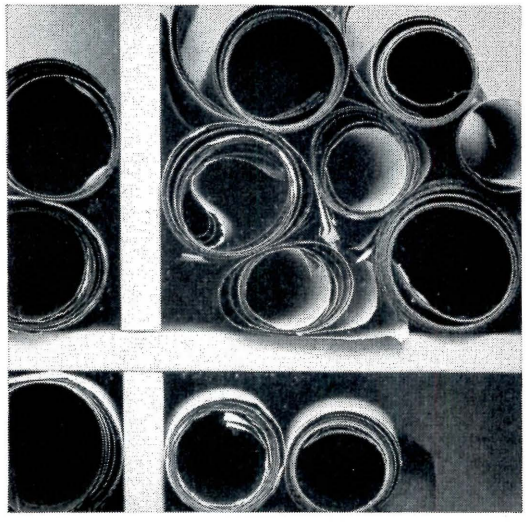

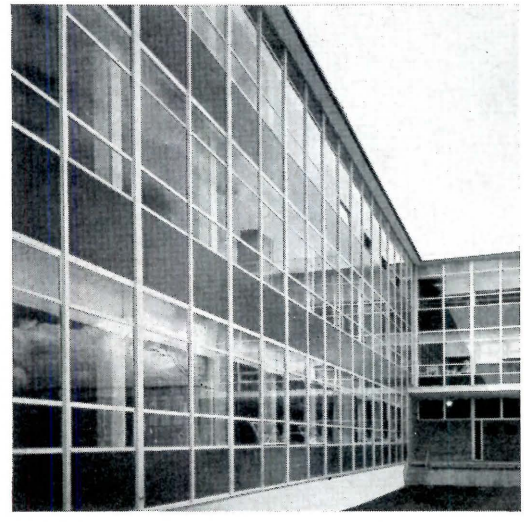

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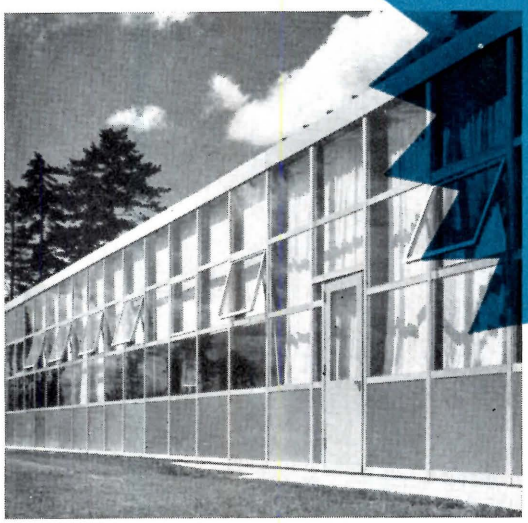

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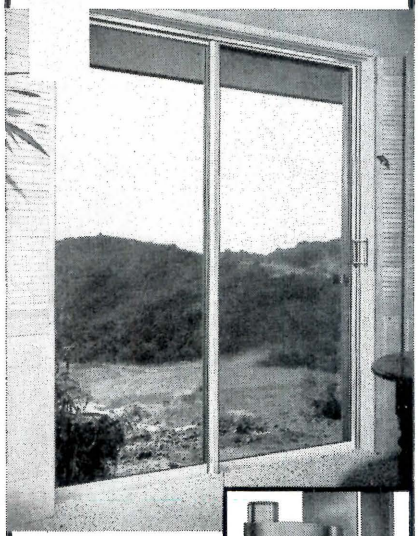

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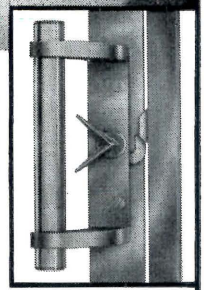

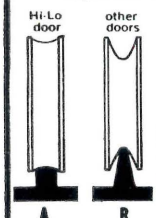

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Diagram B: Pinpoint contact causes indifferent alignment, greater roller wear.

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Rainier Park Bridge Under Way

What might have been one of the Northwest's notable achievements in the field of prestressed concrete construction is now being constructed of steel. The bridge across the Nisqually river in Rainier National Park, Washington, was designed in both prestressed concrete and in steel, and bids were taken on both designs. The bid on the steel design came in low and was accepted.

Construction, begun last summer but shut down in November by winter weather, is being resumed.

News of the Profession

ELECTIONS, APPOINTMENTS: *Sidney Wahl Little,* dean of the University of Oregon's School of Architecture and Allied Arts until his recent resignation, has been named dean of the College of Fine Arts and head of a new department of architecture at the University of Arizona. *Paul Thiry,* Seattle architect, has been reappointed to the Seattle Planning Commission, of which he has been a member since 1952. He was Commission chairman in 1955. *James R. McCarthy,* senior planner in San Francisco's department of planning, has been named director of planning for the city, succeeding Paul Opperman who resigned in March to go to Chicago. McCarthy, a member of the department's staff since 1941, had been acting director since Opperman's departure. *Dr. Chauncey Starr,* vice president of North American Aviation, Inc., and general manager of its Atomics International Division, has been elected president of the American Nuclear Society, a 3000-member organization which includes researchers, consultants, administrators and teachers in the nuclear field.

HONORS, AWARDS: *John Carl Warnecke,* San Francisco architect, is one of five U.S. architects to be named to associate membership in the National Academy of Design. *Charles Luckman,* partner in the Los Angeles firm of Pereira and Luckman, received the honorary degree of Doctor of Fine Arts at the 51st commencement of the California College of Arts and Crafts, Oakland.

OFFICE CHANGES: George B. Allison and Ulysses Floyd Rible of Los Angeles announce the admittance to partnership of *Rodney T. Robinson* and *Raymond Ziegler,* architects. *William R. Hawley,* architect, has joined the firm of Sigal and Johnson, Palo Alto, Calif., as a partner. *Eivind W. Nilson,* architect, has opened offices at Cortez, Colo.

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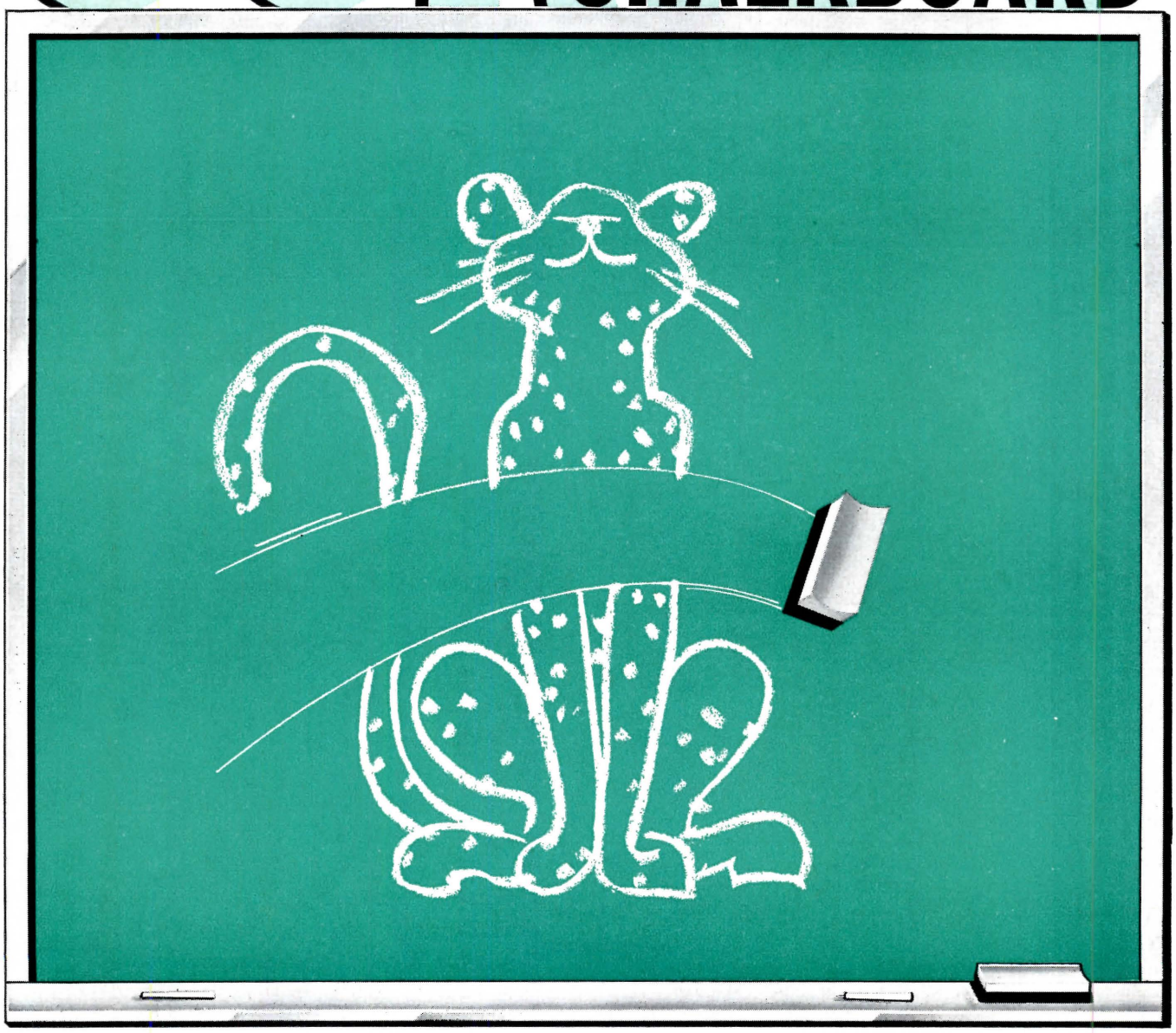

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Big Projects In Prospect for West

SAN FRANCISCO: The architectural side of a $10,000,000 improvement program at the airport, part of the city's intended "jet-age development" there, will be handled by Welton Becket and Associates, selected as architects for the work from a list of 29 San Francisco architects who had signified interest in the job. The work consists of a new passenger terminal, concourses, a cargo terminal and a double-deck garage. Dudley Deane and Associates will be mechanical engineers; John A. Blume and Associates, structural engineers; and Wilsey and Ham, civil engineers. The funds for these new structures are from a $25,000,000 bond issue voted in 1956. The remaining money will be used to prepare the field to handle jet planes.

Conrad Hilton's new 1000-room, downtown San Francisco hotel will get under way this year, the hotelman announced recently, squelching rumors that he had given up his plans for a hotel in the city. This will be his second hotel project in the Bay Area. The first, now under construction, is the Hilton Inn at the airport. The downtown hotel, a $23,000,000 luxury hostelry, will be located on a two-acre site next to the airline terminal now under construction at Taylor and O'Farrell Streets. For both the hotel and Hilton Inn, due for completion around the first of next year, William Tabler, New York, is the architect.

The final structural steel work on the Crown Zellerbach headquarters building has been done, and concrete pouring was begun last month. Next month the operation of attaching the outer skin of the office tower section of the building will be begun. By early spring this part of the construction process is expected to be complete.

San Francisco's finest sidewalk superintendent's facilities are at the site of the new Bank of America service building at Market and South Van Ness streets, where a glass-enclosed grandstand has been erected on a 10-ft elevation above the street level. The stand is equipped with swivel chairs for a full-sweep view of construction. When the building begins to rise, a worm's eye view of its progress can be had through clear plastic bubbles in the roof. For those whose business keeps them on the run, four waist high windows in a fence on the Market street side provide a vantage point. Wurster, Bernardi and Emmons are architects for the 8-story service center whose usable floor area will be the largest of any office building in the city.

LOS ANGELES: Now that the Dodgers seem assured of a home in Chavez Park, the city can settle down to consider the immediacy of a problem it had had on its collective mind before the West Coast became the baseball capital of the country: building a new zoo.

The zoo is a project close to Los Angelenos' hearts. Last year they voted $8,000,000 for preparing the site (in Elysian Park) and constructing new buildings, with the intention of having "the finest zoo in the world."

COALINGA, CALIF.: A water desalting plant, the first in the U.S., was recently approved for the city of Coalinga, a prosperous oil and farming center in the San Joaquin Valley of California. The city's wells produced plenty of water, but it was too salty to drink and fresh water had to be hauled 45 miles to supply the 17,000 gallons it needs daily. With the new desalting plant, built by Ionics, Inc., the supply will be increased by 50 per cent. The plant will electrically remove the excess minerals, "straining" them out through a special plastic membrane and retaining the desalted water, which is then pumped to a water tower for distribution. Hailed as an "important contribution to solving the world's increasing water supply problem," the Coalinga installation will save the city over $400,000 in the next 10 years.

Calendar of Western Events

- August 11-13: Western Packaging and Material Handling Exposition, San Francisco
- August 18-19: Urban Renewal Conference, sponsored by University of California Extension and U.C.L.A. Graduate School of Business Administration, Beverly Wilshire Hotel, Los Angeles
- September 25-27: Seventh annual conference, Western Mountain region, A.I.A., Continental-Denver Hotel, Denver
- October 2-4: Structural Engineers Association of California annual convention, Ahwahnee Hotel, Yosemite National Park, Calif.
- October 9: Departure date, Architects Tour of Japan. Information from Kenneth Nishimoto, 263 South Los Robles Avenue, Pasadena, Calif.
- October 9-12: Sixth annual conference, Northwest regional conference, A.I.A., Harrison Hot Springs, B. C.
- October 15-17: National Resources Council, Energy Resources Conference, "Energy and Energy Sources, Their Impact on Society," Brown Palace West, Denver
- October 15-19: Eleventh annual convention, California Council, A.I.A., "Creativeness in Architecture," Monterey Peninsula, Calif.
- October 16-19: annual convention, California Council of Landscape Architects, El Mirador, Palm Springs, Calif.
- November 7-9: Pacific Arts Association, Northern California Section, Annual fall conference, Asilomar, Calif.

WESTERN SECTION

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a Architectural File (green)
ic Industrial Construction File (blue)
lc Light Construction File (yellow)

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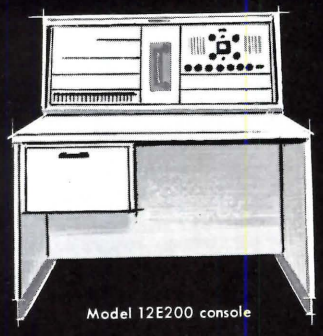
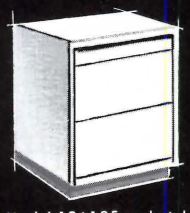
a	Soule Steel Company	64-6-7-18-19
a-ic	United States Steel	64-8-9
	Weber Showcase & Fixture Co., Inc.	64-10

Western advertising offices: LOS ANGELES, Bob Wettstein, 672 S. Lafayette Park Pl.; PORTLAND, Bob Wettstein, 921 S. W. Washington St.; SAN FRANCISCO, Bob Wettstein, Howard Bldg., 209 Post St.

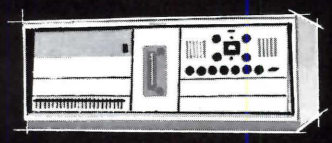
the classic new look in SOUND by DuKane



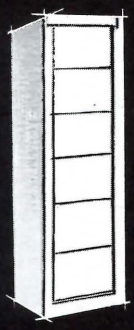
Model 12E200 console



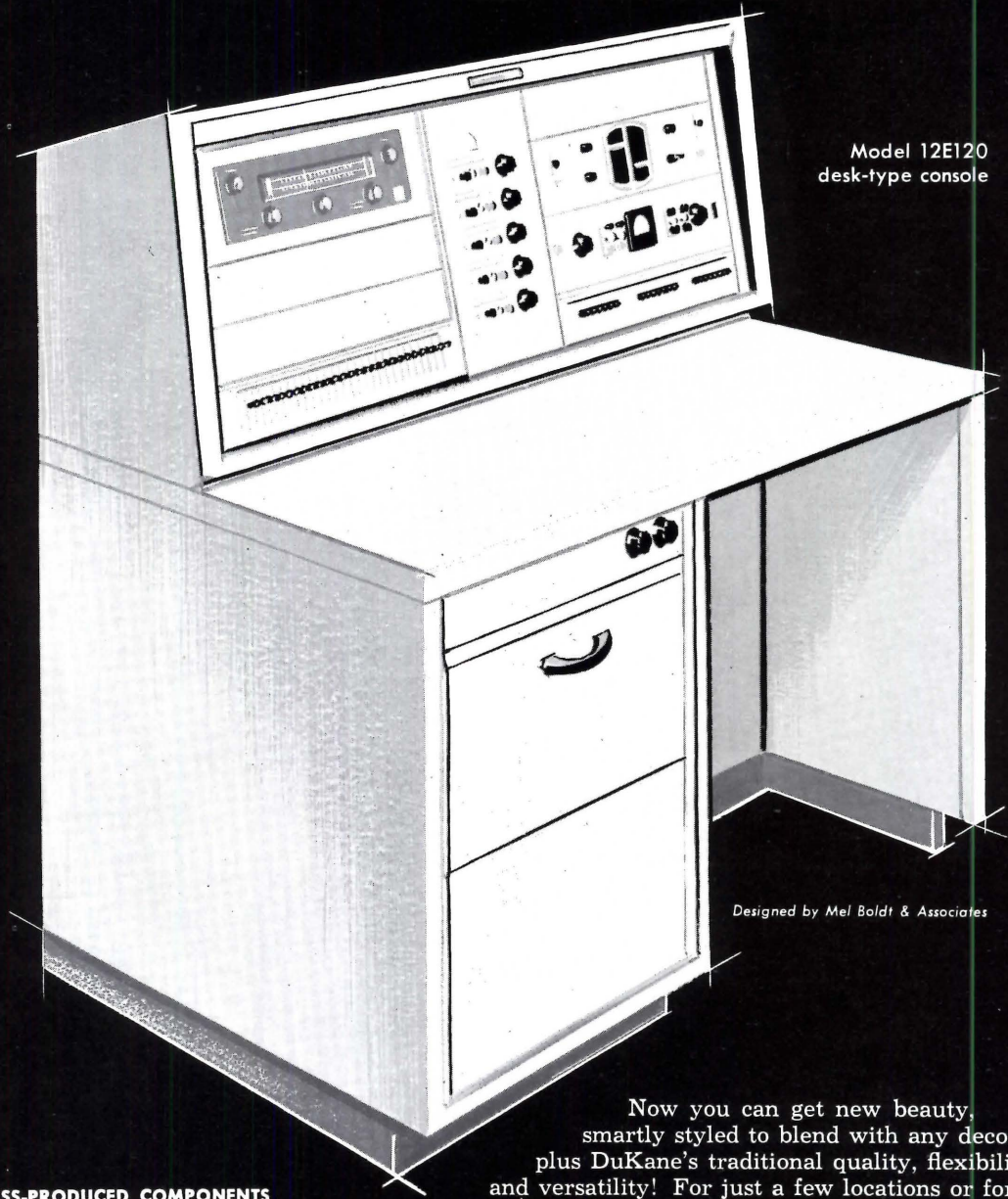
Model 13A185 pedestal



Model 12E190 desk-top consolette



Model 13A250 single console rack



Model 12E120
desk-type console

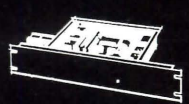
Designed by Mel Boldt & Associates

CUSTOM-ENGINEERED FROM MASS-PRODUCED COMPONENTS

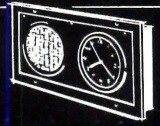
AM FM Tuner

Record Player

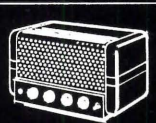
Space-Saver Key Panel



Emergency & Time Panel



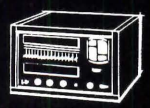
Speaker-Clock Room Unit



Auditorium Amplifier

Flexifone Intercom

Private Telephone System



Junior School System

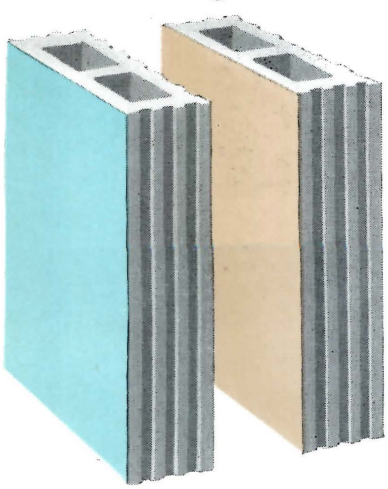
Now you can get new beauty, smartly styled to blend with any decor, plus DuKane's traditional quality, flexibility, and versatility! For just a few locations or for hundreds, there's a DuKane sound system to fit any combination of internal communication needs. And DuKane's coast-to-coast network of nearly 300 factory-trained engineering distributors stands ready to help you determine the exact requirements of any job. The nearest one is listed in your classified directory. For competent help in writing specifications for any sound system, call your authorized distributor or write our Architectural Division.

DuKane

DU KANE CORPORATION, St. Charles, Illinois

NATCO CERAMIC GLAZE VITRITILE for pleasing visual effects. Provides such outstanding advantages as: full range of colors, larger units, fewer mortar joints and modular design for greater flexibility.

Striking effect...artfully expressed in harmonious color with Natco Ceramic Glaze Vitritile



Series	Shape Catalogs	Tile Face Size	Nominal Thickness
"8W"	8W-257	7¾" x 15¾"	2", 4"
"6T"	6T-657	5⅛" x 11¾"	2", 4", 6", 8"
"4D"	4D-1255	5⅛" x 7¾"	2", 4", 6", 8"

A versatile building material which is easily adapted to a variety of attractive interior designs, Natco Ceramic Glaze Vitritile also offers many long-term economies. Preferred by architects and maintenance-conscious clients alike, it provides structural strength and a handsome interior finish *in a single unit* . . . at one cost.

Natco Ceramic Glaze Vitritile possesses many additional advantages. It requires only occasional soap and water cleaning to maintain a sparkling sanitary, new appearance. In addition, it is fire-proof and resistant to acids, alkalies, and physical abuse. Its durable ceramic glaze finish lasts for the life of the building.

Consult with your nearest Natco branch office for complete details on Ceramic Glaze Vitritile. It is available in a full line of shapes and sizes for interior structural walls and partitions, or in "soaps" for facings and veneers.

NATCO
CORPORATION

GENERAL OFFICES: 327 Fifth Avenue, Pittsburgh 22, Pa.

BRANCH SALES OFFICES: Boston • Chicago • Detroit • New York Philadelphia • Pittsburgh • Syracuse • Birmingham, Alabama Brazil, Indiana **IN CANADA:** Natco Clay Products Ltd., Toronto

FTI STRUCTURAL CLAY TILE INSTITUTE

NATCO QUALITY CLAY PRODUCTS SINCE 1889

MUTSCHLER MEANS HOMEMAKING... AT ITS FINEST!

Facts prove Mutschler the elite of school homemaking equipment. Northern maple cabinetwork is sturdily built to take the rigors of everyday school usage. Catalytic finishes in decorator colors and natural grain are practically impossible to scratch, are impervious to household solvents and cleaners. Special-purpose cases for all homemaking needs. New classrooms or remodeling project, inquire about Mutschler. Complete information and specifications are available for your approval... without obligation.

Model Clothing Center
Campus Building
Community High School
Blue Island, Illinois

ARCHITECT:
Nicol & Nicol
Chicago, Illinois

MUTSCHLER SALES OFFICE:
I. P. Rieger Co.
Bellwood, Illinois

SEWING MACHINES:
White Sewing Machine Corp.
Cleveland, Ohio

FOR...

Foods Laboratory
Laundry Areas
Clothing Laboratory
Sewing Areas
Grooming Areas
Home Management Areas
Child Care Areas
Arts & Crafts Rooms
General Storage Areas

Mutschler
SCHOOL FURNITURE

MUTSCHLER BROTHERS COMPANY
Dept. H-2108, Nappanee, Indiana
Please send address of our nearest Mutschler sales engineers.

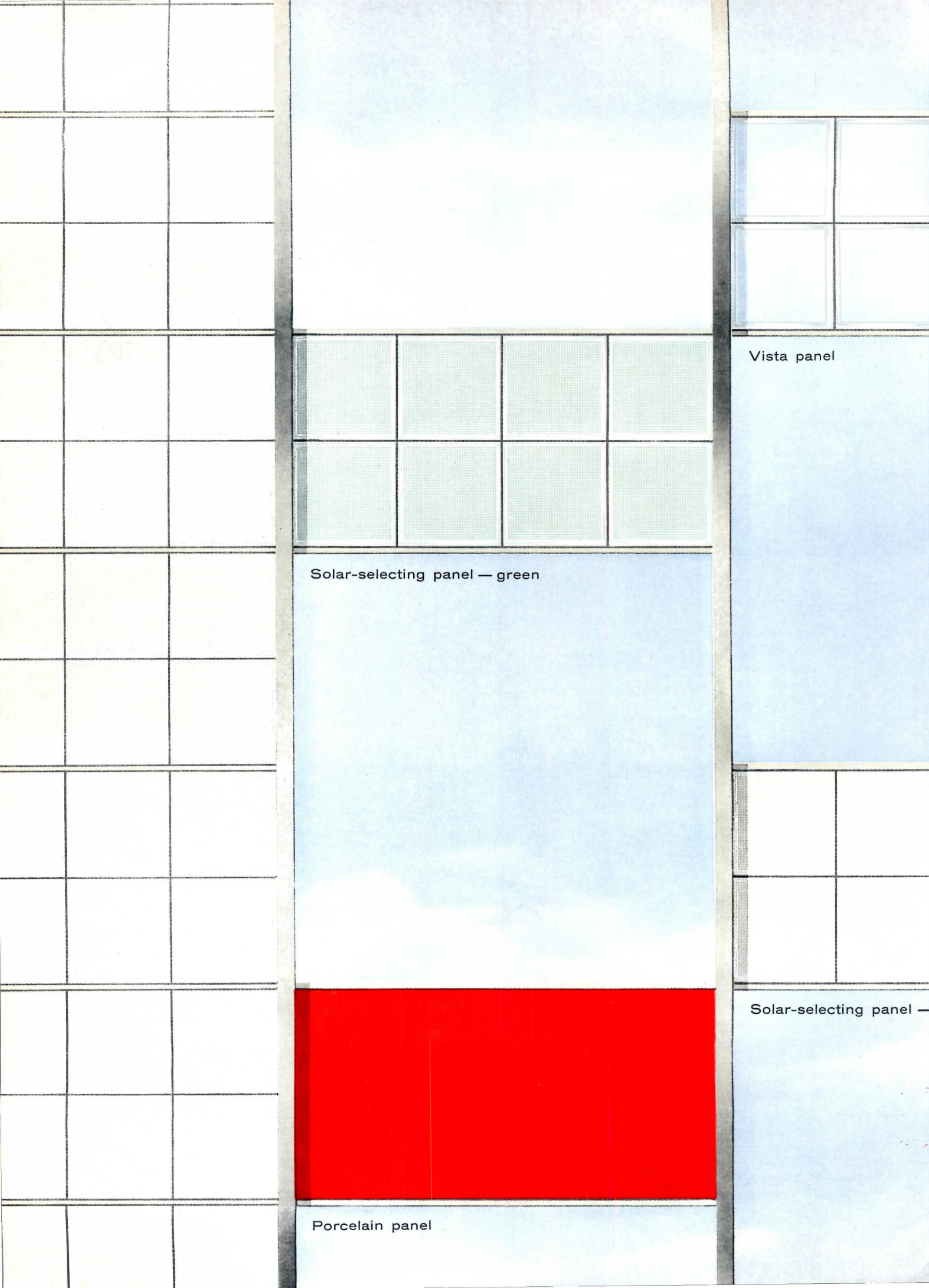
name

school or firm

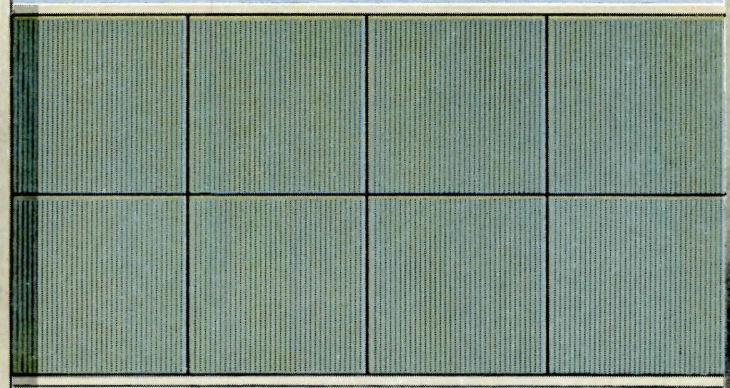
address

city, state

We are interested in:
new department____; remodeled department____.


Vista panel
Solar-selecting panel — green
Solar-selecting panel —
Porcelain panel

OWENS-ILLINOIS
THINLITE
CURTAIN WALL



Ceramic face glass panel

Window panel

— white

Solar-selecting panel — yellow

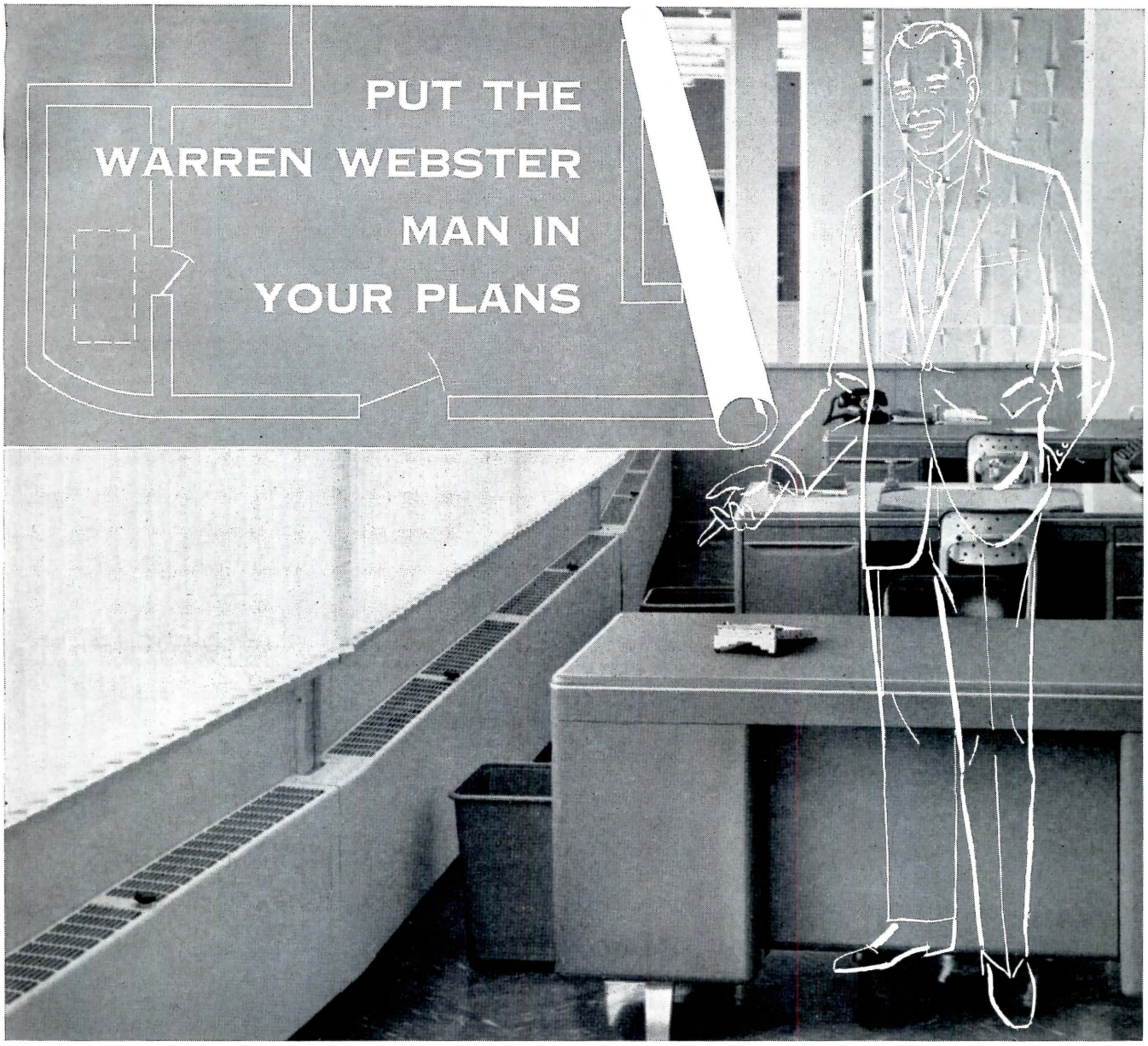
Announcing Owens-Illinois Thinlite* — a revolutionary new concept in curtain wall construction!

The extreme flexibility of this new system affords the architect *unlimited* freedom of design. Its simplicity of erection provides fast, easy installation in all types of weather. Its double gasket arrangement assures complete moisture protection.

As a special feature, the Owens-Illinois Thinlite Curtain Wall incorporates solar-selecting glass panels in white and color with the lowest solar heat transmission factor of any daylighting material available today.

For complete data on this radically new curtain wall, write Kimble Glass Company, subsidiary of Owens-Illinois, Box 1035, Toledo, Ohio.

*Patent pending



When the building and the heating system are made for each other . . .

When you specify Custom Webster Walvector, you marry the heating system to the building design . . . blend them with each other for maximum comfort, beauty and economy. Never does Custom Walvector appear to be just "added" to a building. Instead, it becomes a part of the structure itself. And its wide variety of enclosure types meet every design need.

Custom Walvector uses modern HYDRONICS at its tailor-made best. Here is Webster Tru-Perimeter Heating . . . for hot water or steam . . . for heating comfort everywhere.

Put the Warren Webster Man in your plans . . . by letting him add Custom Webster Walvector at the blueprint stage. Talk it over with him now . . . or write for Bulletin B-1553. Warren Webster & Company, Camden 5, N. J. Since 1888. Offices in principal U.S. cities and Canada.

WEBSTER'S
FINEST
PRODUCT

the Warren Webster Man

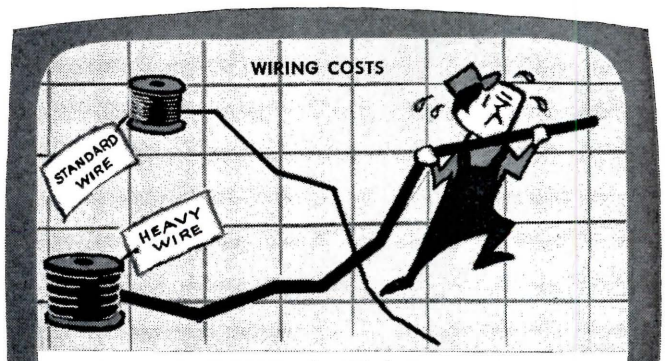
WARREN WEBSTER
HEATING . . . COOLING

INSTALLATION COSTS LESS...

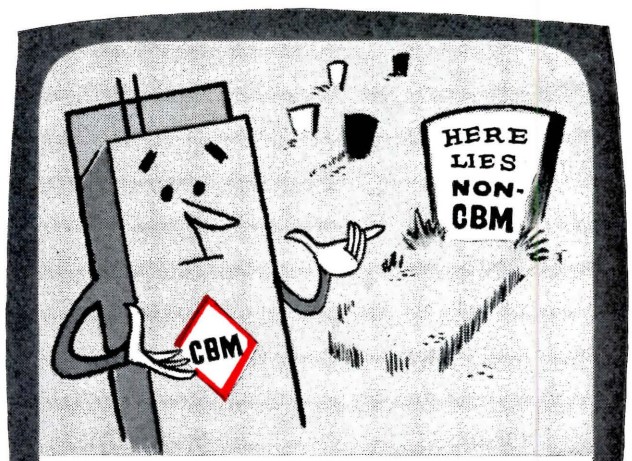
with fixtures using

Certified CBM Ballast

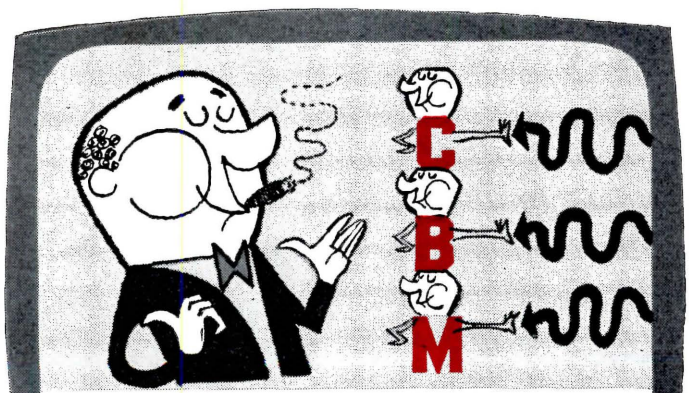
KEEPS LABOR COSTS DOWN, TOO. (Low power factor can boost these costs as much as 65%.) CBM Ballasts mean fewer circuits, fewer man-hours needed.



SAVE ON WIRE COSTS—for High Power Factor in Certified CBM Ballasts saves your customers from expensive oversize wiring needed by low power factor equipment. Guards against penalty charges on light bills, too!

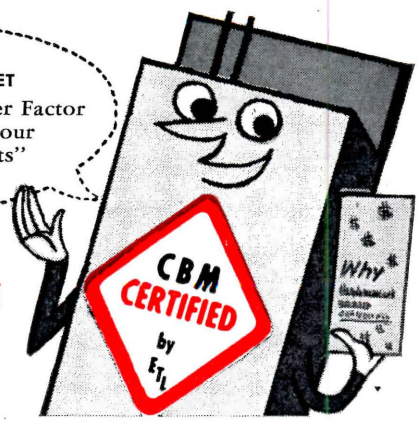


LONGER LIFE FOR CBM BALLASTS—because CBM specifications set a limit for temperature rise. This helps provide more efficient, longer, trouble-free service.



PROTECTION FOR YOUR CUSTOMERS because CBM Ballasts are made to exacting performance specifications; then checked and certified by ETL. And they're also listed by UL.

WRITE FOR CBM BOOKLET
"Why High Power Factor ballasts cut your lighting costs"



CERTIFIED BALLAST MANUFACTURERS

2116 KEITH BUILDING ∘ CLEVELAND 15, OHIO

Participation in CBM is open to any manufacturer who wishes to qualify

CBM-4-E

Construction Cost Indexes

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

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

	NEW YORK					ATLANTA				
	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.	COMMERCIAL AND FACTORY BLDGS.	
PERIOD	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
1946	181.8	182.4	177.2	179.0	174.8	148.1	149.2	136.8	136.4	135.1
1947	219.3	222.0	207.6	207.5	203.8	180.4	184.0	158.1	157.1	158.0
1948	250.1	251.6	239.4	242.2	235.6	199.2	202.5	178.8	178.8	178.8
1949	243.7	240.8	242.8	246.6	240.0	189.3	189.9	180.6	180.8	177.5
1950	256.2	254.5	249.5	251.5	248.0	194.3	196.2	185.4	183.7	185.0
1951	273.2	271.3	263.7	274.9	271.8	212.8	214.6	204.2	202.8	205.0
1952	278.2	274.8	271.9	265.2	262.2	218.8	221.0	212.8	210.1	214.3
1953	281.3	277.2	281.0	286.0	282.0	223.0	224.6	221.3	221.8	223.0
1954	285.0	278.2	293.0	300.6	295.4	219.6	219.1	233.5	225.2	225.4
1955	293.1	286.0	300.0	308.3	302.4	225.3	225.1	229.0	231.5	231.8
1956	310.8	302.2	320.1	328.6	324.5	237.2	235.7	241.7	244.4	246.4
1957	318.5	308.3	333.1	345.2	339.8	241.2	239.0	248.7	252.1	254.7
Mar. 1958	320.1	308.5	338.4	352.5	347.3	241.6	237.9	252.5	258.2	259.0
Apr. 1958	319.5	307.9	337.6	351.9	346.7	241.2	237.5	252.0	257.8	258.6
May 1958	319.5	307.9	337.6	351.9	346.7	241.2	237.5	252.0	257.8	258.6
	% increase over 1939					% increase over 1939				
May 1958	158.7	151.5	158.3	163.8	166.5	179.5	185.8	165.0	164.7	173.1

	ST. LOUIS					SAN FRANCISCO				
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.6	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
1946	167.1	167.4	159.1	161.1	158.1	159.7	157.5	157.9	159.3	160.0
1947	202.4	203.8	183.9	184.2	184.0	193.1	191.6	183.7	186.8	186.9
1948	227.9	231.2	207.7	210.0	208.1	218.9	216.6	208.3	214.7	211.1
1949	221.4	220.7	212.8	215.7	213.6	213.0	207.1	214.0	219.8	216.1
1950	232.8	230.7	221.9	225.3	222.8	227.0	223.1	222.4	224.5	222.6
1951	252.0	248.3	238.5	240.9	239.0	245.2	240.4	239.6	243.1	243.1
1952	259.1	253.2	249.7	255.0	249.6	250.2	245.0	245.6	248.7	249.6
1953	263.4	256.4	259.0	267.0	259.2	255.2	257.2	256.6	261.0	259.7
1954	266.6	260.2	263.7	273.3	266.2	257.4	249.2	264.1	272.5	267.2
1955	273.3	266.5	272.2	281.3	276.5	268.0	259.0	275.0	284.4	279.6
1956	288.7	280.3	287.9	299.2	293.3	279.0	270.0	288.9	298.6	295.8
1957	292.0	283.4	295.2	307.1	302.9	286.3	274.4	302.9	315.2	310.7
Mar. 1958	293.3	284.4	300.3	313.8	308.8	286.3	271.8	306.7	321.1	315.8
Apr. 1958	296.6	287.3	304.9	319.0	314.0	285.7	271.2	305.9	320.5	315.2
May 1958	296.6	287.3	304.9	319.0	314.0	288.9	273.0	310.9	327.7	321.0
	% increase over 1939					% increase over 1939				
May 1958	169.1	168.5	156.9	166.3	163.9	173.6	174.9	164.8	168.8	175.5

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

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

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

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

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

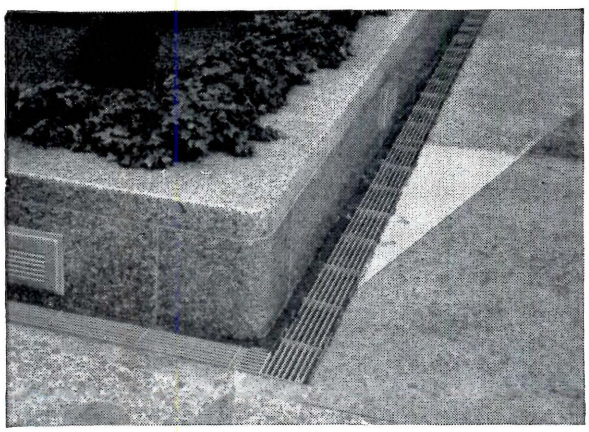
Conversely: costs in B are approximately 14 per cent lower than in A.

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

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

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

BORDEN ALUMINUM GRATING IN MELLON SQUARE PARK . . .



PITTSBURGH, PENNSYLVANIA

Encircled in the picture above is one of several aluminum grating air vents in use throughout the park as air exhausts for the multiple-level parking area below ground.

The arrows indicate two of the locations of a system of drain trenches in existence throughout the park.

The grating installed is Borden Pressure Locked Aluminum Grating. This was an exacting job, one where only standards of quality equal to Borden's would do. Functional beauty and low maintenance are but two of the many advantages of Borden's Pressure Locked Aluminum Grating.

BORDEN METAL PRODUCTS CO.

Gentlemen:

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TITLE .....

COMPANY NAME.....

ST. AND NO.....

CITY AND STATE.....

Write for complete
information on BORDEN
All/Weld, Pressure Locked, and Riveted Floor
Gratings in this FREE 8-page catalog

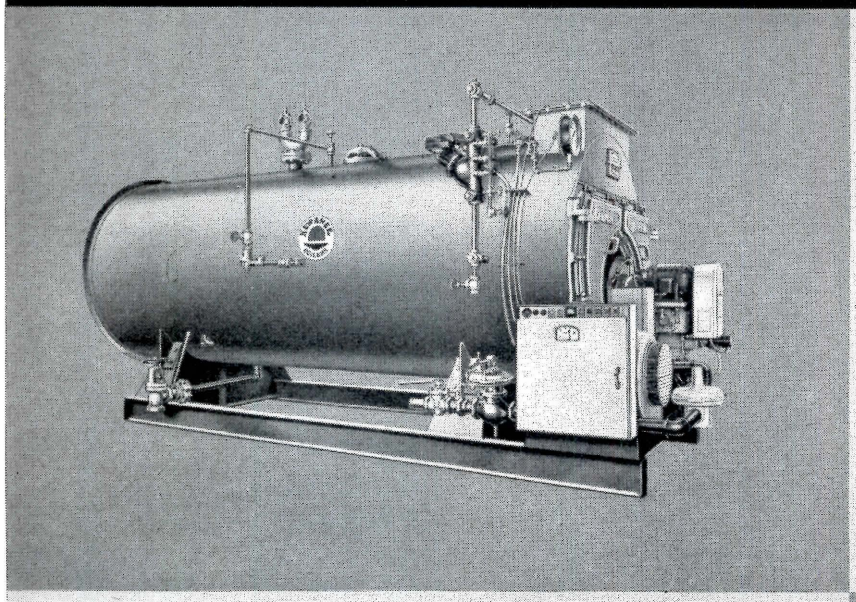
BORDEN METAL PRODUCTS CO.

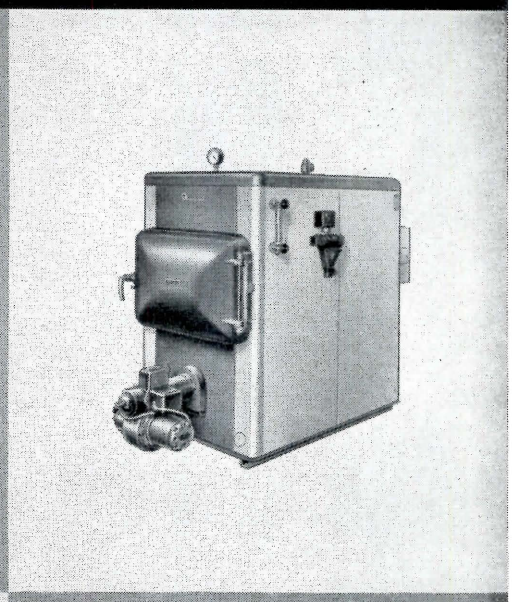
822 GREEN LANE Elizabeth 2-6410 ELIZABETH, N. J.

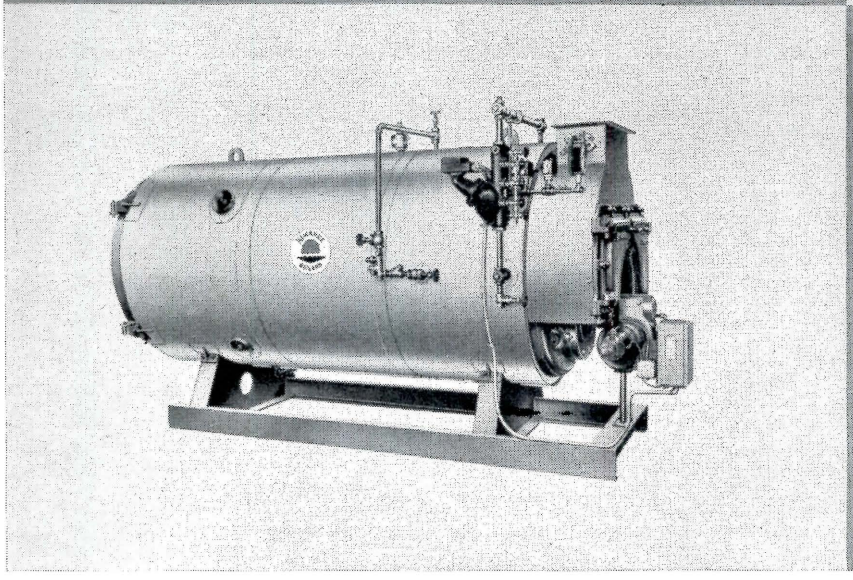
PLANTS—UNION, N. J., LEEDS, ALA., CONROE, TEXAS, BEETON, ONTARIO

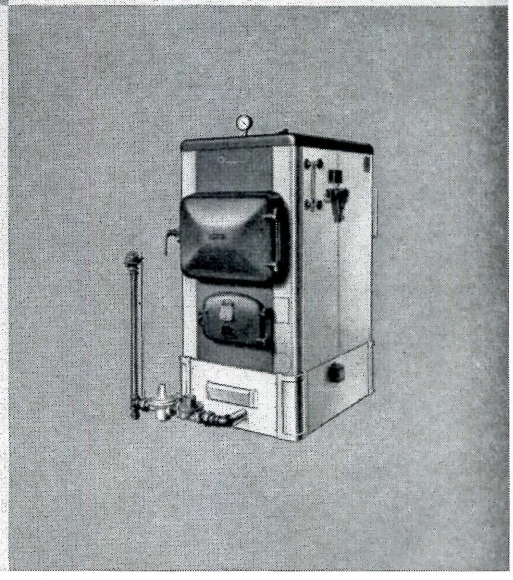
KEWANEE® PACKAGES

36 sizes span a full range of fuels









Now Kewanee's family of integrated boiler-burner packages covers a spread of sizes from 18 to 651 hp in high pressure models . . . 216,000 to 21,855,000 Btuh, low pressure. The fuel range is all-inclusive, too—oil from No. 1 through No. 6 . . . natural, manufactured, mixed or LP gas . . . oil-gas combination firing on any Scotch type package . . . forced draft eliminates high stacks. Factory assembling and fire-testing on Scotch type packages, when desired, means only five simple connections for installation. For complete facts on any type, any size or any fuel, contact your nearby Kewanee Man. AMERICAN-STANDARD, KEWANEE BOILER DIVISION, 105 Franklin Street, Kewanee, Illinois.

AMERICAN-Standard

KEWANEE BOILER DIVISION

DEERING MILLIKEN BUILDING FEATURES

WINDOWS AND ARCHITECTURAL METALWORK

by GENERAL BRONZ

Here's a striking effect in exterior design that accentuates the vertical in an eight story office building. Carson & Lundin, the architects, have effectively designed narrow bays of stainless steel window frames with fixed sash and glass spandrel panels between mullion columns of white marble.

In addition to fabricating the stainless steel window frames General Bronze has also supplied the stainless steel revolving door entrance, the lower floor store fronts and other architectural metalwork.

As the country's foremost producer of curtain walls, windows and architectural metalwork in either aluminum, bronze or stainless steel, General Bronze is anxious and ready to serve you, too. See our catalogs in Sweet's.

Deering Milliken Building,
New York, N. Y.
Architects: Carson & Lundin
Contractor: Turner Construction Co.

GENERAL BRONZE
CORPORATION · GARDEN CITY, N.Y.
SALES OFFICE: 100 PARK AVE., NEW YORK, N. Y.

PERMATITE DIVISION—Custom-built Windows, Curtain Walls, Architectural Metal Work and Revolving Doors. **ALWINTITE DIVISION**—Stock-size Aluminum Windows and Doors. **BRACH MFG. CO. DIVISION**—Radio, Television and Electronic Equipment. **STEEL WELDMENTS, INC. DIVISION**—Custom fabrication in Steel and Iron.

ONLY YORK FAN COIL UNITS GIVE YOU A

Choice of all 3!

Twenty powerful, packaged models—the longest line-up in the industry—save space, installation and maintenance costs!

Only *one* manufacturer—only *York* offers floor, ceiling or exclusive wall-mounted fan coil units that begin saving you money the instant they arrive at the site!

Complete line of York year-around systems circulate chilled or hot water, or both! No need for costly ductwork, special foundations...no need to tie up productive floor space. Compact design, a variety of mountings with choice of smartly styled, decorative enclosures mean greater flexibility, greater design freedom!

And operating costs are slashed...trouble-free performance is assured. Permanent split-capacitor motors, pioneered by York for this application, cut power consumption as much as 50%—require fewer electrical circuits—have a 30% greater life expectancy because they run slower and cooler!

So, before you specify just *any* fan coil unit, make it a point to check all the money saving benefits of the complete York line with your local York sales representative.

You'll find him listed in the yellow pages of your classified telephone book. Or, write York Corporation, York, Pennsylvania, for Catalog EM-216!

YORK
CORPORATION
SUBSIDIARY OF BORG-WARNER CORPORATION
IN CANADA—SHIPLEY COMPANY OF CANADA, LIMITED

Millions Live Better with YORK...
the quality name in air conditioning

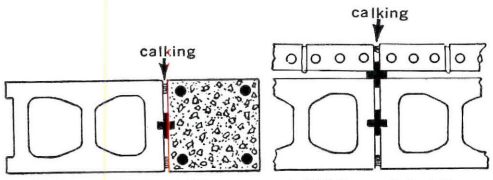
Manufacturers of Residential and Commercial Heating and Cooling Systems • Air Conditioning and Refrigeration Equipment for Industrial and Commercial Installations • Room Air Conditioners • Ice Makers • Refrigeration Units and Systems

The New Way to Protect and Strengthen Masonry Walls

BLOK-JOINT

Pat. Pend.

For Control Joints



BLOK-MESH

Deep Swedged Reinforcing

SIDE VIEW

Write For This FREE BLOK-JOINT Sample

and detailed literature on both Blok-Joint and Blok-Mesh "2-Point" Masonry Wall Protection.

BLOK-JOINT Permits Contraction AND Expansion In Control Joints

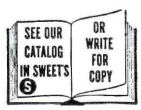
BLOK-MESH Reinforcing Has Deep Swedges For Better Mortar Bond

Today's accepted method of building masonry walls includes reinforcing and control joints. Control joints relieve stresses and strains and reinforcing adds strength and resistance to cracking. Use both to provide maximum strength and protection.

BLOK-JOINT is a cross shaped rubber extrusion for making fast, effective control joints in masonry walls. It is used with ordinary metal sash blocks. No special blocks or building paper and mortar fill is needed. Blok-Joint forms a secure interlock for lateral stability —allows *both* contraction and expansion. It can be used in single walls, block walls faced with other masonry, cavity walls and at pilasters or columns. Molded of "100-year life" rubber, Blok-Joint meets ASTM and Federal specifications.

BLOK-MESH is the masonry reinforcing with the exclusive deep swedged deforming. The well-defined, squared notches give more gripability with the mortar than conventional reinforcing with superficial nicks or burrs. Blok-Mesh provides effective dovetailing—yet requires no more area in the joint than other types.

For Further Information See



4h Car Architectural File

3c Car Industrial Construction File

CONSTRUCTION MATERIALS
CARTER-WATERS
KANSAS CITY MO. & MISSOURI

Blok-Joint and Blok-Mesh are products of The Carter-Waters Corp., 2440 Pennway, Dept. AR Kansas City 8, Missouri

Available in the U. S. through Concrete Block Manufacturers and Building Material Dealers.

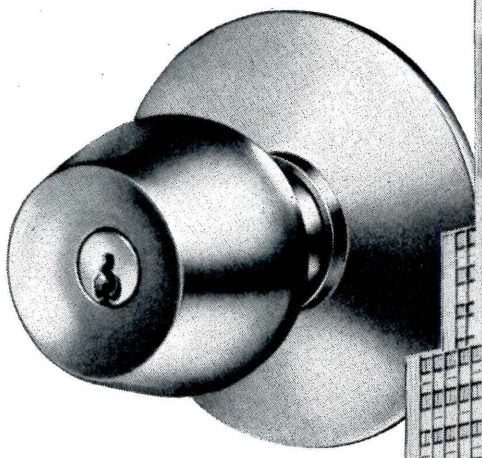
Blok-Joint is distributed in the Canadian Provinces of Alberta, Saskatchewan and British Columbia by CONSOLIDATED CONCRETE INDUSTRIES, Ltd., 9th Ave. & 24th St. East, Calgary, Alberta, Canada.

a new gilt-edged address

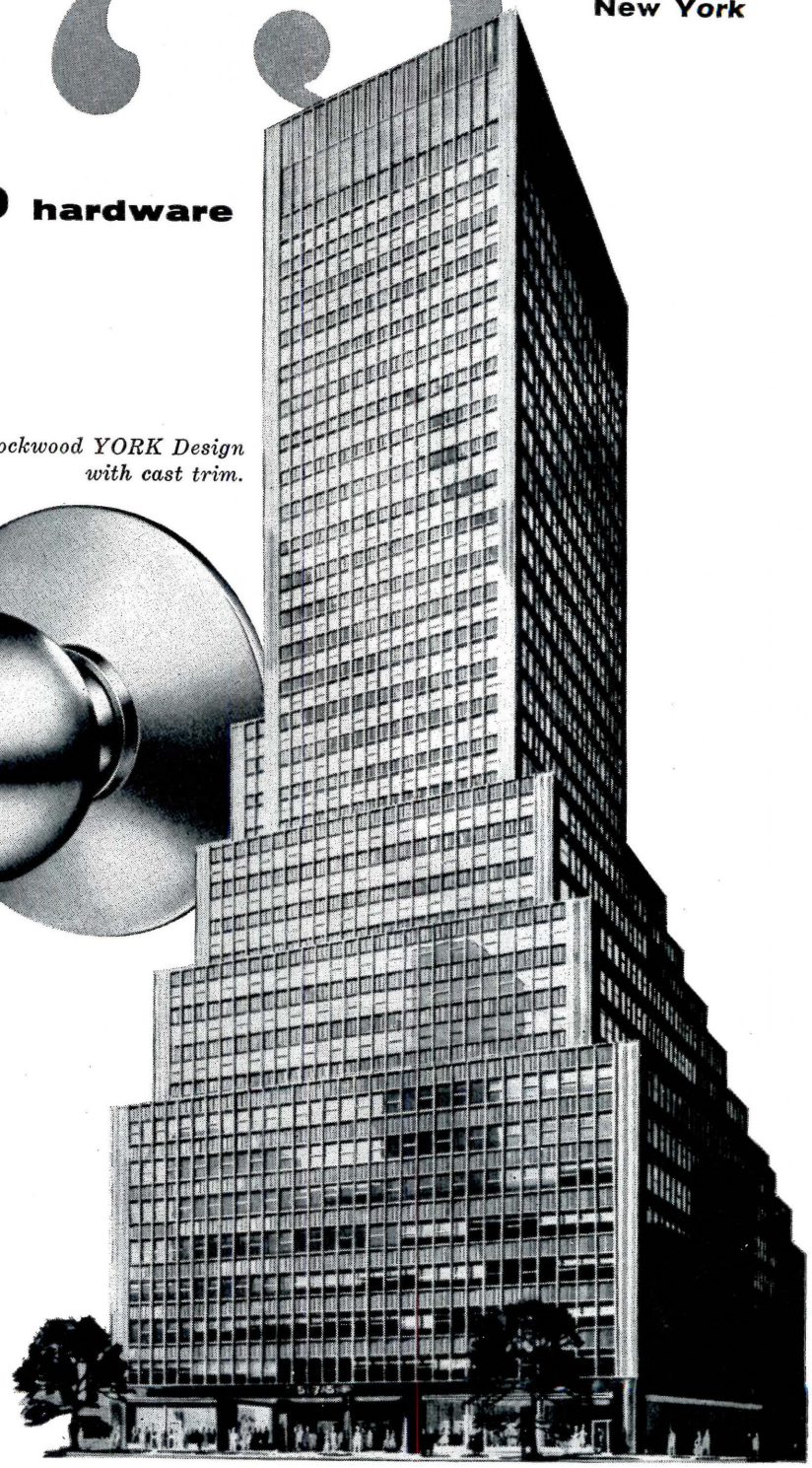
575

Lexington Avenue, New York

with **LOCKWOOD** hardware



Lockwood YORK Design with cast trim.



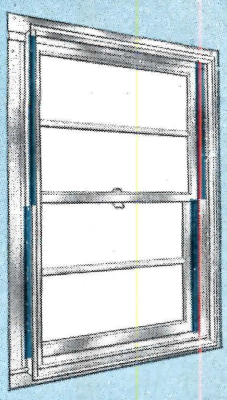
100,000 square feet of golden aluminum spandrels, mullions and window frames — that's the facade of the world's first *gold* skyscraper.

And on the inside, products of quality and glamour to match . . . hardware, for example, by LOCKWOOD . . . ball-bearing door closers, panic exit devices and heavy-duty cylindrical locksets, featuring Lockwood's beautiful, smooth-performing YORK Design with cast trim.

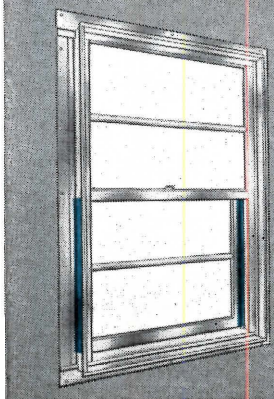
Architects: Sylvan and Robert Bien
Builder: Sam Minskoff & Sons, Inc.

LOCKWOOD

Lockwood Hardware Manufacturing Co., Fitchburg, Mass.

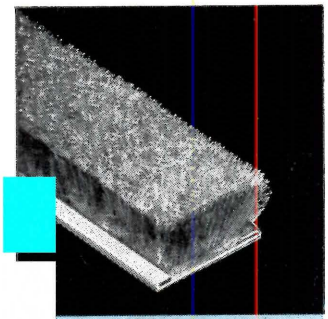


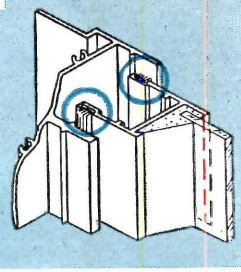
Ceco
Double-hung Window



Ceco
Single-hung Window

Why Ceco Specified Standard Products





WEATHERSTRIP M-80. Over-all width ½". Over-all height from .15" to .35". Available in galvanized steel, aluminum and stainless steel cores.

DRAFTITE* *for efficient weatherseal around new window series*

Two new series of aluminum windows for residential use have been introduced by Ceco Steel Products Corporation. Designed to meet the needs of varying types of architecture and wall construction, these new windows are available in double-hung and single-hung sections in modular sizes.

Standard Products DraftTite solves the problem of sealing around these, as well as all types of metal windows. Pretested DraftTite wool-pile weatherstrip reduces air infiltration to less than ½ cu ft per min. per foot of sash perimeter when subject to a wind velocity of 25 mi. per hour . . . a sealing efficiency greater than that specified by the industry.

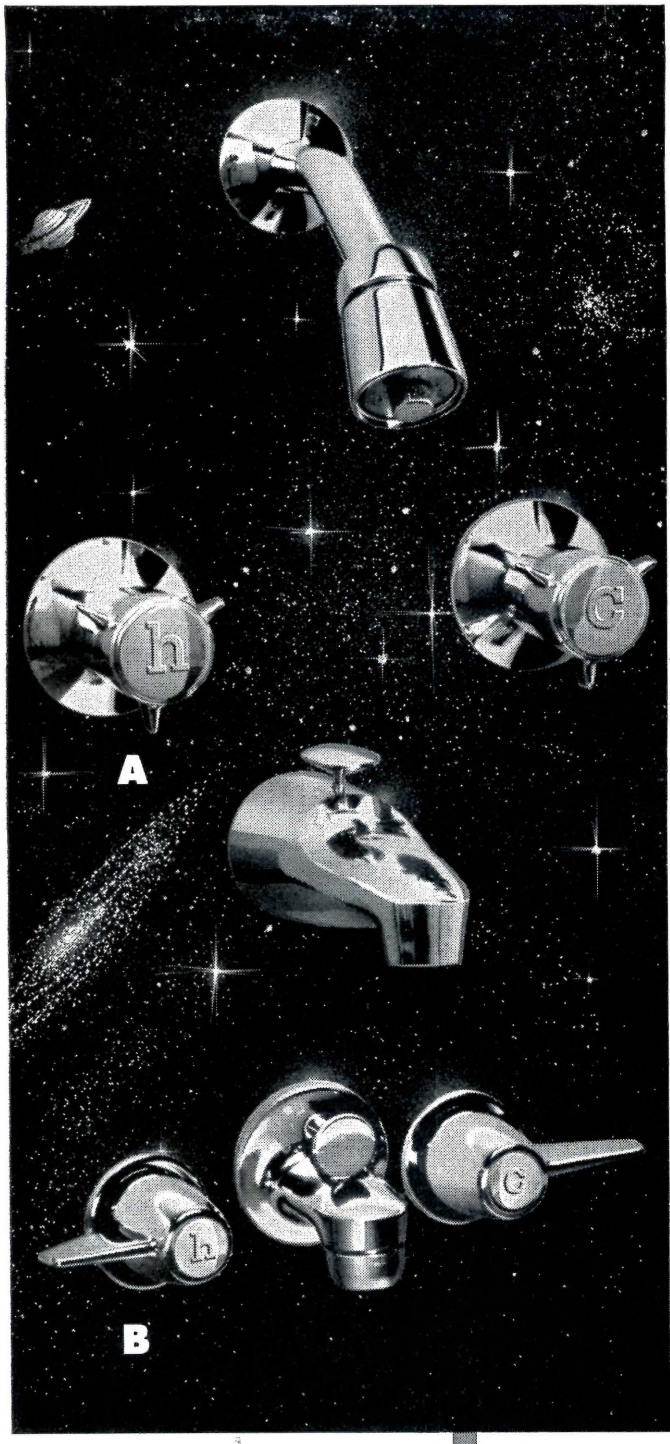
In addition, DraftTite won't leak, sweat or stick. It insures better insulation with *easier* window operation—keeps dust, wind, rain and snow out with an efficiency that lasts for years.

Check into DraftTite's many uses. Write for full information, and call on Standard Products engineering service to help solve your sealing problems. See Sweet's Architectural Catalogue, reference 3e/ST.

*Trademark

The Standard Products Co.

Plants at Lexington, Kentucky and Fullerton, California
Building Products Division • Sales Offices: 316 Fisher Bldg., Detroit, Michigan



NEW BEAUTYWARE FITTINGS ...PERFECT COMPLEMENT TO BRIGGS FIXTURES

Sleek, functional design with color impact

Briggs delivers the most advanced styling possible today in brass fittings! Contemporary lines in complete harmony with the modern look of Briggs Beautyware fixtures. Designed by Harley Earl, Inc., these bright chrome-plated brass fittings are available with interchangeable inserts to match Briggs compatible colors as well as white and chrome. Specify them for residential and commercial uses. Write now to Briggs for complete information.

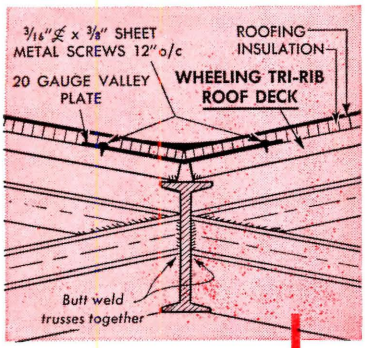
BRIGGS MANUFACTURING COMPANY
WARREN, MICHIGAN

A T-8116. Combination bath-shower fitting, with automatic diverter valve in spout.

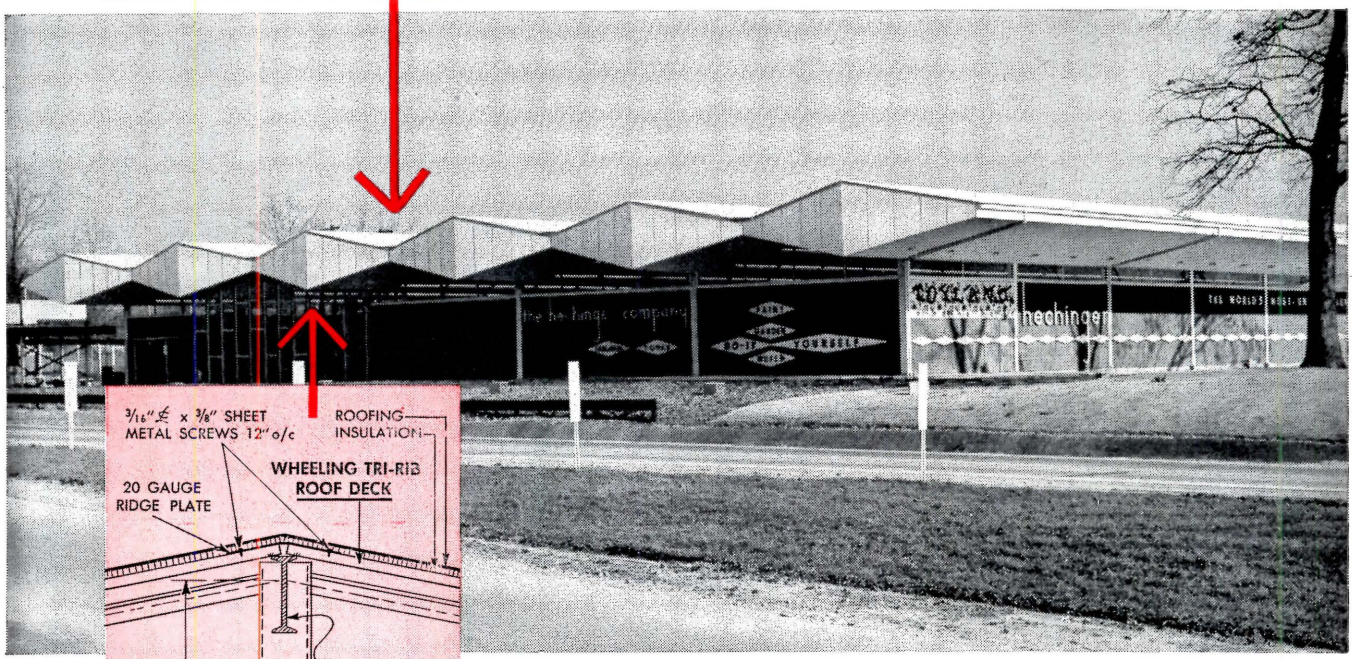
B T-8715-S. Shelf-back lavatory fitting, 5¾″ centers, with aerator and pop-up drain.

BRIGGS

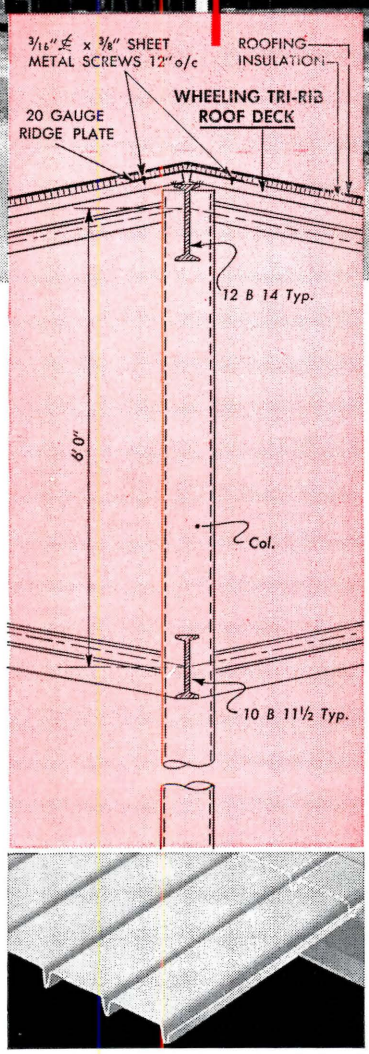
BEAUTYWARE



Unique Building Supply Center features roof of quickly installed Tri-Rib Roof Deck



Hechinger customers can forget about the weather! Roof, made of Tri-Rib Roof Deck, extends out 15 feet over walks on all sides to serve as an all-weather canopy.



Wheeling Tri-Rib Roof Deck is designed in accordance with specifications adopted by A.I.S.I. Light Gauge Cold-Formed Steel Design Manual, 1956 Edition.

Featuring a roof using a series of rhomboid-shaped umbrella trusses joined together and constructed of Wheeling Tri-Rib Roof Deck, the Hechinger Company's Rockville, Md., store is one of the world's most modern building supply centers.

Ideal for many types of construction, Tri-Rib is made of Wheeling Cop-R-Loy® steel — the famous copper-bearing steel that has proved its long-lasting qualities through years of actual field use! And — because Tri-Rib is light and strong — it requires fewer and lighter columns, shallower footings and eliminates the subpurlins required by many other types of roof construction.

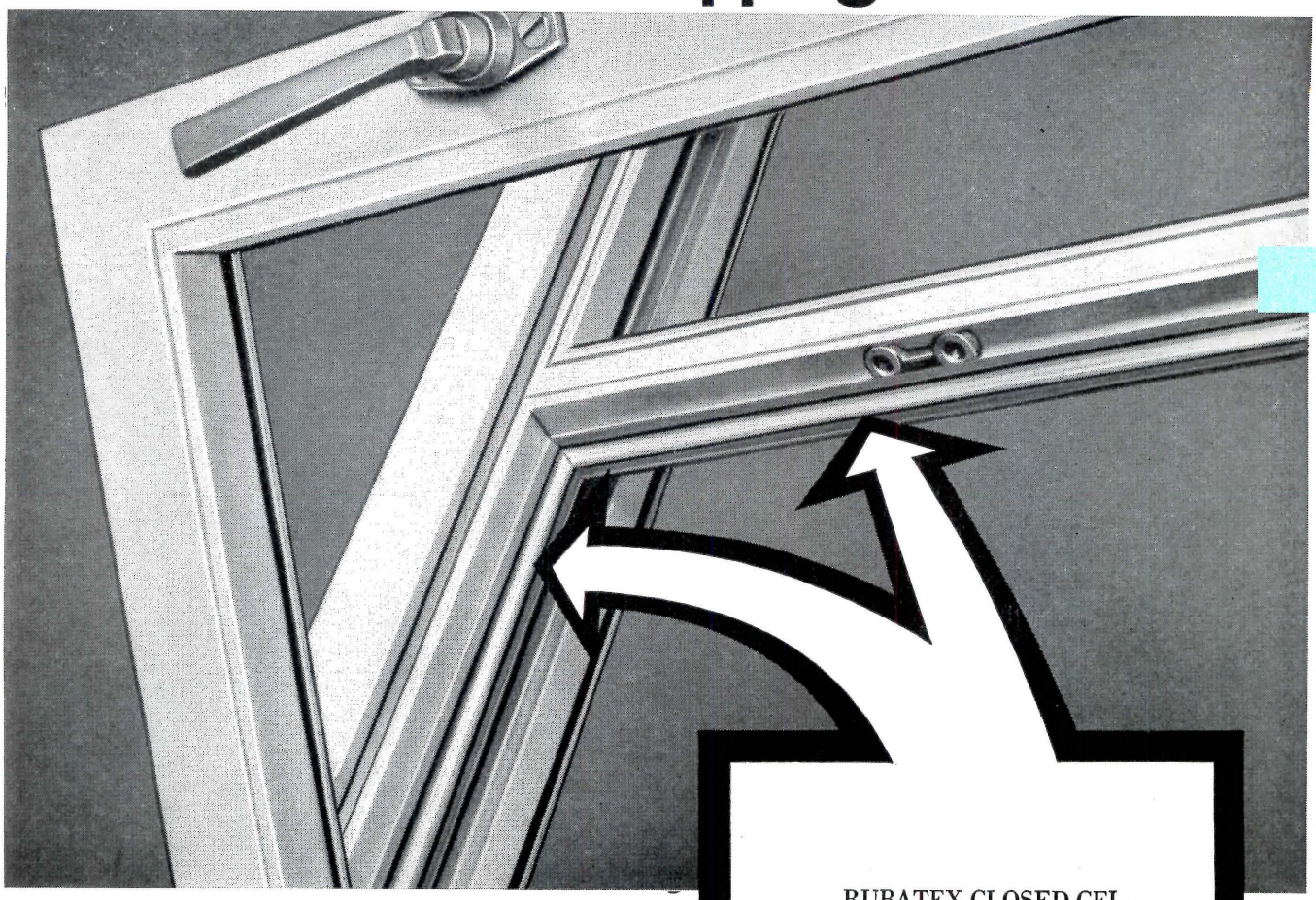
On the installation shown above, Mr. Frank Wolfsheimer, president of Hechinger Engineering Corp., builders of the center, reports, "We were very pleased with the way Tri-Rib went on, especially with the speed of installation and the way Tri-Rib and Tri-Rib Accessories are engineered to work so perfectly together."

Find out how Wheeling Tri-Rib Roof Deck can help you, too. See Sweets, or contact our nearest representative. Wheeling Corrugating Company, Wheeling, West Virginia.

WHEELING CORRUGATING COMPANY
IT'S WHEELING STEEL

WHEELING WAREHOUSES: *Boston, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis.* **SALES OFFICES:** *Atlanta, Houston.*

Rubatex weatherstripping never leak



No air, water, snow or dust get by its Closed Cellular structure

POMEROY custom-built hopper hinged windows —considered "the Cadillac of aluminum windows" —are weatherstripped with RUBATEX CLOSED CELLULAR NEOPRENE for the ultimate in efficiency.

RUBATEX was specified by Pomeroy, above all other gasketing materials tested, because it is completely impervious to water absorption or transmission, assures lifetime resistance to the elements, is extremely soft and conforms to any irregularity with the minimum of effort.

RUBATEX CLOSED CELLULAR NEOPRENE (Stock No. R-414-N, ASTM-SC-41) forms a continuous, self-sealing, permanent, leakproof gasket for hopper vent. Made from cushion-soft, light gray stock, especially developed for ease of installation and to beautifully blend with aluminum.

RUBATEX DIVISION, Dept.AR-6
GREAT AMERICAN INDUSTRIES, INC.
Bedford, Virginia

PIONEER MANUFACTURER OF CLOSED CELLULAR RUBBER

For full details and sample of Rubatex Leakproof Weatherstripping—print your name in space below, attach to your company letterhead and mail to us.

Name _____

Just fill out and mail for free sample and more information about . . .

RUBATEX

LEAKPROOF WEATHERSTRIPPING

WEIRKOTE® — THE RIGHT CHOICE BY EVERY MEASURE

No matter what the specifications of your heating or air-conditioning duct work, Weirkote will meet them as only a quality zinc-coated steel can. No other metal can match it.

Take, for instance, the strength and rigidity of Weirkote. It's a natural for spanning large areas without bending or buckling and with a minimum use of supporting brackets. Consider, too, its fire protection. Its higher melting point makes it provably safer than competing metals. Since ducts sometimes carry volatile matter with a low flash point, this protection can be vital.

Important, too, is Weirkote's economy. Made by the continuous process which integrates zinc and steel, Weirkote can be worked to the very limits of the steel itself without flaking or peeling. Permanent corrosion resistance is provided in every seam and surface. Which, of course, all adds up to longer, maintenance-free life for Weirkote ducts. And its ease of installation cuts cost still further.

After a Weirkote duct installation is in and operating, your clients will find still another reason to be glad you specified Weirkote—it's quiet. Noisy creaks and cracks of expansion and contraction are minimized. With all these advantages plus economy, you just can't go wrong with Weirkote.

Free Weirkote Booklet

Send for the new booklet on Weirkote today. Write Weirton Steel Company, Dept. Q-4, Weirton, W. Va.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

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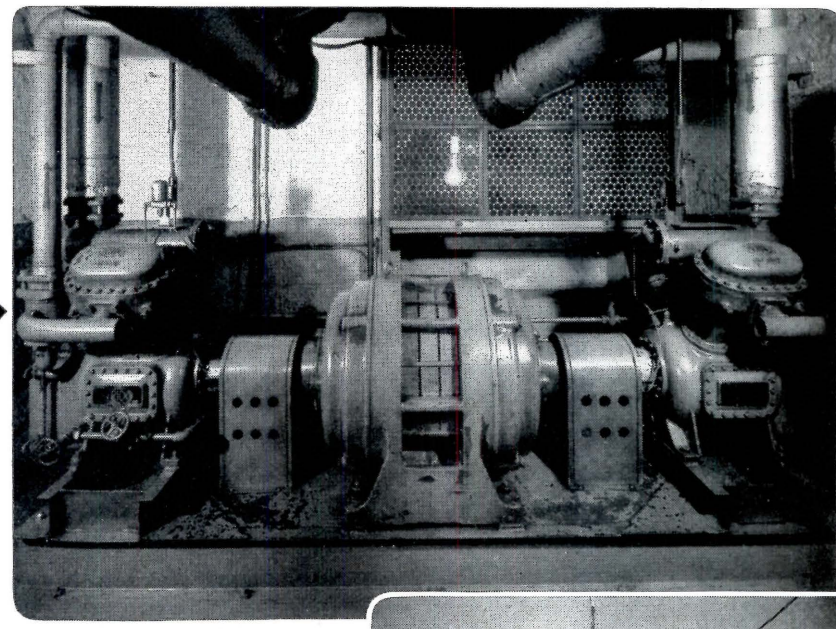
17 YEARS



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"ECLIPSE" COMPRESSORS AIR CONDITION TVA OFFICES

TVA OFFICES AT KNOXVILLE, TENN.

TENNESSEE VALLEY AUTHORITY
KNOXVILLE, TENNESSEE

Frick Company
Waynesboro
Pennsylvania

Gentlemen:

We have a Frick central air-conditioning system in our Old Post Office Building which was installed by your engineers in 1940. It consists of four compressors and two evaporative condensers.

As this equipment has been in continuous use throughout each year for seventeen years, we feel that it is time for a thorough check, and repairing or replacing of necessary parts.

To get a complete and competent check, and proper recommendations, we would like to have one of your staff engineers or field representatives examine our equipment and advise on necessary corrections; also to furnish any cost estimates.

If any of your factory personnel is planning on being in this area in the near future, we would appreciate their stopping here and making the inspection. In the event they do, would you advise us as to the date.

Very truly yours,

A. L. Boyd

A. L. Boyd
Eastern District Manager
Office Service Branch

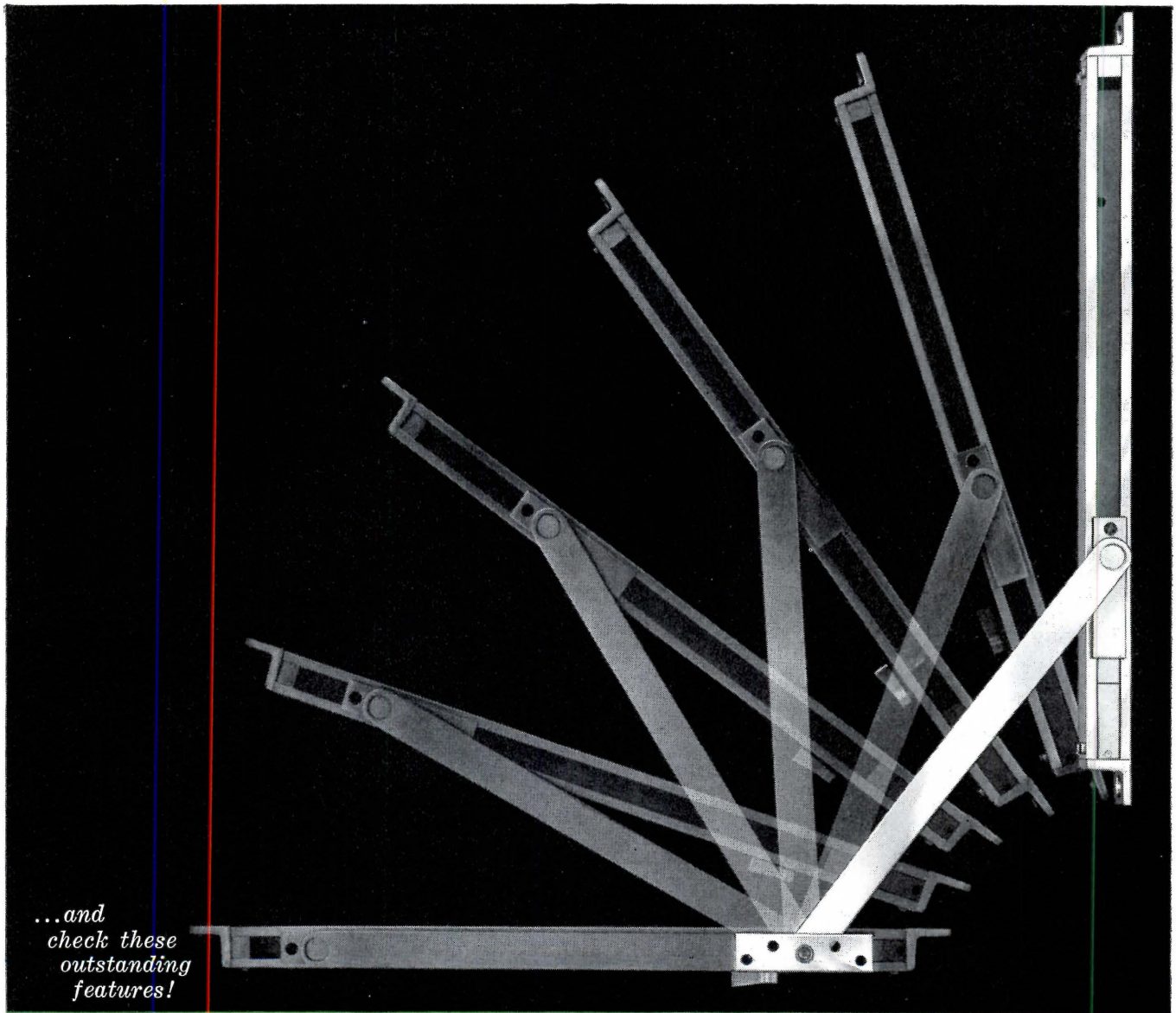
Frick equipment is world renowned for being better-built, more economical, and giving a lifetime of dependable service.

What are your COOLING needs? If you want cool air, cold water, ice, extremely low temperatures, or refrigeration for quick freezing and processing—in any commercial or industrial sizes—call in a Frick representative at the planning stage for recommendations and estimates. They have the specialized knowledge and equipment to solve your cooling problems.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U.S.A.

BUILT TO TAKE SLAM-BANG SCHOOL SERVICE

The 1750 Russwin Door Holder is "made-to-order" for school doors—or wherever rugged service calls for solidly built holders. ✓ ✓ ✓ One clue to the holder's long service life is the extra sturdy holding dog. After a million-cycle test, it was almost as good as new! A remarkable endurance record. ✓ ✓ ✓ Wide-contact latch design distributes the load in the 1750 holder... eliminates concentrated wear. The king-size, deeply case-hardened steel holding dog assures long life. ✓ ✓ ✓ Have your Russwin representative show you the new Russwin 1750 Door Holder. Designed for single-position holding, it is available in six sizes. Your finest choice for lasting service. Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.



...and check these outstanding features!

TOP-MOUNTED SLIDE
Long, rectangular top-mounted slide of exclusive design distributes load over large area of heavy, extruded architectural bronze track... reducing wear.

ADJUSTABLE HOLDING
Holding force adjustment within a wide range is provided through an easily accessible adjusting screw at the top of the slide, with finger-tip on-or-off lever.

ANTI-FRICTION PIVOTS
Heavy, hard-drawn brass arm and bracket, plus silicon copper alloy pivots, offer greater strength and longer life.

FORGED BRASS END BRACKETS
Extra-strong end brackets, with through bolts and sex nuts, assure rigid, permanent mounting.

RUSSWIN®
DOORWARE

Time-Saver. Just 15 minutes to rinse, scour, sterilize, and dry instruments with this all-Monel sterilizer.

How your hospital can handle heavy sterilizing loads

Look at Shreveport's new 325 bed Schumpert Memorial Hospital . . . 22 Wilmot Castle Sterilizers built with Nickel-clad steel and Monel nickel-copper alloy.

In Surgery: 9 sterilizers, including 6 all-Monel* high-speed emergency units.

In Central Supply: a 'round-the-clock processing plant with 2 huge Nickel-clad rectangulars and a Monel cylindrical auxiliary unit.

In Maternity: an automatically controlled autoclave for fast, safe terminal processing of formula.

In Utility Rooms and Laboratory: 9 more all-Monel autoclaves.

In Castle's bulk sterilizer, the inner chamber wall and door is a sheet of Nickel inseparably bonded to a steel shell. For cylindrical autoclaves, Castle uses double walls of Monel alloy.

These nickel containing metals have maximum resistance to corrosive saline solutions, steam, organic debris, cleansers. Surfaces remain smooth and easy to clean. There's no peeling or warping despite repeated temperature extremes. All welded construction virtually eliminates possible leakage.

Any way you look at it, Castle's Monel and Nickel-clad sterilizers are built for a lifetime of service . . . economical service . . . unfailing service.

Need help *in planning*? Take advantage of Wilmot Castle's Hospital Planning Service. Write: Wilmot Castle, Inc., Rochester, N. Y.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N. Y.

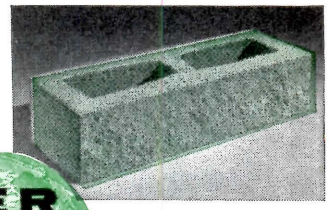
INCO NICKEL ALLOYS

—the Split Block with Character!

BES-STONE
gives a small home that expensive big residence appearance, without stretching the home-builder's budget.

BES-STONE Split Block actually has the appeal and durability of fine quarried stone. It also has another distinct advantage — ECONOMY. With BES-STONE, you get a wider range of beautiful colors, textures and patterns to meet new ideas or cost problems. It offers economy and versatility in construction, freedom from costly upkeep and a distinctive charm that lasts for years.

BES-STONE Split Block gives you beauty plus permanence. It meets all code requirements . . . is adaptable to all types of architecture . . . challenges the creative ability of both architect and builder. Ask your nearby Vibrapac block plant for new Bulletin No. 121 showing BES-STONE applications in natural colors, or write:



BES-STONE is available i variety of sizes and colo for either veneer or solid masonry construction.

BESSER Company

Dept. 173, Alpena, Mich., U. S. A.

FIRST IN CONCRETE BLOCK MACHINES

A7-135

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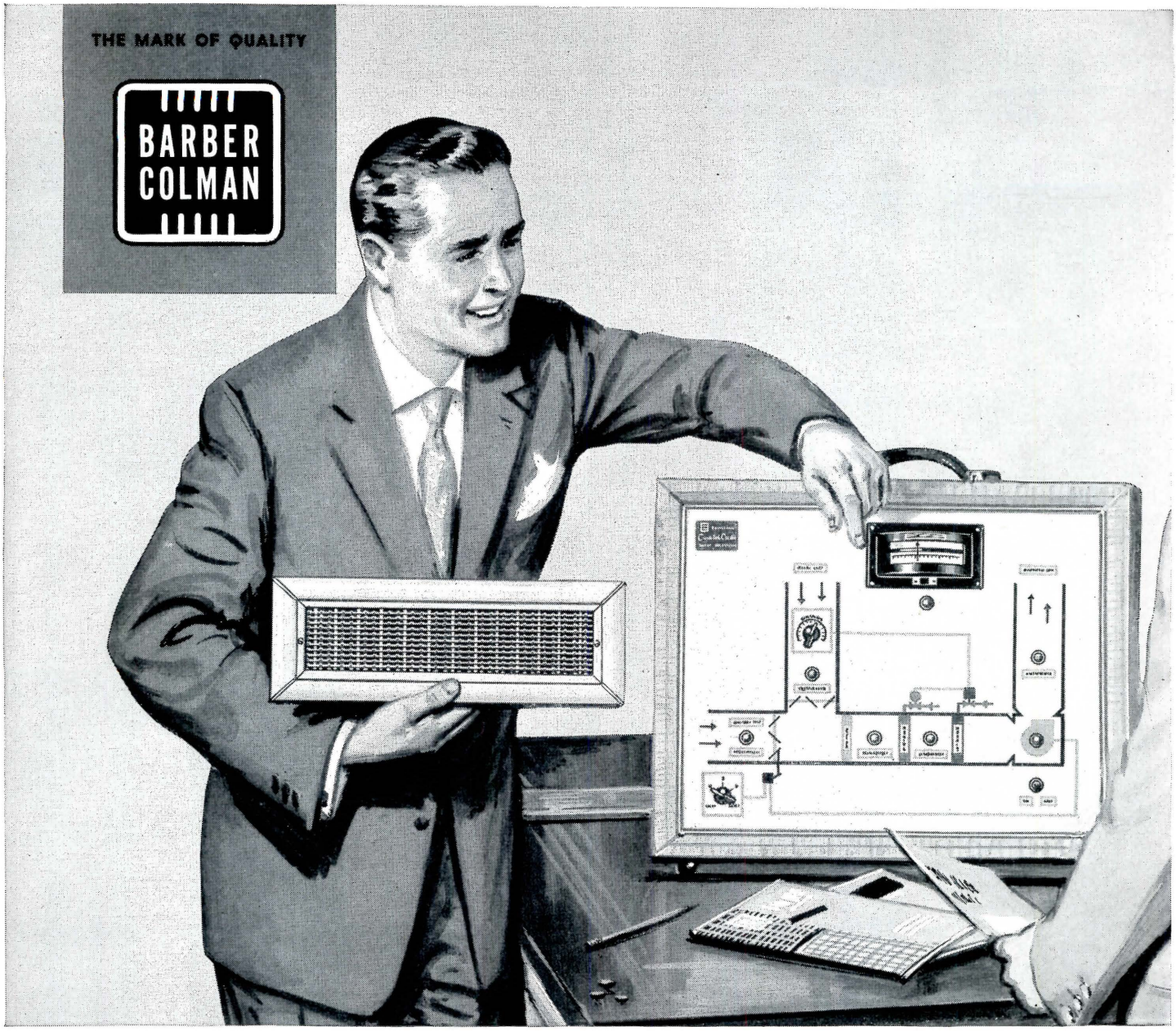

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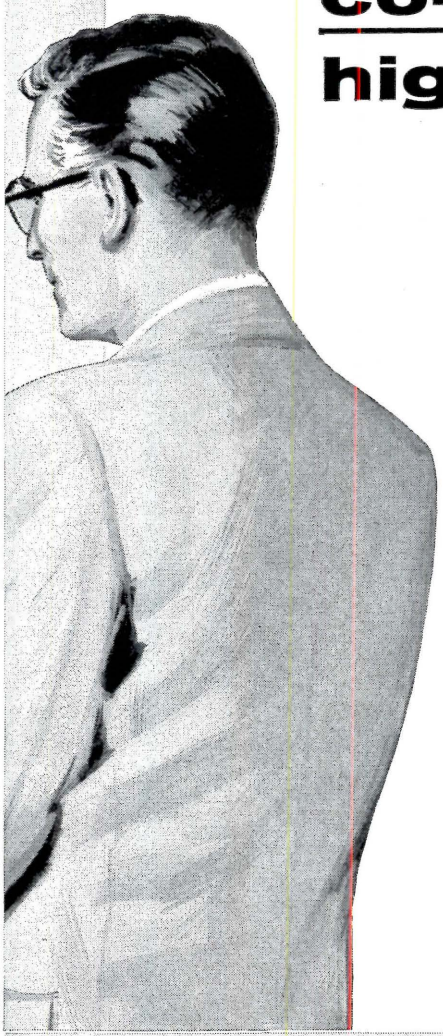
try Barber-Colman's co-ordinated approach to high comfort standards!



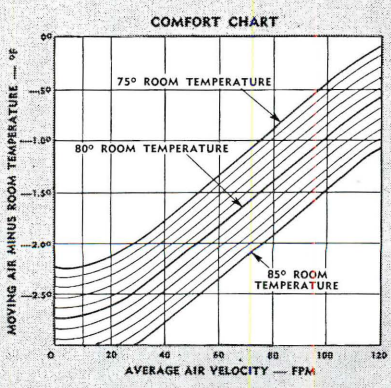
More and more architects and engineers are learning the value of one responsible source for both Automatic Controls and Air Distribution Products

From first contact until your air conditioning is balanced and checked, your Barber-Colman representative offers co-ordinated products and service on *both* Automatic Controls and Air Distribution.

At the design stage, he provides engineers with invaluable assistance in selection and placement of equipment.

During installation, he checks out control systems and is available for final balancing of the air distribution.

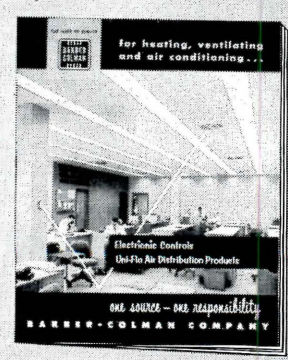
He guarantees not merely the equipment but the final result — a draft-free, ideally controlled system fulfilling today's high comfort standards. Rely on Barber-Colman to help you cope with problems arising from an ever-changing architectural and engineering concept.



COMFORT STANDARDS

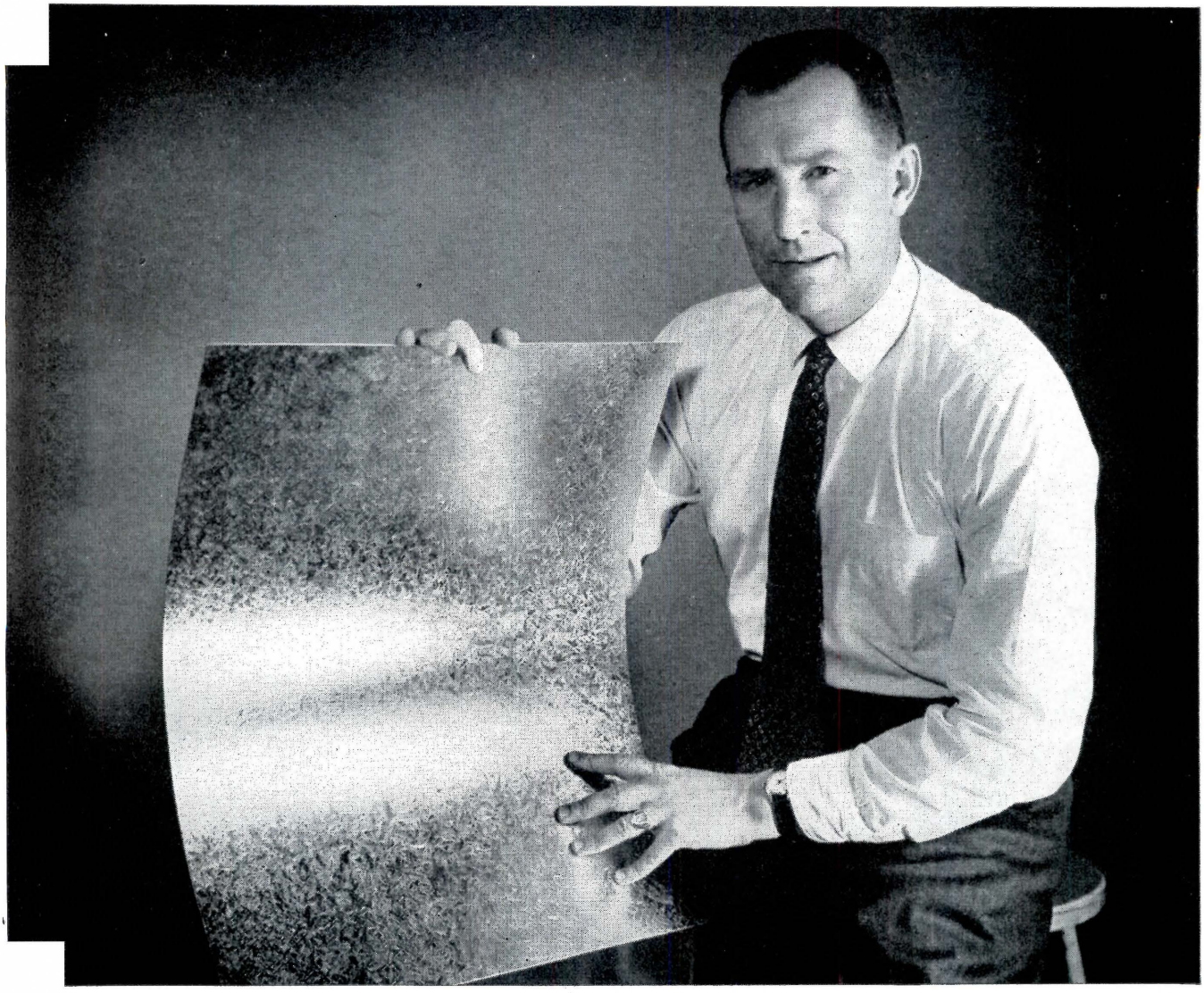
This chart developed by Barber-Colman indicates conditions of air movement and temperature in the occupancy zone. Line shown for each average room temperature is limit of satisfactory comfort conditions. Points above the line fulfill Human Comfort Standards. The Barber-Colman "Comfort Engineer" is the one supplier who can assure *proper relationship* of temperatures and air velocities as dictated by this chart. Copies available from your nearby Barber-Colman Field Office on request.

Ask your Barber-Colman Field Office for this new, fully illustrated bulletin detailing advantages of Automatic Controls and Air Distribution system combinations. Just look for the name Barber-Colman in the telephone book for any of the 95 cities listed on the left-hand page of this ad.



BARBER-COLMAN COMPANY

Dept. H, 1604 Rock Street, Rockford, Illinois



Get the "feel" of Bethcon
before you specify your next air conditioning system

Next time you get a piece of galvanized sheet in your hands, flex it back and forth a few times to get the "feel" of it. If that piece of steel is Bethcon, we'll bet it felt just right. Not limp and lifeless, not stiff as a board, but full of the zip and workability so desirable in sheet metal work.

STRONG, BUT FORMS READILY

Bethcon forms up readily on brakes and lock-formers. Your completed duct system will be strong and durable, ready for many years of trouble-free service.

CONTINUOUS GALVANIZING AND ANNEALING

Our continuous galvanizing lines at Sparrows Point, Maryland, are of the very latest design, and include a continuous annealing process which gives the sheet just the right blending of strength and ductility for good results.

ZINC COATING HOLDS TIGHT

Our continuous galvanizing process also bonds the zinc to the base metal much more tightly than conventional methods; so tightly, in fact, that the coating will not flake off even when the sheet is bent back on itself. A Bethcon sheet has no drip end, consequently no bothersome bead.

AVAILABLE IN CUT LENGTHS OR COILS

You can specify Bethcon sheets in cut lengths or coils, 13-ga and lighter, in either plain open hearth or copper-bearing (Beth-Cu-Loy) steel for the base metal, depending on your requirements. For further information, just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

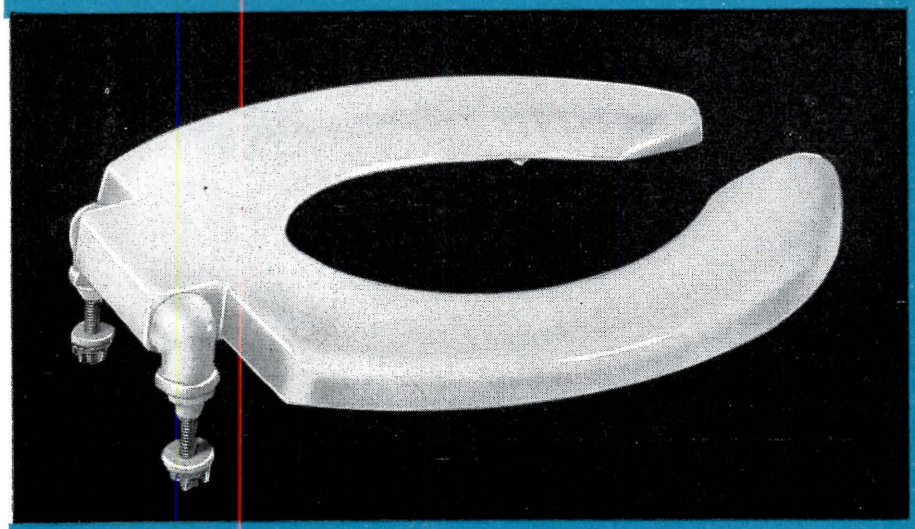
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

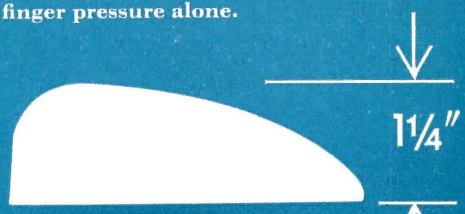
new shockproof Olsonite seat

95

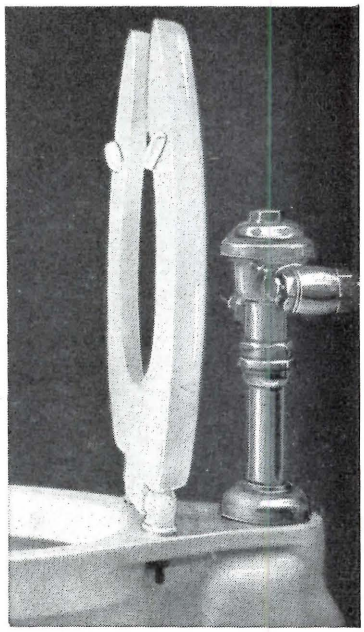


Extra strength No. 95 Olsonite includes lock nuts and washers that allow permanent installation with finger pressure alone.

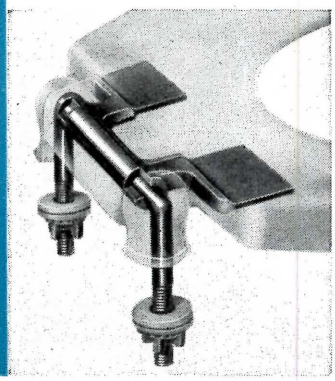
Extra heavy construction with a full 1¼ inches of high impact Olsonite material.



Snap-in vinyl bumpers with the resiliency of rubber have no metal to corrode. Vinyl will not yellow—has 8 to 10 times the life of rubber bumpers.



Concealed check hinge prevents seat from rising more than 11° past vertical. It's standard on all Olsonite No. 95's and 97's.



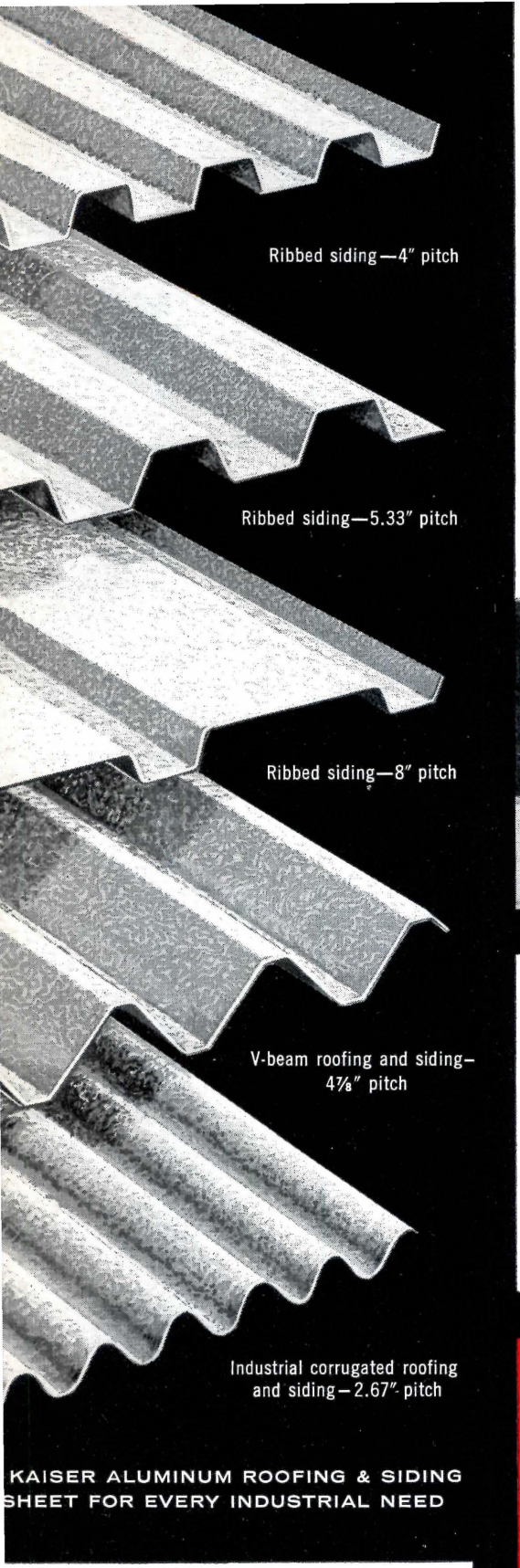
Additional strength is provided by the durable heavy-duty brass reinforcing plate. No wood filling to crack.

High impact construction and extra strength design makes it ideal for all non-residential installations

Never before has any manufacturer offered a seat more able to "take it" and remain sanitary and attractive. Extra strength, high impact material has been combined with a tough, shock absorbing, brass reinforcing plate to make the Olsonite No. 95 an incomparable choice for all non-residential installations. The Olsonite 95 will not discolor—it looks sanitary and *stays* sanitary. Available in white or black only, the Olsonite No. 95 is for elongated bowls. No. 97 fits regular bowls.

SOLID Olsonite SEATS

SWEDISH CRUCIBLE STEEL COMPANY, *Plastics Division*
8801 CONANT AVE., DETROIT 11, MICH. 58-A1
ORIGINATORS OF THE SOLID PLASTIC SEAT

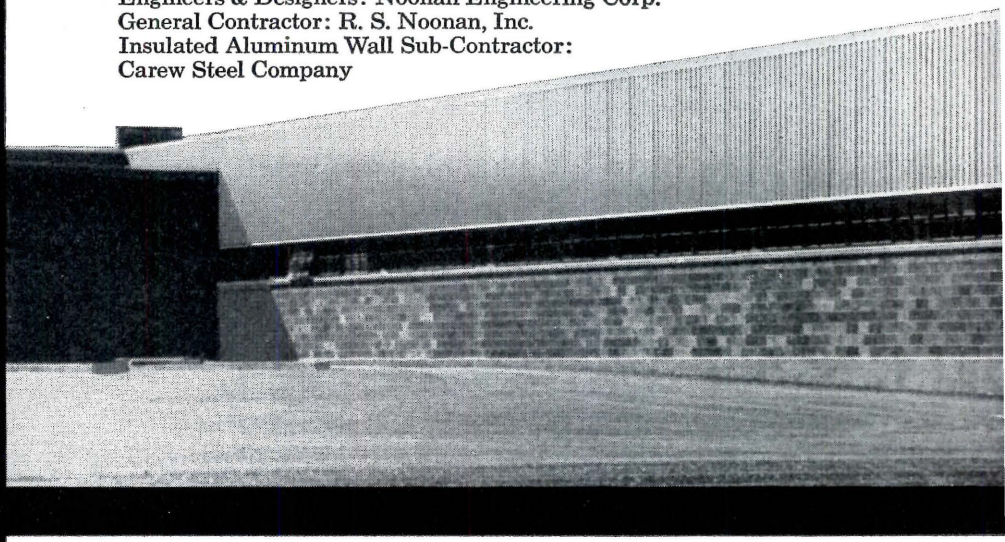


KAISER ALUMINUM ROOFING & SIDING
SHEET FOR EVERY INDUSTRIAL NEED

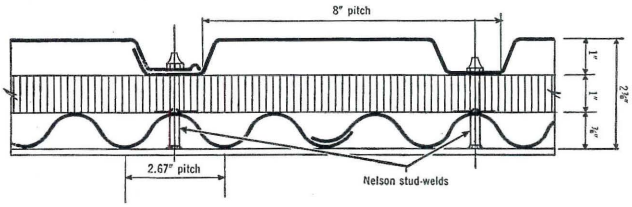
FORM, FUNCTION A

EXAMPLE: LOW-COST INSULATED

The Standard Register Co., Manufacturing Plant, York, Pa.
Engineers & Designers: Noonan Engineering Corp.
General Contractor: R. S. Noonan, Inc.
Insulated Aluminum Wall Sub-Contractor:
Carew Steel Company



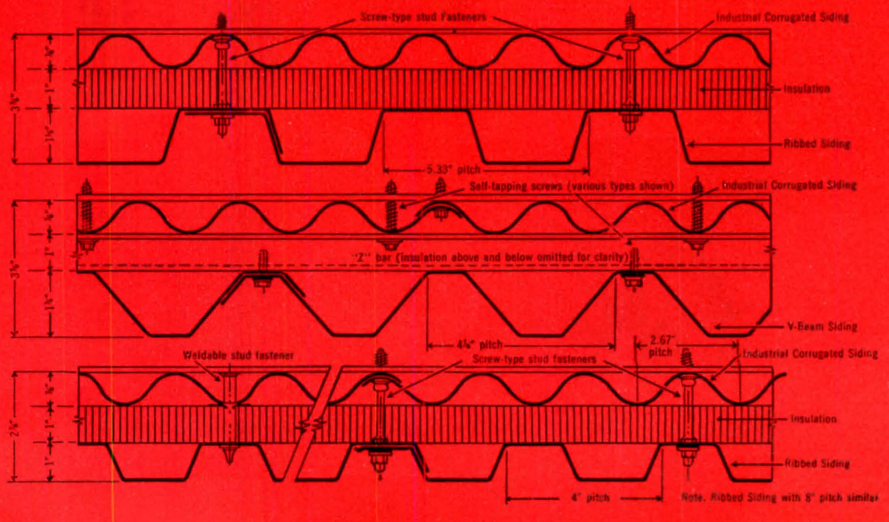
**TYPICAL SECTION—
STANDARD REGISTER
WALL ASSEMBLY**



Outer skin: 8″ pitch ribbed siding
Inner skin: 2.67″ pitch industrial corrugated siding
Fastening system: Nelson Set-Lock studs

TYPICAL SECTIONS... OTHER INSULATED ALUMINUM WALL ASSEMBLIES

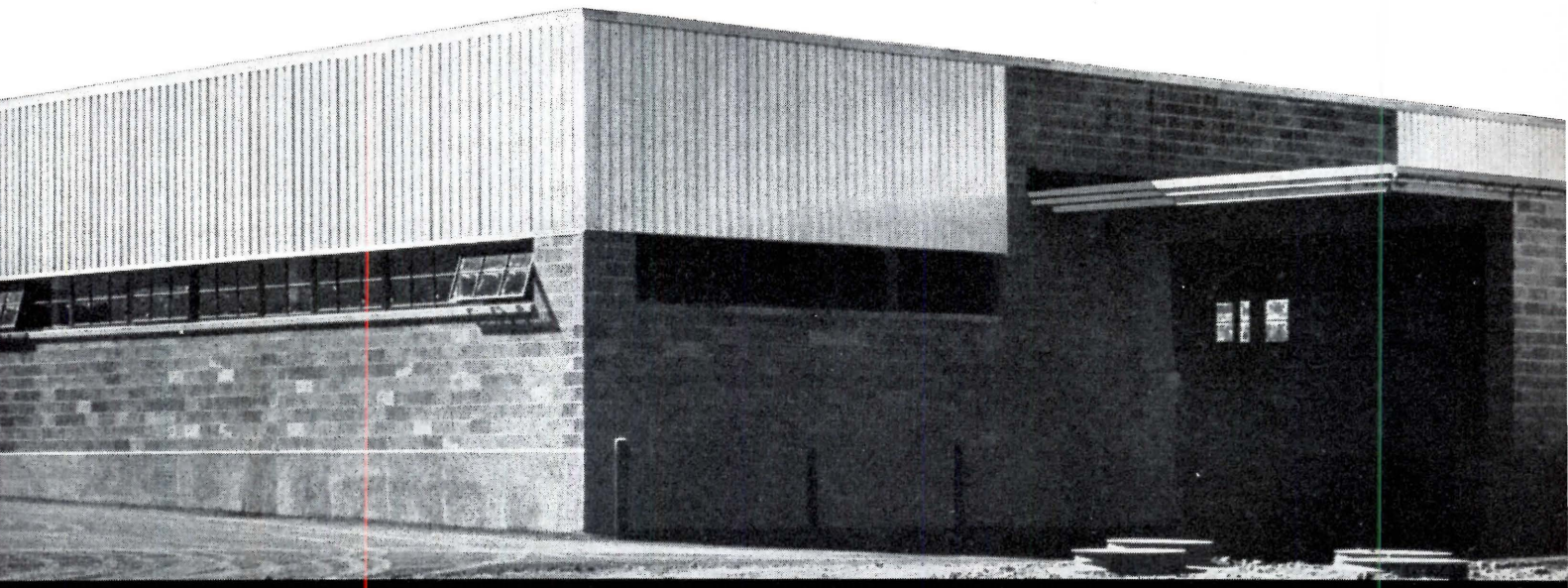
Flexibility of insulated aluminum wall design is made possible by Kaiser Aluminum's wide range of siding sheets in ribbed, corrugated and V-beam configurations — plus its selection of quick, dependable fastening systems.



These roofing and siding sheets are available in a selection of thicknesses, finishes, widths, lengths. Flashing sheet, pre-formed flashing, closure strips and other accessories also available. For full information, see Sweet's 1958 Architectural File 8b/Ka or Industrial Construction File 4b/Ka. Complete specifications provided on request.

FLEXIBILITY–CONCEIVED IN ALUMINU

ALUMINUM WALLS FOR NEW STANDARD REGISTER PLANT



Installed at a labor and materials cost of $1.50 per square foot, Standard Register's new insulated aluminum sandwich walls were quickly fabricated *at the site* from a layer of 1″-thick rigid glass fiber insulation —flanked by rugged sheets of lightweight Kaiser Aluminum ribbed and industrial corrugated siding.

Extra Economies

Their *extreme light weight,* from 1 to 1.5 pounds per square foot, reduces dead load—effecting many savings throughout the building.

Their *minimum thickness,* as little as 2¾″ overall, extends usable floor space. And their *high insulation value* (U Factor of 0.16 with 1″ thick glass fiber insulation) by lessening the load on heating and air conditioning equipment, promises reduced operating costs for the life of the structure.

Minimum Maintenance

In addition, because the siding sheets for these sandwich walls are formed of a special clad Kaiser Aluminum alloy, they provide *extra* resistance to corrosion — will keep their good looks for years with little maintenance, and without the need of paint.

Reliable counsel on insulated aluminum walls is available from a qualified Architect's Service representative through the Kaiser Aluminum sales office nearest you. Consult the yellow pages of your telephone directory; or, write for catalog: Kaiser Aluminum & Chemical Sales, Inc., 919 N. Michigan Avenue, Chicago 11, Illinois.

KAISER ALUMINUM

THE BRIGHT STAR OF METALS

See "MAVERICK" Sunday evenings, ABC-TV Network. Consult your local TV listing.

APPROVED APPLICATORS

Additional information on Kaiser Aluminum industrial building products may also be obtained from:

WALTER G. MITCHELL COMPANY
2303 Jefferson Street
Torrance, California
Mr. W. G. Mitchell, Pres.

CAREW STEEL COMPANY
R. D. 9
York, Pennsylvania
Mr. Paul Kohr, Treasurer

DALE BENZ, INC.
1912 West Grant Street
Phoenix, Arizona
Mr. Dale Benz, Pres.

WM. C. KULZER COMPANY
3340 North 10th Street
Philadelphia, Pennsylvania
Mr. William C. Kulzer, Pres.

HUGHES STEEL ERECTION CO.
43 Leon Street
Boston 15, Massachusetts
Mr. John Hughes, Pres.

ALLENTOWN ROOFING & SHEET METAL COMPANY, INC.
Highland & Fenwick Streets
Allentown, Pennsylvania
Mr. Charles C. Graver, Treas.

CALLERY INDUSTRIES, INC.
130 Hillvue Lane
Pittsburgh 37, Pennsylvania
Mr. David C. Starr, Pres.

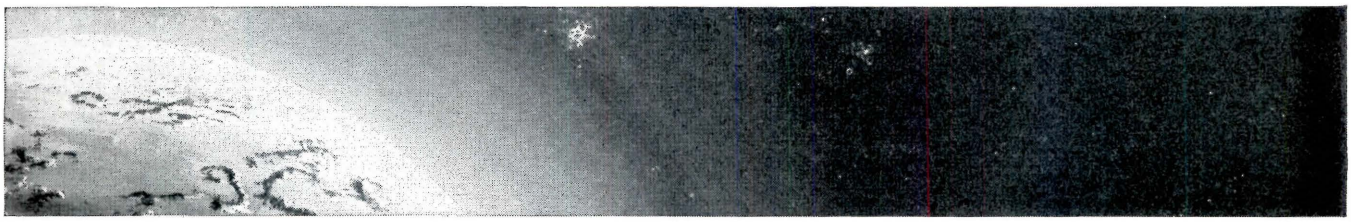
METAL PRODUCTS, INC.
106 Birney Street
Greenville, South Carolina
Mr. Thomas Burdette, Vice Pres.

FRASER EDWARDS COMPANY
2412 Harrison Street
San Francisco, California
Mr. J. S. Fraser

THE YOUNG COMPANY
1101 West First Street
Charlotte, North Carolina
Mr. W. B. Young, Pres.

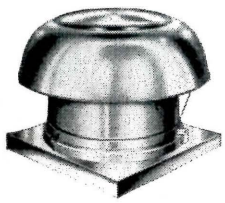
SOUTHERN FABRICATING, INC.
P. O. Box 97
Staley, North Carolina
Mr. Forrest A. Paschal
Mr. R. F. Paschal, Jr.

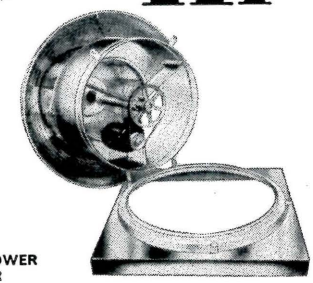
JENN-AIR LAUNCHES



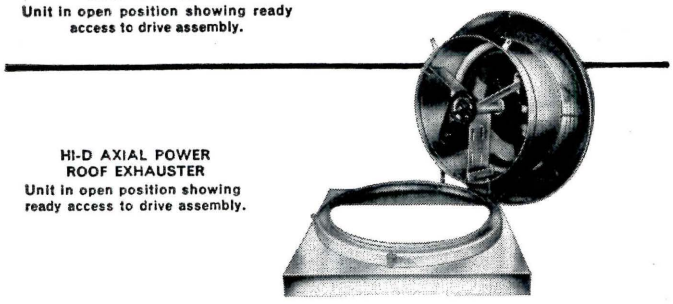
TWO NEW STARS INTO ORBIT

Hi-D CENTRIFUGAL AND AXIAL POWER ROOF EXHAUSTERS





HI-D CENTRIFUGAL POWER ROOF EXHAUSTER
Unit in open position showing ready access to drive assembly.



HI-D AXIAL POWER ROOF EXHAUSTER
Unit in open position showing ready access to drive assembly.

Observe These Outstanding Features Shared in Common by 2 New Jenn-Air Hi-Discharge Exhausters:

1—*Maintenance-Free all-aluminum housing* supplies strength without weight.

2—*Bird guard* of heavy gauge stainless steel construction comes as an integral part of every unit.

3—*Special vibration absorbers* reduce noise to an absolute minimum.

4—*Totally enclosed* full ball bearing, permanently lubricated, motor assures smooth, uninterrupted service. Air cooled application adds years to motor life.

5—*Tubular drive assembly* has permanently sealed, pre-lubricated ball bearings.

6—*Motor and drive* can be serviced from interior of building, if desired.

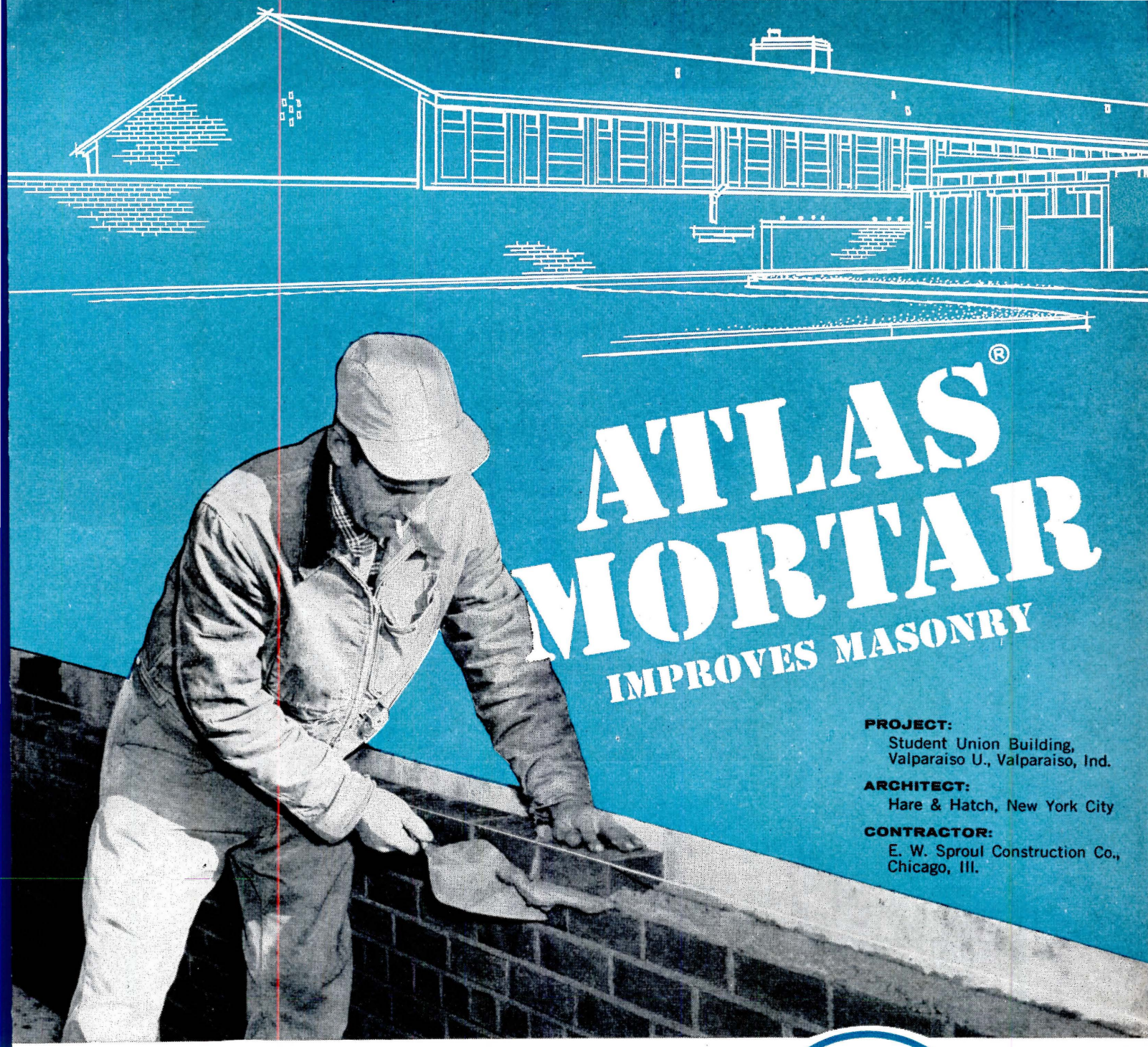
7—*Specially designed hinge* on housing permits ready access to damper and drive. Positive stopping device holds unit in open position. Simple locking mechanism keeps it tightly closed.

Now, for the first time, aluminum belt driven units combine high discharge with low-contour appearance

Since 1947 the power exhauster industry has looked to Jenn-Air for leadership. Now Jenn-Air starts its second decade by introducing two new and useful additions to its line: Hi-Discharge *Centrifugal* Power Roof Exhauster, Series HCB; and Hi-Discharge *Axial* Power Roof Exhauster, Series HAB. These exhausters fill the need for general area ventilation and have a clean engineering design that features compactness and serviceability. By locating the wheel at the top you derive the advantage of a high point of discharge which allows low curb construction. Thus, Jenn-Air units offer the lowest overall height of any exhauster on the market. Once you compare, you will decide on Jenn-Air.

JENN-AIR PRODUCTS COMPANY, INC.
1102 Stadium Drive • Indianapolis 7, Indiana

Member of Air Moving and Conditioning Association



ATLAS® MORTAR

IMPROVES MASONRY

PROJECT:
Student Union Building,
Valparaiso U., Valparaiso, Ind.

ARCHITECT:
Hare & Hatch, New York City

CONTRACTOR:
E. W. Sproul Construction Co.,
Chicago, Ill.

"...best in workmanship...best in strength,"

says Henry Gagne, Masonry Foreman,
E. W. Sproul Construction Co.

- Mortar in masonry construction must resist the destructive effects of weather in any climate.
- Because ATLAS MORTAR is an *air-entraining* masonry cement, it produces a durable mortar that strongly resists deterioration due to weather.
- Quality-controlled manufacture of ATLAS MORTAR cement maintains high product standards, assures uniform performance and appearance on every project.
  (Complies with ASTM and Federal Specifications.)

Write for your copy of "Build Better Masonry,"
Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

M-72

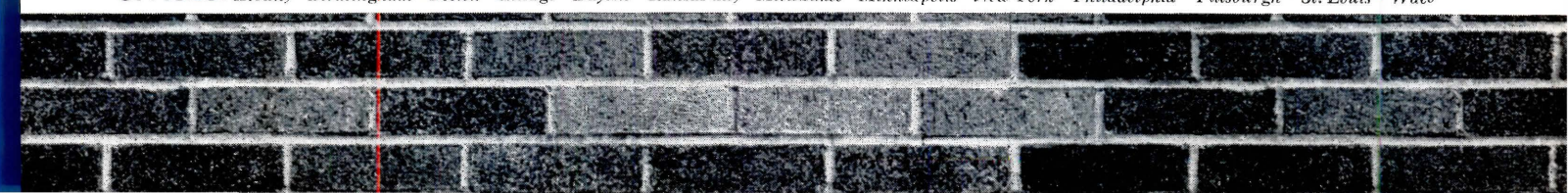
UNIVERSAL ATLAS CEMENTS

Universal Atlas Cement Company

Subsidiary of United States Steel

USS TRADE MARK

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*



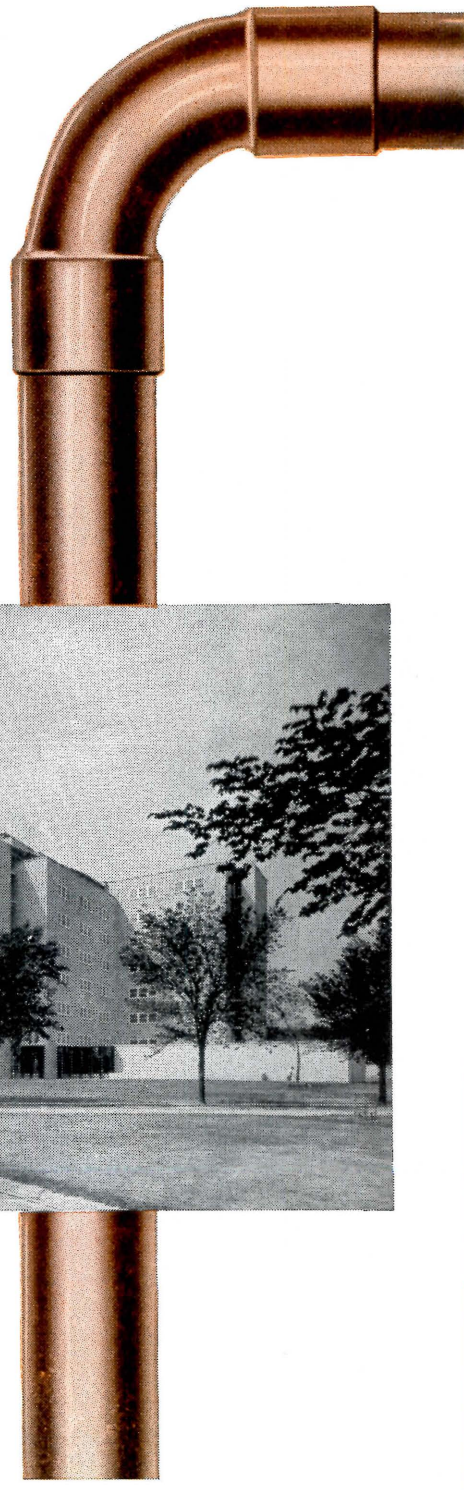
three progressiv

select MUELLER BRASS CO. Streamline® copper tube and fittings for three magnificent new buildings

There are many good reasons why leading architects and builders everywhere are specifying STREAMLINE copper tube and solder-type fittings for modern construction piping. They know that an all-copper plumbing system gives a lifetime of dependable service. Valuable floor space is increased because copper is compact and requires less room to install. Copper tube and solder-type fittings are lighter in weight, easier, quicker to assemble and solder, which lowers plumbing costs. The smooth interior bore is rust, scale and corrosion free . . . which permits the clean, unrestricted flow of liquids with minimum friction-loss. This actually reduces the work-load on circulating pumps, and often allows the use of smaller capacity units. You, too, can take advantage of all of these desirable features at no extra cost . . . by specifying the best . . . copper tube and fittings that bear the tradename STREAMLINE.

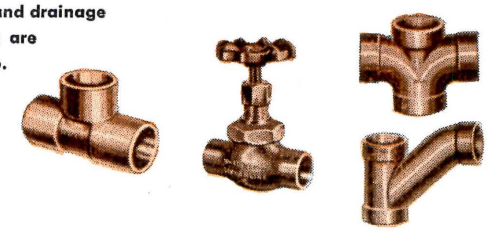
25 YEARS OLD
and still like new!

25 years ago, copper tube and fittings were installed in the Civic Auditorium in St. Louis, Missouri. In January, 1958, a section was removed from the line for inspection and found to be still like new! . . . Positive proof of the durability of copper.

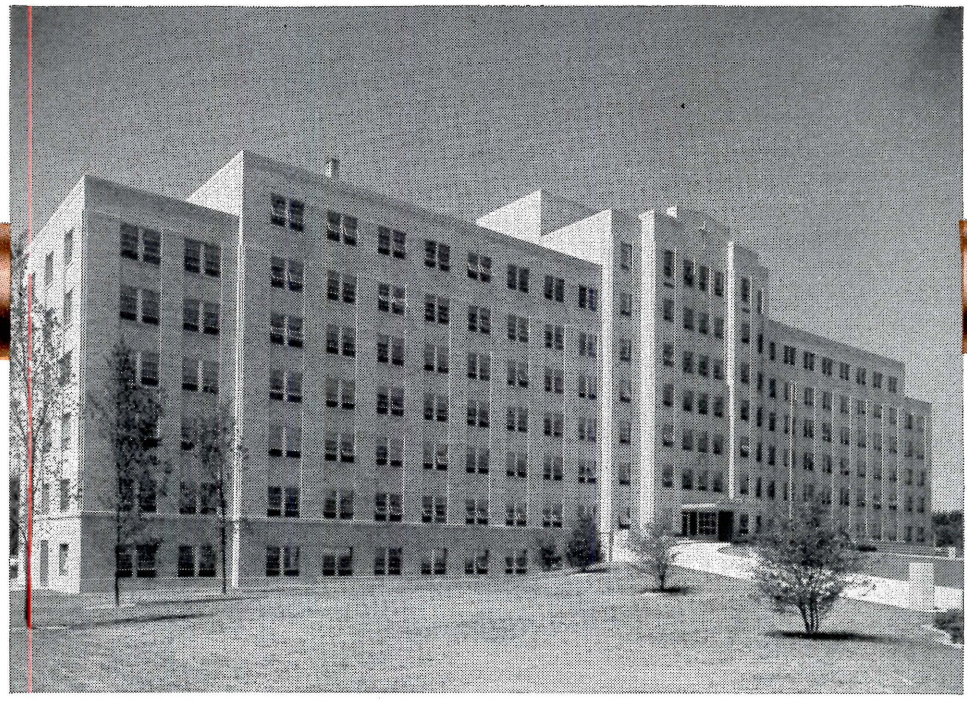


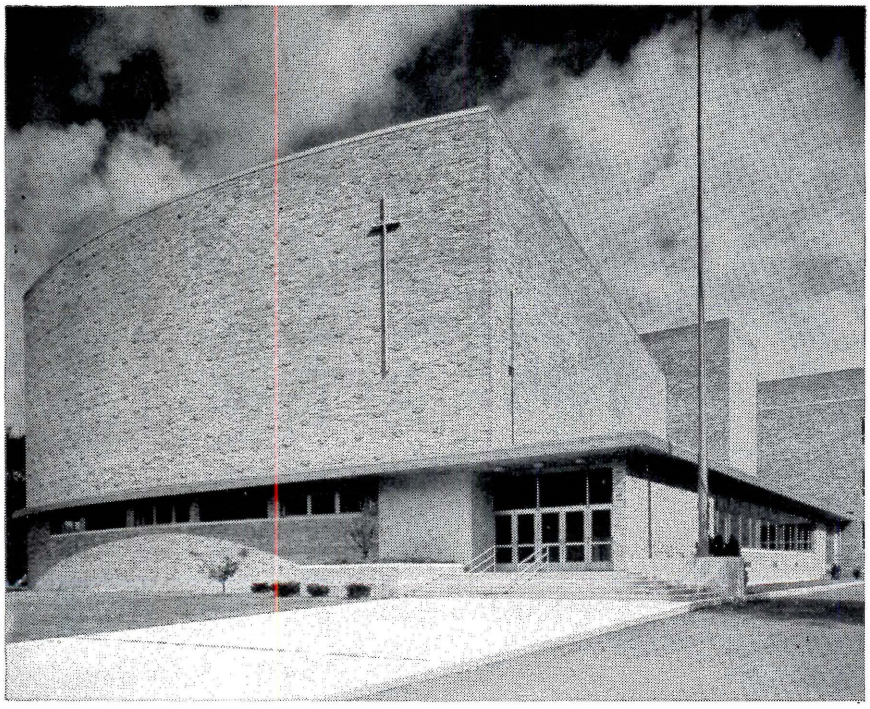
The giant new Milwaukee County General Hospital was designed by Schmidt, Garden and Erikson, architects, Chicago, in association with Brust and Brust of Milwaukee. Mueller Brass Co.'s STREAMLINE copper tube and fittings for all plumbing and heating were installed by Wenzel and Henoch Company, Milwaukee.

A complete line of tubing, valves, supply and drainage fittings for plumbing and heating are available from Mueller Brass Co.



rchitects...





STREAMLINE tube and fittings were used throughout the new St. Francis Hospital in Milwaukee, Wisconsin, for all supply, waste and vent piping. Francis S. Gurda A.I.A. was the architect and plumbing was installed by Joseph Wittig Company.

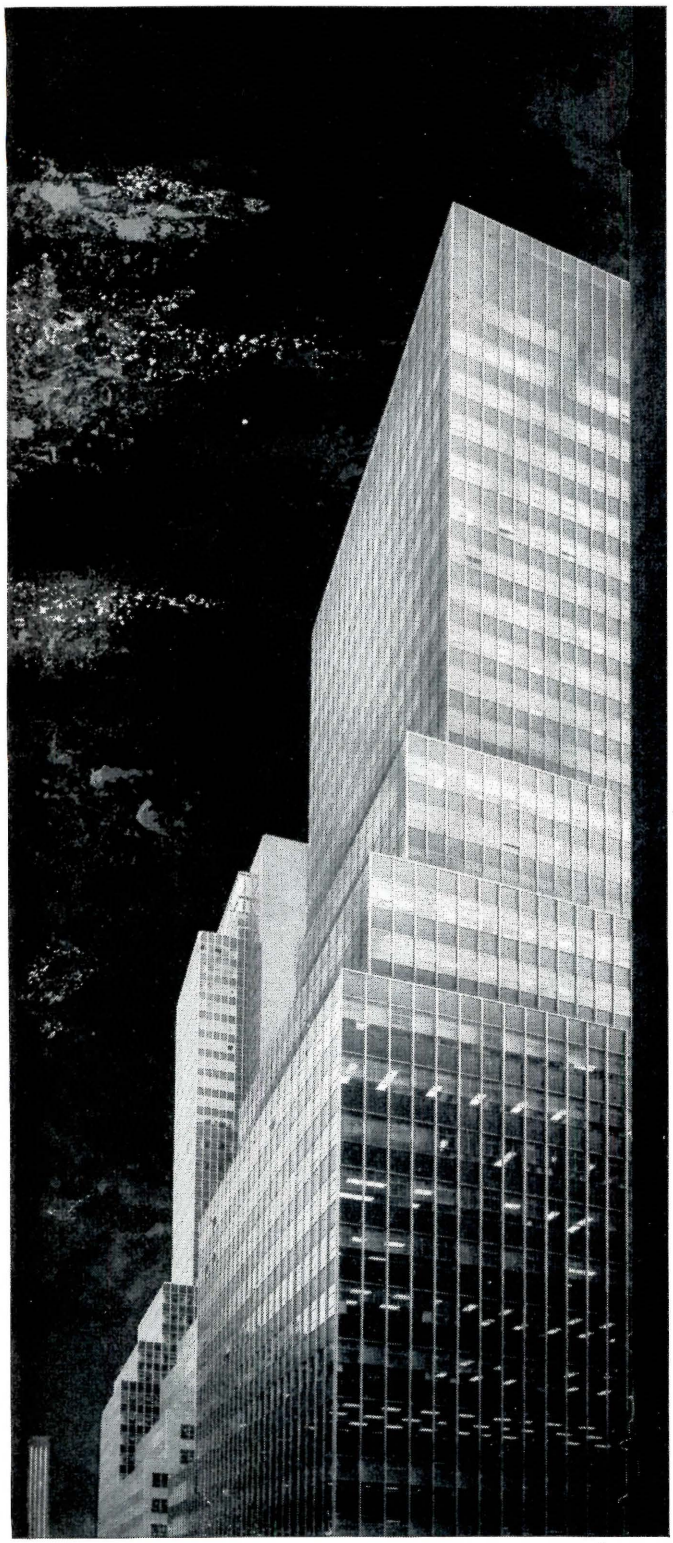
Architects Grellinger and Rose of Milwaukee designed the Dominican High School, one of the newest schools in Whitefish Bay, Wisconsin. STREAMLINE copper tube and fittings were installed in this building by Joseph Wittig Company.

244

MUELLER BRASS CO
STREAMLINE PRODUCTS

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

MUELLER BRASS CO.
PORT HURON 8, MICHIGAN



*Owners and Builders: Uris Bros., New York, New York
Architects: Emery Roth & Sons, New York, New York
Glass & Glazing: David Shuldiner, Inc., Brooklyn, New York

Ageless
no city pall will ever mar its freshness

Some day many of New York's newest buildings will shroud their newness in grime or corrosion . . . and decline to time-blackened hulks in the skyline.

And when that happens . . .

The new Uris Building at 750 Third Avenue will still look lustrous, freshly colored, clean . . . its beauty ageless, permanent as pyramids.

Because age doesn't mar the attractiveness of glass.

And the Uris Building is clad in glass . . . curtain walls of HUETEX® by Blue Ridge. The lifetime, care-free spandrel material, with rich color of ceramic enamel fused to the back of the glass and protected by aluminum to add insulating value.

Uris Building*, including its recent expansion, has over a million and one-quarter square feet of office space which make it one of the largest buildings ever constructed of glass curtain walls.

Either inside or outside, design for life with Blue Ridge—where you see creative ideas in glass . . . in HUETEX spandrels for building walls . . . in patterned glass for home and office . . . in heat absorbing and wired glass for industrial buildings.

For additional information on Blue Ridge Glass, look in Sweet's Architectural Files 3c/BL and 16d/BL. Or write direct.

Huetex by **Blue Ridge Glass**

A DIVISION OF AMERICAN-SAINT GOBAIN CORPORATION
KINGSPORT, TENNESSEE

BLUE RIDGE GLASS

Sales Agents in United States and Canada:
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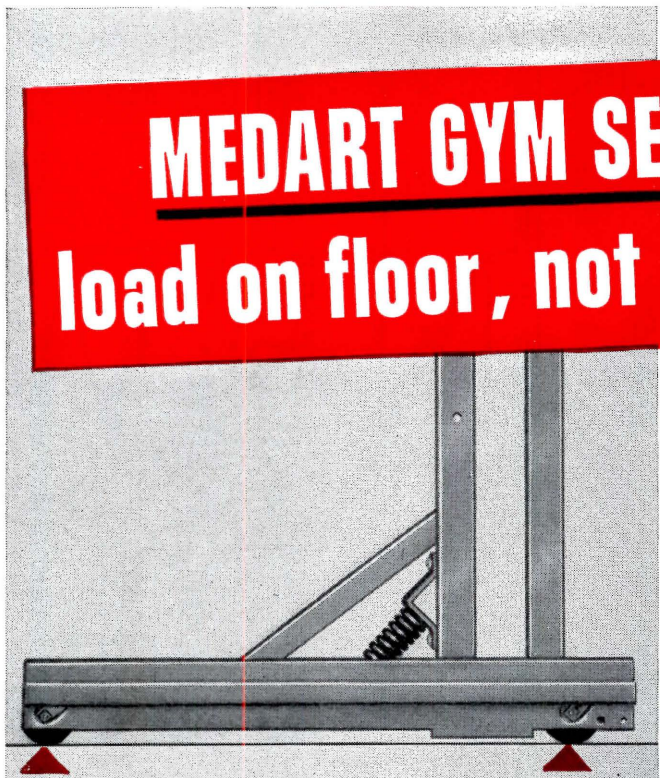
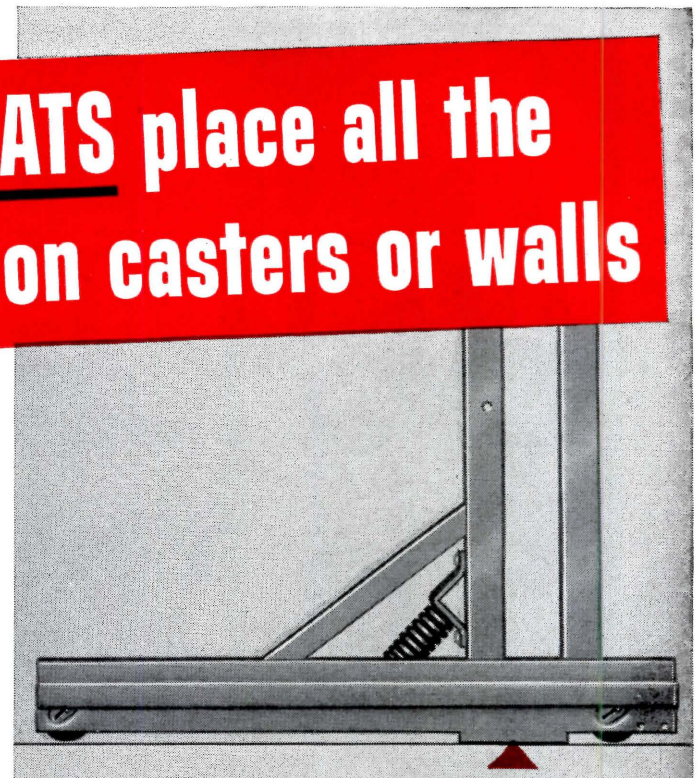
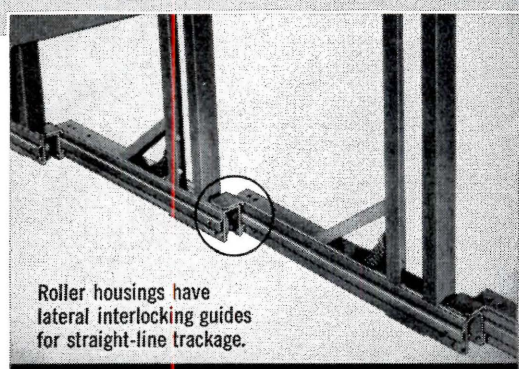
MEDART GYM SEATS place all the load on floor, not on casters or walls



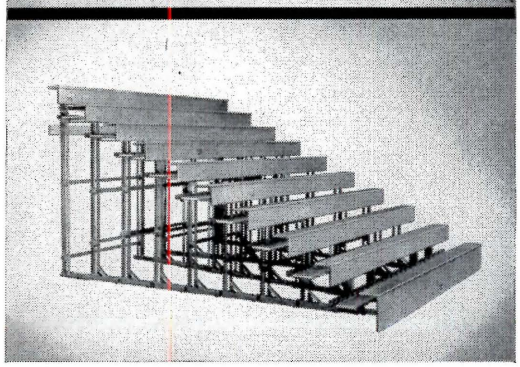
With no spectator load on seats, roller housings and uprights are raised leaving casters "free" for smooth, easy operation.



Under spectator load, casters retract and let housing shoes transmit weight to floor. No weight on casters means no depressions in floor.

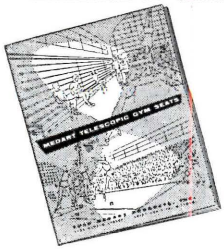


Roller housings have lateral interlocking guides for straight-line trackage.



Medart Telescopic Gym Seats can be furnished with 10½" or 11½" row rises and 22" or 24" row spacing.

EXCLUSIVE FULL-AUTOMATIC POWER OPERATION IS AVAILABLE AT SMALL COST. (PATENTS PENDING)



ASK FOR YOUR COPY!

Medart's Gym Seat Catalog tells how to get better, safer seating with minimum investment. It's yours for the asking.

Each seatboard in a Medart Gym Seat section has eight *vertical* steel angle uprights—four pair of strong supports, each mounted on a steel roller housing with two retractable rubber casters. This construction gives Medart Seats several important advantages:

- With seats in use, casters retract and place all weight on steel housing shoes. Floors can't be dented or marred by casters.
- Entire spectator load bears directly on floor through *vertical* uprights. There are no diagonal braces, hinged rods or similar stress-bearing devices. No weight is borne by casters or wall fastenings.
- Interlocking of telescoping members at top of supports, and roller housings at bottom, insure easy, straight-line, non-binding operation.

MEDART SEATS ARE SAFER, NEED LESS UPKEEP

1. Free-standing, self-supporting understructure carries loads 3 times recommended standard.
2. Tough, smooth, most abrasion-resistant wood finish on market.
3. More leg and foot room—better visibility.
4. Vertical fronts are safer, look better, permit flush recessing.

MEDART

TELESCOPIC GYM SEATS

SPECIFY the best, then INSIST on it!

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

Medart SEE OUR CATALOG IN SWEET'S

BOLD NEW CRANE DES

Now Crane offers the graceful new CROWN Round Lavatory designed for easy installation in any type countertop as well as marble

You know the big problem with oval lavatory basins up to now. They had to be mounted under the counter. Which meant using a finished material like marble. And making an exact cut to match the rim.

But now you can specify an even more beautiful round lavatory in *any type* of countertop. The new Crane Crown with its metal frame fitted into a simple round cut provides today's newest, easiest, and smartest countertop installation! (Easier to clean and keep clean, too!)

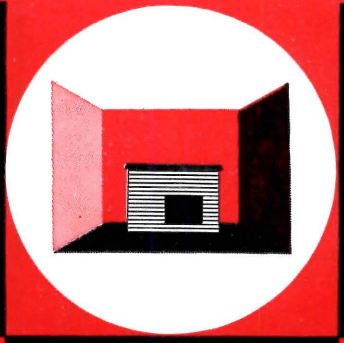
Another Crown advantage: it has Crane's new Singl-ese faucet mounted right on the lavatory. No extra cuts for the supply fittings. The Singl-ese controls water volume and temperature at the touch of a single lever. It represents more than 10 years of research—a convenient, one-handle faucet with all the quality and dependability of Crane's Dial-ese control.

The new Crown is designed by Henry Dreyfuss and features a hidden front overflow and deep oval basin. It's made of hand-finished vitreous china in all 7 Crane colors and white. Overall size, only 18 inches. Call your Crane Architects' Representative for more information now.

CRANE CO. 836 S. Michigan Ave., Chicago 5 • VALVES • FITTINGS • PIPE • PLUMBING • HEATING • KITCHENS • AIR CONDITIONING

VERSATILITY

Masland Duran upholstery beautifies all types of furniture. Distinctive colors and patterns. Easy to keep clean with a damp cloth. All-vinyl—or vinyl with elastic fabric back.



Masland Duran flexible wall covering. Elastic fabric backed. Colors from deep, rich tones to delicate pastels—all easy to keep clean. Easily applied with paste, primer and ordinary paperhanging tools.

Masland Duran Clad-On. Vinyl sheeting with coated adhesive backing. Can be pressed on to any horizontal or vertical surface, flat or curved. Practical beauty for walls, desk tops, and many other decorative uses.

Masland Duran Clad for laminating to metal or hardboard. A new and integral textured finish for cabinets, doors, counter panels, fixtures, etc. Resists peeling, abrasion or chipping.

IN VINYL

Masland Duran®

- Elastic fabric backed or all-vinyl for upholstery.
- Elastic backed for colorful, practical wall covering.
- New semi-rigid Clad and Clad-On for flat surfaces.

You can probably think of dozens of places where these Masland Duran products can be used in your plans with outstanding results. Naturally, you'd like to see *samples.* They're yours for the asking. Write. The Masland Duraleather Co., Dept. 36, Philadelphia 34, Pa.

Vision-Vent installations such as this now can be specified with exclusive new Truscon Supercoat Finish to eliminate field painting. Pictured is Activities Building, Georgia Training School for Girls, Adamsville, Ga. John J. Harte, architect. Abco Builders, contractor.

New...Truscon Vision-Vent Window Walls with Sensational Supercoat Finish

Install without painting!

Stave off maintenance painting!

7 Colors!

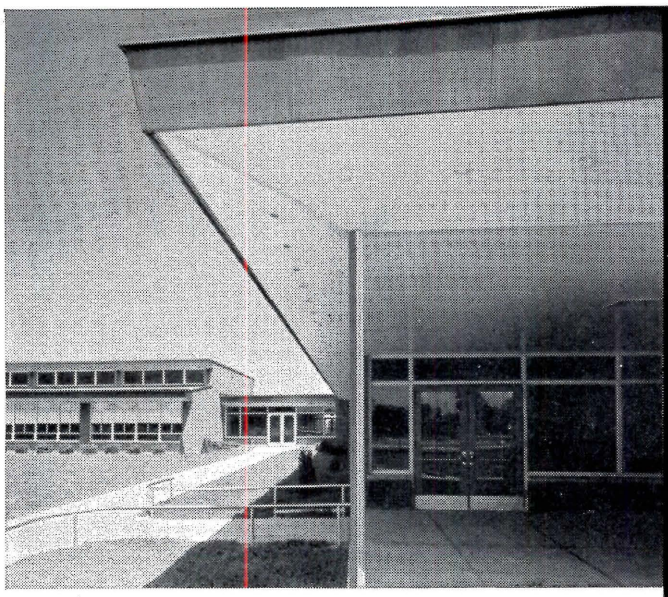
Now, you can get the solid strength of steel for curtain walls and windows and save field painting costs, too. New Truscon Supercoat Process is factory-applied to eliminate all field painting . . . both at installation and during the years.

This outstanding Truscon development has been thoroughly laboratory tested—for weather, atmosphere, time, and abuse. It has successfully met each challenge.

Vision-Vent brings you all the mass-production and installation economies of standard steel windows. It's an insulated wall section, complete with window. It goes up fast.

With Truscon Supercoat and Vision-Vent Window Walls, there is no need to sacrifice strength and solidity in walls and windows simply to avoid painting. Supercoat Process can be furnished now on specification for all Vision-Vent types . . . as well as in factory shipment on all Truscon Steel Windows for commercial, institutional, and industrial construction. Choice of seven colors.

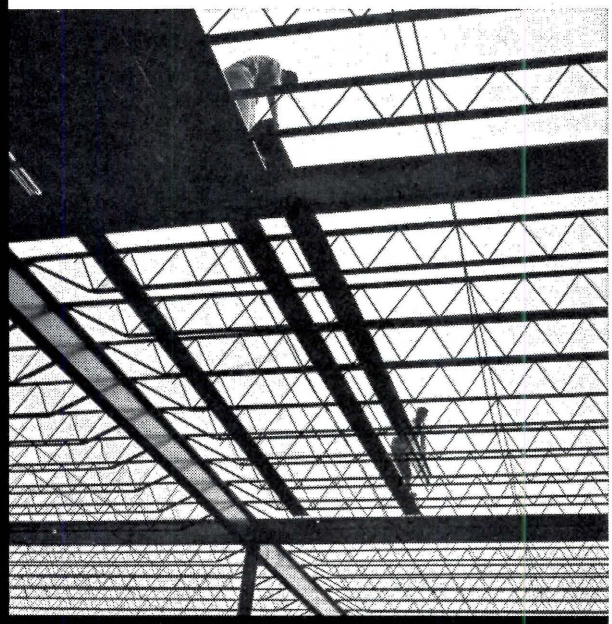
See Sweet's (17b/Tr) or send coupon for Supercoat booklet. Supercoat sample on request.

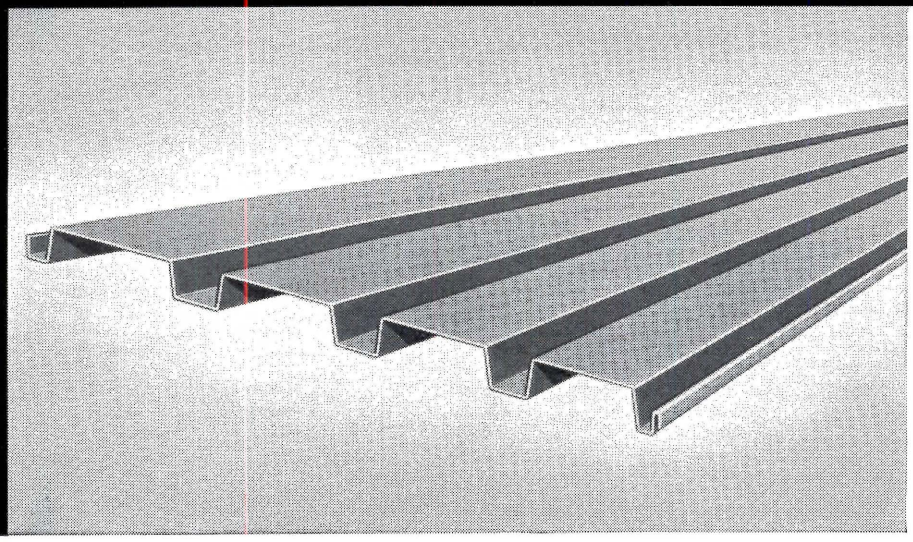


IDEA! CONSIDER SQUARE WELDED STEEL TUBING. For columns, supports, mullions, rails. Pound for pound, tubing is strongest of all structural shapes. And, square tubing gives a handsome, contemporary architectural effect. Republic's Steel and Tubes Division pioneered the manufacture of electric resistance welded steel tubing—can supply ELECTRUNITE® brand in squares up to 4 inches . . . and innumerable combinations of rectangular sizes in peripheries up to 16 inches in various wall thicknesses . . . out of local distributor stocks. Send coupon for reference data.

NOW . . . TRUSCON CERTIFIES EVERY "O-T" STEEL JOIST. For your protection, Truscon now offers you, upon request, written certification that the "O-T" Steel Joists you specify are manufactured in accordance with the standards of the Steel Joist Institute and are fully qualified to bear the SJI Seal of Approval.

This certification covers each building for which the joists are engineered. It is further assurance of predictable, dependable load-bearing. No extra cost for this protection. Send coupon for facts.





SPEED COMPLETION WITH 24-INCH FERROBORD® STEEL ROOFDECK. New, wider Truscon Ferrobord is available in lengths up to 32 feet, 6 inches. It roofs large areas quickly. Straight lay means that several crews can roof without delay. All work is done from above—Ferrobord is quickly welded to top chords of joists or purlins. Ferrobord is light, strong, fire-resistant. Available now. Send coupon for specs.

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Name_____ Title_____

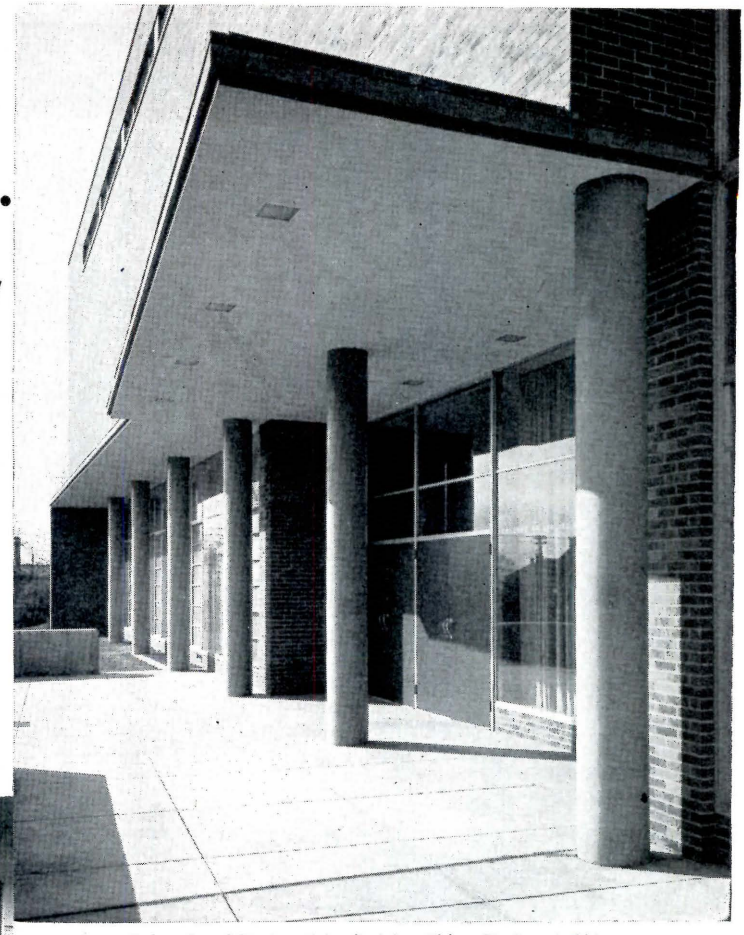
Firm_____

Address_____

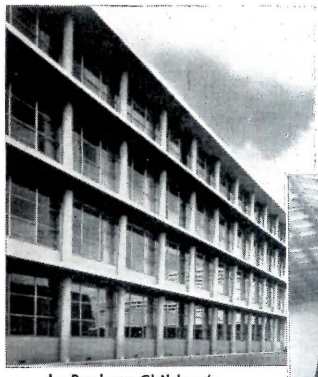
City_____ Zone_____

State_____

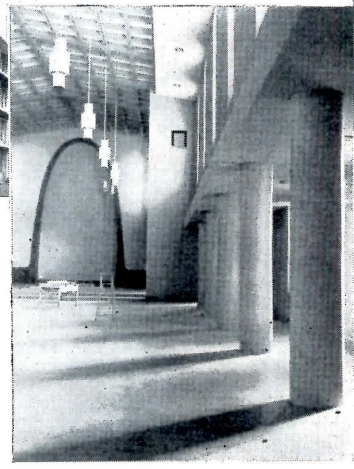
For institutional buildings.. round columns add dignity yet lower construction cost



University of Cincinnati Applied Arts Bldg., Cincinnati, Ohio
Architect: James E. Allen



Le Bonheur Children's Hospital, Memphis, Tenn.
Architect: J. Frazier Smith & Assoc.



Our Lady of Fatima Church, Albuquerque, N. M.
Architect: W. C. Kruger

Specify round columns of concrete formed with

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FIBRE FORMS

For schools, hospitals and churches, natural dignity in design is an architectural quality to be desired. Specify round columns of concrete for such structures to help fulfill this requirement. Specify that the columns be formed with Sonotube Fibre Forms and you assure your client of lowest construction costs. That's because low-cost Sonotube Fibre Forms provide the fastest and most economical method of forming concrete columns . . . they save the contractor time, money and labor!

Sonoco Sonotube Fibre Forms are available in three types, Seamless, "A" coated and "W" coated in sizes from 2" to 48". I.D. Standard shipping lengths—18'. Your contractor can order in other lengths if required.

Specify the Seamless Sonotube Fibre Form (pat. pend.) or the patented "A" coated type for exposed columns.

See our catalog in Sweet's—for additional information, write

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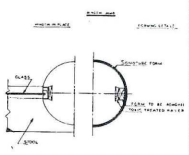
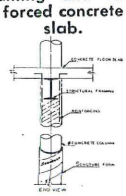
3288

Typical forming details (not to scale)

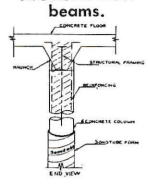
Window joint at round concrete column



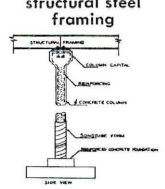
Round concrete column with structural framing and reinforced concrete slab.



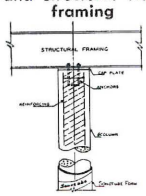
Round concrete column with haunched structural steel beams.



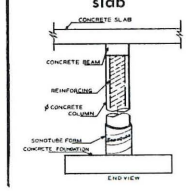
Tie between round concrete column with capital and structural steel framing



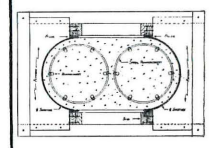
Tie between round concrete column and structural steel framing

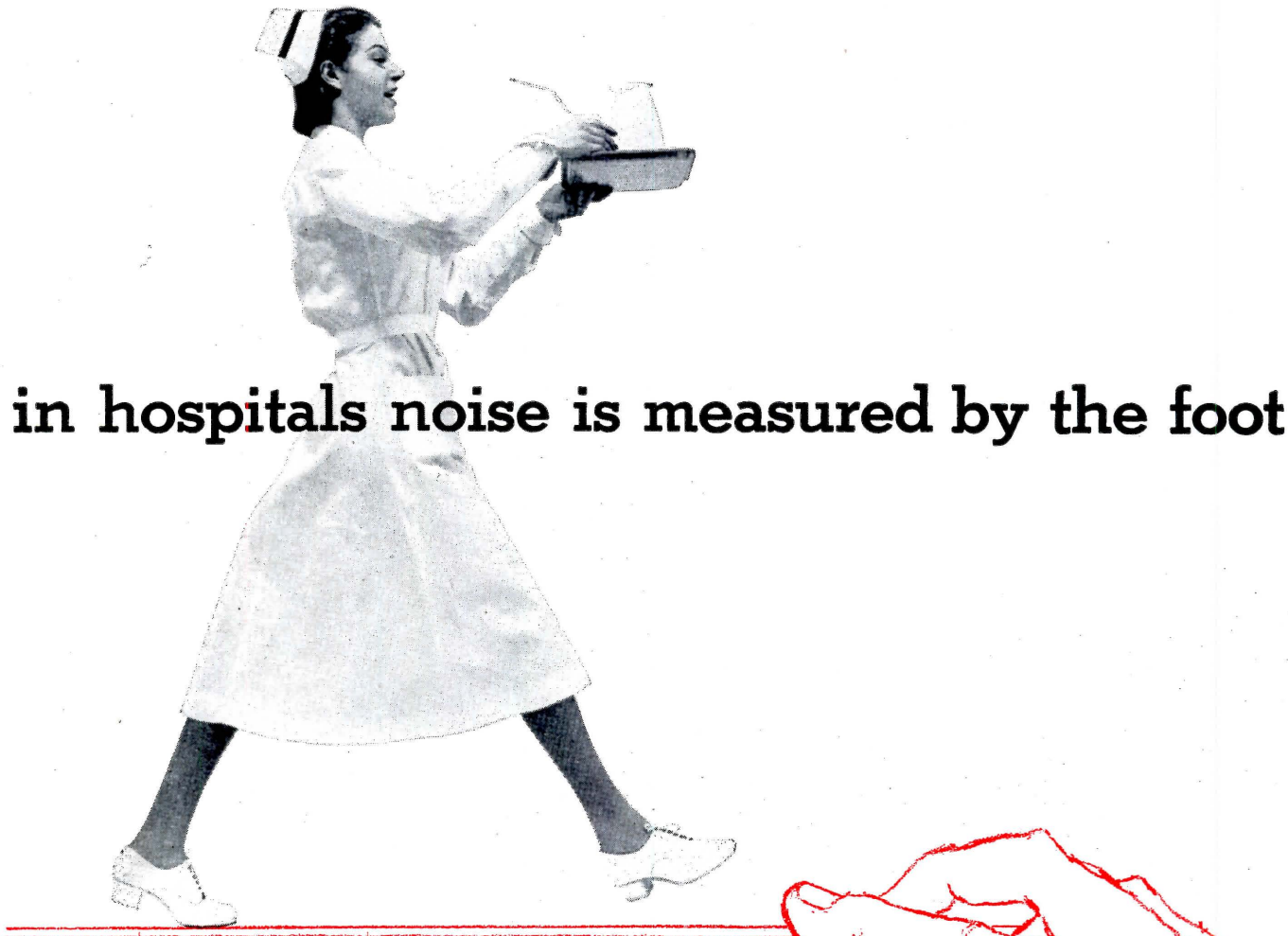


Round concrete column with concrete beam and concrete slab



Obround concrete column forming

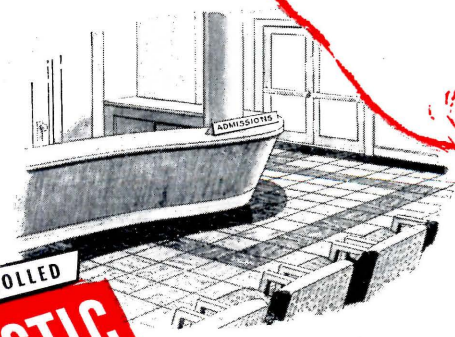




in hospitals noise is measured by the foot

. . . and it's only a few feet to bedlam in any busy corridor. To put the hush on traffic clatter, leading architects specify Sofstep Rubber Tile or Wearever All-Vinyl Tile for hospitals and other heavy-traffic projects. These highly resilient floors still footsteps to a whisper . . . ease impact for day-long walking comfort. And these fine floors are outstanding, too, for lustrous beauty that years of use won't diminish. For your next project consider both of these practical, colorful floors.

Sofstep® rubber tile • Wearever all-vinyl tile



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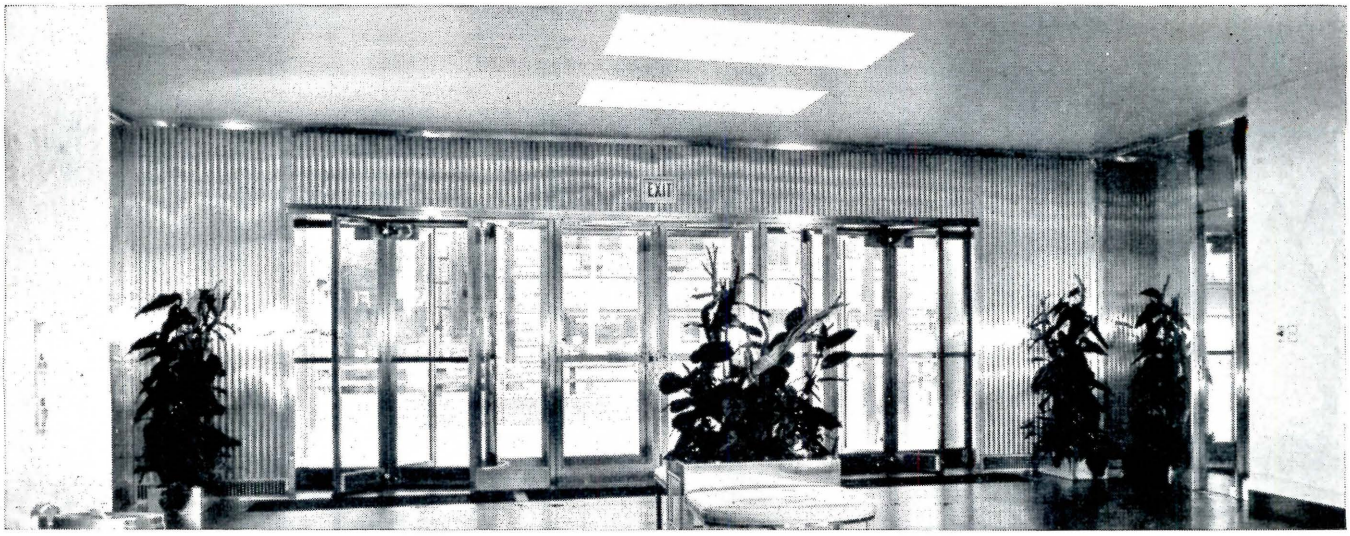
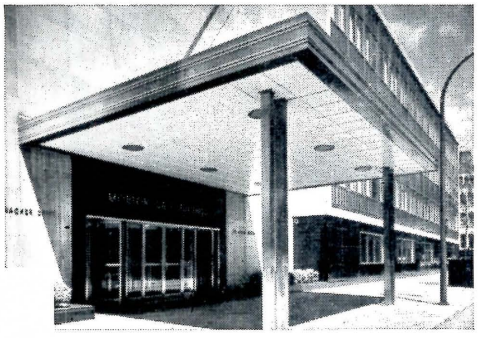
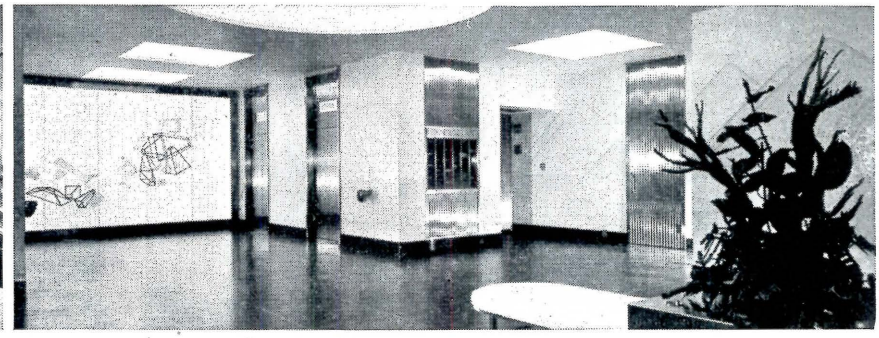


Morton Salt Company Building, Chicago
Architects: Graham, Anderson, Probst & White, Inc.

Stainless Steel Fabricators: Rippel Architectural Metals
General Contractor: Sherman Olson Co.





New steels are born at Armco

Where beauty must be durable ...specify Armco Stainless Steel

To insure lasting beauty for the new and distinctive Morton Salt Company building in Chicago, architects selected stainless steel for the curtain walls, entrance and lobby. Its sparkling luster contributes to the basic richness of the design and blends harmoniously with the other materials. Its hard impervious surface assures low cost, lifetime beauty.

DURABILITY AND ECONOMY

Armco Stainless Steel is widely used in modern architecture because architects know it will preserve the original appearance of their buildings and save their clients money in the long run. Stainless doesn't tarnish or gray with age, has no plated or chemically treated surface to wear off. It keeps its lustrous good looks with little or no maintenance. Due to its strength and toughness, stainless resists scuffing, abrasion and denting in severe service.

More than a quarter-century of extensive use in architecture has demonstrated stainless steel's utility, economy and ageless beauty.

MANY APPLICATIONS

Consider the many advantages of durable stainless for entrances, wall panels, mullions and interiors as well as doors, windows, hardware and other standard units in the buildings you design.

For complete information on Armco Stainless Steel and assistance in selecting the most economical grade, finish, gage and size for specific applications, write to Armco Steel Corporation, 2578 Curtis Street, Middletown, Ohio.

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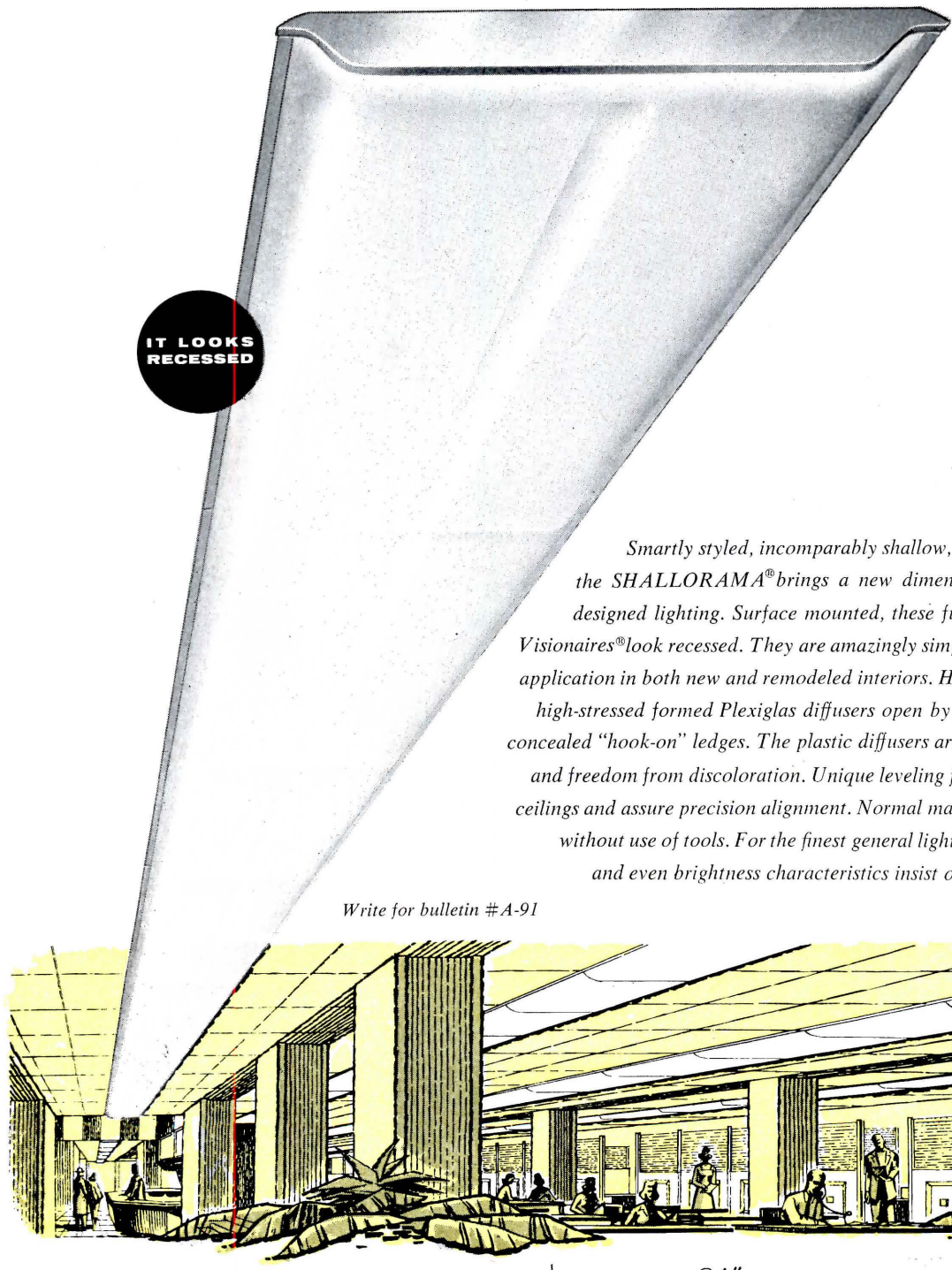
insist on wafer-thin

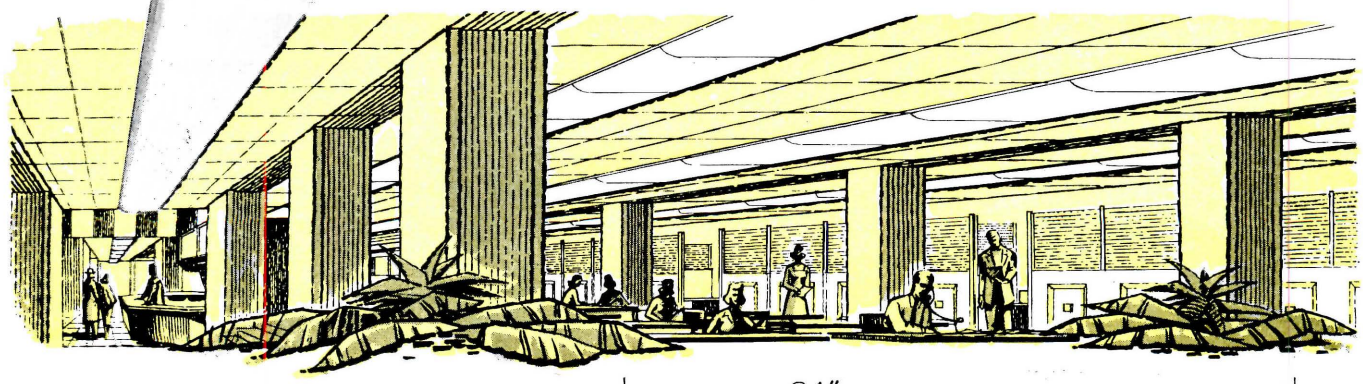
SHALLORAMA®

for modern, custom-styled lighting

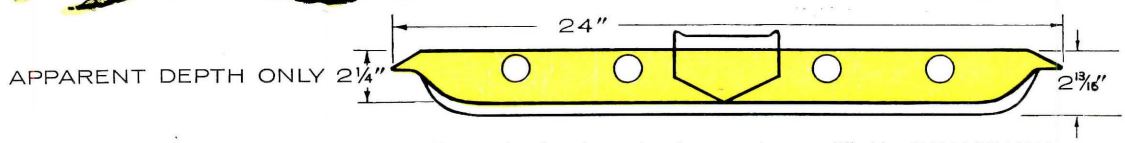


Smartly styled, incomparably shallow, sturdily constructed, the SHALLORAMA® brings a new dimension to architecturally designed lighting. Surface mounted, these fully enclosed, self-luminous Visionaires® look recessed. They are amazingly simple to install and have wide application in both new and remodeled interiors. Handsome, translucent white, high-stressed formed Plexiglas diffusers open by hand from either side on concealed "hook-on" ledges. The plastic diffusers are guaranteed for long life and freedom from discoloration. Unique leveling jacks compensate for uneven ceilings and assure precision alignment. Normal maintenance accomplished without use of tools. For the finest general lighting with wide distribution and even brightness characteristics insist on SHALLORAMA.®

Write for bulletin #A-91



Patents Pending



New peaks of engineered performance is exemplified by SHALLORAMA's soft, uniform diffusion of light and efficient ballast heat dissipation.

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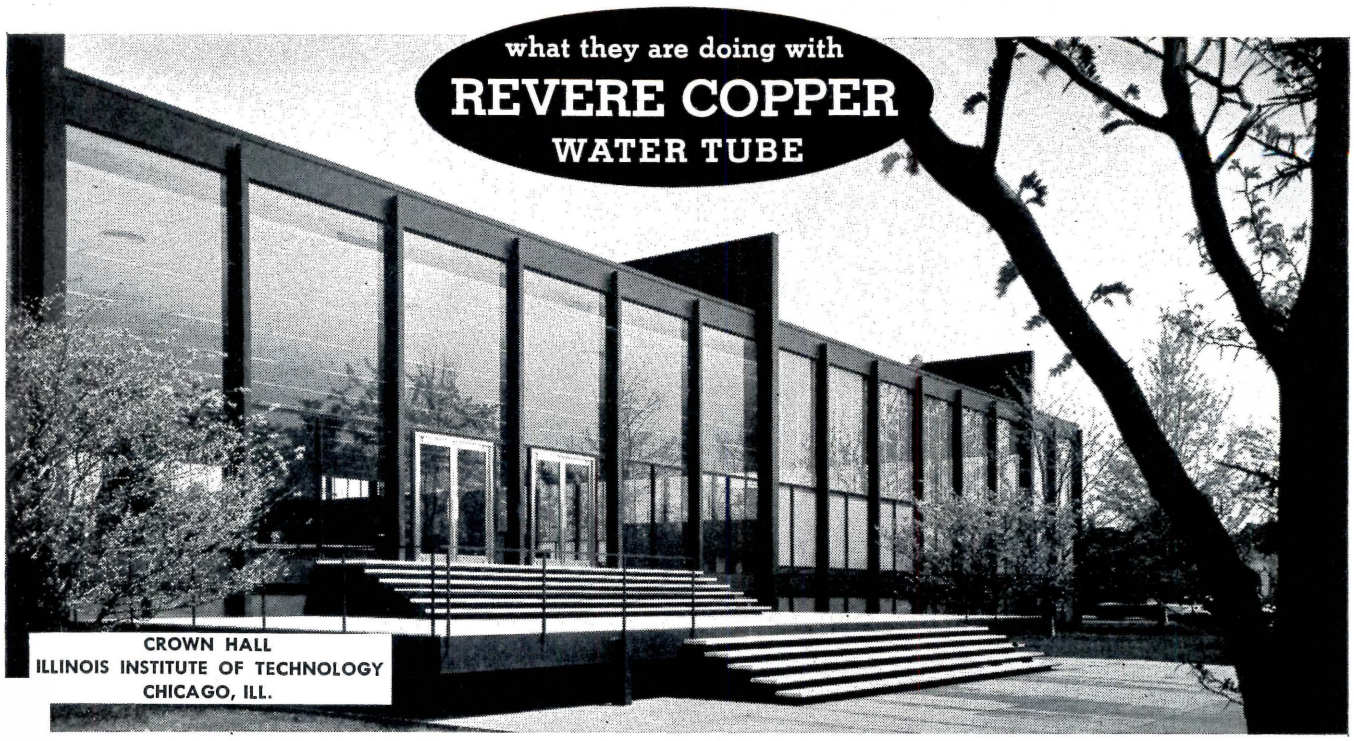

Architect: MIES VAN DER ROHE. *Associate Architect-Engineer:* PACE ASSOCIATES. *Structural Engineer:* FRANK J. KORNACKER. *General Contractor:* DAHL-STEDMAN COMPANY. *Landscape Architect:* ALFRED CALDWELL, all of Chicago.

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In this split system, ventilation ducts in the ceiling provide the necessary air changes per hour as required by the Chicago Building Code. In the winter the air is heated, supplemented by the radiant panel system in the floor. The warm air system carries the principal heat loss while the radiant panel system offsets the heat loss of the large glass areas.

Revere Copper Water Tube was used for radiant heating panels because the standard 60′ lengths mean fewer fittings, the sure soldering of copper means tight joints and its non-rusting qualities mean no clogging or reduction of flow. In addition, contractors are finding out that when properly applied, copper water tube not only is dependable and easier to work, but actually *costs less* than rustable materials.

The inherent qualities of Revere Copper Water Tube also make it the first choice for hot and cold water lines, underground service lines, processing lines, drainage and waste lines, vent stacks. See your Revere distributor for your needs.

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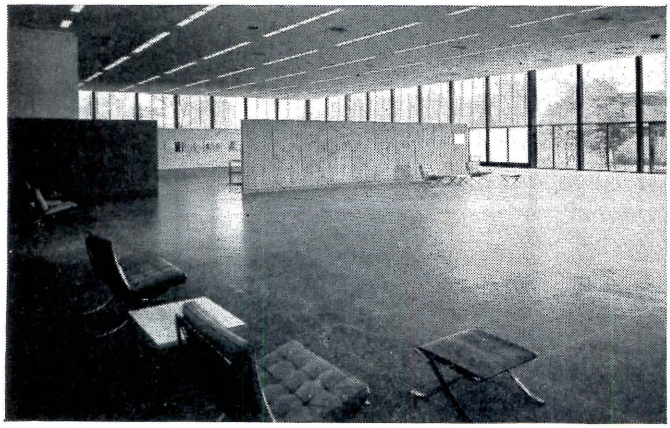
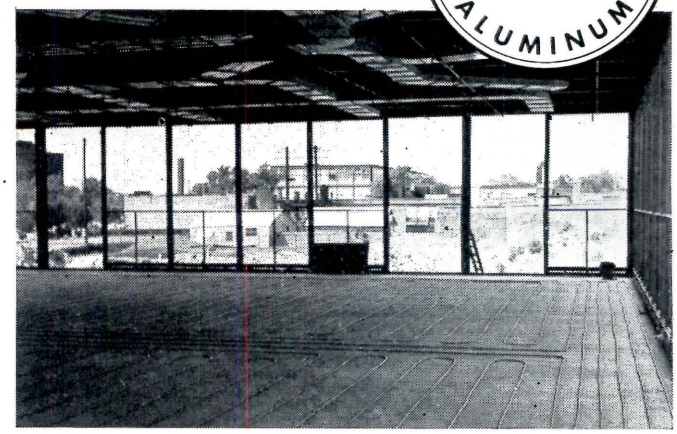


13,580 FEET OF TYPE "L" Revere Copper Water Tube were supplied the Heating Contractor, CHICAGO CONDITIONAIRE COMPANY by the Revere Distributor, COLUMBIA PIPE & SUPPLY CO., both of Chicago.



AN IDEAL HEATING COMBINATION—Air ducts in the ceiling and radiant panel heating coils in the floor. Note that, due to greater heat loss, panels near the windows are spaced on 12" centers, while the remainder are on 24" centers.

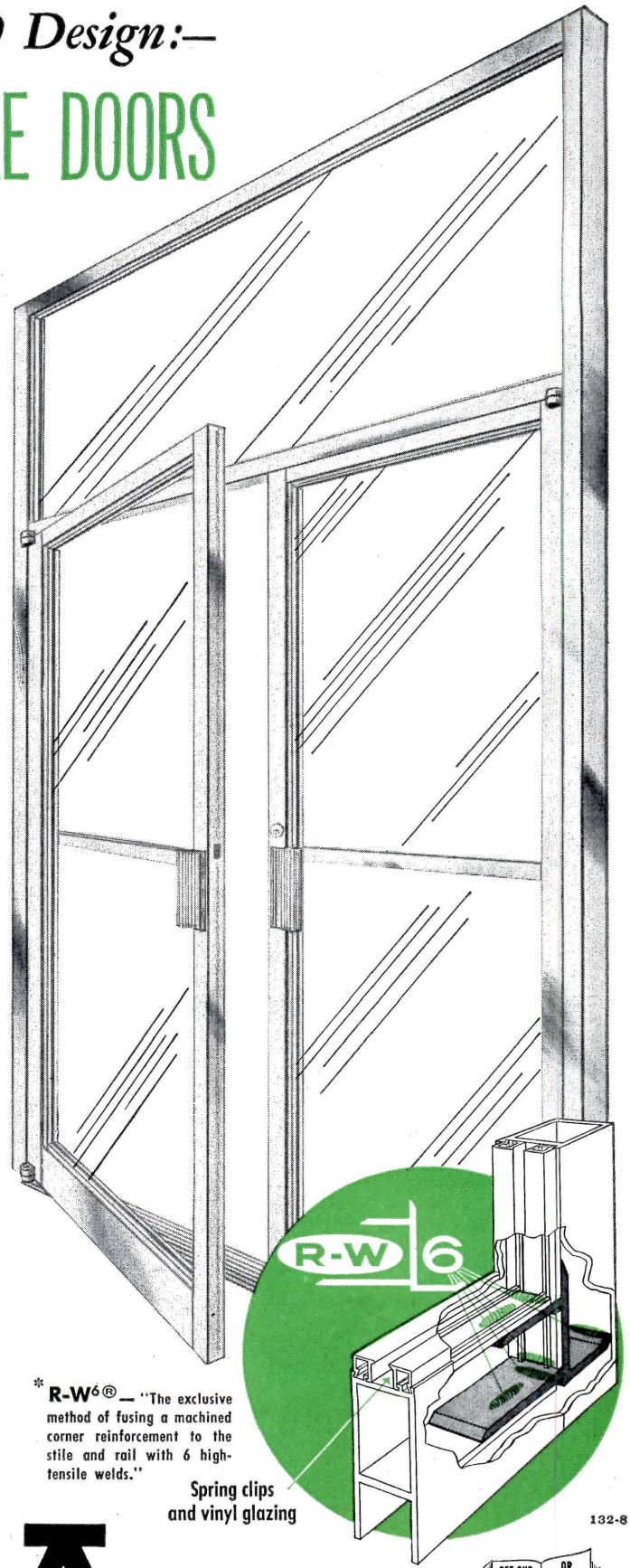
A NEW and IMPROVED Design:—

Aluminum NARROW STILE DOORS

with R-W⁶ *®

by ALUMILINE

- *stronger*
- *quality finish*
- *more versatile*
- *more competitively priced*



* **R-W⁶®** — "The exclusive method of fusing a machined corner reinforcement to the stile and rail with 6 high-tensile welds."

If you require *strength, versatility* and *quality finish,* Alumiline doors are designed to meet your needs:—

STRENGTH — Only Alumiline has R-W⁶® — "The exclusive method of fusing a machined corner reinforcement to the stile and rail with *6* high-tensile welds."

Exhaustive tests prove this door is two to four times *stronger* than other current designs.

VERSATILITY — Alumiline's new door design
— features a unique glazing principle, eliminating screws and permitting faster installation.
— accommodates glass up to 3/8" thick.
— accommodates a wider range of hardware.
— enlarges scope of hardware modifications.
— enlarges scope of design modifications.
— can be custom-built to meet architect's specifications.

ALUMILITED FINISHES
— Alumiline's Polished Alumilite: 204 A1-R1
— Alumiline's Satin Alumilite: 204 C1-R1
— Alumiline's Architectural Colors:*
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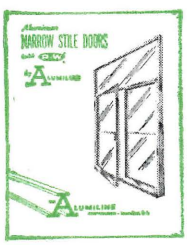
**Available on complete door, or used as colored trim on glazing sections and push, pulls.*

At a time when other manufacturers may be tempted to redesign for price — sacrificing strength — Alumiline is very proud of its New and Improved Door Design with R-W⁶ which incorporates *additional* strength and versatility factors — *at more competitive prices.*

You can rely on Alumiline — *first* in modern design and quality construction.



For more details, write Dept. (NSR) for Narrow Stile Brochure and Construction Details.

132-8

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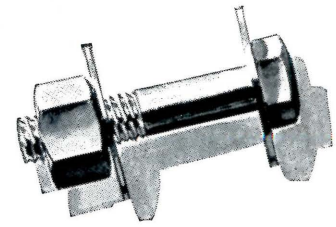
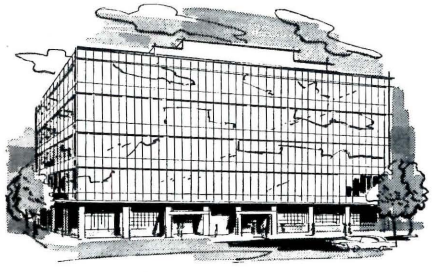
THE ALUMILINE CORPORATION — Pawtucket, R. I.

"Finishers and Fabricators of Architectural Aluminum Products"

Steelwork for New Building in Oregon Erected Quickly . . . Quietly



HIGH-STRENGTH BOLTS JOIN ITS STRUCTURAL MEMBERS



The new First National Bank Building, Portland, Oregon. Structure is being built in two stages, to avoid any interruption in banking service. Architects: Stanton, Boles, Maguire & Church. Structural Engineers: Cooper & Rosé. General Contractor: Hoffman Construction Company. Fabrication and erection of steelwork: Bethlehem Pacific Coast Steel Corporation.

The 815-ton steel framework for the new home office building of First National Bank, Portland, Oregon, was erected quickly and quietly with Bethlehem High-Strength Bolts. Some 6,000 of the husky steel bolts, in ¾-in. and 1-in. diameters, join the structural members of the five-story structure.

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BETHLEHEM STEEL

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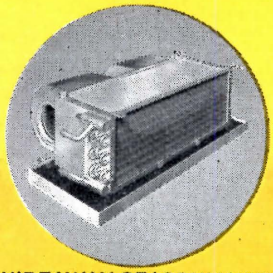

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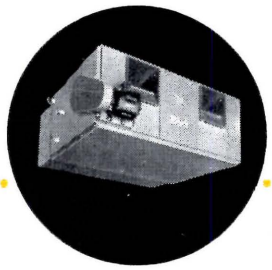
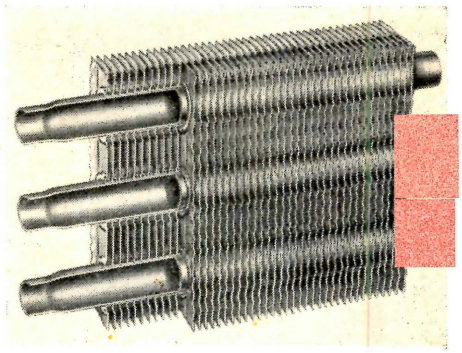
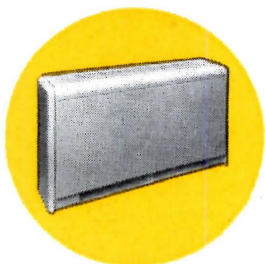


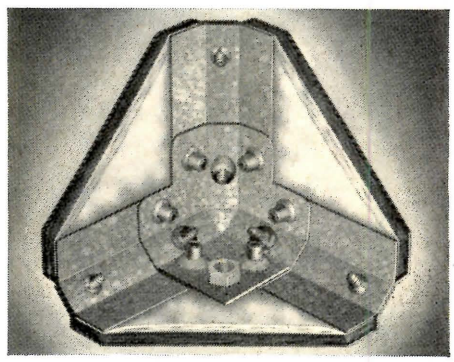
SEASONMASTER AIR CONDITIONER



RIPPLE FIN COIL CONSTRUCTION



INDIVIDUAL ROOM SEASONMAKER



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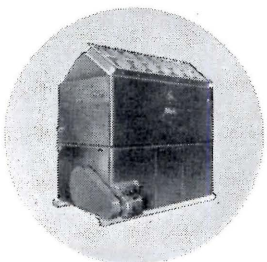

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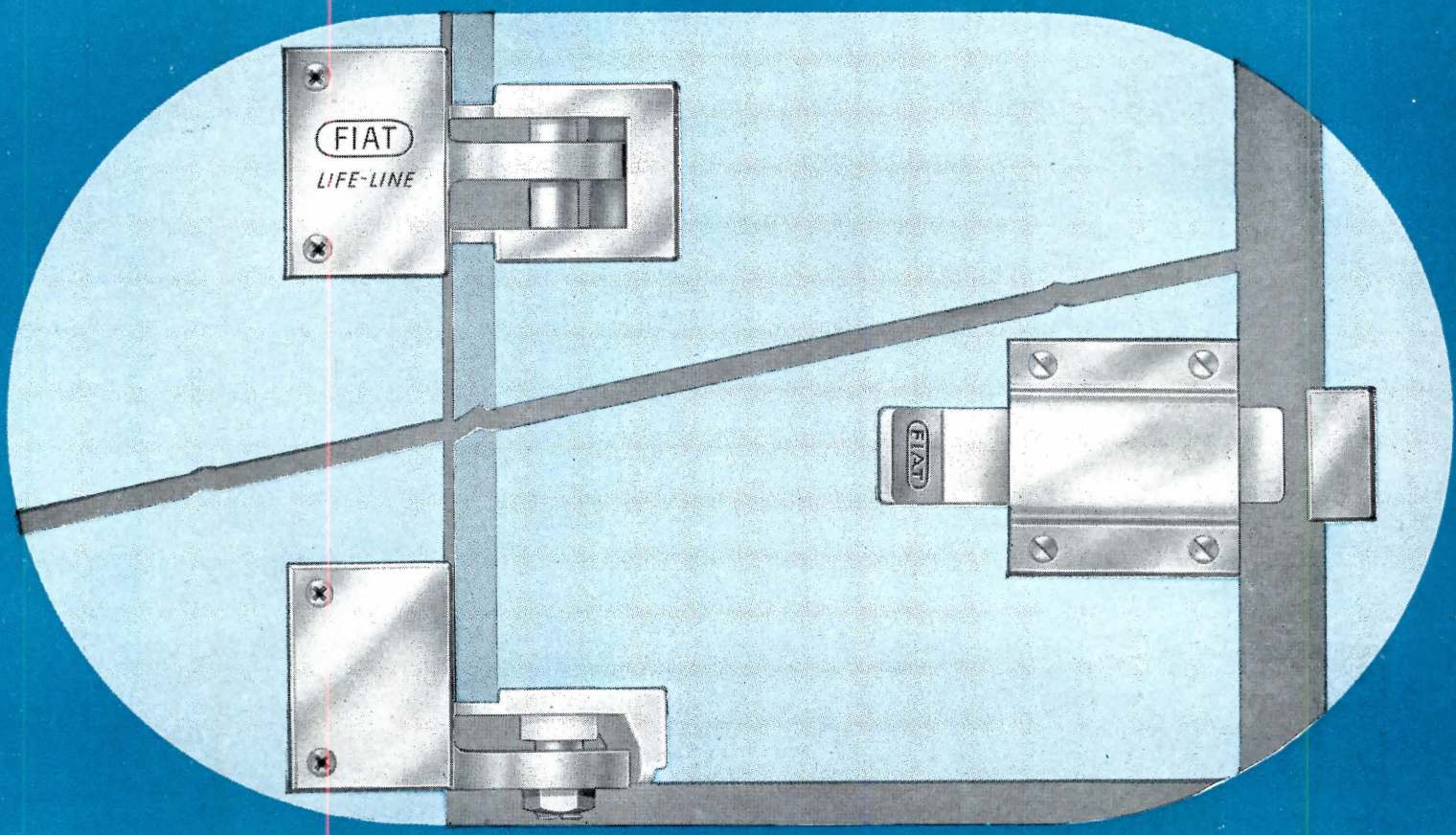

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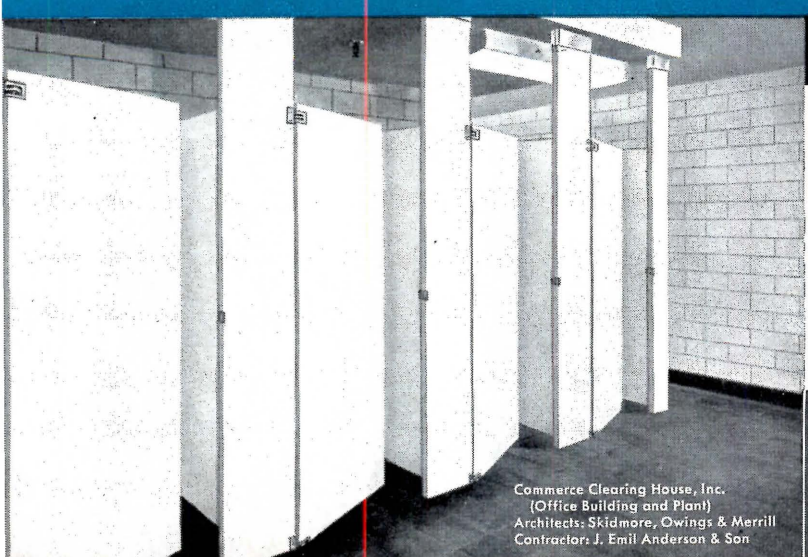

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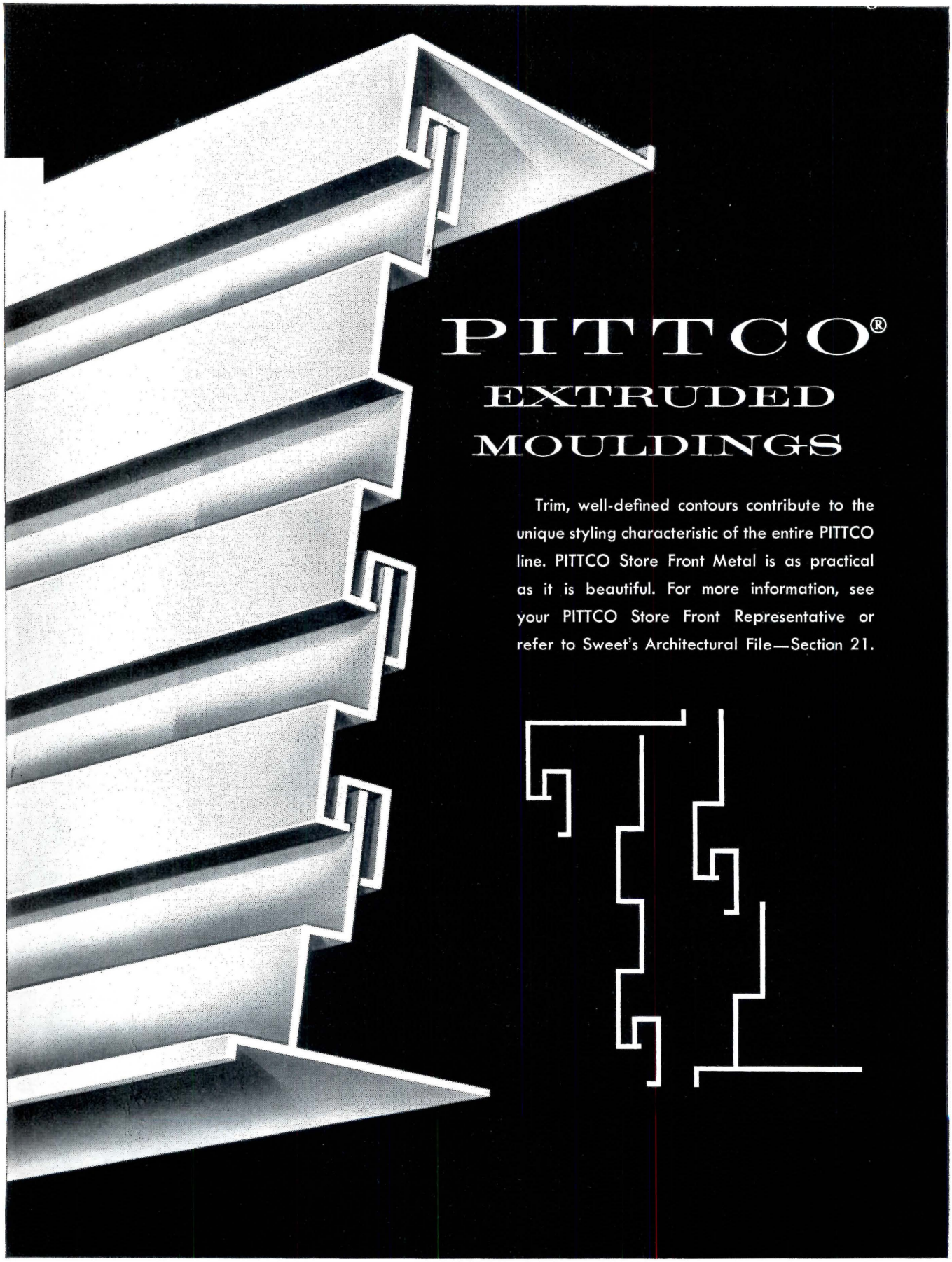

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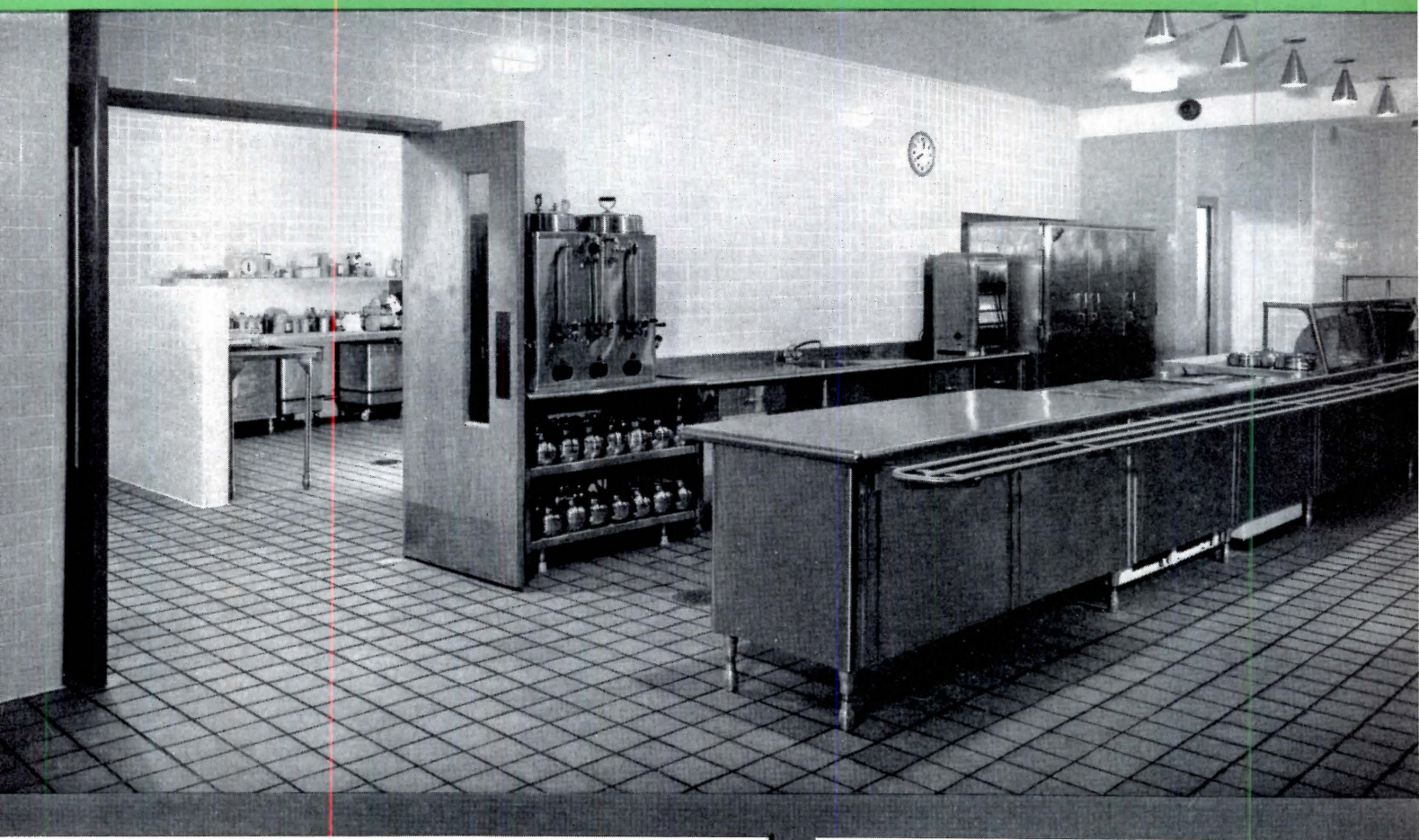
Stylon ceramic tile, floor to ceiling



why?

In remodeling and adding a cafeteria to this school, architects Barry and Kay gave their clients the sanitary, low-maintenance, long-life wall coverings they had to have. They used Stylon ceramic tile all the way to the ceiling.

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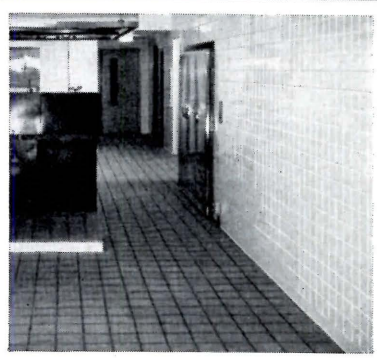

Client:
Rosarian Academy for the Sisters of St. Dominic, Palm Beach, Fla.

Architects:
Gerald A. Barry and Fred D. Kay, AIA, Chicago

General Contractor:
Butler and Oenbrink, Inc., Palm Beach

Tile Contractor:
Sikes and Sons Tiles, Inc., W. Palm Beach

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Stylon Corporation, 43 Summer Street, Milford, Massachusetts

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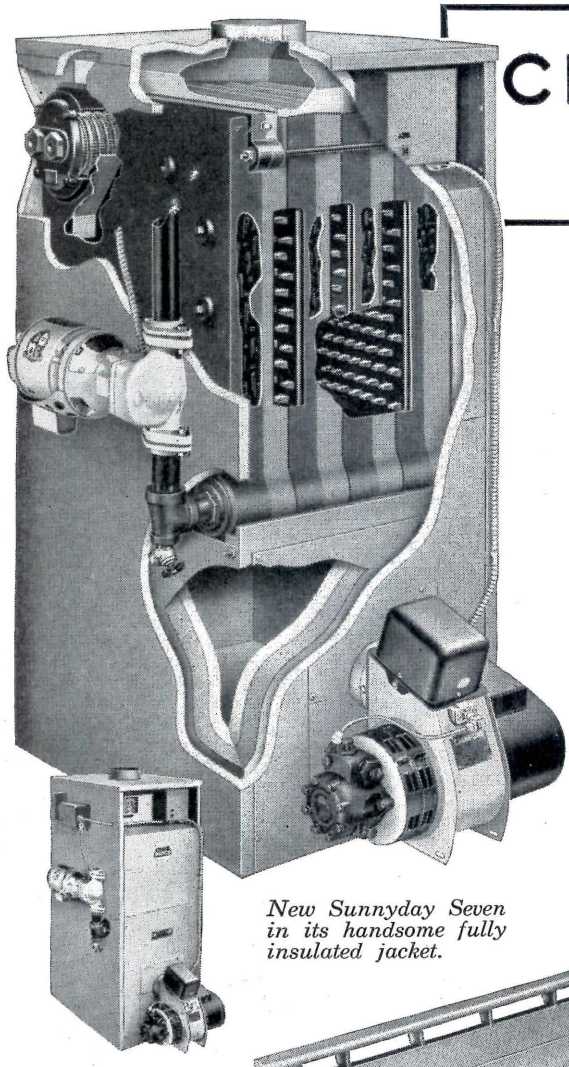

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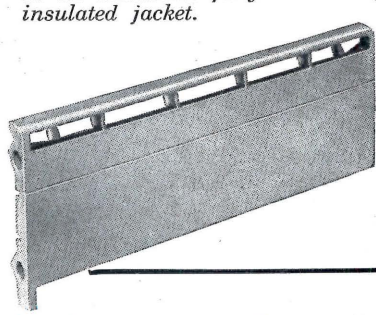

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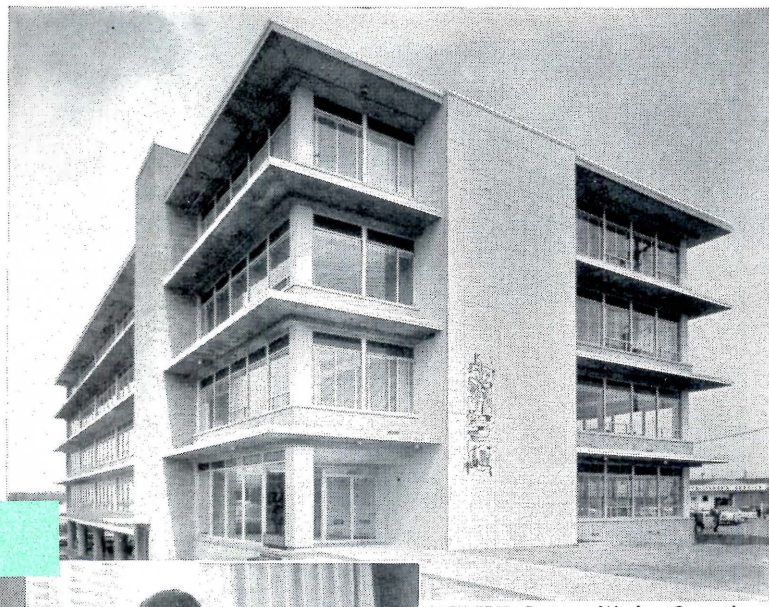

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CONSULTING ENGINEER: Superior Engineering Co.
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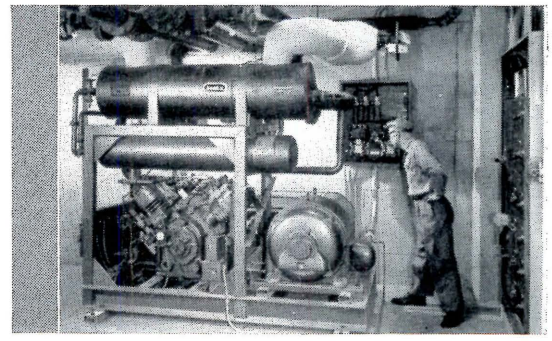

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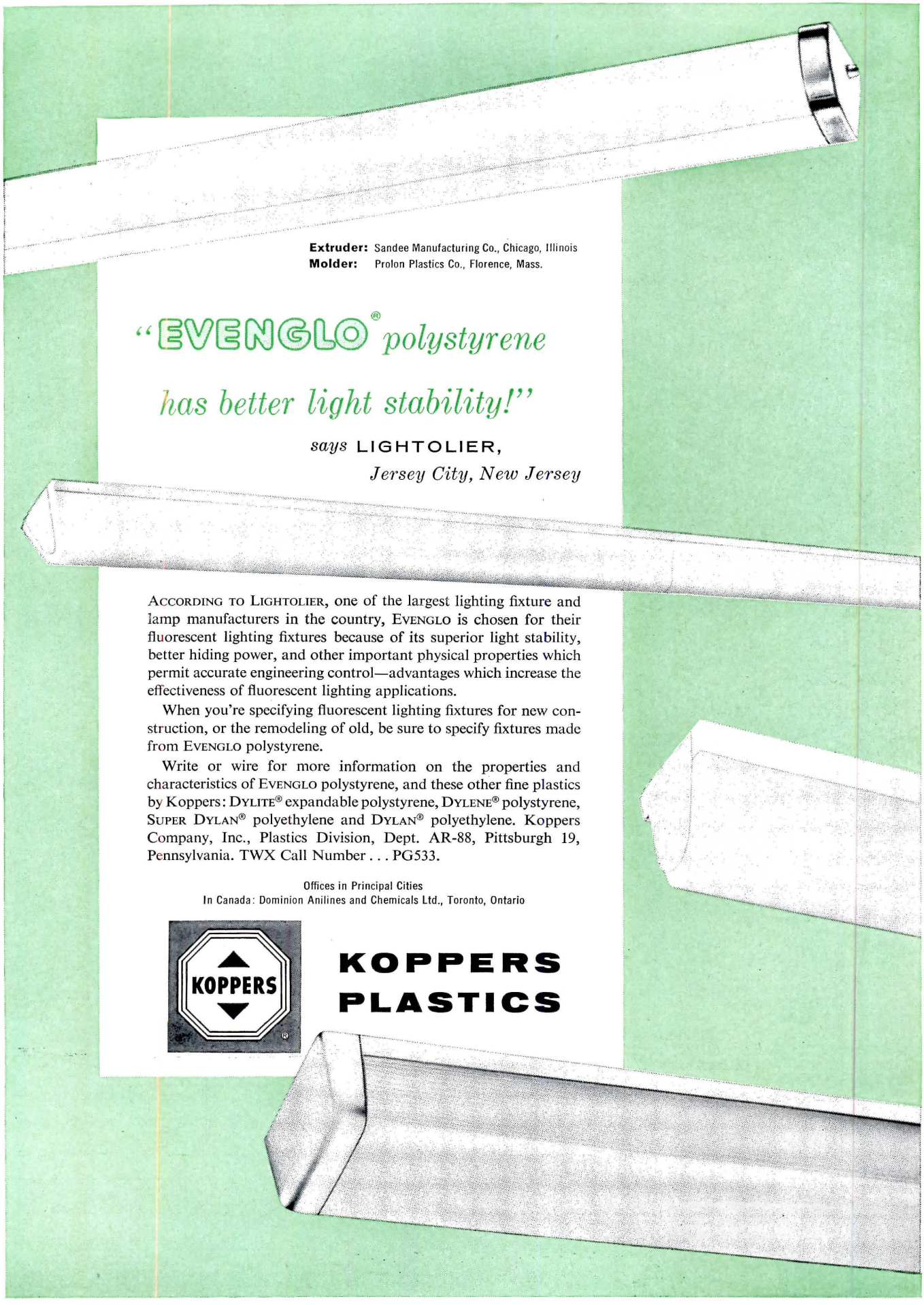

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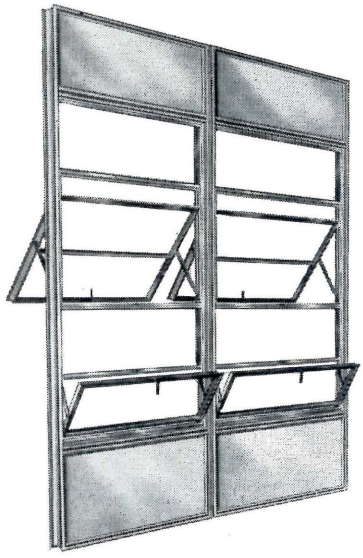

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Row House VERNACULAR and High Style MONUMENT

Travel Notes from a Sabbatical Tour Around the World

By William W. Wurster

Photographs by Catherine B. Wurster

In seven months, westward around the world from San Francisco, we visited 25 countries for periods from seven weeks in India to 45 minutes in Monaco. Too fast, but the flood of impressions tends to dramatize the links rather than the differences. Greece faced East as well as West. Nepal was a Buddhist bridge from India to China. Wood has the same inherent qualities everywhere. And all architecture seems international, with the great styles following the paths of religious, military and cultural influence, while in everyday building similar conditions produce similar results. A house is a house is a house, whether in Kathmandu or Liverpool.

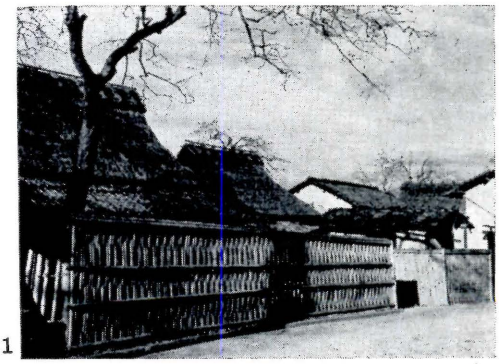
We visited the great Asian temples and palaces that all travelers see, and found them fabulous and exciting. But there is also a wonderful low-keyed popular tradition that may have more meaning today. Now that we look back, this split between high style and vernacular and the latter's neglect by modern architects, particularly in Asia with respect to housing, seems important.

The row house is a universal building form which continental Europe is trying to revive, England to modify, America to develop anew. And Asia has a rich array of row house traditions.

The Japanese villages were romantic, beautiful, often more irregular than this example—I guess picturesque is the word. But the Chinese villages near Hong Kong have an urbanity that I like and understand better than the picturesque, having always doubted Rothenburg and liked Lancaster, Pa. Some Chinese villages are walled; in others brick row houses, enriched at each door, are set in open country, sharing the fields that extend in front.

THE ROW HOUSE VERNACULAR:

Asia and Europe, Old and New



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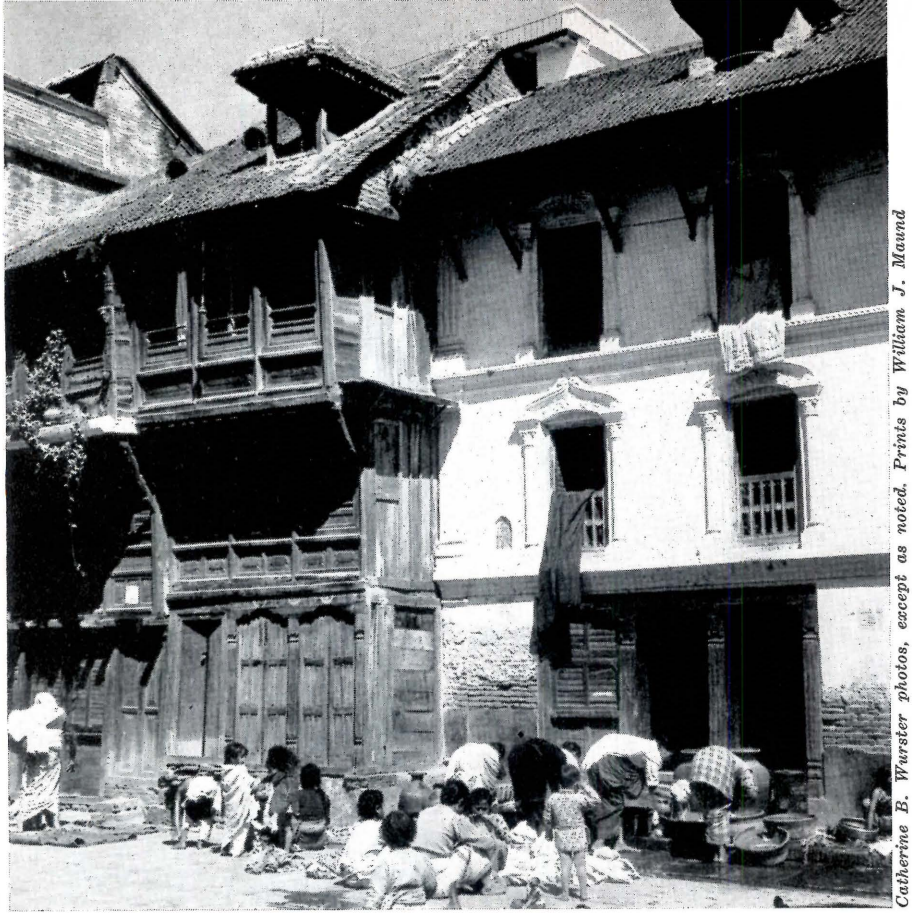
1. Village near Kyoto: woven fence gives a regularity unusual in Japan

2. Open village near Hongkong: other towns are walled, more formal

2



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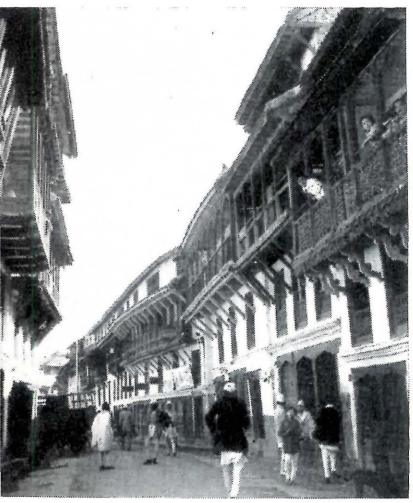
Catherine B. Wurster photos, except as noted. Prints by William J. Maund



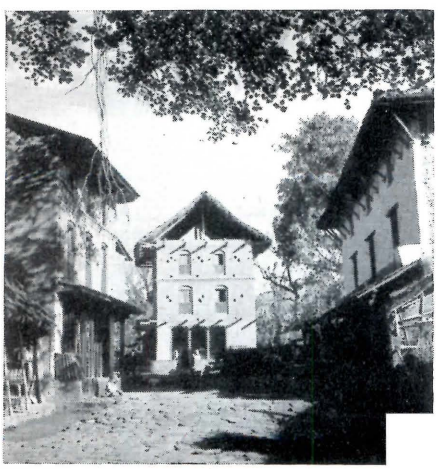
4

3. Kathmandu, Nepal: elegant houses on a square. Workroom or shop below, sleeping quarters above, with cooking on open top floor

4. Typical Kathmandu street with carved teak shop fronts and balconies. No glass in openings, wood shutters for bad weather

5. Houses in Pokhara, Nepal, under Annapurna, are simpler in detail but have same general form as in Kathmandu with family life at top

6. Pokhara's gently sloping street, a true pedestrian mall, is lined with row houses of stone and brick set in mud mortar



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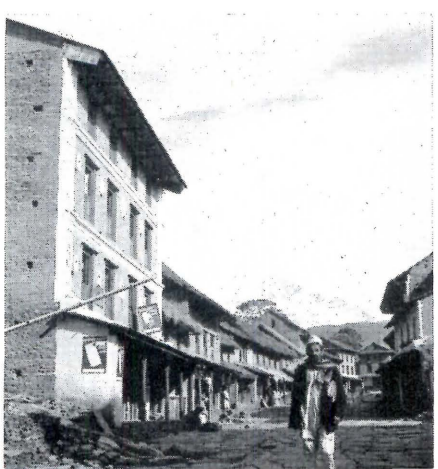


This beautiful Tahoe-like valley of Nepal, fresh and cool in February, is 5000 feet high, with terraced farms sweeping much higher up the mountainsides. Kathmandu, the capital, is still an unspoiled medieval city of perhaps 250,000 population, not yet commercialized by tourists who have only been allowed in for two years. The people are friendly and smiling, but it is difficult to buy anything!

The first rough road from India is just completed and I only hope automobiles can be kept off the handsome narrow old streets. We spend millions to make pedestrian malls in America, but here they have always been. If only they can be preserved! The fine brick buildings with delicate teak carving, sometimes painted in intricate bright patterns, and the beautiful woodwork around openings and in grilles, are a delight.

An hour's flight (otherwise, a ten days' walk) from Kathmandu is Pokhara, under the great white Himalayan wall rising to Annapurna and Manisulu. The first wheel that touched here was an airplane's. But Pokhara is anything but primitive or unknowing in design. A linear town, its granite-paved road curves gently upward for several miles, with an ancient stone drain under the slabs (already being broken by the one truck flown in). Stone walls give way to elegant temple squares and urbane brick row houses, some painted white or yellow, with fine teak detail. Each house has a shop below with storeroom or animal quarters behind, bedrooms above, and cooking and family living on the top floor.

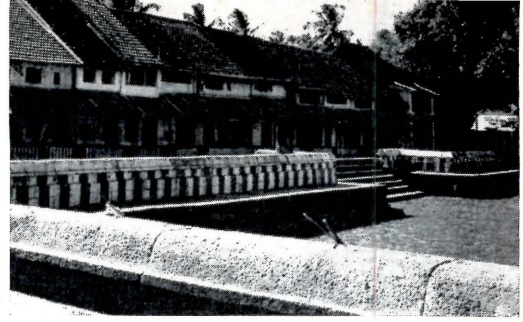
We drove south from Trivandrum, capital of the new state

of Kerala, to Cape Comorin, the bleak southern tip of India where the Arabian Sea, Indian Ocean and Bay of Bengal meet. It is a crowded countryside: coconuts and rice, too little industry. Near the Cape at Suchindram is a fine temple group with carved towers, a green tank with stone walls painted in the lively red-brown stripes so frequent in this region. Along the tank, with stone steps leading to the water, we found a handsome row of masonry houses, with porch.

From Madras we went to Conjeeveram, with the most magnificent temple complexes we saw in India. The many slanted *gopuram* towers, richly carved all over, were visible ten miles out above the palms. We were equally struck with the simple beauty of traditional dwellings in this hot region. Each house has a raised porch (to be above the monsoon mud) with fine teak posts, set back under a roof of tiny tiles.

No one should miss the Ajanta Caves, rediscovered only in 1819, with their brilliant Buddhist paintings from 2000 years ago, comparable to Giotto's murals at Assisi. At the opposite end of the esthetic spectrum, we also liked some pleasant house groups in Ajanta village.

Chandigarh, Corbu's new capital for the East Punjab, has a fine schematic layout but seems too spread out, as does New Delhi. All this unassigned open space in a hot, dry, windy plain can mean dust. But no one here seems to agree, so we could be wrong. House designs vary pleasantly and—particularly those by Jeanneret—use native materials and motifs. Every dwelling has private outdoor space.



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7. Facing temple tank at Suchindram in Southeast India is a row of masonry houses painted in different colors

8

8. Typical southwest India houses at Conjeeveram have raised porch, inner court and cookroom behind

9. Group of houses with airy balconies at Ajanta village, Hyderabad, near the famous caves

10. Public housing for government workers, Chandigarh, East Punjab: left, low-rent with enclosed rear yard; right, middle-rent with balconies, roof deck, lattice screens

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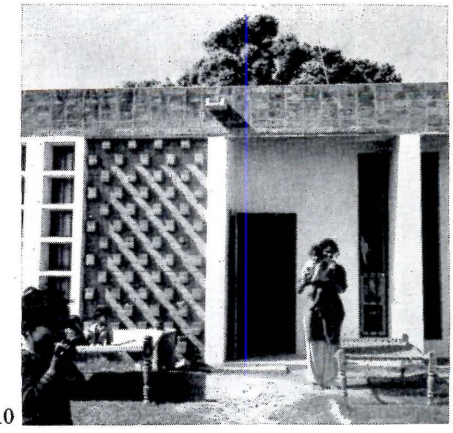

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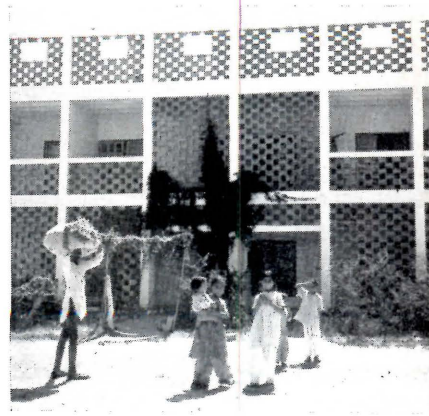

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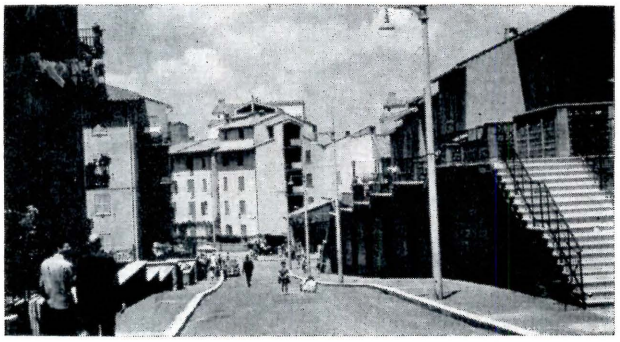

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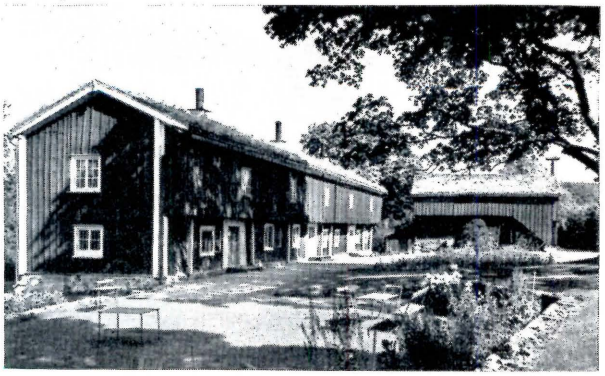
11. Solid Dutch provincial elegance along a canal at Kampen on the Ijssel. Holland has the old, the beautiful and new with imagination

12. In the new Quartiere Tiburtino, Rome, three-story houses with raised walk designed for *Inacasa:* Quaroni and Ridolfi, architects

13. Houses in Scandinavian vernacular at Tapiola, new community near Helsinki, Finland. Kaija and Heikki Siren were architects

14. Scandinavian row-house prototype with characteristic vertical battens and overhanging second floor, in Lindesberg, Sweden

Akta photo



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Holland is probably the great example of man's ability to control his entire environment with efficiency, humane purpose and esthetic imagination. Everything has orderly beauty: old and new architecture, landscape and cityscape, monument and vernacular. The man-made countryside is like a great park, and the towns have a cameo quality with no frowzy edges. En route to the Northeast Polder with its dramatic new development on land reclaimed from the Zuider Zee, we stayed at Kampen near the Ijssel mouth of the Rhine, a fine old town with restrained but handsome houses along the canals.

Once again, Rome is a place of booming vitality. It has one very moving postwar structure, the Ardeatine Cave Memorial, which can hold its own with the old monuments. And it has miles of new housing, not always sensible, but livelier and more urbane than the American equivalent. Tall apartments predominate, usually with balconies. But there are some interesting row house experiments too, including an intricate and picturesque group in the Quartiere Tiburtino . . . incredibly, a public housing project! A raised walkway, with bridges to second-story front doors, steps down the hill with the houses.

In Scandinavia, the Danes are in a surprising wave of glassy Brutalism, while the Swedes have left this behind. Norway seems uncertain, but the Oslo City Hall is, we decided, a great piece of popular architecture, vulgar but vigorous. Meanwhile, Finland maintains its high standard, still seeking vernacular solutions molded by local conditions and personal taste. Like most new north European communities, Tapiola, outside Hel-

sinki, includes all dwelling types, from high-rise to individual houses.

In England, the native habitat of the row house, there are many different species. The quaint story-book cottages at Saffron Walden might be termed a "wild" or primitive type.

Equally British, however, is the eighteenth century formality of the London squares, Edinburgh and Bath. Man has seldom designed a more stately residential group than the Royal Crescent at Bath. It has some of the scale and nobility of a Roman piazza but is still domestic . . . and drenched in greenery, for it rains and rains.

In a postwar version at Harlow there are stilts and a free-form superblock plan but there is still the undulating green lawn, plus a fine sculptured Family Group by Henry Moore.

Meanwhile, the London County Council, trying to save land and prevent sprawl, puts row houses on top of row houses and mixes them with high-rise apartments, at Roehampton and elsewhere.

In many of their glassy new schools and housing projects, the L.C.C. has broken the London mold and I find myself surprisingly sympathetic. To appreciate these bright clean things one must see them in their surround, the great sea of smoky brick that is London. Golden Lane is flashy, but it brightens a grim old district.

With its distinguished postwar work done almost entirely by staff architects, led until recently by Leslie Martin who has just been knighted for it, the L.C.C. has broken still another mold: apparently "bureau architecture" *can* be good.

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17

15. The medieval English vernacular survives in a number of towns and villages. This picturesque row of cottages is at Saffron Walden, Essexshire

16. Eighteenth century elegance in the stately Royal Crescent at Bath, designed by John Wood the younger

17. "Double maisonettes"—two layers of two-story row houses—by London County Council, at Roehampton

18. Housing at Harlow New Town by Fry, Drew and Partners, architects, facing Henry Moore's sculpture, "The Family," in Mark Hall Park

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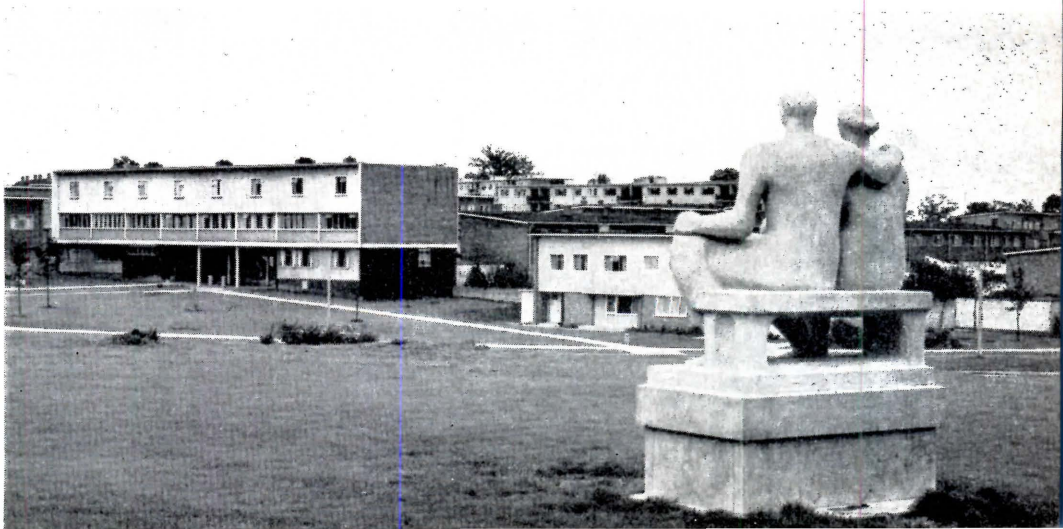

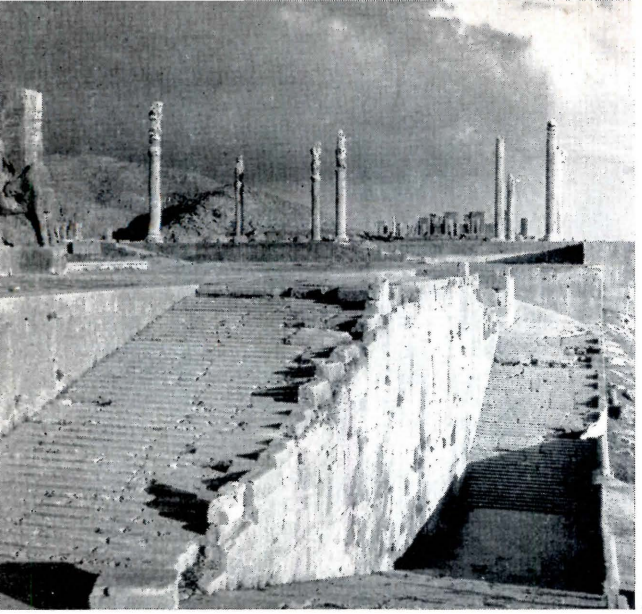

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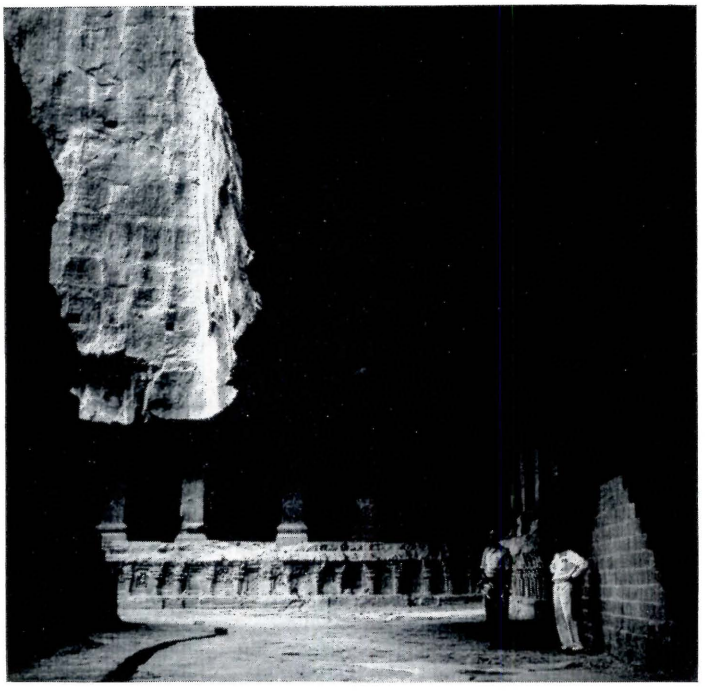
BEHIND THE INDIAN MONUMENTS: Many Different Influences



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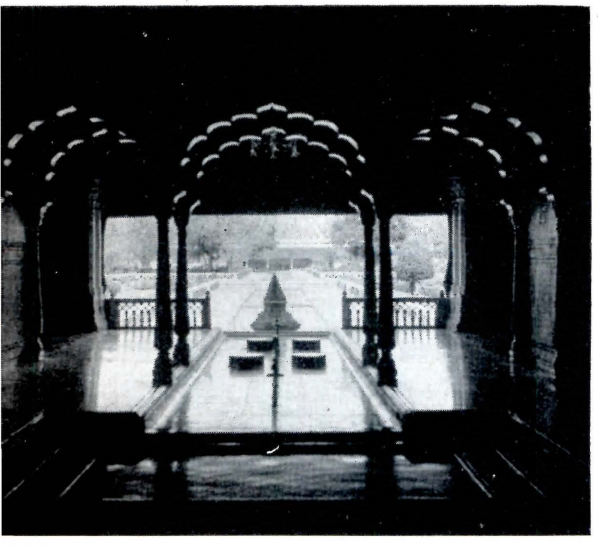

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19. Persepolis, Iran: built before 500 B.C., burned by Alexander, 331 B.C., a majestic composite of great scale and delicacy. Propylaea, Apadana, Darius' palace

20. Ellora Caves, Hyderabad: lower hall, Kailasa, Brahman temple of Siva, c. 750 A.D.: a great temple carved from solid rock by a sculptural not an architectural process

21. Water pavilion and garden, palace of Maharajah Jai Singh II, Jaipur, have luxury and geometric perfection brought to Indian architecture by Mogul conquerors

Once you have come across Asia to Persepolis, Istanbul, Athens and Crete, the East and West can never seem entirely separate again. The horns of Minos' bull face both ways.

Persepolis seems quite Greek (except the stylized sculpture) in its combination of grandeur and delicacy. The platform, approached by a majestic staircase and supported by a wall of enormous fitted stones, overlooks a great valley and seems part of the mountains behind. Both Greece and Persia influenced India, the Greeks as settlers following Alexander, the Persians later among the Moslem conquerors.

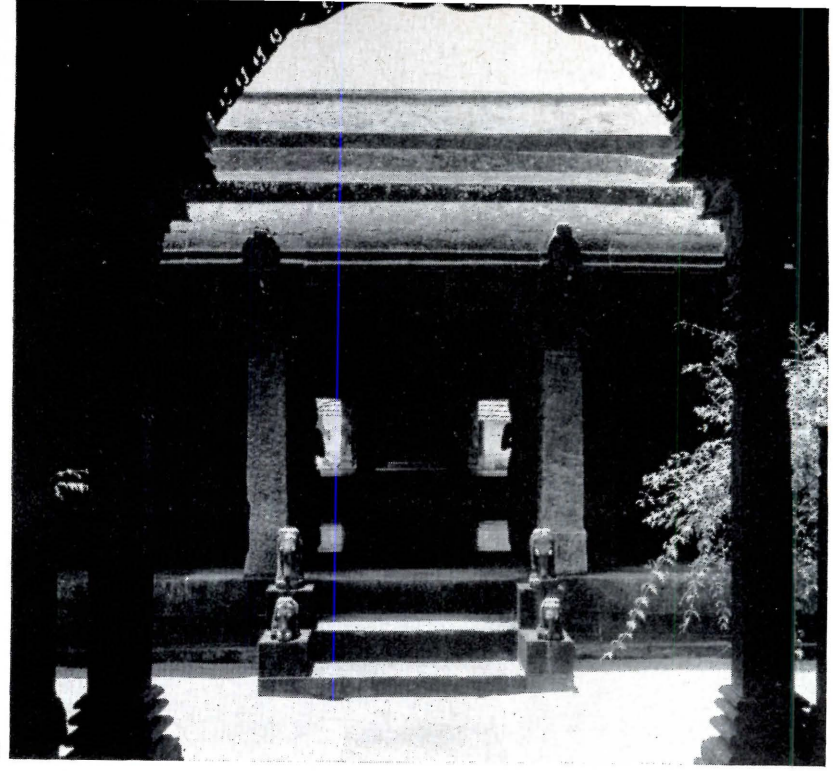
With its mystical, inturning, ascetic quality, the Hindu spirit is basic in Indian architecture. Nothing reflects this better than the Ellora caves, a vast monastery group cut 100 feet down into a hillside of black volcanic rock. The eighth century Kailasa Temple has great pillared halls, connecting bridges, huge free-standing elephants, female figures Greek in feeling, all carved from solid rock with grace and awesome majesty. How was this work planned? Were there drawings? A master designer? Errors could not be tolerated. This is the reverse of construction: it was all sculpted down to the product.

Entirely different is the Islamic influence, at its height after Akbar in the sixteenth century. Nothing mysterious or ascetic here: these elegant military chieftains believed in Order and Authority, wanted grandeur, luxury and worldly perfection in their buildings and gardens. Jaipur, built by Hindus of the warrior caste—doers, sportsmen and military men who got along well with both Moslems and British—is

a fine example of the Mogul influence.

We were unprepared for the beauty of the Padmanabhapuram Palace, south of Trivandrum, which compares in scale and delicate distinction with the Katsura Palace in Japan. Dating from 1335 to the sixteenth century, it is the finest example of Nair architecture, with its latticed teak galleries whose slatted walls often curve in at the bottom like a corn-crib. The Nairs used another fine trick here to keep out tropical glare, and driving rains also. The buildings are tucked up under sloping overhung roofs, both on exterior elevations and in the numerous small inner courts with an occasional pool to collect rain water. These are buildings designed for the climate, the wood grilles giving privacy but encouraging the easy movement of air. Most structures are quite thin through, also ventilation.

Completely Hindu in feeling, the Nair work also shows Chinese influence—particularly in the roof lines—from the days when southwest India was the trading post between Europe and China. The Palace has a three-story pagoda tower with sophisticated murals from Hindu mythology in its galleried upper hall. The close Hindu relationship between life, art and religion is evidenced in a small palace temple with a magnificent stone hall, the Mandapam, for religious dances. The teak carving in dormers, gable ends, grilles and occasional columns of unbelievable richness, is unsurpassed anywhere. With all its richness and complexity, it seems nevertheless a simple, natural group of structures. Of the buildings we have seen in India, it is the most beautiful, the most human and within understanding of our own orbit.



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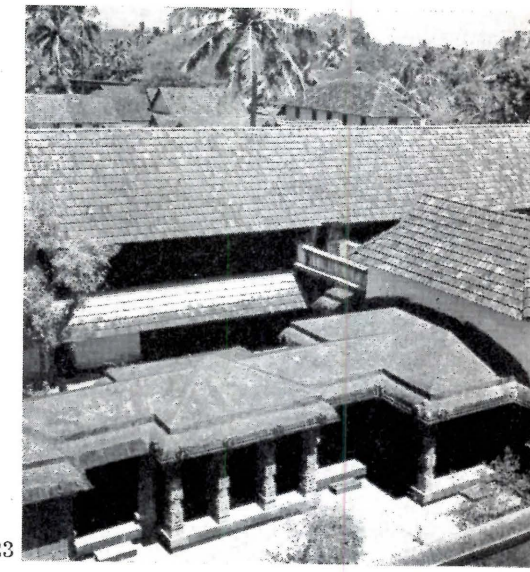
22. Tranvancore, India: integral parts of Padmanabhapuram palace are temple and Mandapam, religious dance hall. In this relation of life and religion palace is pure Hindu

23. From pagoda-like tower Mandapam's stone roof and massive structure are visible. Hall is open on both sides; its floors are cement darkened by charred coconut shells

24. Carved teak lattice of flat spindles forms outer wall of long ground-floor gallery, admitting air, cutting glare, heat. Small openings provide views out at intervals



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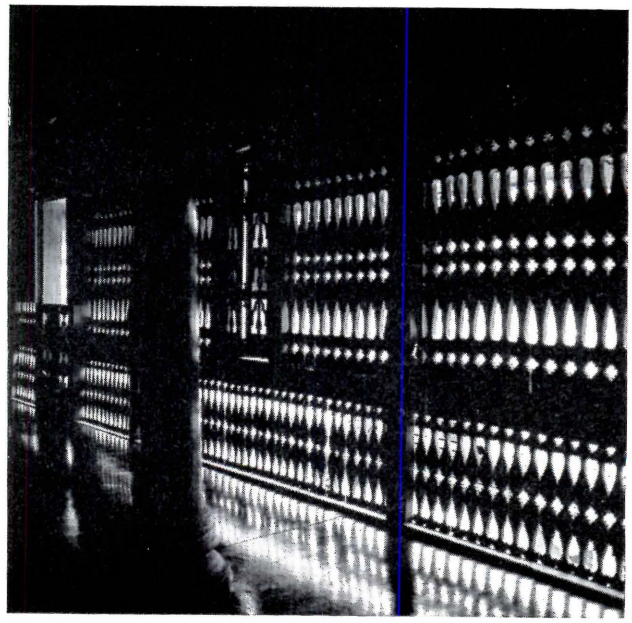

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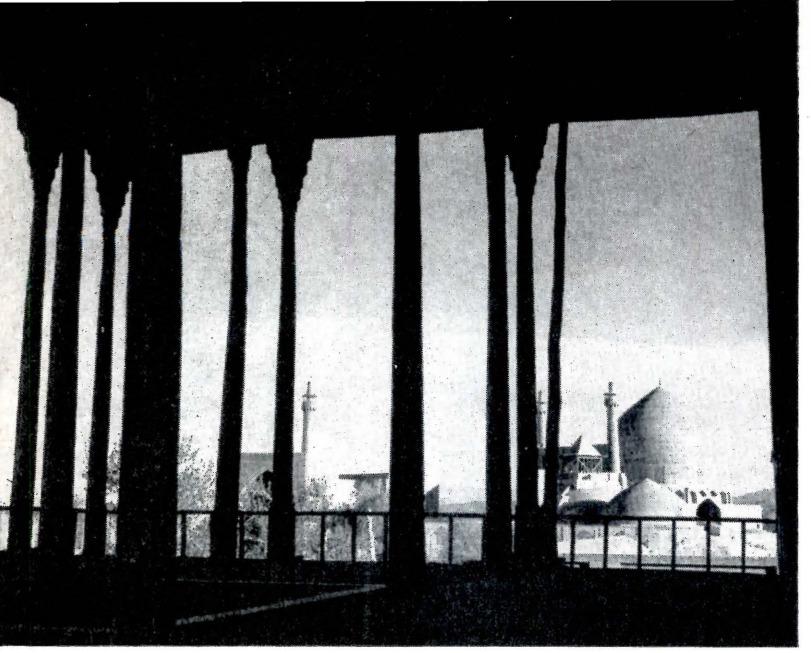

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THE PERSIAN-MOGUL LINE TO CORBU:

Five Great Builders

In grand-scale civic design we felt a kind of sequence from seventeenth century Persia and Mogul India—the work of Shah Abbas, Shah Jehan and Jai Singh II (their architects' names we do not know)—down to Lutyens at New Delhi and even Le Corbusier at Chandigarh. Despite the difference in purpose and conditions, there is a real kinship.

The Persians have had a gift for doing all kinds of things with a unified, orderly, delicate and exciting kind of beauty—monuments, houses, gardens, streets, cities, villages, paintings—and they have not entirely lost their hand, even in modern Teheran. But Isfahan, built by Shah Abbas, is to us the most beautiful city in the world, not just for its magnificent monuments but *as a city*. Its unity is quite different from the unity of religion, work, play, love and art of Hindu India, which is spiritual and permits dirt and confusion in the physical aspect of things. The Persians are a visual people who like three-dimensional clarity and drama *per se*. The clean, straight, tree-lined avenues with channels of rushing water, the neat houses and beautiful gardens behind light brick walls, the river with its splendid bridges and handsome factory district, the great covered bazaar, the parks with trees, water and flowers are not *too* orderly . . . all reach a climax in the Maidan with its brilliant tile-domed mosques and the elegant Ali Qapu pavilion from

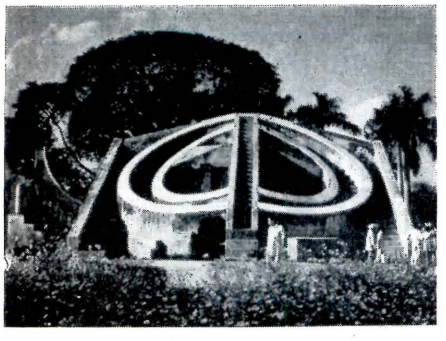
Shah Abbas

and Jai Singh II

25. Isfahan, Iran: Ali Qapu pavilion (above, and right center of air view) overlooks Maidan, great plaza for games built by Shah Abbas, and superb blue-tiled dome of Shah's Mosque

26. Jantar Mantar, Delhi: a part of an astronomical observatory built in 1724 by Jai Singh II, founder of Jaipur

27. Jaipur: galleries with latticed screens, each with opening, in pink-and-white palace of Jai Singh II



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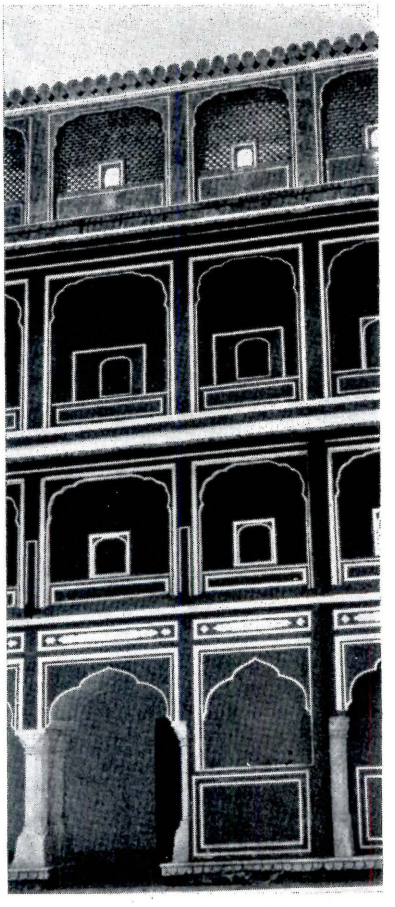

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which the Shah watched polo games in the plaza below.

Pink Jaipur has some of this gay quality too, but we were struck by two aspects of Jai Singh's work because of their present-day connotations. One was the grilles in the Palace galleries which, as at Padmanabhapuram, have carefully designed openings for an unobstructed outlook. Modern architects have borrowed the Indian grille but sometimes omit the opening even when it might be pleasant to look out. The other was the Jantar Mantar, one of several groups of massive geometrical structures built by the Rajah (who was also a mathematician) for astronomical observation. Here is the dream of modern architects, to translate pure mathematics directly into physical form. And it does make an exciting park.

But the great Mogul builder was Shah Jehan who produced the Delhi Fort and Palace, the Agra Fort and Palace and the Taj Mahal at the same time that Shah Abbas was developing Isfahan. We saw the Taj first quite properly by moonlight, on a Hindu holiday with hundreds of people in flowing saris and dhotis walking quietly on bare feet in and out of the deep shadows on the great platform. And despite the endless views of the front axis, we were astonished at the dramatic site and the splendid river view from the rear of the platform. But the Taj is a full-blown rose in its over-obvious perfection, and I preferred the more stimulating variety—in buildings, gardens, and water-channels—of the great Delhi Fort. This magnificent complex reflects all the activity that went on there: perhaps that is why it seems to have more vitality.

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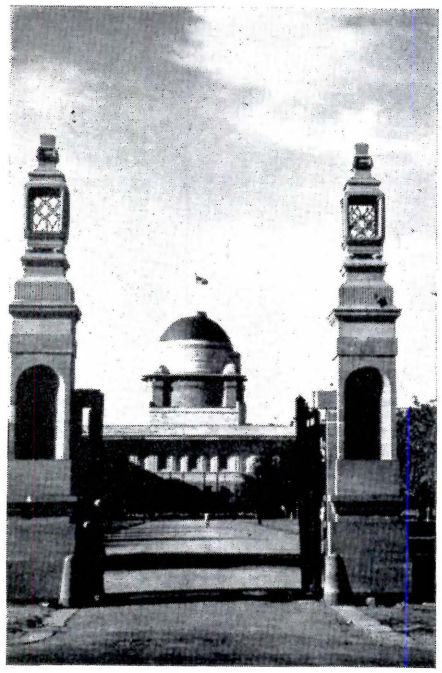
Shah Jehan,

Lutyens, Corbu



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28. Taj Mahal, Agra: dramatically located on a platform above Jumna River is tomb built (1630-1652) by Shah Jehan for his Persian wife, Mumtaz

29. New Delhi: Sir Edwin Lutyens' red-and-yellow sandstone Viceroy's (now President's) Palace has India's Eastern splendor and strong contrasts

30. Chandigarh: Le Corbusier's recently finished High Court building makes a virtue of imperfections of concrete

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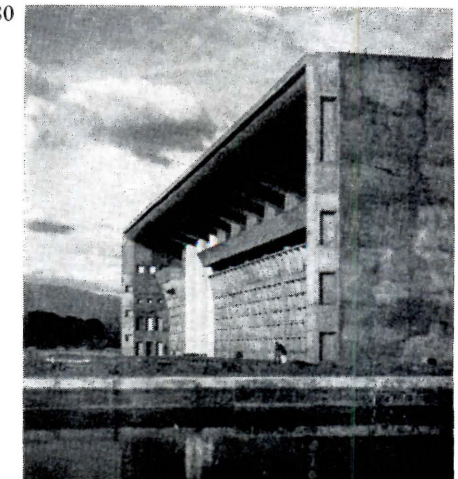

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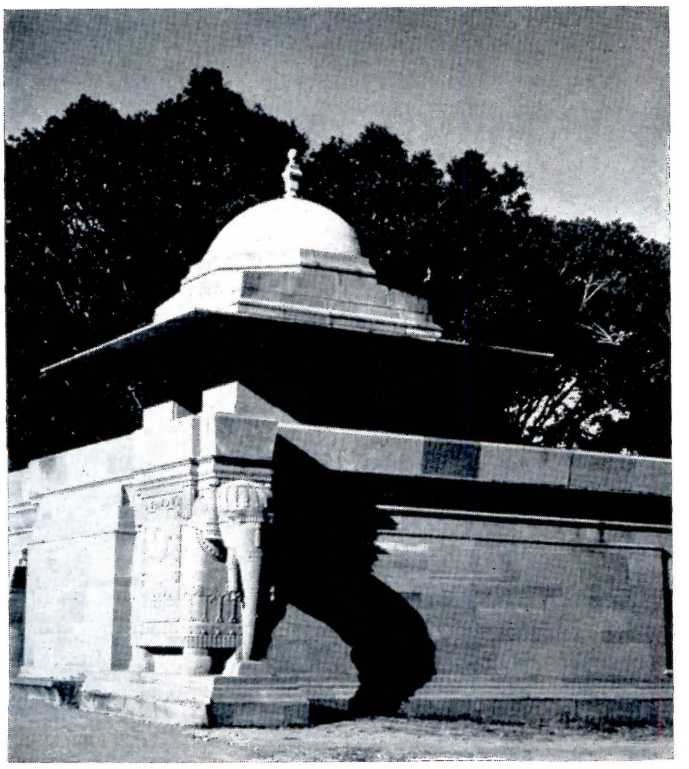
31. From roof terrace of High Court building in East Punjab's new capital city, a view of the Himalayan foothills

32. New Delhi: Lutyens' red sandstone entrance gatehouse to the President's Palace, reminiscent but not imitative



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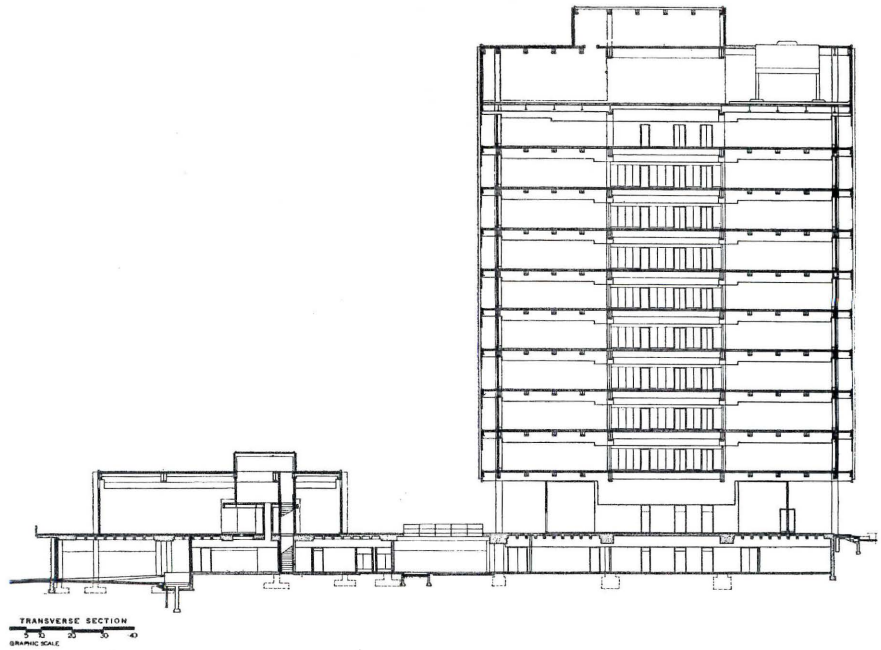
We saw from our plane the great spread-out Beaux Arts scheme of New Delhi, only partially filled in, and Catherine exclaimed, "Why, it's half Washington, half Los Angeles!" But although we expected to be bored by the Government center, we weren't. It may well be the best single product of the Beaux Arts epoch, with its bold and beautifully scaled buildings of rich red and yellow sandstone. Particularly in the Viceroy's Palace and gardens (now the President's house) Lutyens caught the strong contrasts of India. Somehow he threw over British caution and wound up in Asiatic splendor.

In entirely different modern terms, Le Corbusier has caught something from the proud Indian past as well as the forward-oriented present, above all in the High Court building. It is a romantic structure designed with a bold free hand, and has none of the machine-worship quality that makes the Marseilles housing a piece of brutal technocratic sculpture, however handsome. Later, when we saw Ronchamp, it seemed obvious that he had designed it after he had been to India.

Corbu has also made a thoroughly practical contribution to modern Indian design by using rough concrete as a virtue, in an era when intricate craftsmanship can no longer be relied on to carry the day. In Lutyens' work the costly finish is still an integral part of the design. But LeCorbusier and Jeanneret have embraced the imperfections of poured concrete without trying to cover them up. Paint on concrete or plaster mildews after one monsoon in India, as we noticed from our first day in Calcutta. But the High Court will require minimal upkeep to maintain its original quality.

THE WARREN PETROLEUM BUILDING

All Photographs © Ezra Stoller



Unique Double Skin Functions Well—Looks Good

Warren Petroleum Building
Tulsa, Oklahoma

Skidmore, Owings & Merrill
Architects

Bolt, Beranek & Newman
Acoustical Consultants

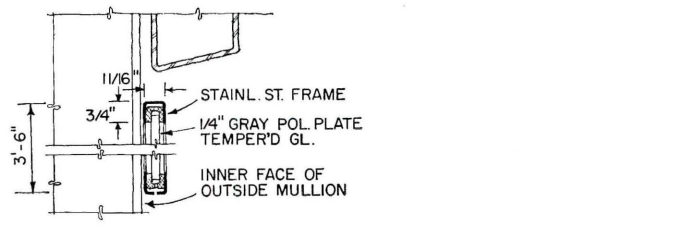
W. R. Grimshaw Co.
General Contractors

Efficiently air conditioning a structure that stands in the blazing southwest sun appears to demand special exterior treatment. The more usual kinds of sunbreakers tend to build up a pattern of horizontals or verticals or eggcrates that often restricts the vision of the occupants in unpleasant fashion. For this building, however, the architects have devised a unique double skin that reduces the heat load satisfactorily, forms an expressive and well proportioned pattern, and provides interior spaces that open out attractively to the view. The floor slabs extend 5 feet beyond the plane of the sealed glazing and there pick up a series of thin, vertical aluminum I's which in turn support horizontal bands of dark gray, heat-retarding glass placed at ceiling height. Full details follow.

Otherwise, the building is notable for the manner in which the necessary basic elements (office area, public area, cafeteria, service) have been arranged and articulated in space and in relationship to the sloping, 1-acre site. With the building located a mile from the center of the city, complete employee facilities were required. The cafeteria is separated—yet connected to—the 12-story aluminum and glass office block by a travertine and granite terrace which also roofs the lower level garage and service area, easily reached by automobile from the side street or by truck from the rear.

Warren Petroleum's executive and administrative staff occupies the entire building. When expansion is necessary, the north (or side) terrace will serve as a link to a future office unit.

The architects were responsible for the interiors, which are restrained as a result of the wide use of neutral color and natural materials, with accents of bright color, carefully placed. The public entrance lobby is shown in the photograph below.



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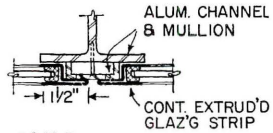

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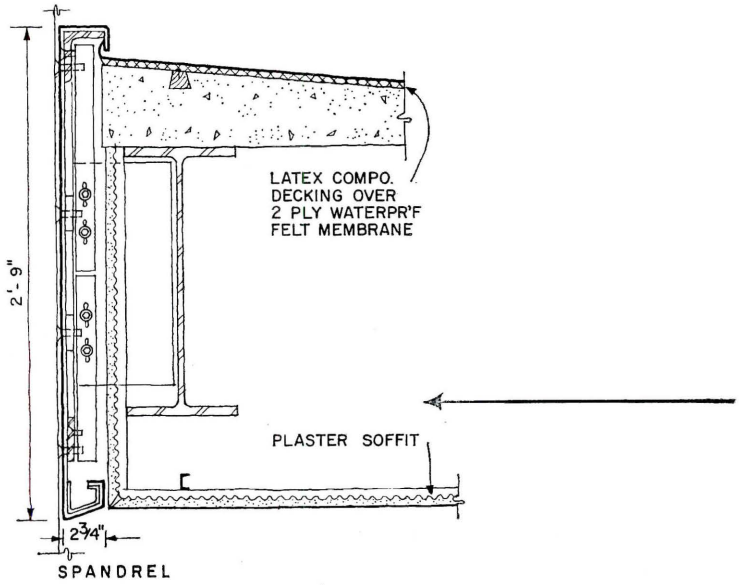
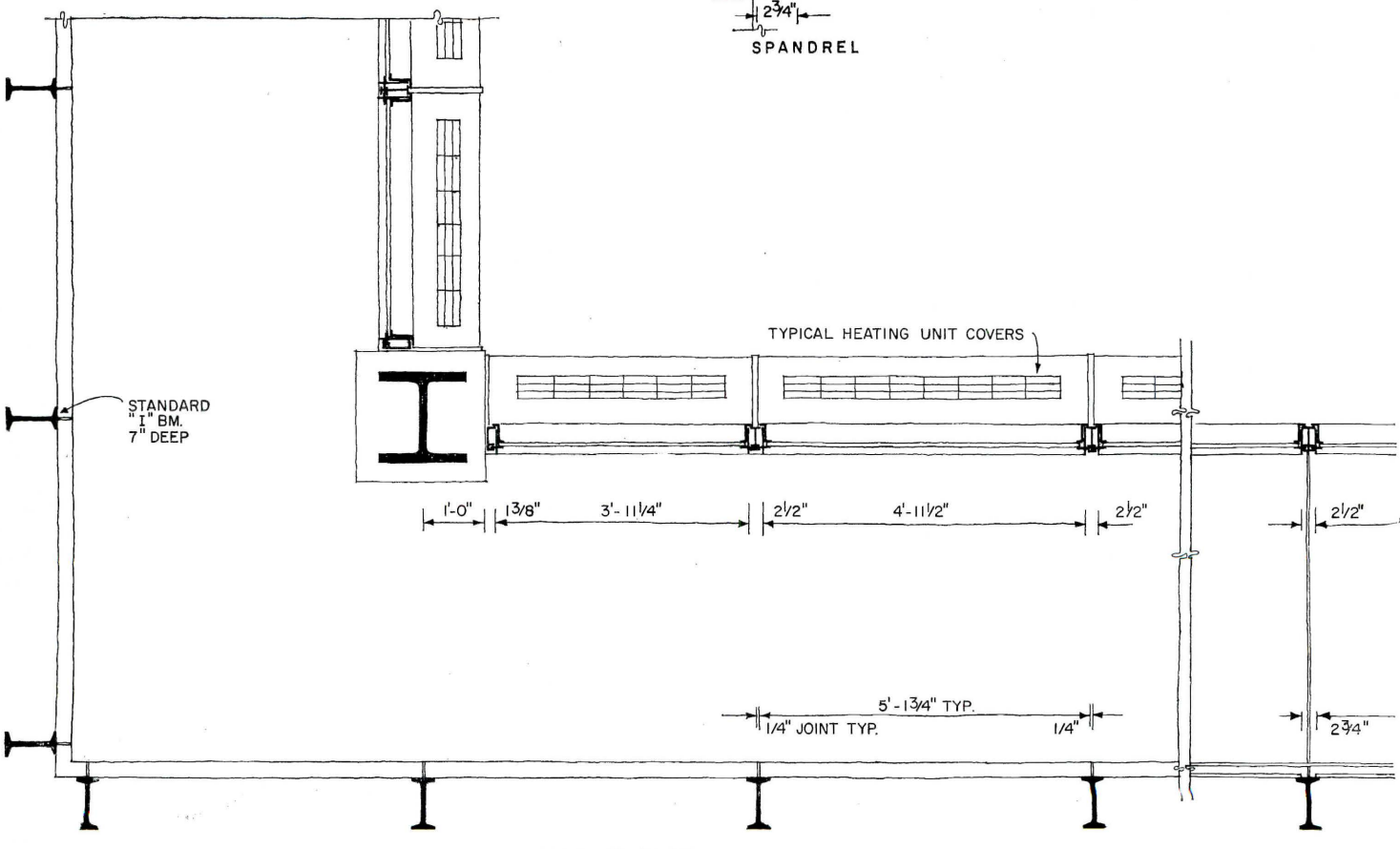
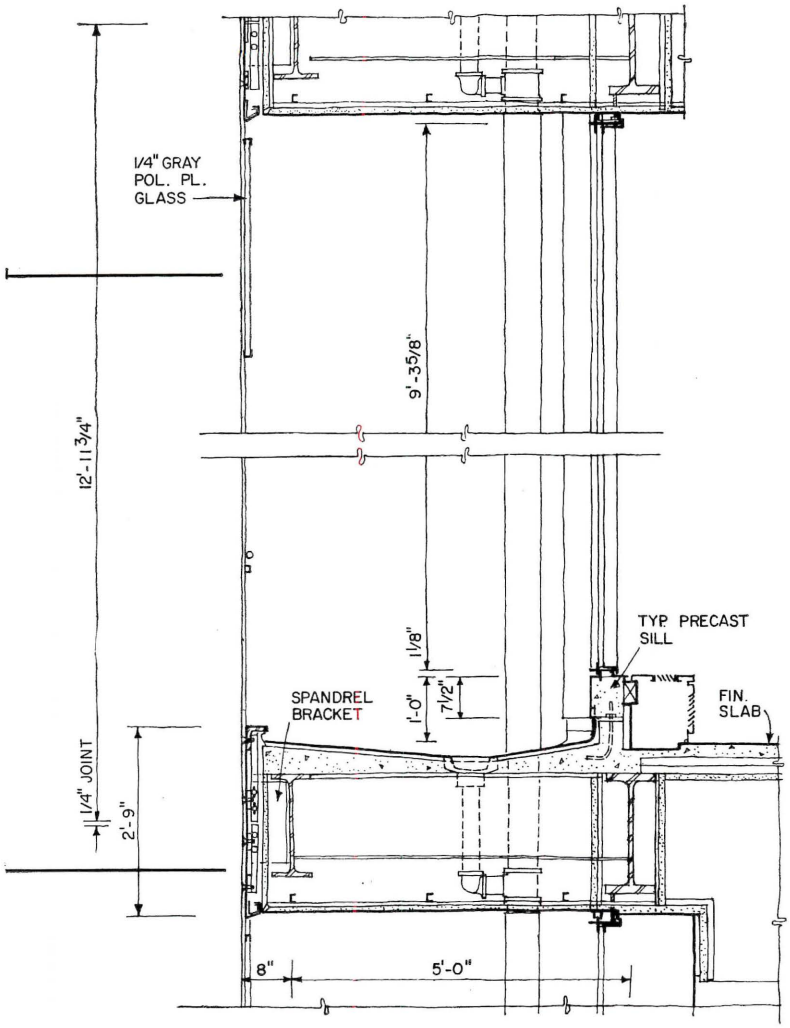


SPANDREL

Warren Petroleum Building

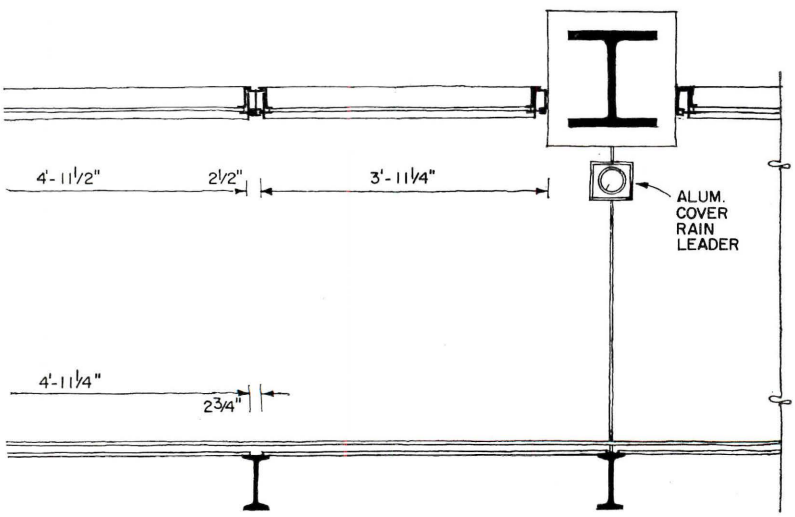


BALCONY PLAN

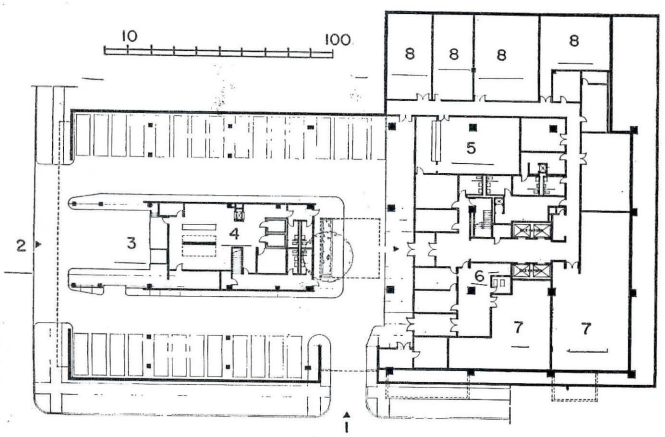


TYPICAL SECTION THROUGH BALCONY & WINDOW

The outer building element is composed of 5 ft wide balconies, with visors of ¼ in. dark blue-gray heat-retarding glass supported on aluminum I sections set 5 ft 2 in. o.c. to conform to the glazing and building module. The visors shade the sealed glass and cut sky-glare; the balconies serve for window washing as well as to protect the fixed glass

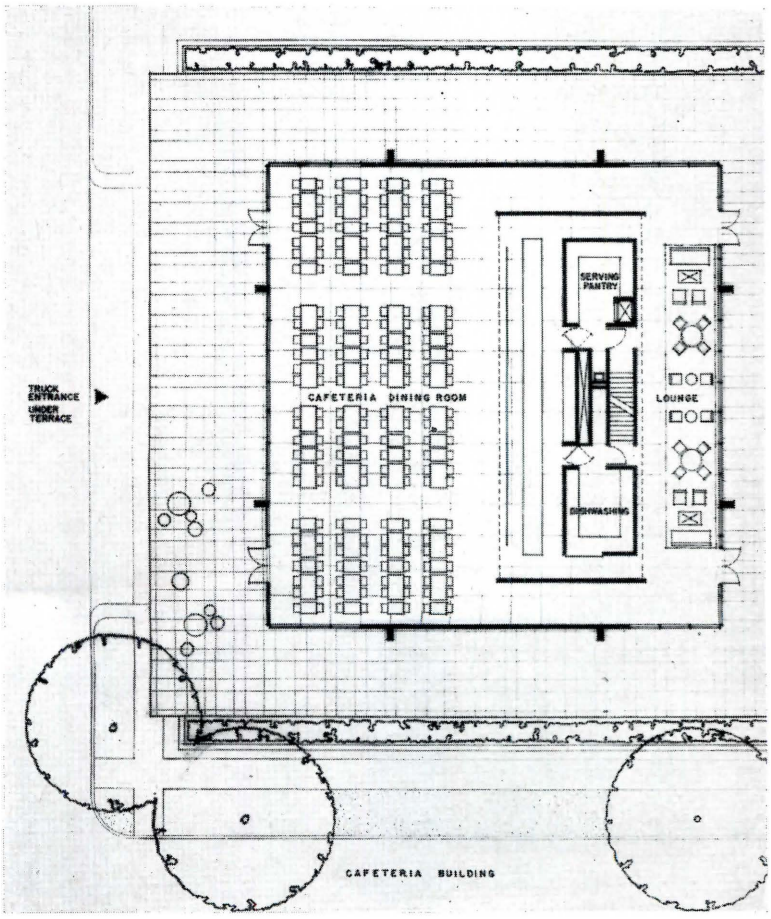


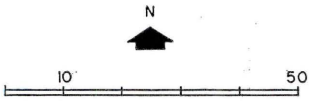
REFLECTED CEILING PLAN

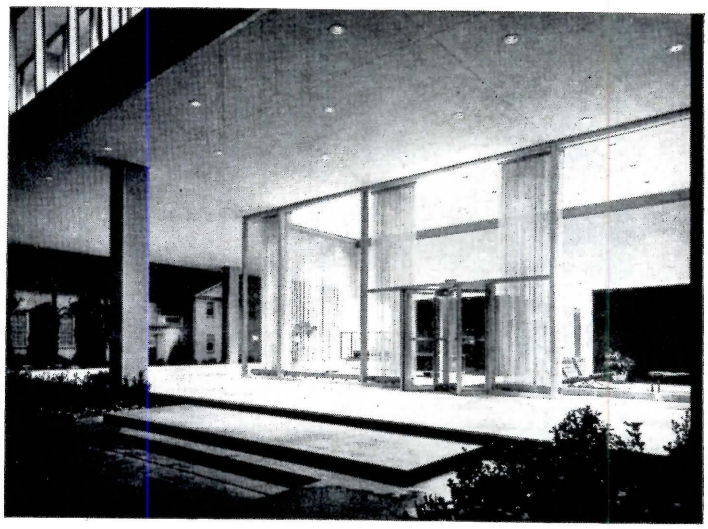


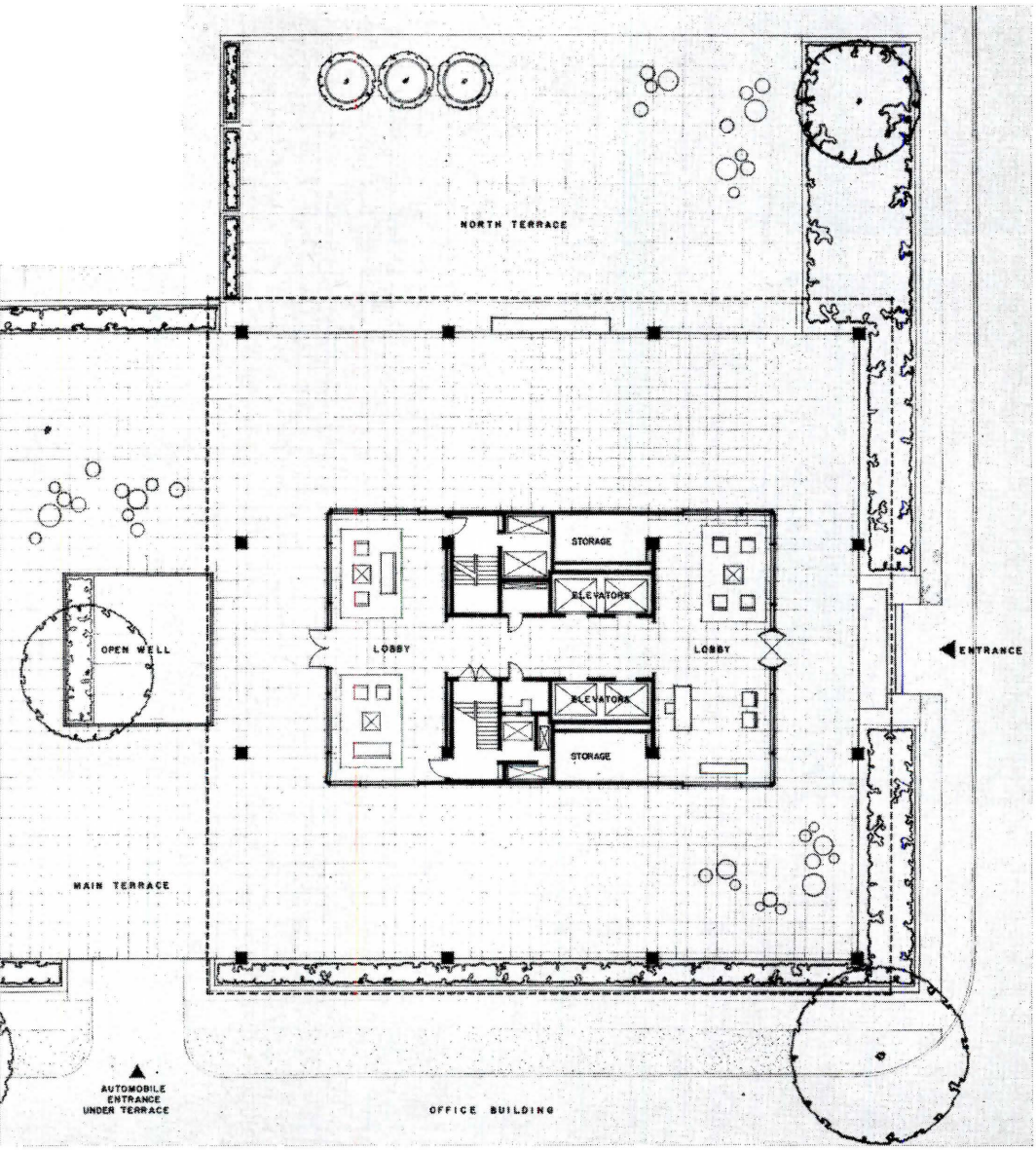
LOWER LEVEL

1. Cars
2. Trucks
3. Dock
4. Kitchen
5. Phone Center
6. Mail
7. Services and Supply
8. Storage







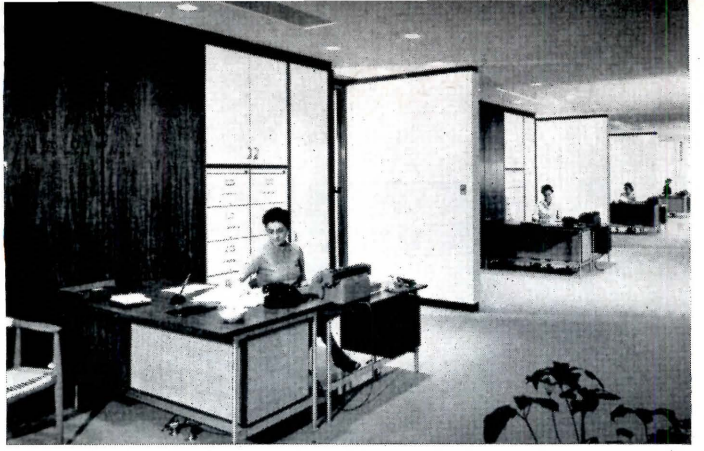


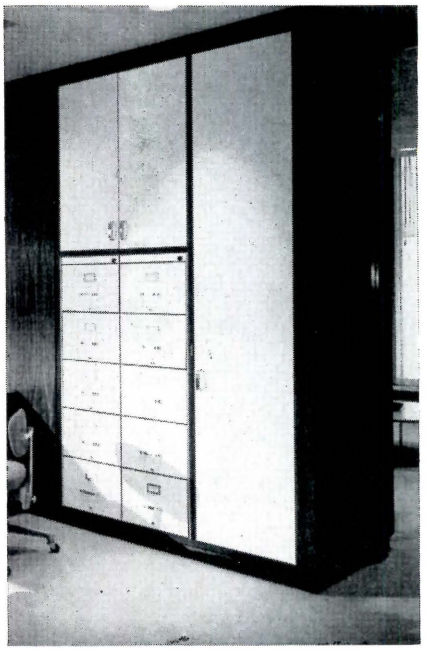
Warren Petroleum

The 12-story office block, containing approximately 120,000 sq ft, is supported on a welded steel frame of 36 ft spans in both directions. Floor to floor height is 13 ft. The square shape—108 ft on a side—furnishes a clear area 36 ft wide about the core. This dimension works nicely for corridor plus inner office plus outer office; or for large clerical areas; or for more luxurious executive quarters (see next page). Exteriors of the office block ground floor and cafeteria are of polished-aggregate precast concrete units, aluminum, and glass.

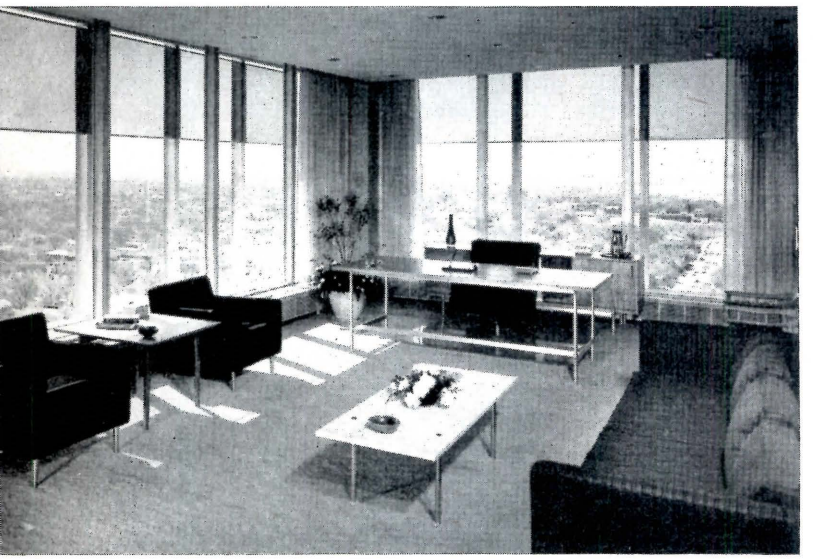
The cafeteria is framed by two sets of intersecting welded steel bents which span 80 ft. There are 200 seats for the present 400 employes in two shifts; service is by dumbwaiter from the kitchen-dishwashing facility below. The interior has wood paneled and blue-tiled partitions, white plastic topped tables, plastic shell chairs in red and off-white, and curtains of linen casement cloth.

The lower level houses executive parking for 28 cars, a truck dock, kitchen services, mail and supply center, phone center, storage areas, and certain mechanical installations.



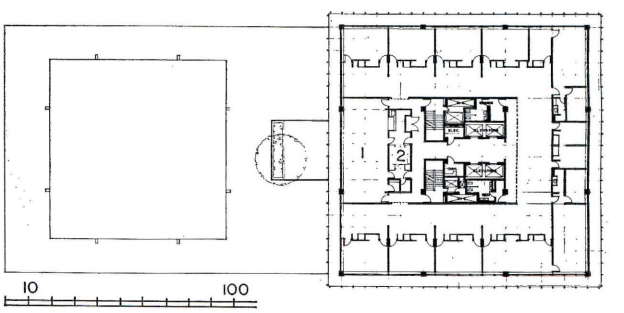


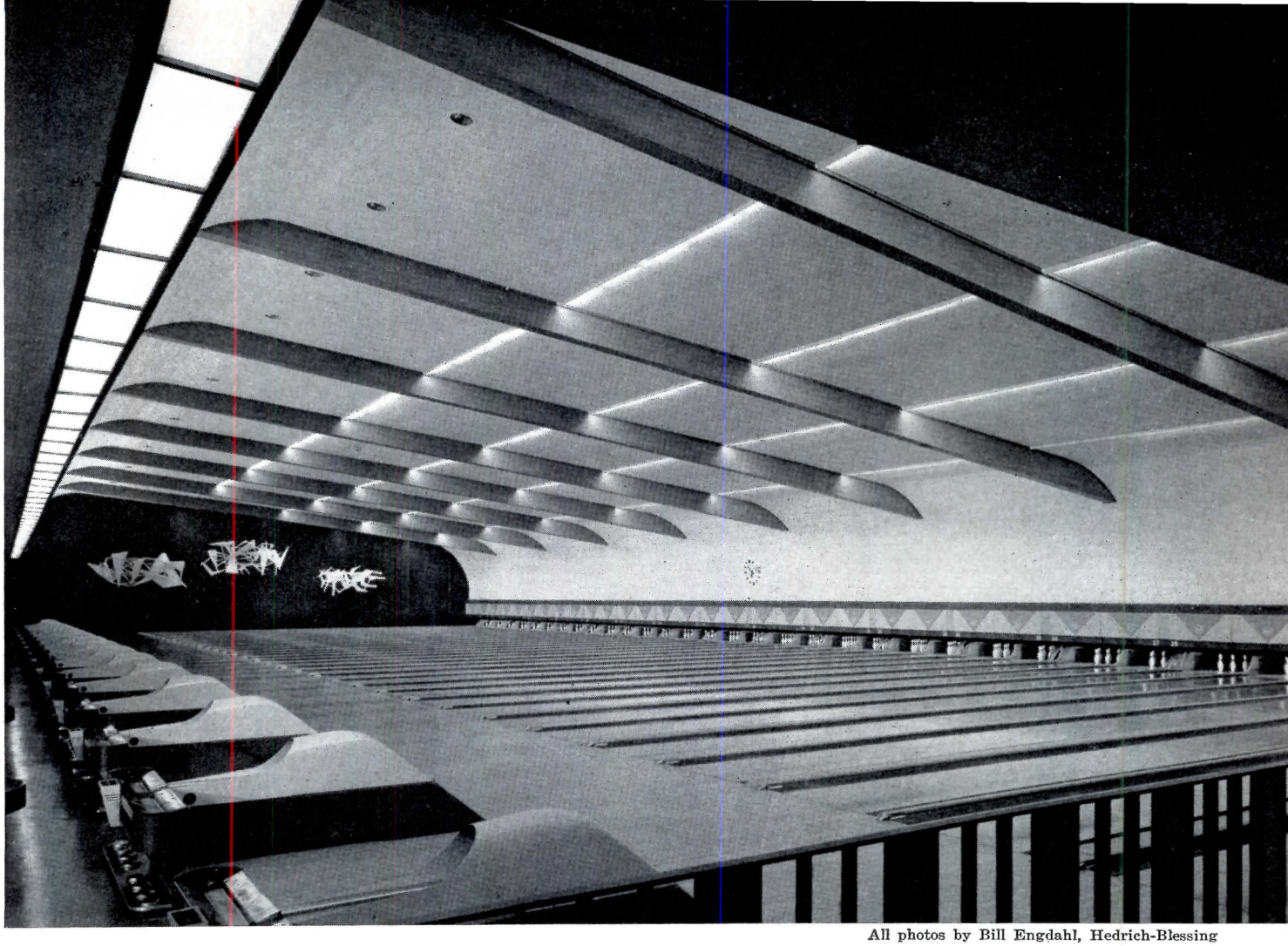
Warren Petroleum Building



The executive floor is characterized by elegant, simply finished and detailed interior materials—oil-finished walnut, white sand-finished plaster, beige carpeting, unpolished plate glass, travertine table tops, and handwoven fabrics. Executive desks and cabinets of walnut and aluminum were especially designed by the architect. Note the attractive secretarial area and detail of built-in filing, wardrobe, and supply cabinets. On this, as well as typical office floors, partitions, air conditioning, fluorescent lights, and power are arranged on a 5 ft 2 in. module for flexibility

1. Dining
2. Kitchen





All photos by Bill Engdahl, Hedrich-Blessing

Designed To Lend Glamour To Bowling

All Star Bowling Alleys
Stokie, Illinois

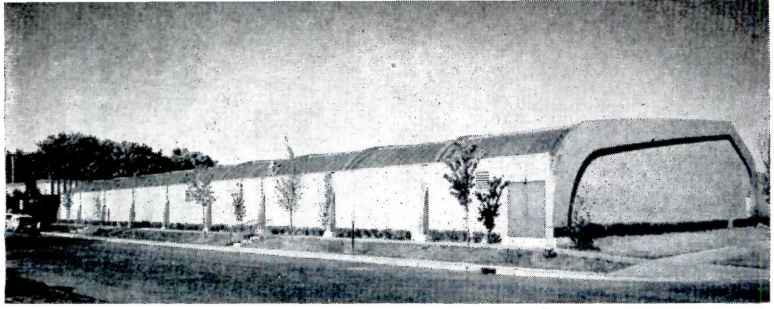
Barancik, Conte & Assoc.
Architects

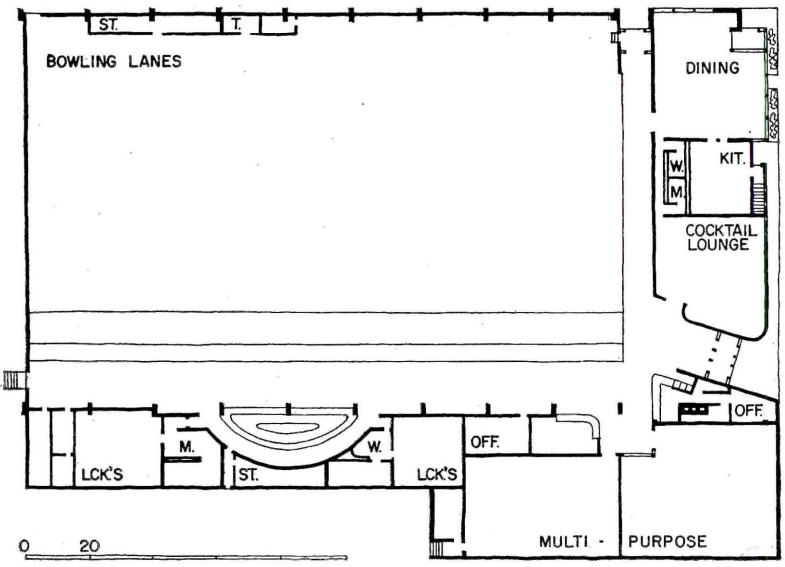
David Cheskin
Structural Engineer

Abramson & Klipp
Mechanical & Electrical
Engineers

Accommodating 34 bowling alleys plus a restaurant, cocktail lounge, billiard room, bar, and locker rooms, this air-conditioned building was designed to bring glamour and respectability to bowling—a sport long associated in many minds with a "pool-room" atmosphere and often housed in a barn-like, industrial type of structure. The venture has been notably successful; has remained open (due to the press of business) 24 hours a day.

The main bowling space, shown above, is framed over by laminated wood bents spanning 130 ft., also visible on the exterior (see next page). The ceiling is finished with acoustical tile, while the end wall is clad in random thicknesses of insulating cork plank (2, 4, 6, and 8 in.) arranged to create an interesting vertical pattern. The white plaster sculpture mounted on this wall was designed and executed by Abbot Pattison, who also did the exterior metal sculpture by the entrance.





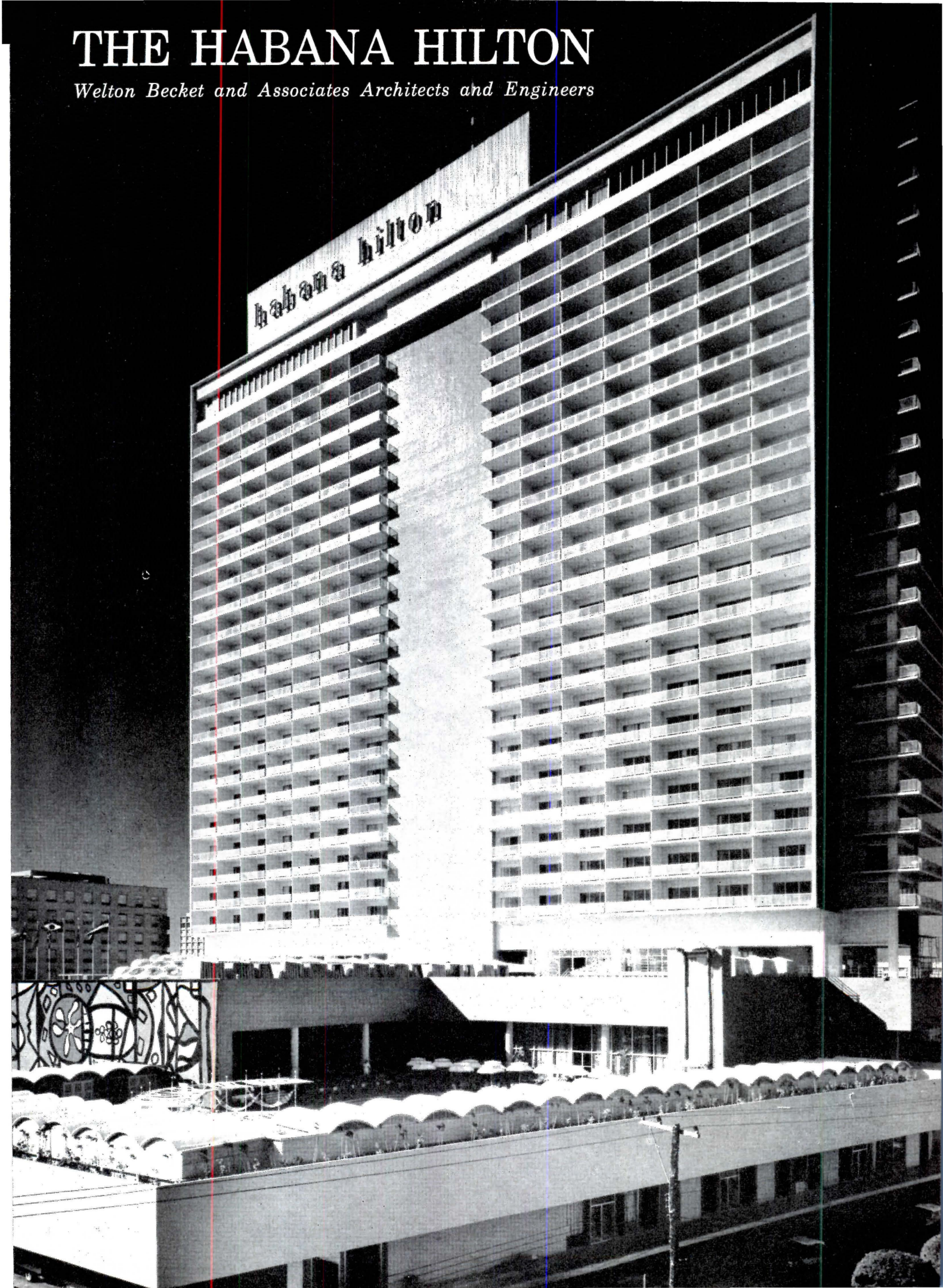
All Star Bowling Alley

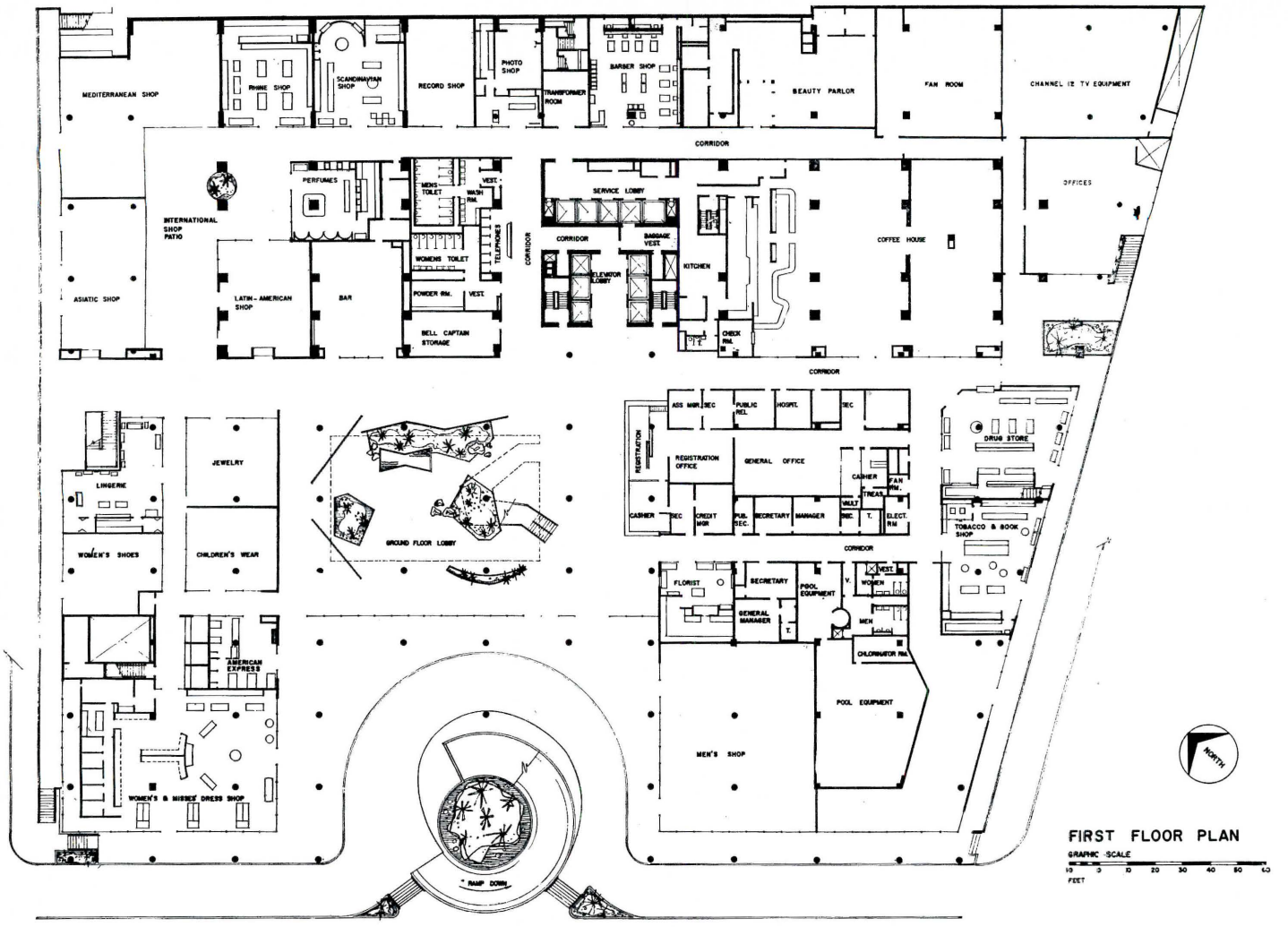
The alleys, designed and installed by American Machine & Foundry, are flanked on two sides—see plan—by a gray carpeted corridor. The players area at the rear of the alleys is floored in putty gray vinyl tile, and contains seating—designed by the architects—plastic-upholstered in a variety of colors that serve to identify groupings, further marked by similar colored inserts in the surrounding railing.

Wood paneling for the bar (bottom photo) and billiard room is Philippine pal dao; while stone walls, where carried inside, are untrimmed ashlar in a range from light tan to pink, with spottings of light blue

THE HABANA HILTON

Welton Becket and Associates Architects and Engineers





A thirty story skyscraper of six hundred and thirty rooms, Havana's new hotel is the largest and tallest building in Latin America. Operated by Conrad Hilton, it is owned by the Cuban Catering Workers Union, who partially financed its cost of $24,000,000 by means of their retirement fund.

The design consists of two major elements: a structural tower so planned that each hotel room has a balcony, and a low wide base of six levels containing a garage, equipment rooms, public rooms, shops and a terrace swimming pool. The building rests on a concrete "spread footing" foundation based on grouted coral (highly porous coral, pressure-filled with concrete). The main shaft of the structure obtains its lateral strength from a design which provides a concrete stiffening wall at two-room intervals, plus a rigid central service core.

The architects have used many Cuban materials for exterior and interior finish. Generous use was made of native woods. Although the main body of the structure is finished in blue glass mosaic imported from Italy, its lower elements are of native volcanic stone. Cuban artists were invited to cover large areas of the exterior with bold mosaic murals. Paintings and sculpture by Cubans appear in the public rooms and suites.

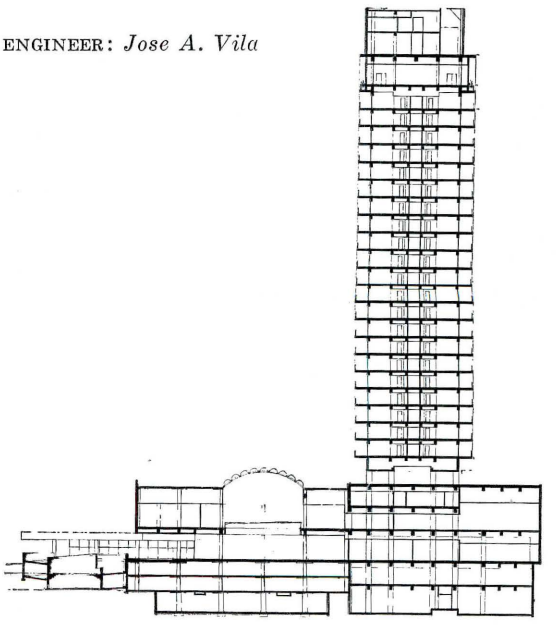
The Habana Hilton

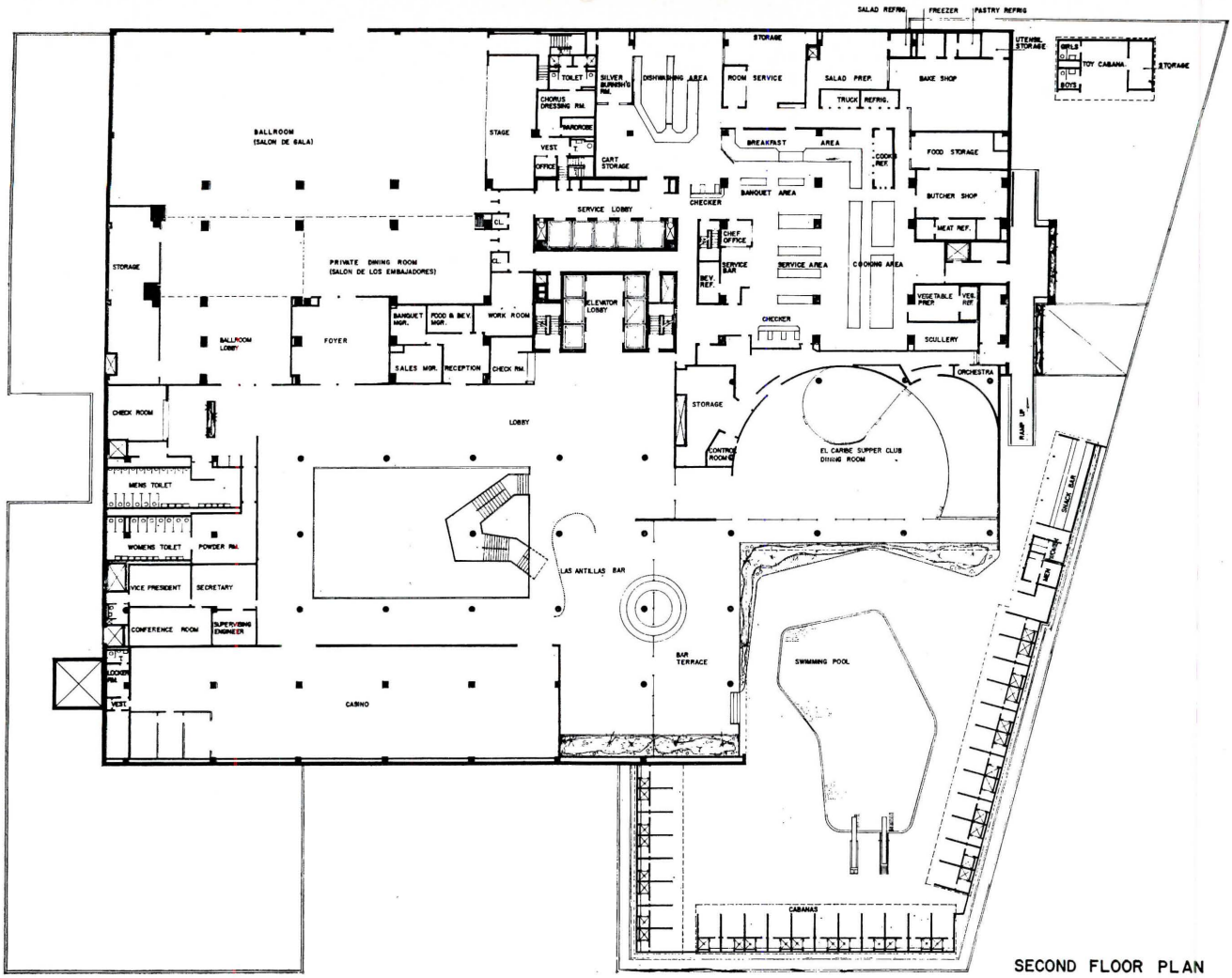
ARCHITECTS: *Welton Becket and Associates*

ASSOCIATE ARCHITECTS: *Nicolas Arroyo and Gabriela Menendez*

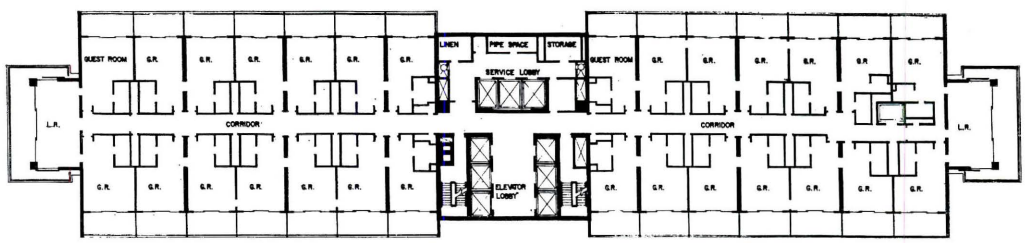
GENERAL CONTRACTOR: *Frederick Snare Corporation*

STRUCTURAL ENGINEER: *Jose A. Vila*



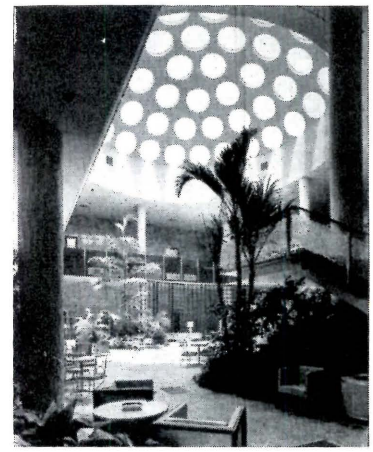


SECOND FLOOR PLAN



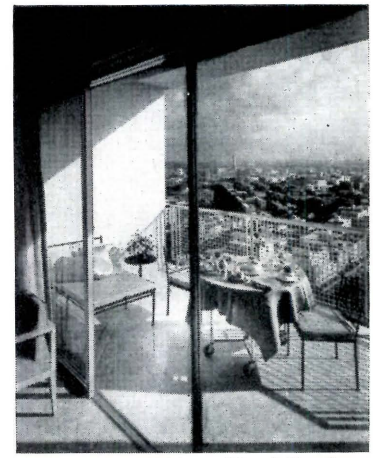
TYPICAL FLOOR PLAN

At first floor level (see plan opposite page) the hotel visitor may arrive at the main entrance and turn his car over to an attendant who drives it down an adjacent spiral ramp to the basement garage. The individual room unit (left) is flexibly arranged so that it can be a sitting room by day and a bedroom by night. Intercommunicating doors offer a parlor and bedroom suite combination. Dressing area is well planned



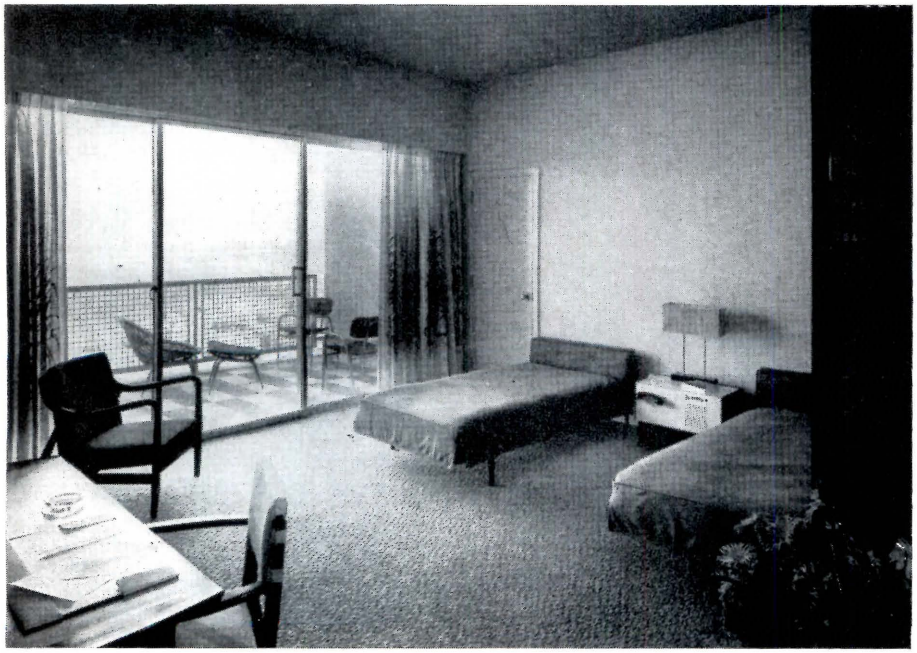
The Antillas Bar on the upper lobby floor is dominated by a ten-panel ceramic tile mural by Rene Portocarrero. Each panel in the mural represents a legend or myth of the Carribean area. Bar and table tops are faced with orange and yellow Venetian glass mosaic. The bar is circular and extends beyond the glass wall to an open terrace overlooking the pool. In the main lobby (right) are lush tropical plants

The Habana Hilton



Lionel Freedman

Sliding screen which separates dressing area from bedroom can be seen on the right in the photograph above. It is of stained mahogany and particle board. Balcony floors are of terrazzo. Railings and sliding windows are of anodized satin aluminum



House in Maryland has living room pool

Residence for
Mr. and Mrs. Edward M. Passano
Easton, Maryland

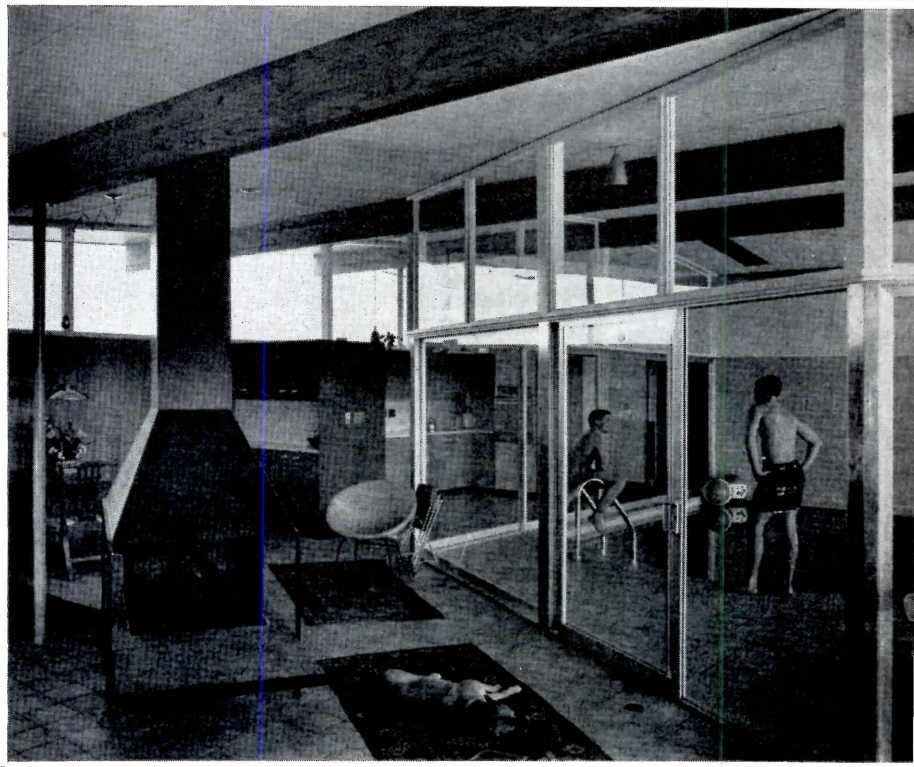
Wilson and Christie
Associated Architects

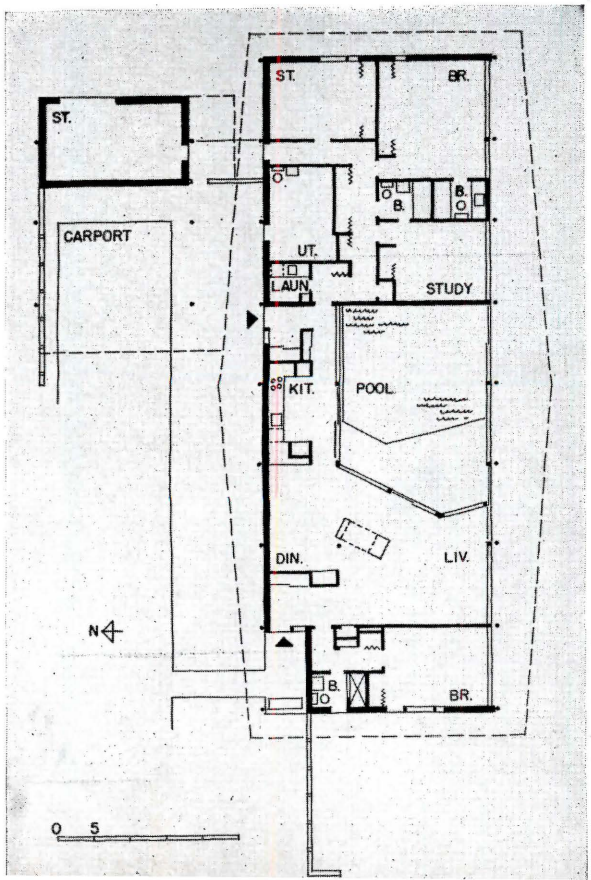
Frank E. Daffin
Contractor

E. Bruce Beetjer
Landscape Architect

S. Yeardley Smith
Consulting Engineer

Wm. H. Thompson
Consulting Engineer

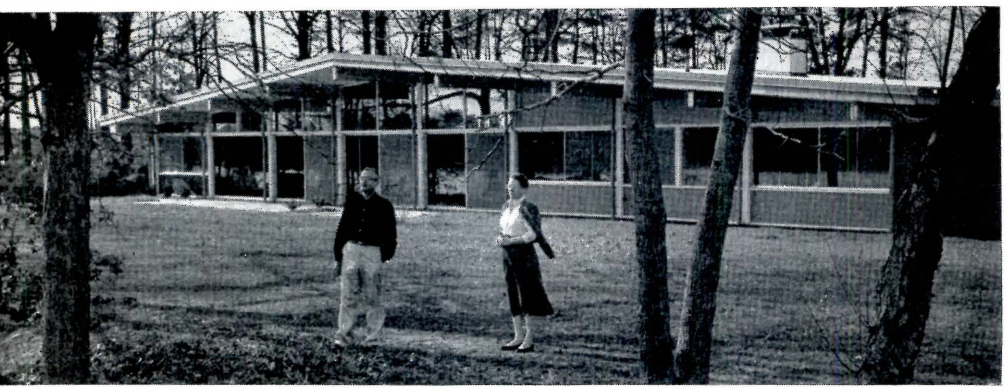


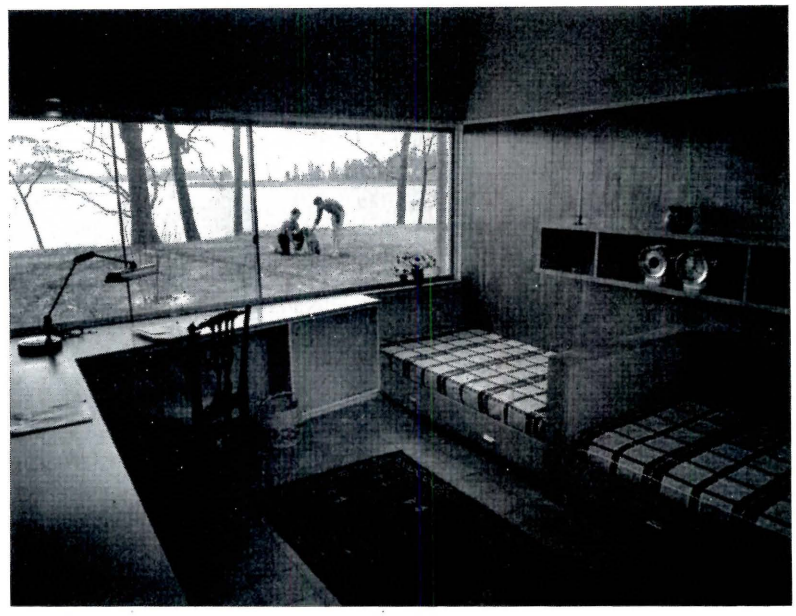


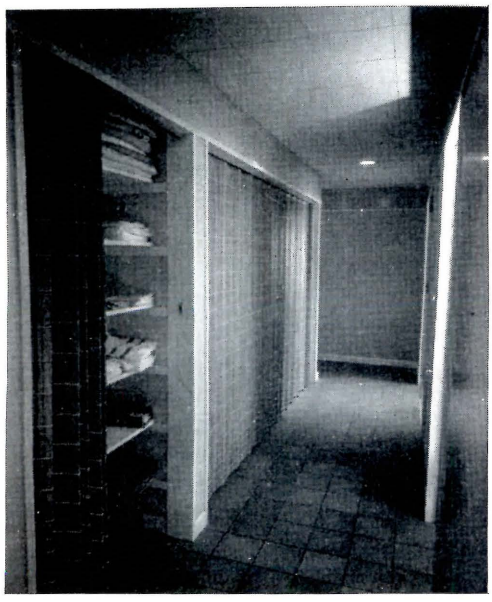
A swimming pool in the living room was the one all-important owner's requirement around which this weekend and vacation house was planned. The pool, roughly 21 by 21 feet in size, with a maximum depth of 7 feet at the center, was intended to be—and obviously is—the focal point for family activity even though the house occupies a water-front site: in Maryland outdoor swimming is out of the question through the winter months, and during the summer the river on which this home fronts is besieged by nettles which plague the swimmers.

The pool has three walls of glass and aluminum sliding doors, and one wall of concrete masonry units faced with glazed plastic tile. Pool ceiling is cork acoustical tile cemented to cement asbestos board; plastic sheeting on under side of joists provides vapor seal. Water comes from 600-ft deep well, is circulated through diatomaceous filter, heated (in winter) and chlorinated. It needs no changing.

House in Maryland







Almost all furniture is built in to simplify maintenance, and flooring throughout house is tough plastic tile with glass silica sand aggregate. Roof is wood joists on exposed laminated pine beams supported by steel columns, providing continuous joist space full length of house and permitting use of strip diffusers over large glass areas. House is air conditioned (two seperate units operated from one exterior tower), and has combination floor radiant and warm air heating system; warm air system only is used until outside temperature falls below 50 F at which point radiant system, controlled by outside thermostat, automatically starts to operate

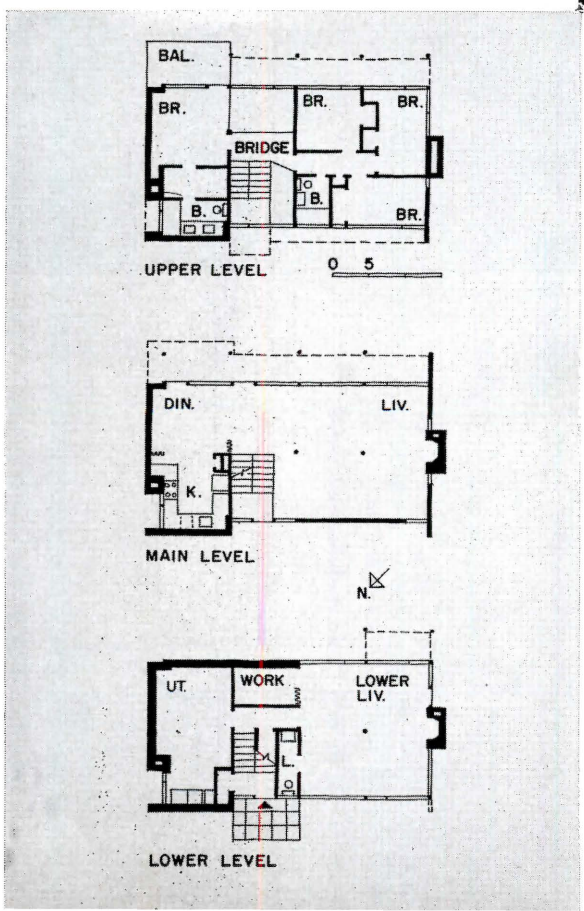
Narrow city lot yields space for outdoor living

Residence for
Mr. and Mrs. Thomas W. D. Wright
Washington, D. C.

Leon Brown &
Thomas W. D. Wright
Architects

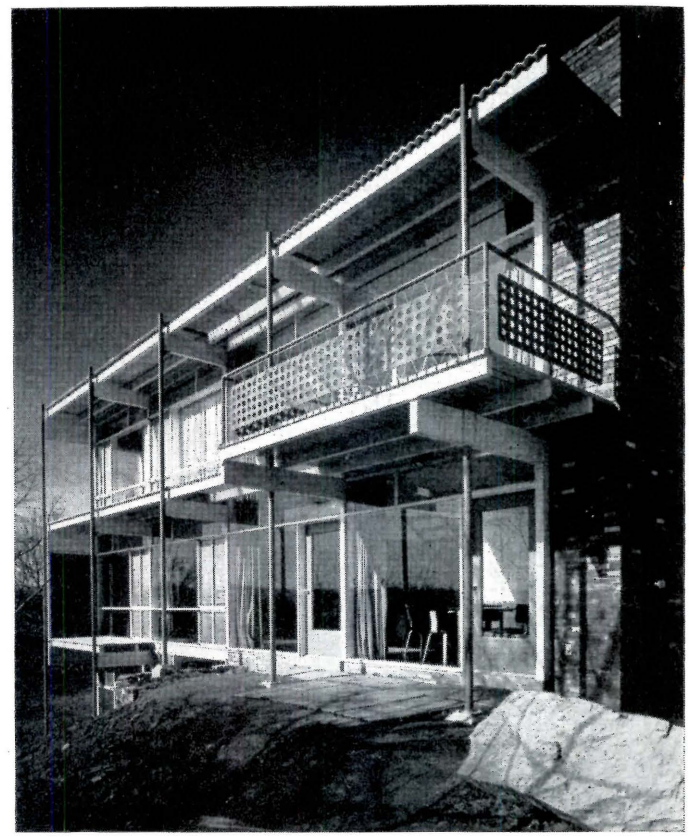
Flack and Derrenbacker
General Contractor

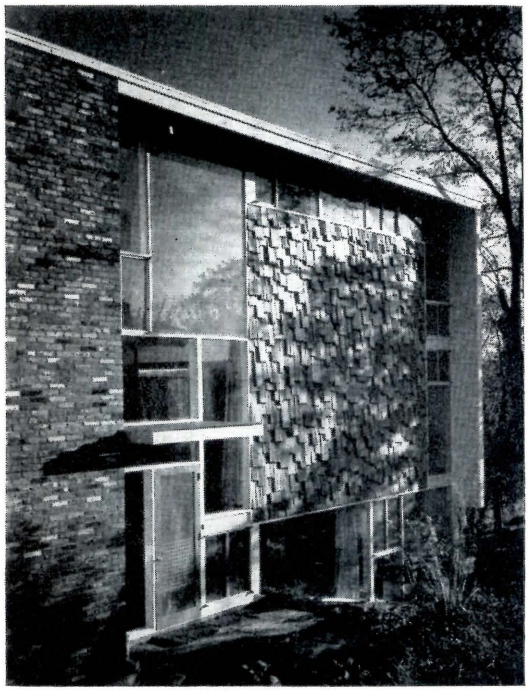
R. G. Picard
Heating Engineer

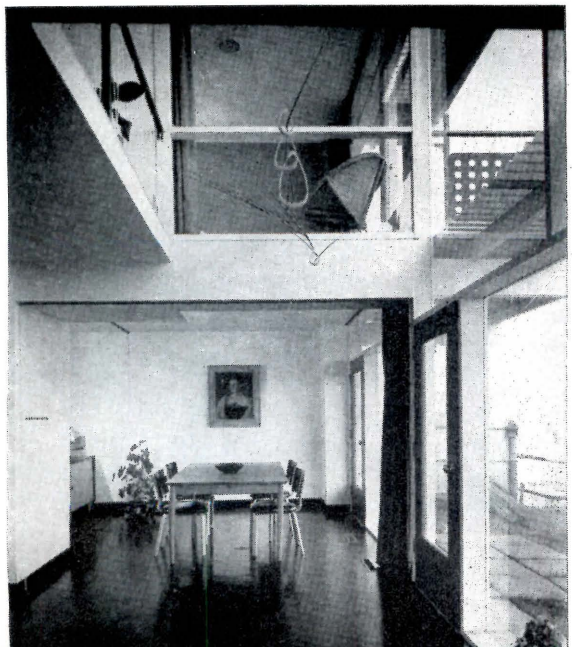


A narrow city lot with a magnificent view of the city of Washington was the main consideration in the design of this year-round residence. For maximum enjoyment of the view (the Washington monument, the Lincoln Memorial, Georgetown University, the Potomac River, the Virginia hills, etc.) the house was built at the top of the site, close to the street but 18 ft. above it, and was made three stories in height; ground coverage was thus kept to a minimum and 100 feet of the 150-ft lot remained clear for a garden, on grade with the lowest level. The main (living room) floor opens to a terrace facing the view, sheltered in part by a balcony off the master bedroom.

Construction is wood and steel pipe frame on a concrete foundation. Exterior walls are used brick and red cedar shingles. Interior walls and ceilings are sheetrock, floors are asphalt-tile. Cost was $9.50 per square foot of living space.





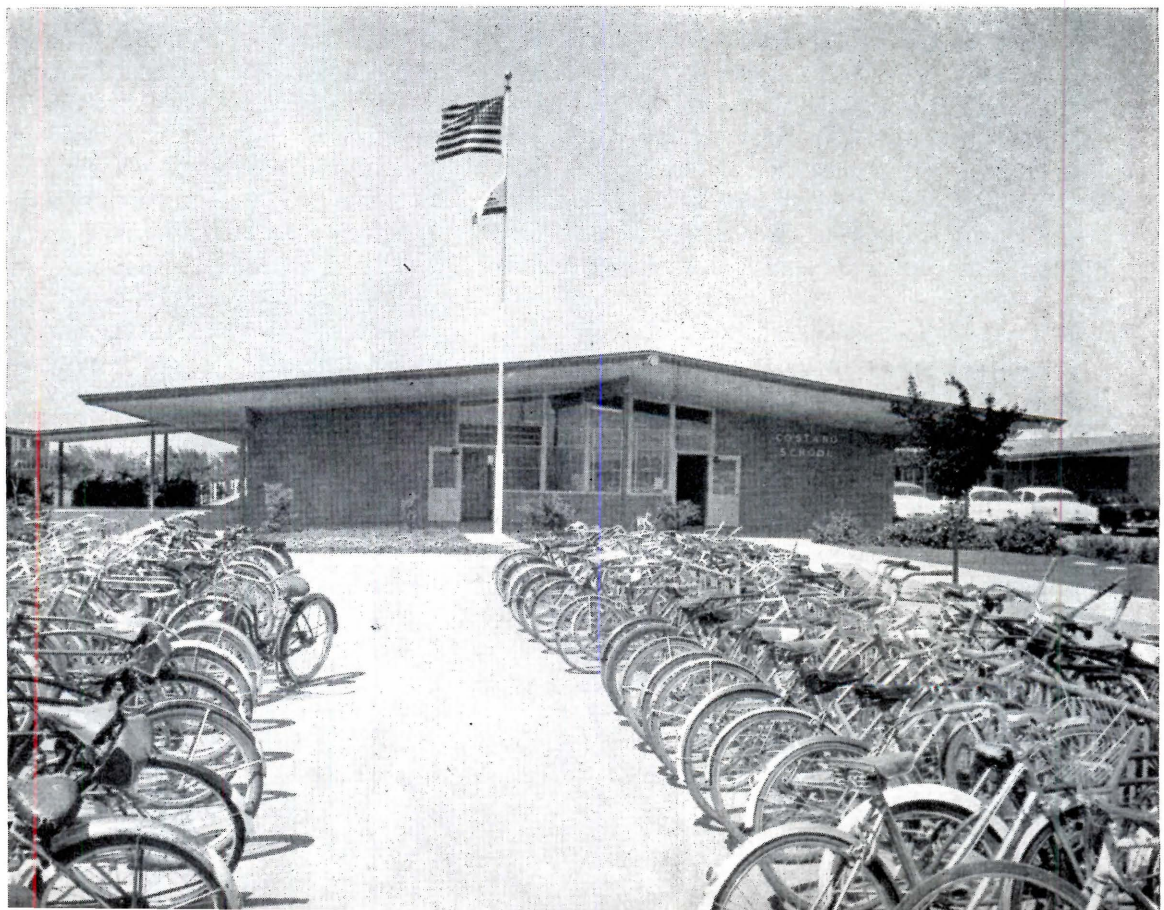


Exterior of house is colorful with light blue sunshades on vermilion columns; mellow old brick (which eventually will be vine-covered) and 1¼-in.-thick cedar shakes provide interesting textural content with long glass walls. Interior stresses openness and view, particularly in living-dining area on intermediate level. Bedroom area above is divided into two wings, one for the children and the other for the parents, joined by a bridge across the two-story living rooms. Children's rooms are small, but "large enough for overnight guests in trundle beds." Noise isolation is good, the architect-owner reports, and the stairs are "healthy exercise"

THE COST PROBLEM IN SCHOOLS

The cost problem in schools is a two-edged one: cheapness versus elaborately complete facilities for our educational system. Rigid pursuit of either extreme can lead to difficulties. It is each architect's obligation to weigh the factors for a given school, and soundly balance the requirements with the funds available.

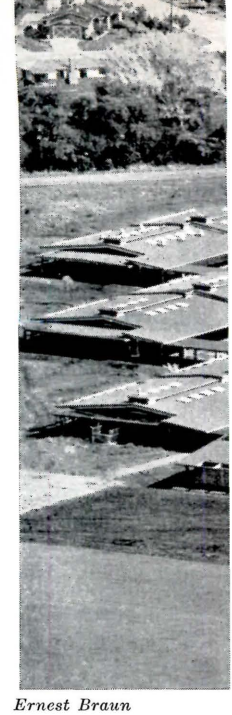
The recently released Rockefeller Report on education has a significant title, "The Pursuit of Excellence", and poses a great challenge: "An educational system grudgingly and tardily patched to meet the needs of the moment will be perpetually out of date. We must build for the future in education as daringly and aggressively as we have built other aspects of our national life in the past."



Costano School, East Palo Alto, California. Peter Kump, Architect.

SIX KEYS TO SCHOOL ECONOMY

1. **Eliminate the unnecessary**—justify every item throughout.
2. **Reduce quantities** by imaginative site adaptation, multiple use of spaces and components.
3. **Judge and balance selection of materials** within appropriate cost range.
4. **Design for Flexibility.** Facilitate future space and functional changes and additions.
5. **Design for easier construction** by creating dimensional order with or without modules. Reduce number of different field operations required and call for fewer different sizes and parts that require cutting and fitting.
6. **Exercise creative administration.** Organize and frame drawings and specs to produce most intelligent and informed bids. Be alert to advantages of proper bid timing and use up-to-date knowledge of locally available materials and labor. Conduct all projects on orderly and punctual time schedules.



Ernest Braun

THE ARCHITECT'S PART IN SCHOOL

By Kenneth Reid and James D. Fessenden, Office of Ernest J. Kump

OVERALL economy, from the time the school is planned until it is finally abandoned as obsolete, is a major part of the architectural problem that must be satisfactorily solved. An inappropriately expensive public school, no matter how well arranged or beautiful it may be, is not acceptable as the correct solution today. The architect's responsibility to the public client includes the duty of providing the greatest value for the money available. In each case, the community—not the architect—should determine (according to its needs, desires, and resources) the minimum acceptable content and the maximum price.

To a unique extent, as compared to other building costs, school costs are today under the microscope for dissection, analysis, and comparison—not only among the professionals of architecture and education, but with increasing frequency in lay fora and public prints. The facts, figures, and formulas that have consequently been made available for bandying about by incompletely informed but sometimes extremely vocal individuals have produced at least as much confusion as enlightenment.

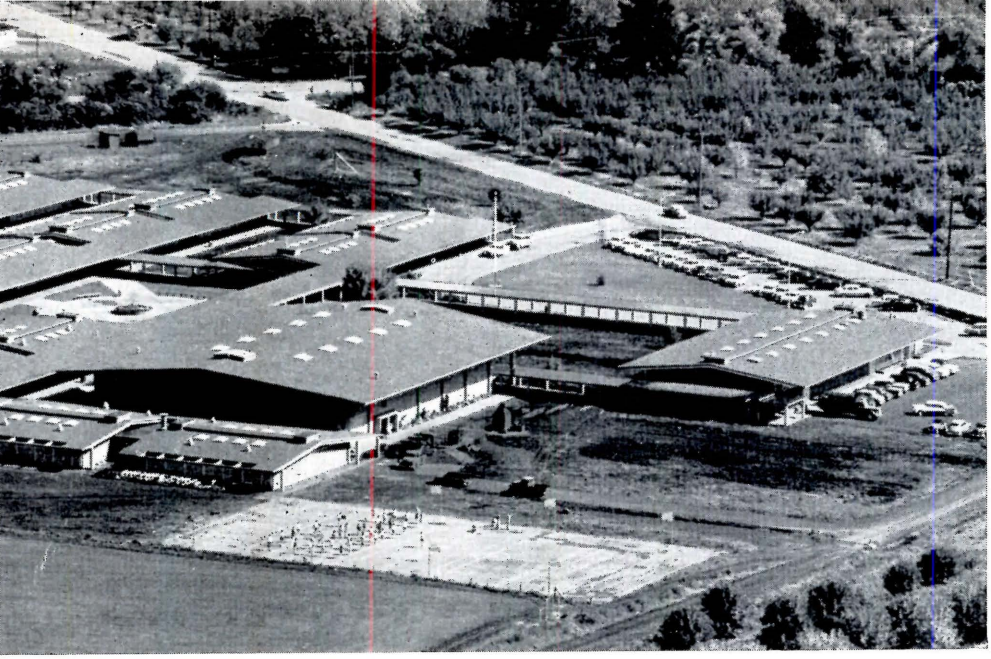
True Cost is a Multiple Factor

Strangely enough, or perhaps not so strangely, it often happens that the school which is most successful in combining the virtues of "commodity, firmness, and delight" turns out to be the most truly economical. To accept this, the "cost" must be regarded as including not merely the initial capital outlay, but also the costs of operating, maintaining, adapting, expanding, and insuring the plant over its effective lifetime. The "values" received in return must be understood to include not only educational utility and flexibility, physical comfort and safety, but the spiritual and emotional educational forces exerted by an environment.

This is a broad, farsighted view, shared by a proportion of our enlightened citizenry but not always by the more typical taxpayer, whose woes are not easily assuaged by pointing out to him that the part of his school dollar used for new buildings is only a small fraction of the total educational budget.

School Cost Per Child is Stable

Actually, the school cost record over the past twenty years has been remarkable. During that time, in the face of steadily rising dollar cost of everything, the cost per child of school building has remained almost stationary. In terms of square foot costs of construction, school building prices have about doubled, while the unit prices of *all* types of buildings have almost tripled. According to John Lyon Reid of Cali-



MODULAR COORDINATION: Miramonte High School in California (left), is the first consructed example of the use of Ernest J. Kump's Basic Space Module. This is based on the economic advantage of repetitive components: whole buildings of identical structural, mechanical, and electrical design are repeated many times in a large school

MODERN BUILDING METHODS: prefabricated concrete columns and joists used in all two-story portions of this large high school in Allen Park, Michigan, speeded construction and eliminated much expensive formwork. Eberle M. Smith Associates, Inc., Architects

ECONOMY

Lens-Art

fornia, elementry schools erected in the twenties and now being torn down because of obsolescence, originally cost about five dollars a square foot and contained from 120 to 140 square feet per pupil. Their replacements today in California afford better and safer education facilities at 55 square feet per pupil and are costing on the average around $12.50 a square foot. Thus, the building expenditure per child has remained between six and seven hundred dollars—and the power of the individual dollar has shrunk.

Says John Reid, "If we were to build today a 1930 school, and assumed school construction costs had risen the same as average building costs, we would now be spending $2050 to house one school child. But instead, while building better school plants to house a more expanded scholastic program, we are spending only a third this amount." In this light, the school building today is a bargain!

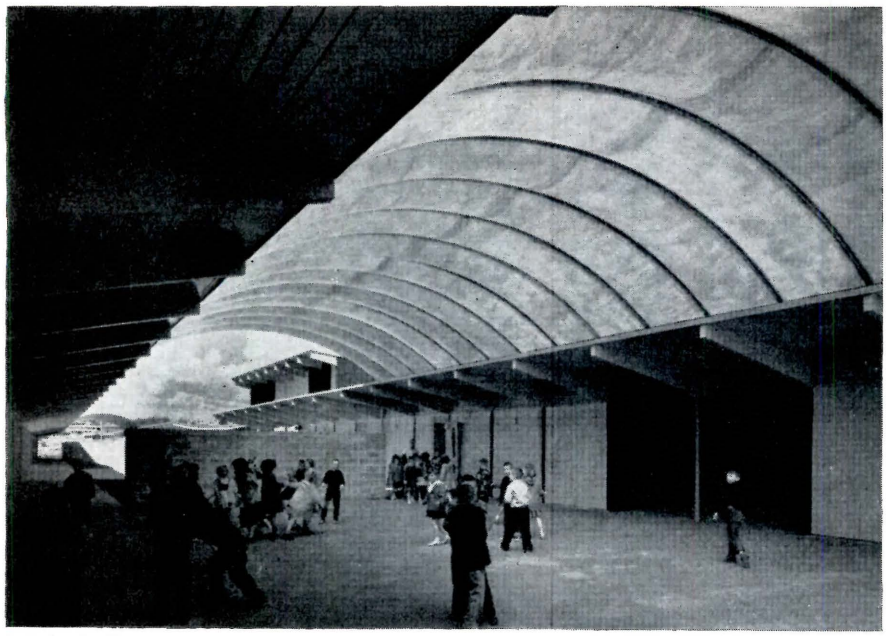
Research and Good Management Are Vital

Of course, architects alone have not been responsible for all the improvements and economies. But they have coordinated and effectively applied the results of the group thinking. As a profession they have pooled their experience and shared their researches for the common good. Every serious architect has approached his school building project as a challenge to develop better plant in all respects—and at a cost within the capacity of the community. But he must be constantly on the watch for new ways to apply the principles of true economy.

Biggest economies always come from basic principles adopted by the architect, tested and confirmed by his experience, and consistently applied in *all* phases of his work, including the management of his own office and adminstration of each job. If it is his nature to be orderly and to follow well-organized procedures with each step supporting the next, he is most likely to produce greatest value for money.

Elimination of Frills is The First Saving

The revolution in school design relative to reducing costs really began in the middle or late thirties, with the reduction and elimination of the expensive and unfunctional "architectural embellishments" that used to be favored on public buildings to add to their seeming importance. The depression ended the feeling of public opulence, and it became fashionable to take a good hard look at any extraneous adornments that could be dispensed with. Then materials were studied to see whether less expensive and equally or more durable substitutes could be found to replace the costly decorative outer and inner surfaces long



Charles R. Pearson

NEW USE OF EXISTING MATERIALS: an available plastic product has been skillfully adapted to roof several playsheds between buildings in the Phantom Lake Elementry School, Bellevue, Washington. Installed cost was substantially less than usual roof. Naramore, Bain, Brady, and Johanson, Architects

MULTIPLE USE AND REPETITIVE PARTS: in the Parkway Junior-Senior High School, near St. Louis, Architects Hellmuth, Obata, and Kassebaum used three nearly identical classroom buildings to segregate age groups into small schools within the total school. Each unit groups classrooms around a multi-purpose area which serves as corridor, temporary gym, and special projects area

countenanced in many areas. These things made great cost reductions.

Smaller, Flexible Spaces Give Better Value

Quantities were an obvious cost factor, and architects became more attentive to the matter of allocating and arranging a reduced amount of space for efficient and intensive educational use. Ceiling heights were lowered and intermittently used areas put to double or multi-use, thus saving in many ways. One-story buildings needed no stairs, saved on ceilings, permitted top-lighting and were easier to evacuate in case of fire—so came into favor.

The principle of flexibility was applied to make space changes easier and cheaper and extend the useful life of the buildings. Structural design was simplified to use materials more efficiently. Partitions were made lighter, strip-windows for extended glazing gave way to manufactured standardized wall panels, plywood and other sheet materials found many uses at greatly increased efficiency, and more and more materials and building components became available in larger units for easier handling and quicker assembly on the job.

Modular Design Offers Big Economy

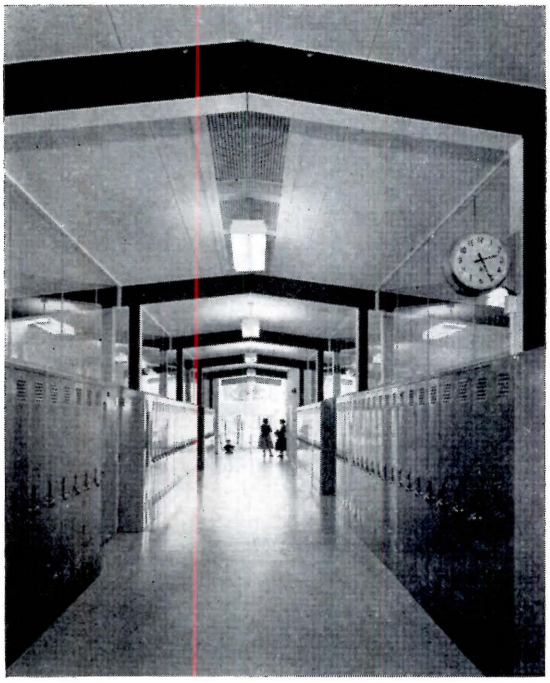
The use of modular dimensioning, as a means of bringing about a more rational relationship between manufactured products and their use in building design, has steadily increased since about 1933 and has caused product manufacturers to conform to an ever greater degree. If logic and mathematics are not enough, there now exists sufficient empirical evidence to show that its extended use promises much greater savings of time and money than any other presently known factor.

Many of the means used during the last two decades to bring about the paradoxical cost reduction for schools alluded to above have already had their maximum effect and will bring diminishing returns from now on. Buildings have been scraped clean of meaningless excrescences; areas have been reduced to near minima and volumes compressed about as far as is acceptable; structures have been simplified and lightened and made flexible almost to the limits allowed by laws and codes; new materials will continue to be devised, but it seems improbable that they will be very much less expensive than those we now have. *The great hope for further general gains in economy from now on lies in the architect's use of the increasing scientific industrialization of the building process, continuing the trend.*

Land Use is Part of the Problem

Above and beyond savings that have been and are being accomplished by the design of the buildings

MULTIPLE USE OF MATERIAL AND EQUIPMENT ELEMENTS: frankly exposed steel columns, beams, roof deck, free-standing lockers and fixtures provide neat finish for this corridor in Lake Orion High School in Michigan. Eberle M. Smith Associates, Inc., Architects



Lens-Art

MULTIPLE USE OF STRUCTURAL MATERIAL AND FORM: in the Conard High School, West Hartford, Connecticut, reinforced concrete pan construction enabled exposed structural ceilings throughout for structural, finish, acoustic, and esthetic purposes, and provided built-in light baffles to house inexpensive fixtures. Nichols and Butterfield, Architects

themselves, of course, lie a number of areas in which architects can save money for their school clients. Today's philosophy of school architecture fosters savings growing out of flexibility and ingenuity in adapting and using the sites. Since schools no longer attempt to be civic monuments, they can be much more freely shaped and disposed to take full advantage of topography, orientation, exposure, and natural accessibility.

This fresh attitude, made possible by changing times, results in opportunities for reduced expenditures for grading, foundations, drainage, retaining walls and similar costly items in site development. The land may be more efficiently used and less is likely to be wasted. There are often ways to use comparatively low-priced property for school sites, and thus produce a double saving; lower cost construction on lower cost land. The growing practice of depending heavily on the architect's experienced advice on the selection of the best available site is wise, since he is able to appraise not only the cost of the land but the cost of putting the school on it.

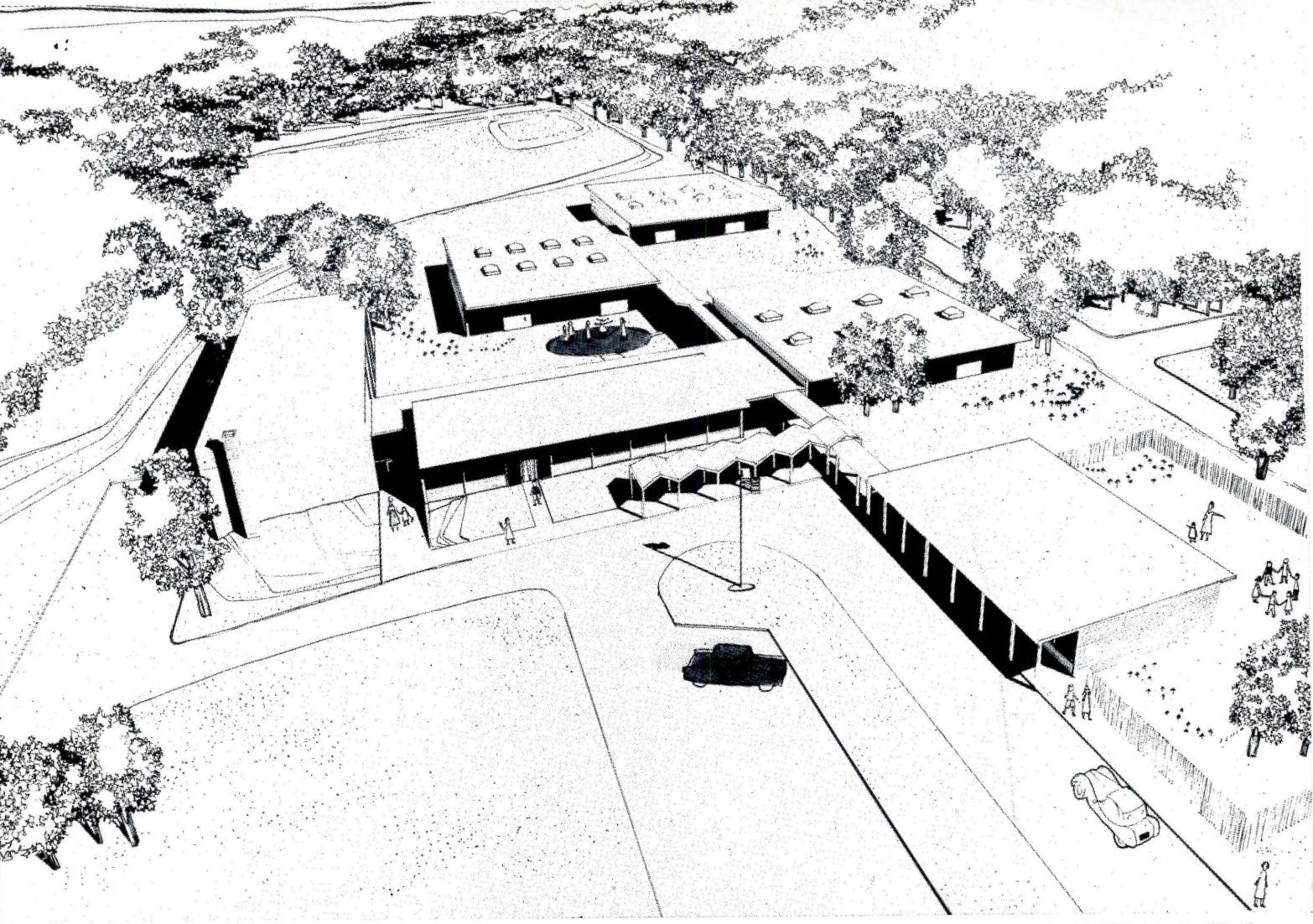
Clarity Brings Better Bids

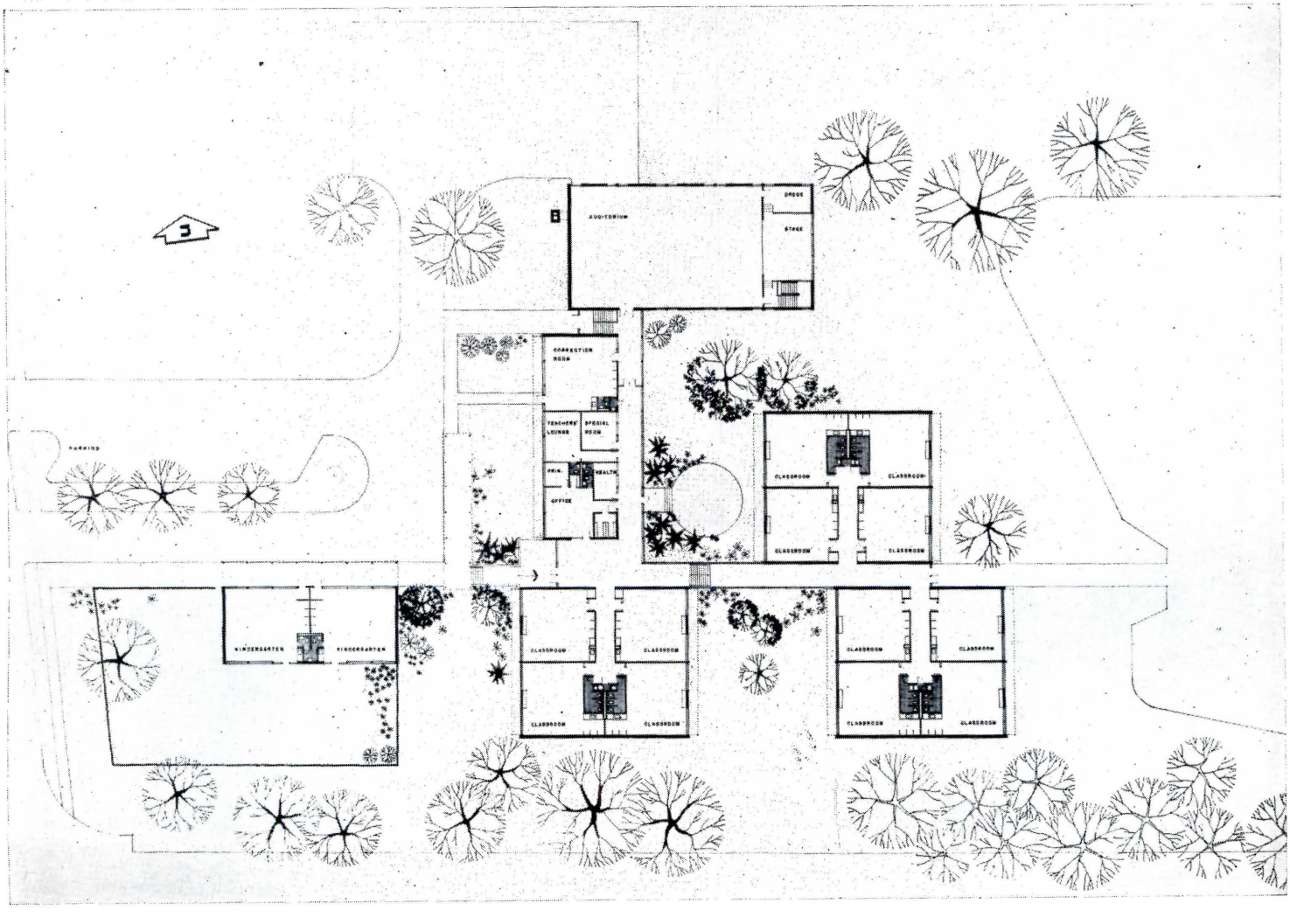
The architect who produces clear, complete, and easily understood working drawings and specifications will, other things being equal, generally bring in better bids—more accurate and more competitive. Unseen and unacknowledged but important savings are made by this factor. After all, the price of the project is determined by what the successful contractor thinks it should be, and any uncertainties, omissions, or ambiguities are allowed for in his cost estimates. Continuing research on ways to refine the scope and organization of bidding documents, so that contractors may determine ever more precisely what is required and how to accomplish it, is our urgent professional duty to our school clients.

Watch Market Conditions

Another important economic opportunity for the architect to reduce the costs of schools lies in his awareness of current market conditions relating to the availability and price fluctuations of common building materials. He should adjust his design to take best advantage of the immediate situation, and by being alert to adapt his design, construction systems, and details to exploit local or regional availability of certain classes of materials and building craftsman.

Significant savings come through good timing of both bidding and construction. Scheduling the building process to dovetail with the seasonal weather cycles is a prime necessity. It is noteworthy that even a few days difference in a bid-opening date will often avoid conflict with current bidding.




AUDITORIUM
STAGE
CORRECTION ROOM
TEACHERS LOUNGE
SPECIAL ROOM
OFFICE
CLASSROOM
KINDERGARTEN

The cost problem in this school was less one of stringent economy than of meeting programmatic requirements "at a cost no greater than that for a comparable multi-story single structure." The program required a "campus," separate building pattern, and more than common amenities. All this was provided within the budget through savings made by using a ten-foot module throughout, and by the repetition of identical "classroom clusters" using brick load-bearing walls as interior and exterior finish.

A Campus-Plan Elementary School

McGrath Elementary School
Brentwood, Missouri

Hellmuth, Obata & Kassabaum, Inc., Architects

Leslie J. Bergmeier, Structural Engineer

Ferris & Hamig, Mechanical Engineers

Frank T. Hilliker, Kitchen Consultant

Layton, Layton & Rodes, Landscape Architects

Ray M. Dilschneider, Contractor

This elementary school, designed to accommodate a maximum of 450 children, from kindergarten through sixth grade, includes six separate buildings: kindergarten, administrative unit, two-story cafeteria and auditorium, and three "clusters" of four classrooms each. All are linked by glass-enclosed, heated passageways. The kindergarten, at the front, has two large rooms each with its own entrance, wardrobe, washroom, storage and work sink facilities, and bilateral natural light. A fenced play area is accessible from both.

Each of the classroom clusters has wardrobe and washroom facilities located in the center, and separate storage space and work sinks in each room. A court in the center of the plan is developed as an outdoor area for activities and play. The administration unit includes an entrance lobby for the entire school, office facilities, health room, teachers lounge, a conference and personnel interview room, and a special classroom for handicapped or retarded children.

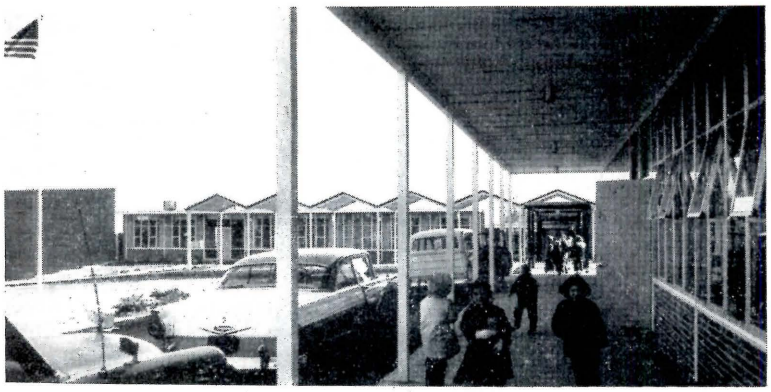
The two-story unit houses a cafeteria on the lower level, with a combination auditorium-indoor-play-area above. Two levels were used to take advantage of a slope in the site: each has a ground-level entrance.

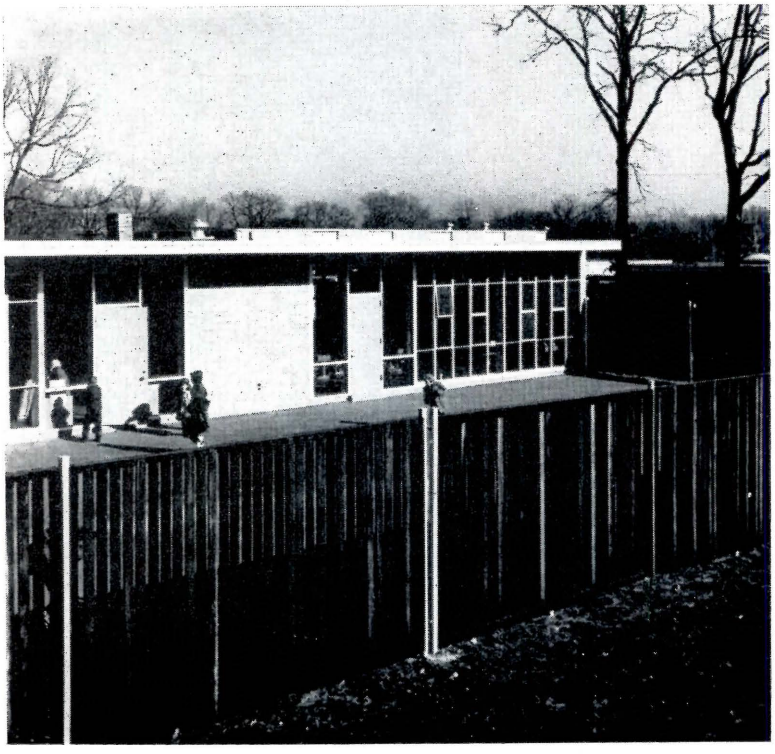
Construction of the buildings is of light steel frame with brick panels and steel bar joists for all but the classroom clusters. These have load-bearing brick walls, exposed as interior finish. Other interiors are principally painted masonry block. All ceilings are fireproof acoustical plaster except passageways. These are finished in perforated white metal over a layer of glass fiber insulation. Floors are asphalt tile, ceramic tile in washrooms.

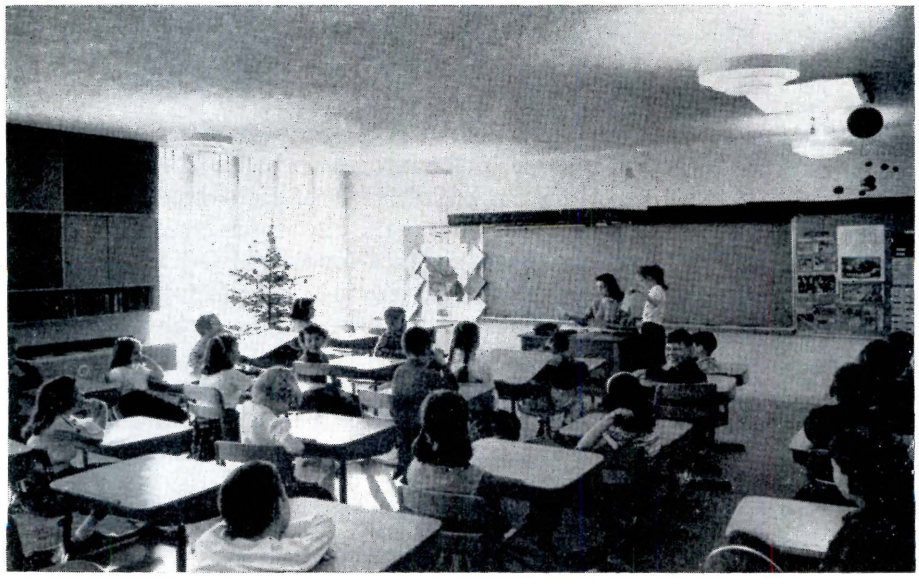
Circulating hot water heat is used throughout, with a unit ventilator in each classroom for individually controlled heat and fresh air. Kindergarten floors have radiant heating. Boiler room and major storage adjoin the cafeteria.

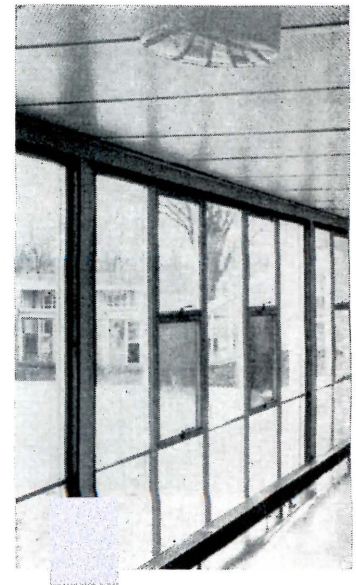
Total construction costs for the school were $419,800. This averages at about $932 per pupil for the maximum enrollment.

McGrath Elementary School



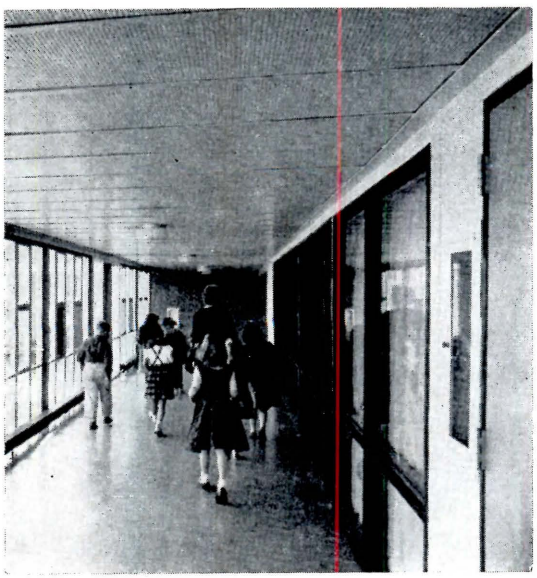


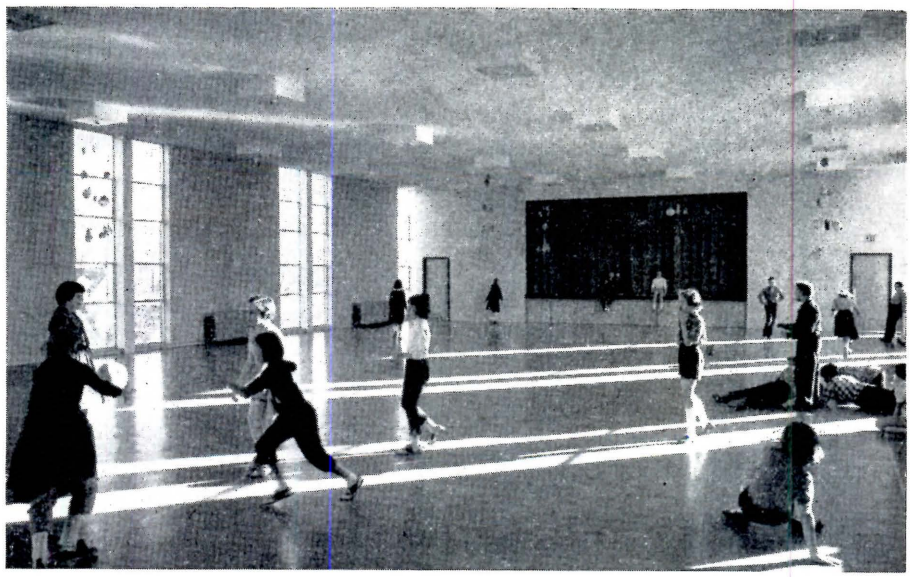


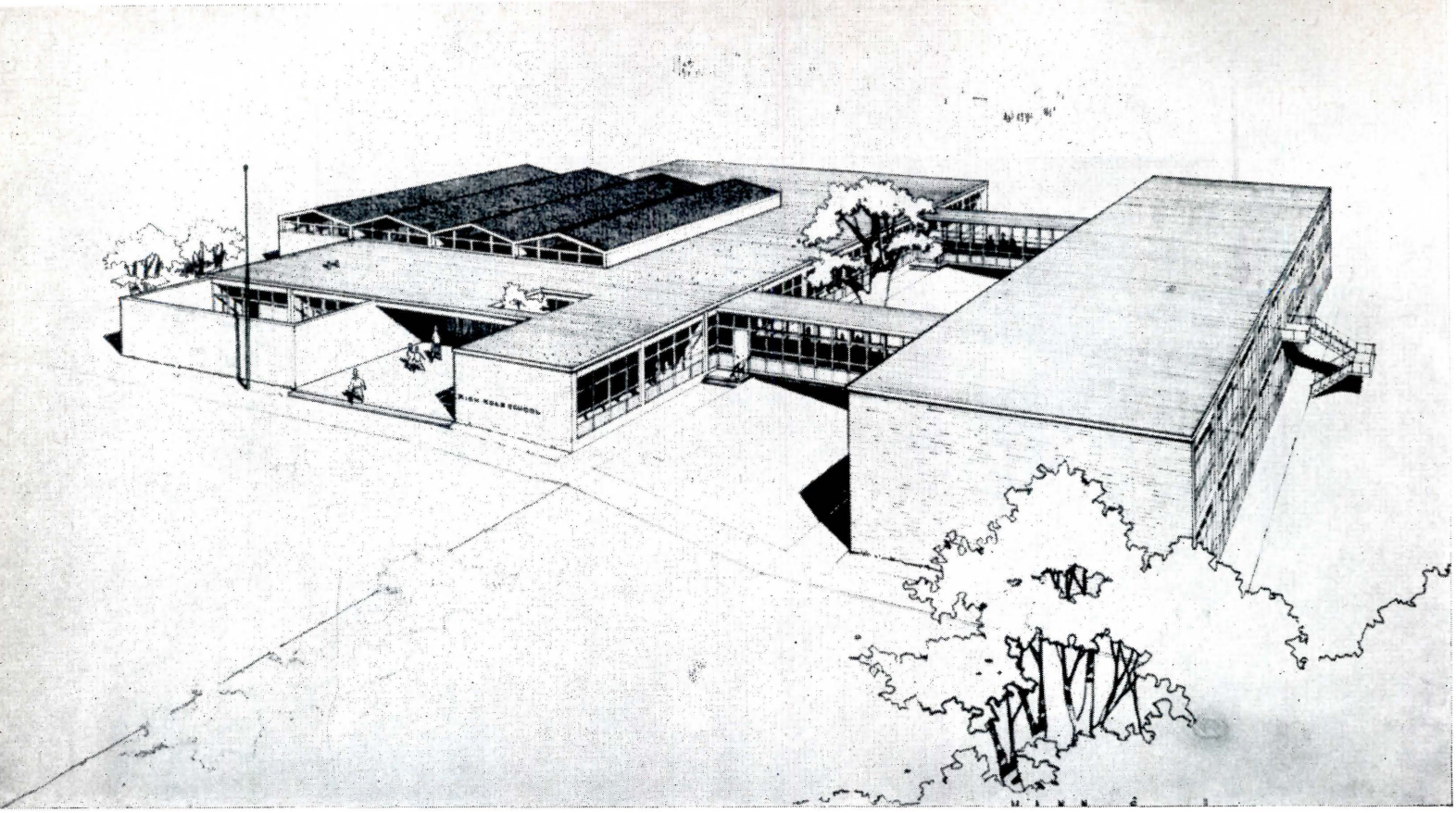


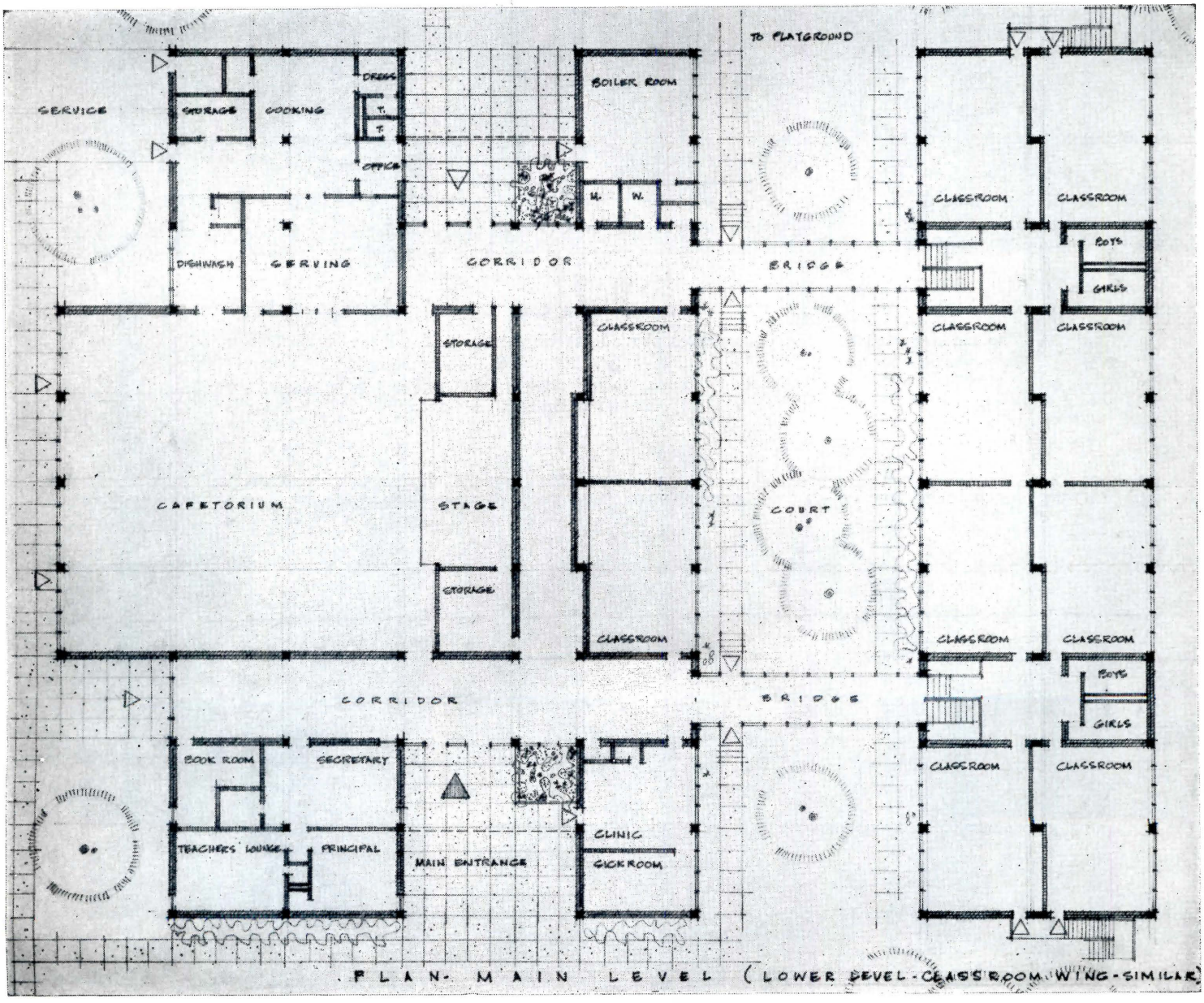
Art Fillmore

The kindergarten building (two photos above left) has access to the drive in front, a play yard in the rear. Other classrooms (below left) have plastic skylights to evenly distribute daylight. Glassed-in corridors (below center) have colored panels set in glazing. The auditorium (below right) doubles as indoor play area









PLAN- MAIN LEVEL (LOWER LEVEL-CLASSROOM WING-SIMILAR)

Costs were held to a minimum in this school—about $600 per pupil—by extremely careful attention to choice of materials and structural techniques. The width and length of classrooms and choice of furniture, lights and hardware were set by the schoolboard. A two-story variant on the cluster-classroom scheme (with access at mid-level) effected considerable saving, as did a regular bay system by giving better use of formwork for the concrete structure.

Elementary School Planned for Expansion

Richland Elementary School
Memphis, Tennessee

Mann & Harrover, Architects

Leigh Williams, Associate Architect

John Brough, Structural Engineer

Griffith Burr, Mechanical Engineer

S. & W. Construction Co., Contractors

This extremely neat elementary school makes the most of its concrete structural frame, which is left exposed and filled with steel-framed window walls, or with brick panels. The entire structure, with the exception of the multi-use auditorium-cafeteria, is based on a bay system of 15 by 23 feet, established by the per-determined classroom sizes. All columns are carefully shaped to eliminate any cutting and patching of masonry that adjoins them.

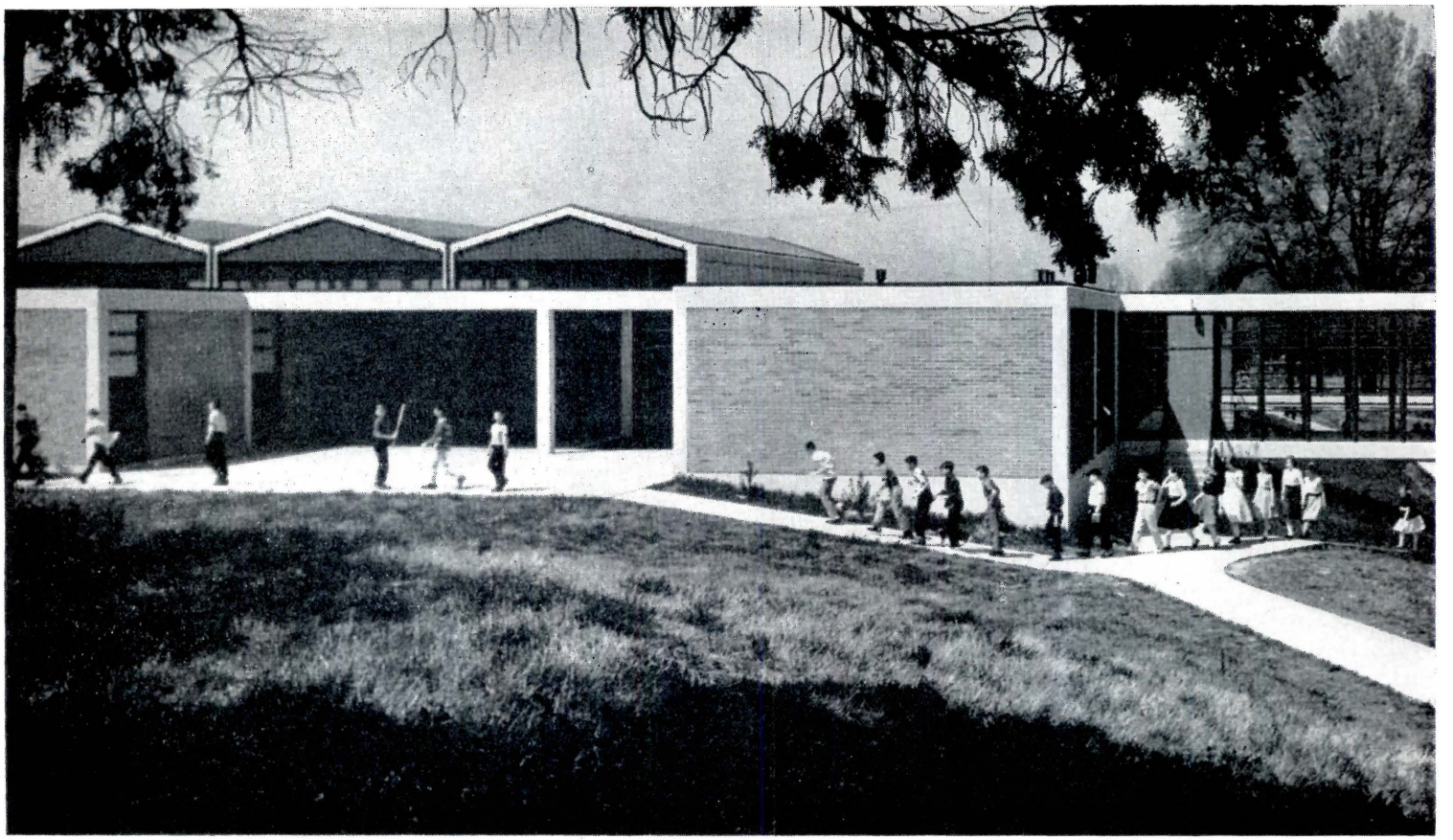
The auditorium-cafeteria has a folded plate poured-concrete roof that dominates the building complex. The roof slabs are five inches thick, stressed with post-tension cables, and have a clear span of 62½ feet. It is the first time this type of construction has been used in that part of the U.S., and eliminated interior columns or excessively deep beams that would otherwise have been needed with concrete construction.

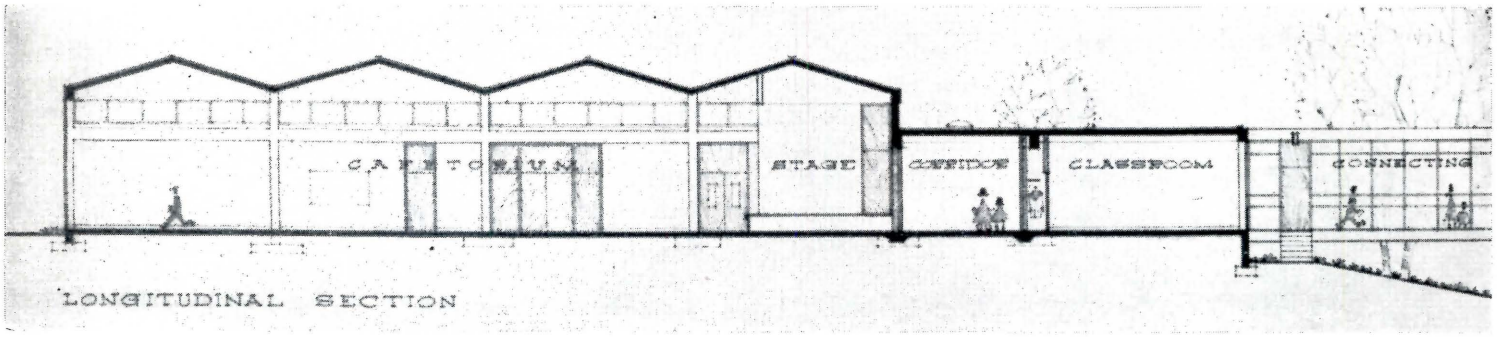
The "bridges" connecting the two parts of the school are formed of precast concrete channels, which are low cost, and dropped into place by a crane.

The underside of all roof-ceiling slabs are sprayed with an acoustical material, which also eliminated the necessity for extra finishing and painting. All corridor walls are finished with a gray manganese brick, which has an extemely easy-to-keep surface. Gray quarry tile is used in kitchens and toilets. Bright colors are introduced in metal panels beneath the windows, and on doors and stairrails.

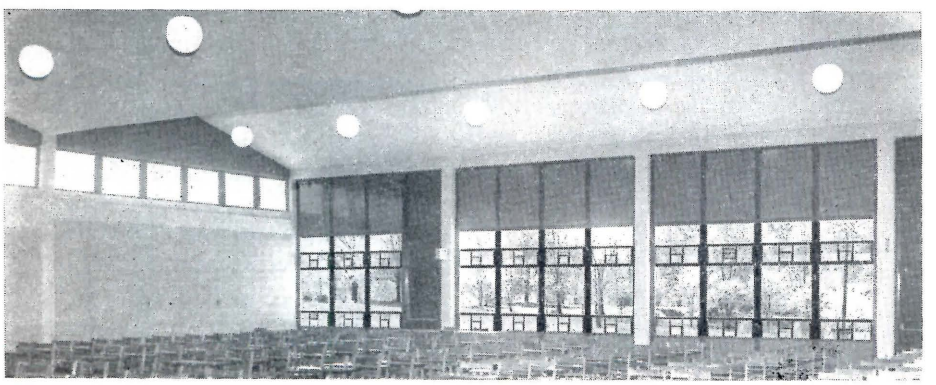
The architects estimate that about 3000 square feet of corridor space was eliminated by the variation of the cluster concept in the two-story unit. At the buildings cost of about $10 per square foot, about $30,000 was reportedly saved.

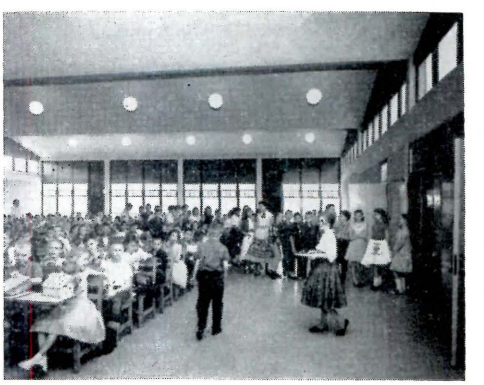
One of the prime reasons for the separation of the two units of the school is to facilitate expansion, and community use of the auditorium at night. A junior high school wing will be added shortly. Cafeteria chairs with broad arms double as dining "tables" and as spectator seating without shifting in the combination auditorium cafeteria.

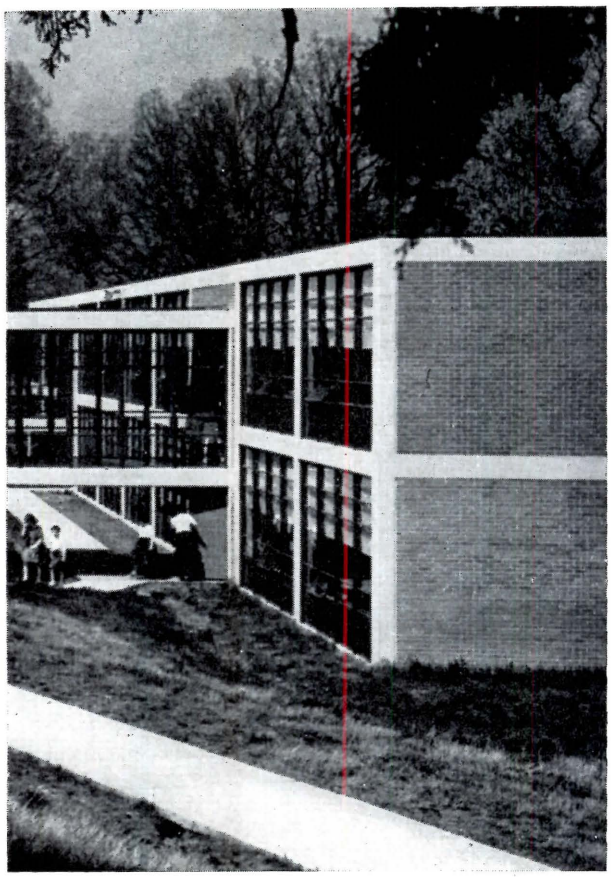


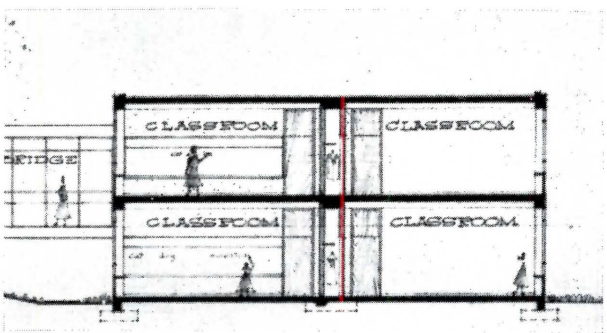


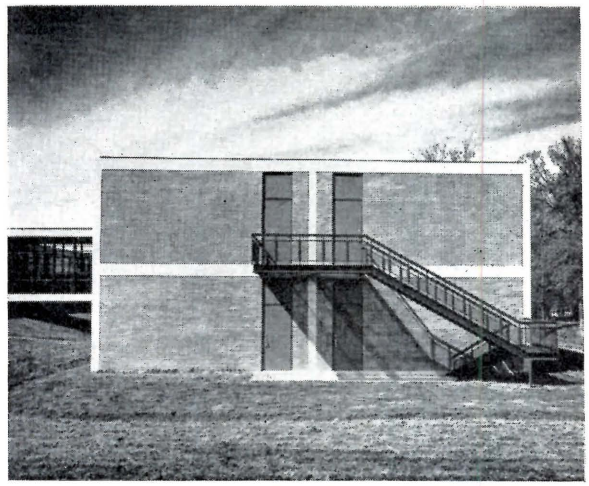
The administration and auditorium unit (at left in photo above) will form the hub of a larger eventual school complex. The three photos below show the "cafetorium" and its special access for use by the community

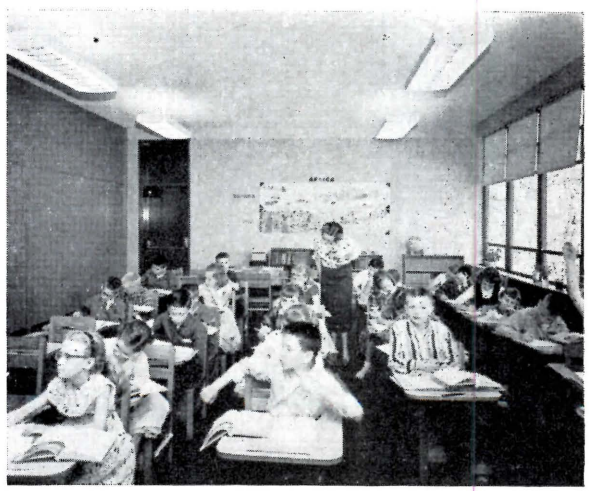






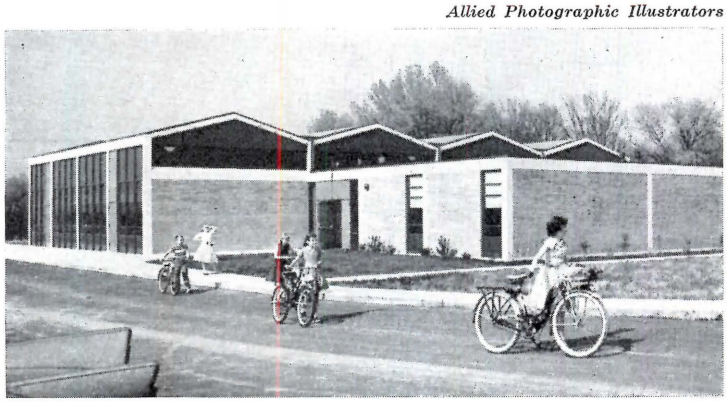


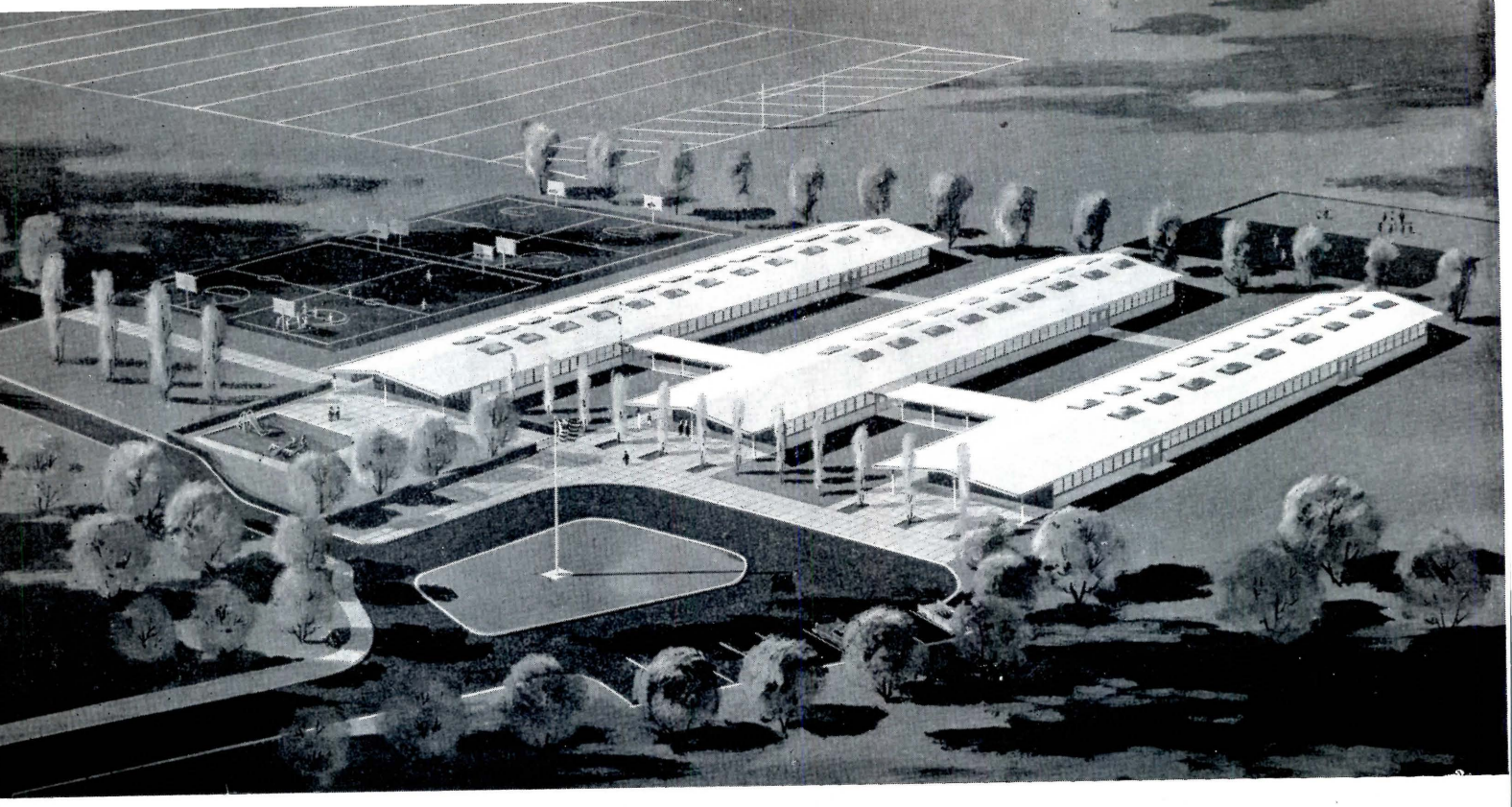


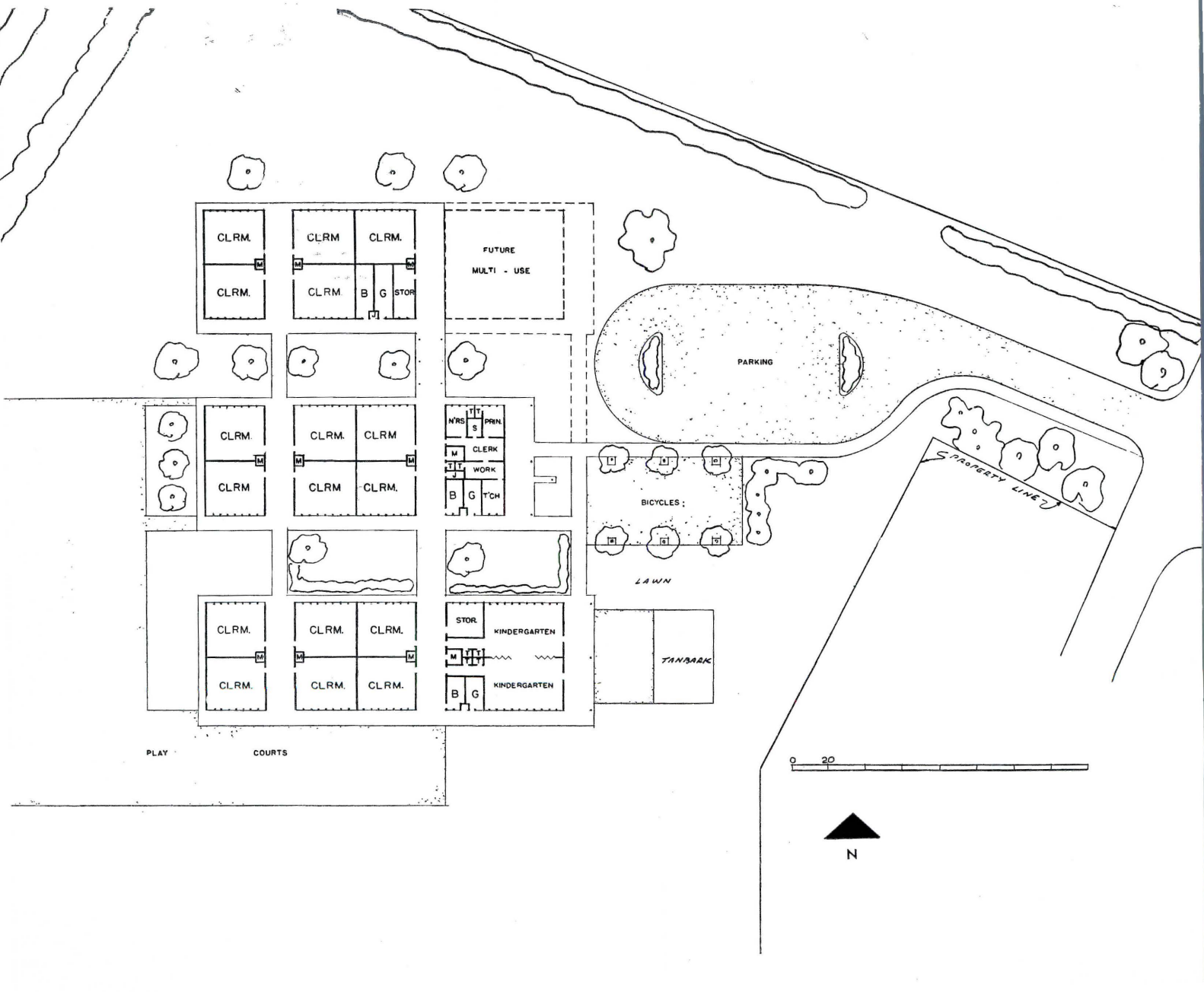


Secondary access to classrooms (top) is provided by decorative fire stairs. Storage walls with special vent shafts separate classrooms (bottom). The main building corridor (above center) has simple niches for coat racks

Allied Photographic Illustrators



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The principal sources of economy in this school are the exploitation of a dimensional module and repetition of large space units as well as their smaller components. Especial attention was paid to adapting the construction system and detailing to the experience and skills of available residential builders and craftsmen. All was kept simple, orderly and compact.

A Three-Unit Elementary School

Costano Elementary School
Ravenswood District
East Palo Alto, California

Peter Kump, Architect

Eric O. Moorehead, Structural Engineer

Buonaccorsi, Murray & Lewis, Mechanical and Electrical Engineers

N. A. Lamb, Contractor

Arthur Cobbledick, Landscape Architect

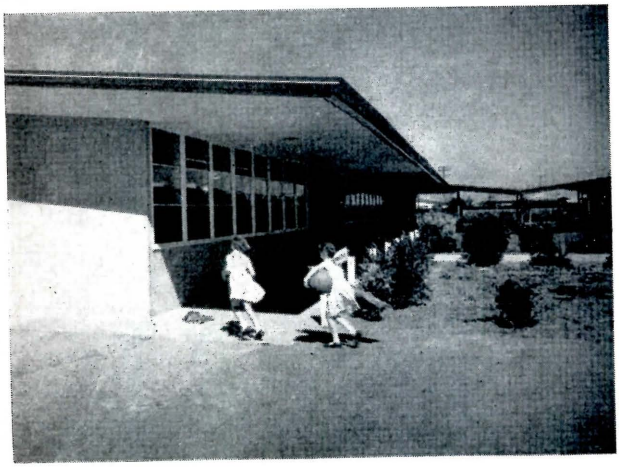
When the first two wings of this K-6 school were completed in 1955, the square foot cost of $9.23 attracted much attention as the lowest recorded in San Mateo County in recent times. The third wing, built in 1956, was equally economical. In spite of its low unit price, it is of higher than prevailing quality level for similar communities, and is marked by many refinements of design leading to easy maintenance, efficient educational use, and comfortable, attractive child environment.

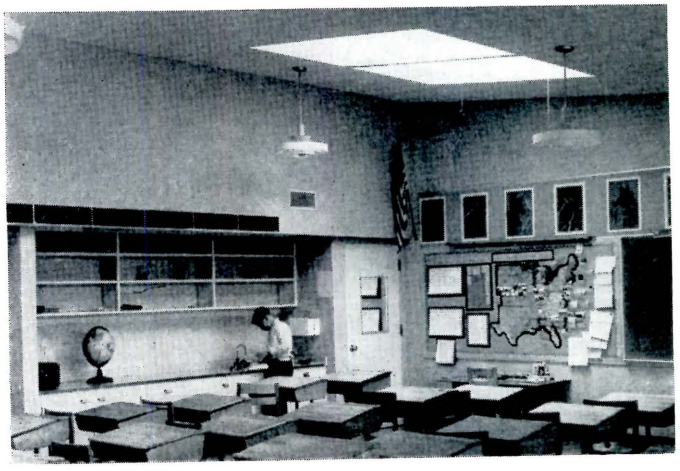
The level site, near the shore of San Francisco Bay, consisted of fine clay soil—originally bay-bottom mud. Foundations were drilled bell caissons and grade-beams with reinforced concrete slab on grade. Buildings are wood frame with bearing walls designed to resist lateral shear. Outside walls are plaster with integral color on metal lath, and steel windows set in wood mullions. The roof extends plaster soffits over outside walks, and is four-ply built-up with tar and gravel finish. Walks are reinforced and tied into slab. The building is modular on a four-foot grid.

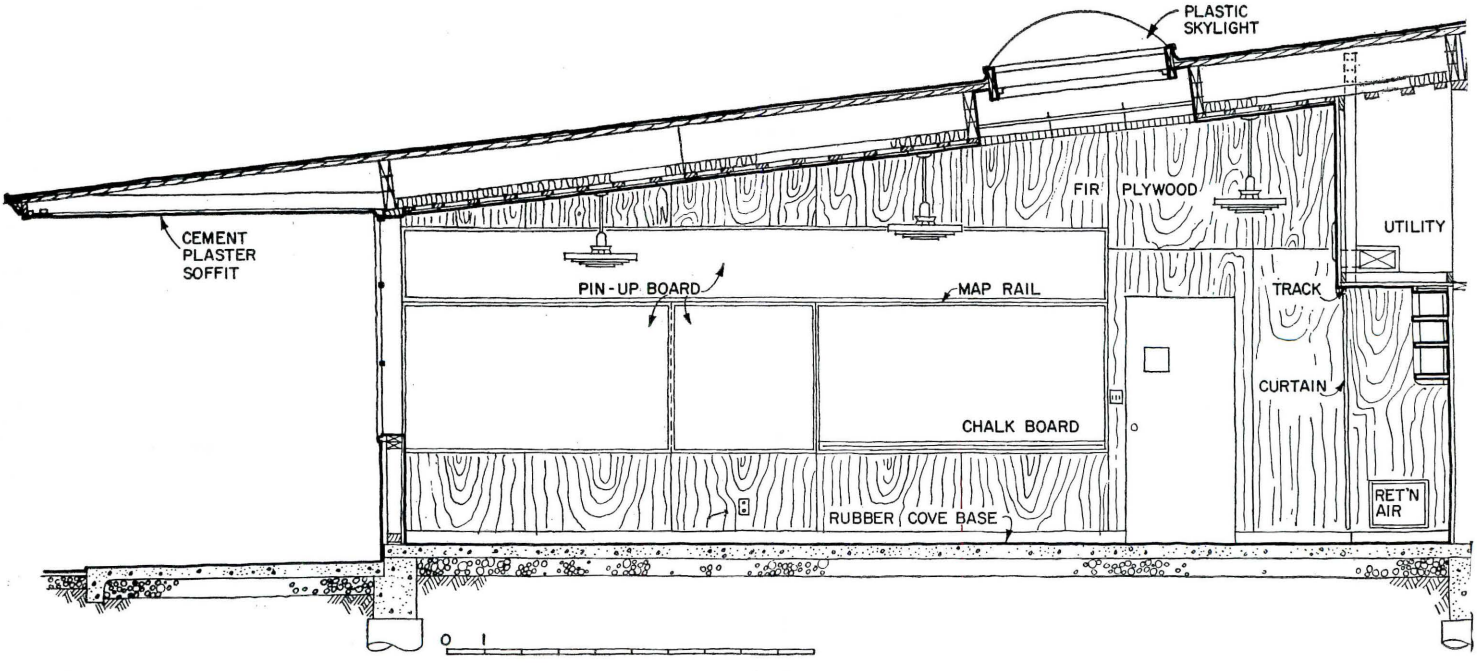
The plan is compact but not compressed, and has openness and easy circulation. Rooms are grouped back-to-back in fours to form units which are organized in continuously roofed rows with protected and top-lighted cross corridors between units for access. Covered walks connecting the wings continue the roof slopes and neatly convey roof drainage to catch basins.

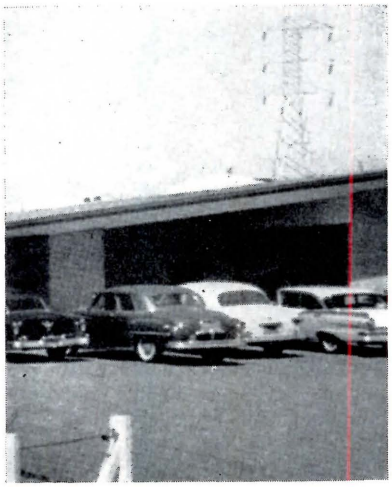
Room interiors are finished with stained and varnished plywood over insulating board on wood studs. Asphalt tile floors with rubber cove base make maintenance easy. Ceilings are acoustic tile. Natural fir casework with plastic tops is grouped along wall opposite windows and may be screened with draw curtains as desired. Each classroom has individual thermostatic control of its own gas-fired warm-air furnace. The furnaces are paired in heater closets accessible only from corridors.

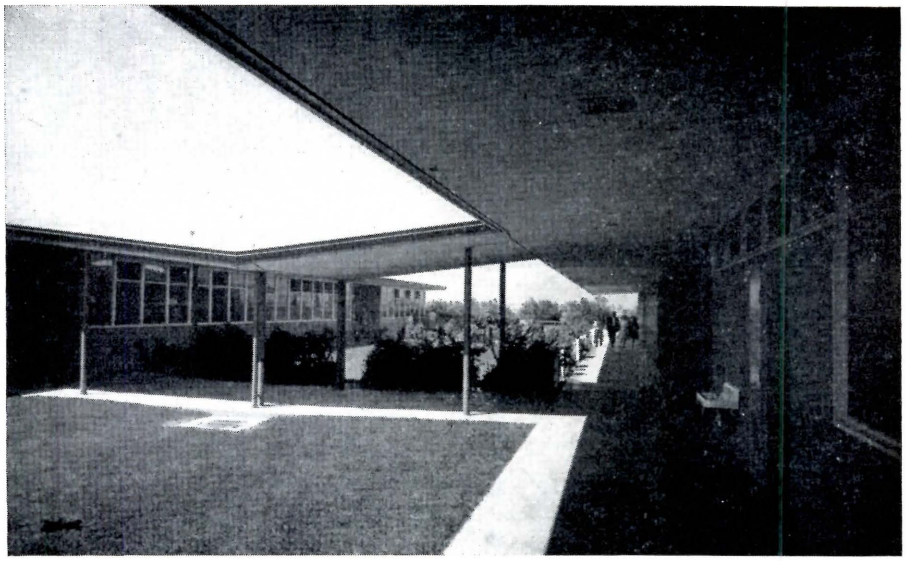
Costano Elementary School

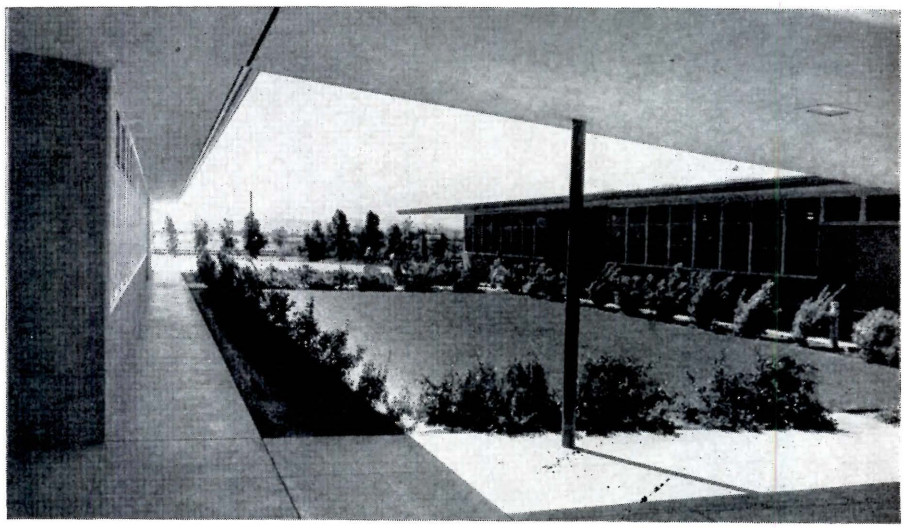




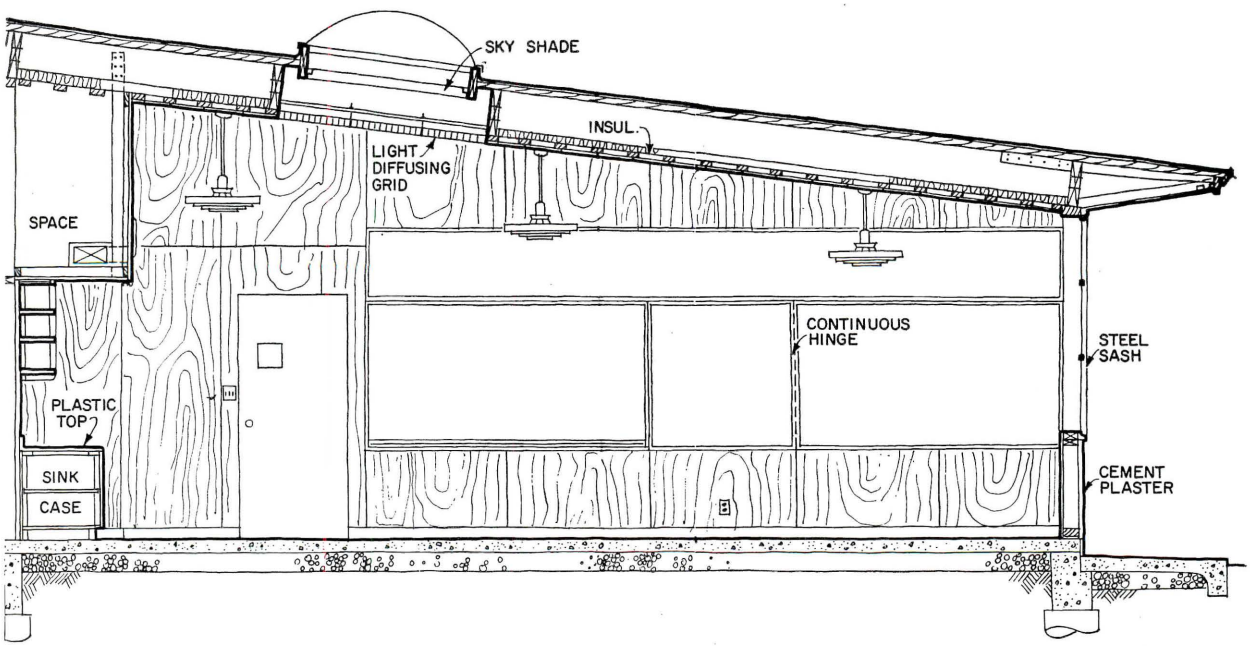


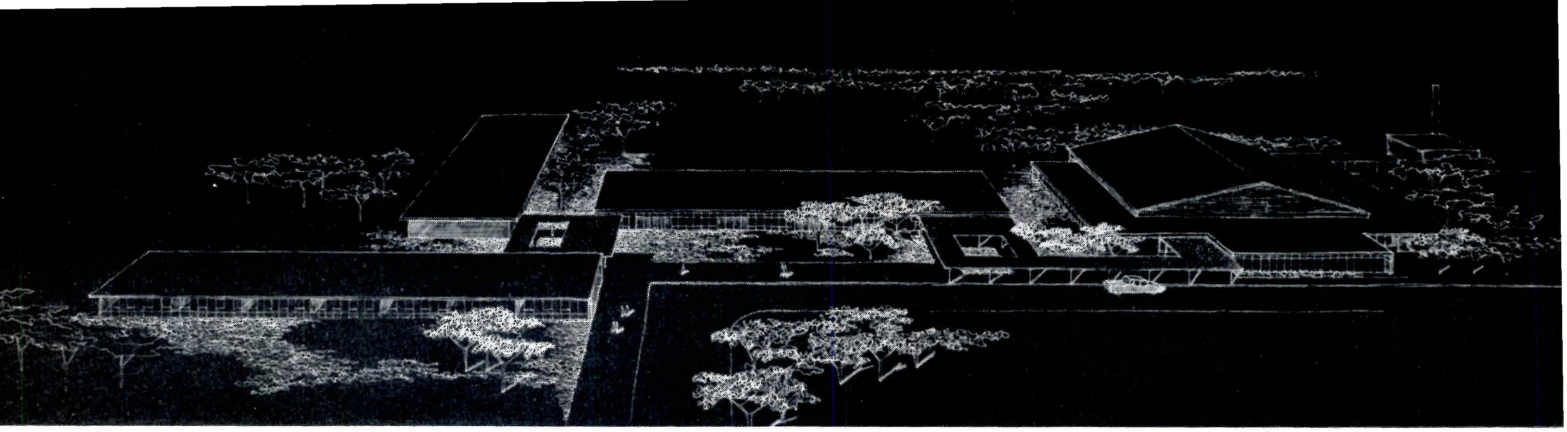


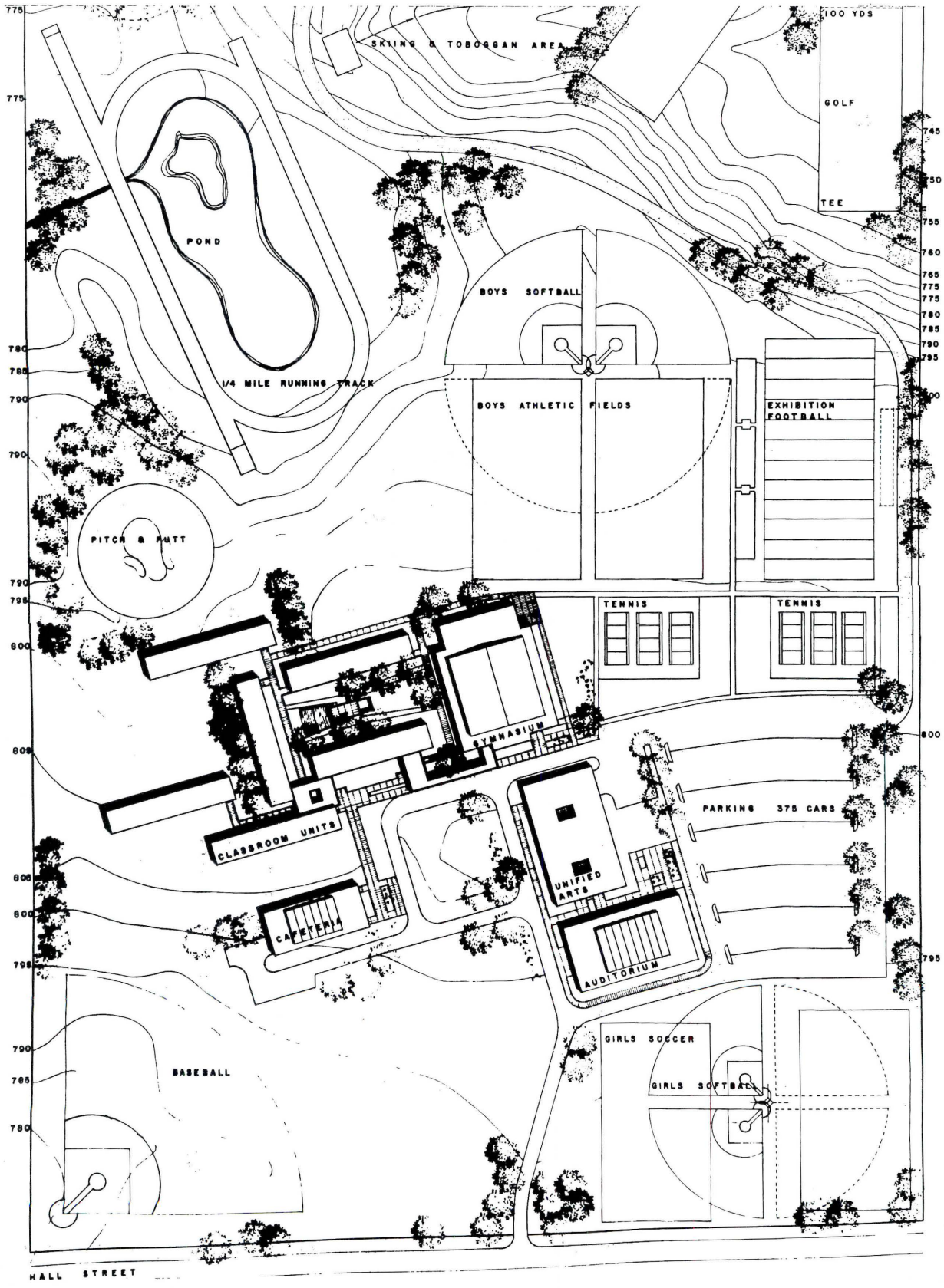




The low, rather domestic quality of the repeated building units gives a pleasant child-scale at low cost. Note plastic skylights to help balance the natural light






SKIING & TOBOGGAN AREA
100 YDS
GOLF
TEE
POND
1/4 MILE RUNNING TRACK
BOYS SOFTBALL
BOYS ATHLETIC FIELDS
EXHIBITION FOOTBALL
PITCH & PUTT
TENNIS
TENNIS
GYMNASIUM
CLASSROOM UNITS
CAFETERIA
UNIFIED ARTS
AUDITORIUM
PARKING 375 CARS
BASEBALL
GIRLS SOCCER
GIRLS SOFTBALL
HALL STREET

For economy and flexibility in this school, a plan was selected with relatively small buildings of light construction which would afford inexpensive lighting, heating and ventilating arrangements. Besides affording less costly construction, the smaller repeated units gave more competitive bidding. Modular design used throughout further reduced costs through repetitive components and assembly operations. There is a rigorous limitation of elements in the buildings, with multiple use of materials, and materials used to maximum functional or structural capacity wherever possible.

Light Construction for a Large High School

Forest Hills High School
Kent County, Michigan

Perkins & Will,
Architects and Engineers

J. & G. Daverman & Co.,
Associated Architects

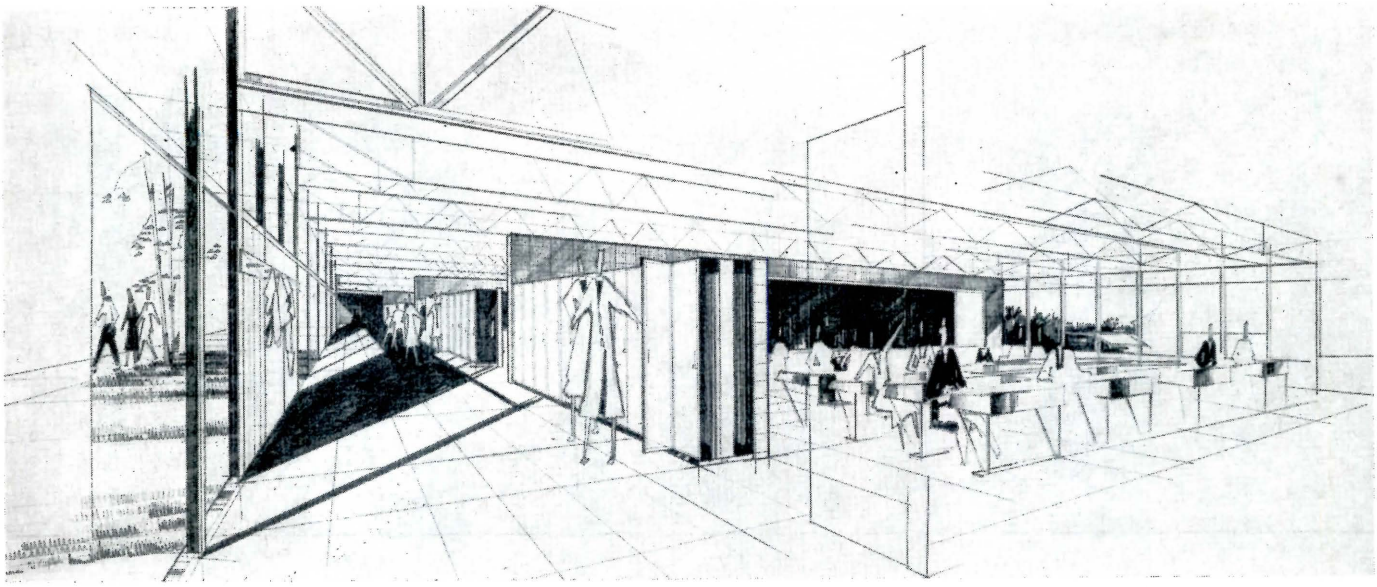
Bert Johnson Construction Co.,
Contractor

This school, now under construction, serves a recently consolidated district several miles east of Grand Rapids. The area is primarily residential and farm land of low assessed value. This limited available funds to under $1000 per pupil for buildings, and made economy a large factor in the design. The initial stage shown is nearing completion, and is part of a master plan which visualizes an ultimate capacity of 1200 students. Present enrollment is 500 for grades 7 through 12. The area is being built up rapidly and is expected that a junior high will be added within ten years, at which time this school will become a senior high.

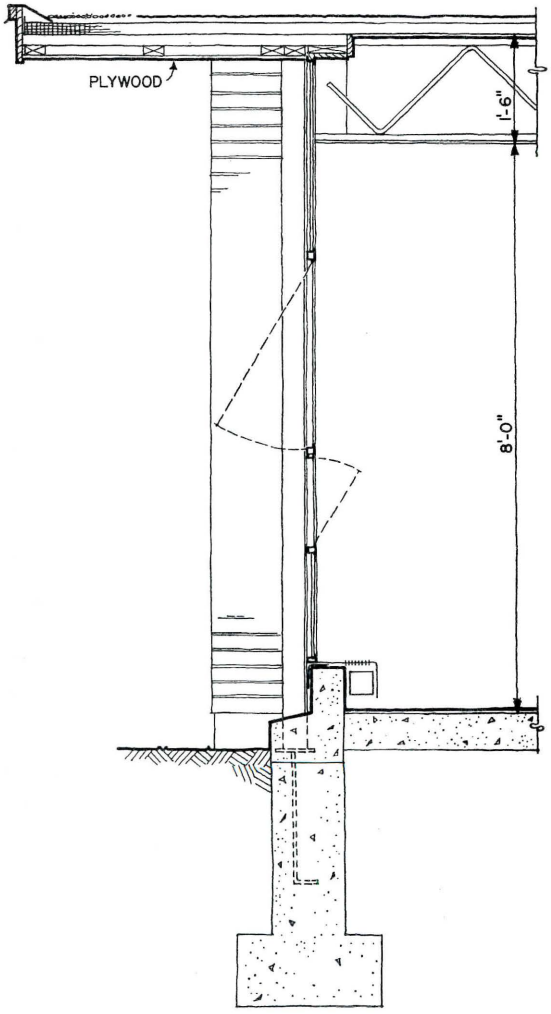
The first stage includes a gymnasium-cafeteria building, and three essentially identical classroom structures. These are designed with wall footings, spread foundations, and slab on grade. Structural tees, set 48 inches on center, double as columns and mullions, and support exposed 18-inch bar joists stressed to their maximum efficiency across the combined classroom-plus-corridor width of 36 feet. The roof decking gives insulation, acoustic treatment, and finished ceiling all in one material.

The structural system establishes a modular increment of 4 feet for interior partitioning or future expansion. Partitions between classrooms are non-load bearing, of light concrete block left exposed. Corridors are separated from classrooms by a five-foot-six-inch-high block wall with lockers on the outside and tackboard inside. There are no classroom doors and space above the lockers is left open.

The economies achieved by careful planning and simple, effective structure are reflected in the successful bid, which came in at $11.90 a square foot for the group of buildings totaling 37,640 square feet. The functional and environmental values are many, with attractive space relationships and durable, pleasant materials of good quality.

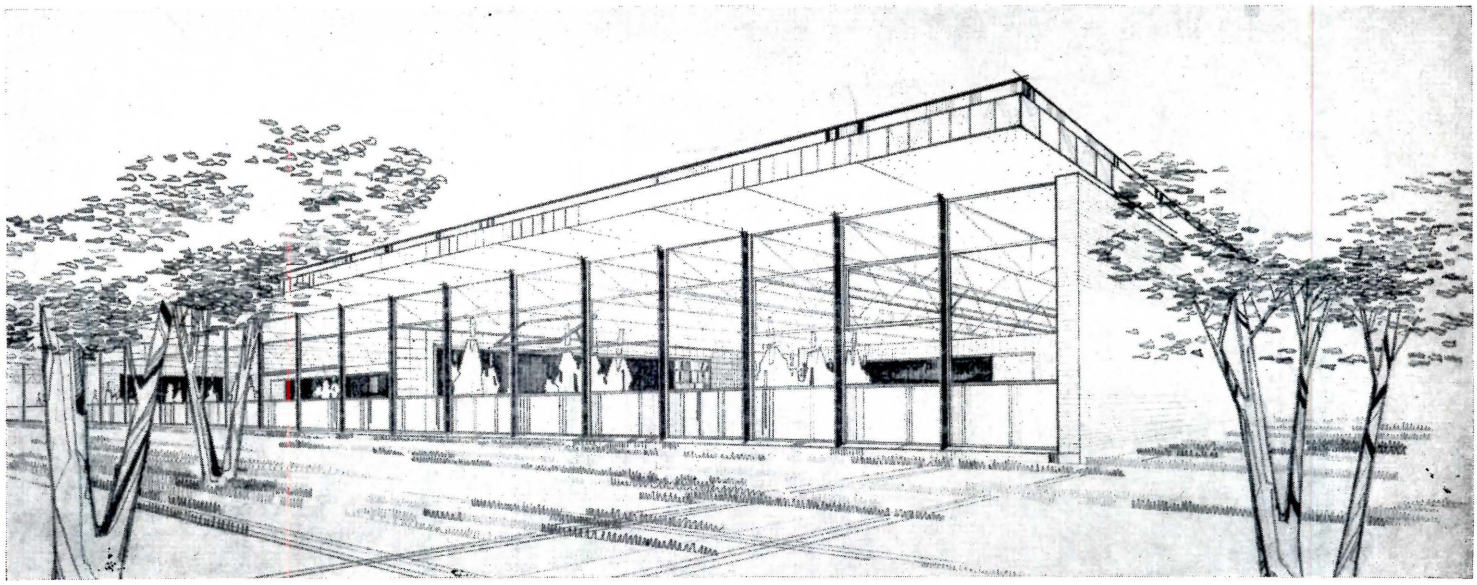


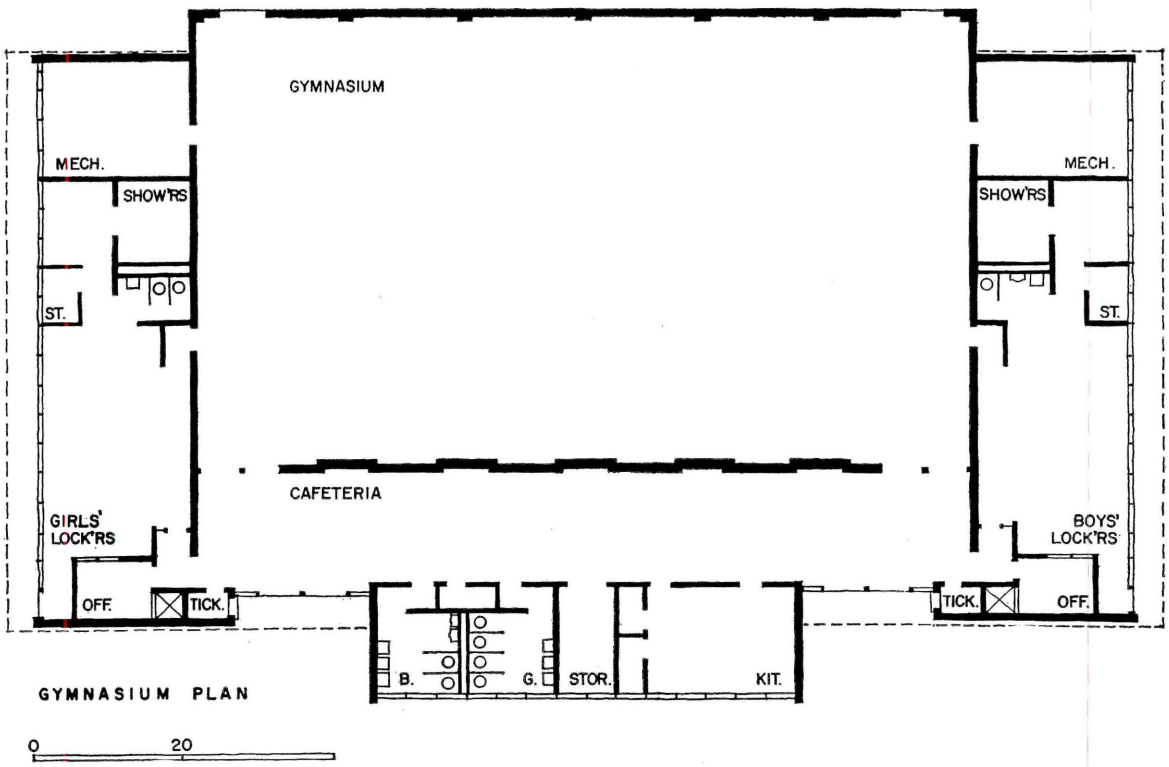
The structure of this school is simply done, frankly exposed. Above: typical classroom and corridor; a similar construction shot is shown below, along with a wall section



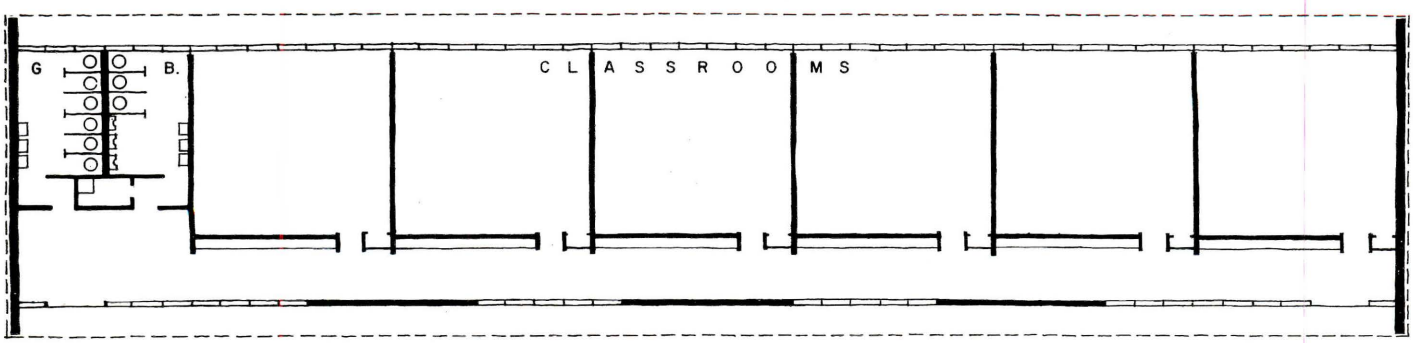
TYPICAL EXTERIOR WALL SECTION CLASSRM. UNITS

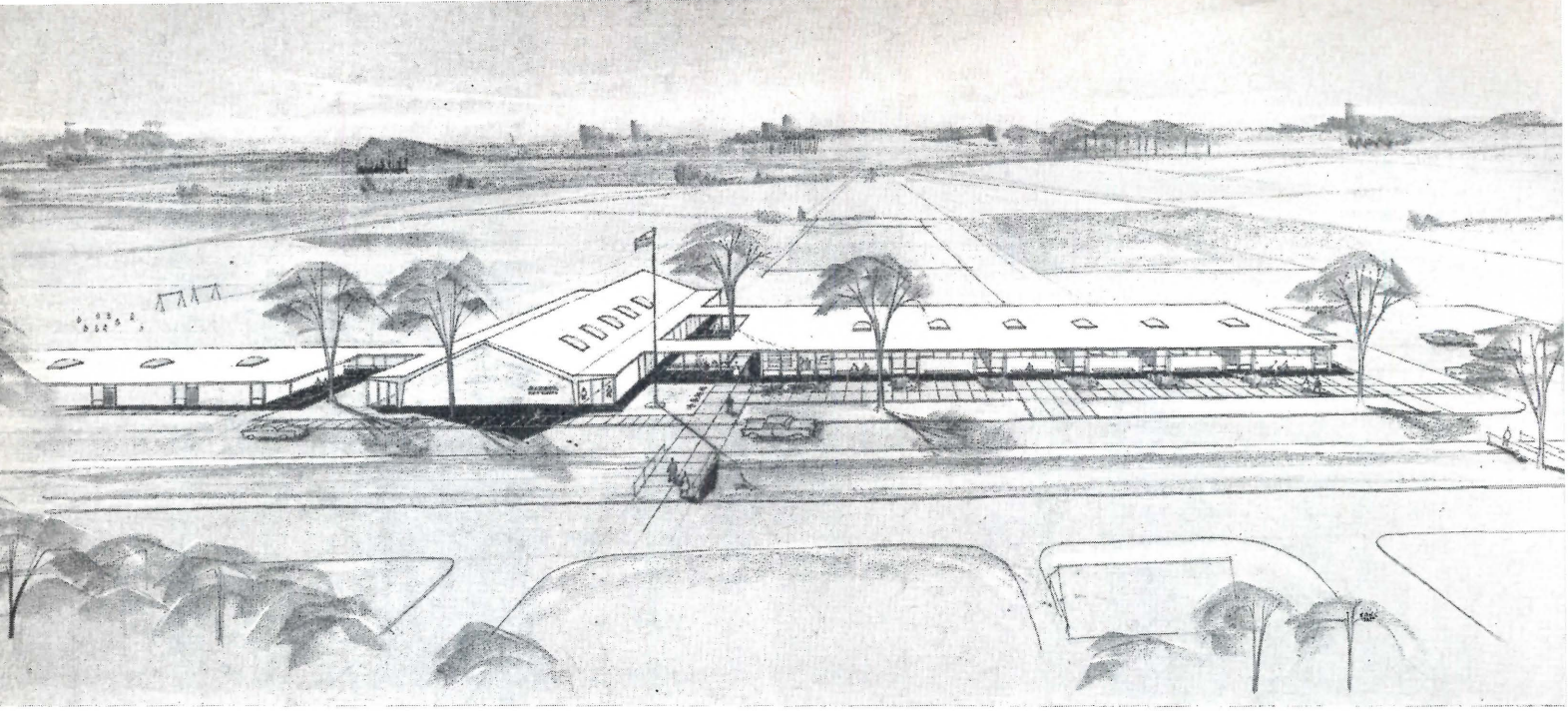
Gerald Gard

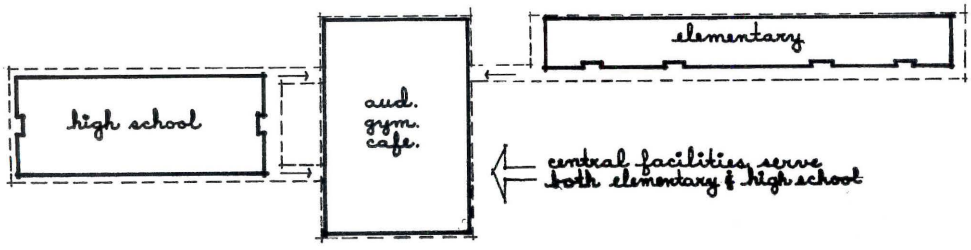


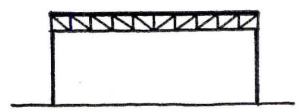


One of the identical classroom structures is shown in the drawing at top, and in the plan below. At center is the plan of the gymnasium-cafeteria



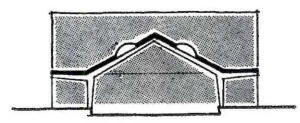




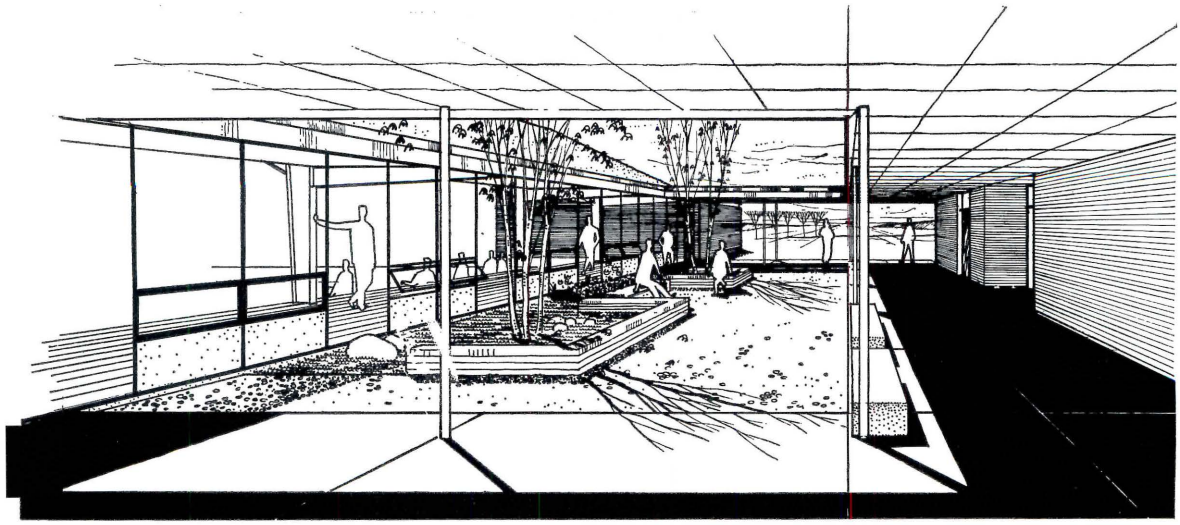


Instead of starting with a box-like gym with high walls and high volume .....

why not start with a low hovering roof and dig down for required height



saves 25-30% volume over conventional high wall gym; ceiling ht. same over center of court; eliminates down spouts & parapet walls.



This school is a solution to the special problem of a small school plant in a small town, and is meant to serve as a community center as well as school. To achieve this at low cost, the multipurpose unit was designed to serve an amazing number of functions, as can be noted on the next page. Costs were generally kept low by open planning, eliminating doors and other closures, and by designing for unusually low volume and perimeter per usable square foot.

School Center for a Small Town

Garber High School
Garber, Oklahoma

Caudill, Rowlett, Scott and Associates, Architects

James M. Sanis, Mechanical and Electrical Engineer

MacDonald & Floyd, Consulting Structural Engineer

J. J. Reardon Construction Co., Contractor

Located in a small rural community about 80 miles north of Oklahoma City, this school was added recently to an existing elementary school built about two years ago by the same architects. The addition includes a single-story classroom wing with double-loaded corridor, plus a gymnasium and cafeteria building which serves several purposes for both school and community. A total building area of 25,338 square feet was bid at $10.06 a square foot.

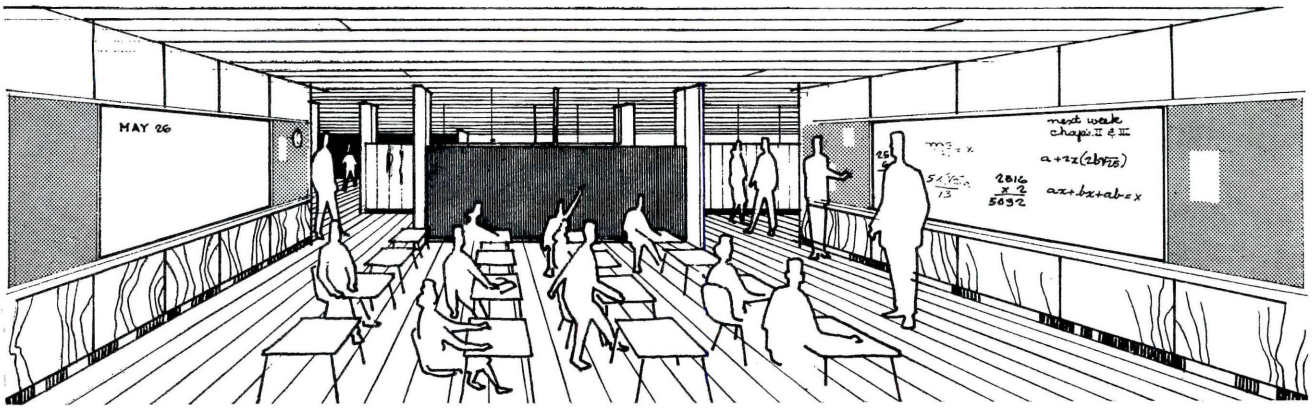
The classroom building contains five typical rooms 24 by 28 ft; a library which may be joined to one of these classrooms through a folding partition; special rooms for home-making, science, and typing; administration offices; boys' and girls' toilets.

Many economies stem from simple, orderly plan and structure, well-considered use of a small palette of materials, design attention to coordination of trades during building, provision for dual and multi-use of space, good choice of materials for maintenance, simple and effective detailing, elimination of classroom doors, and exercise of volume control.

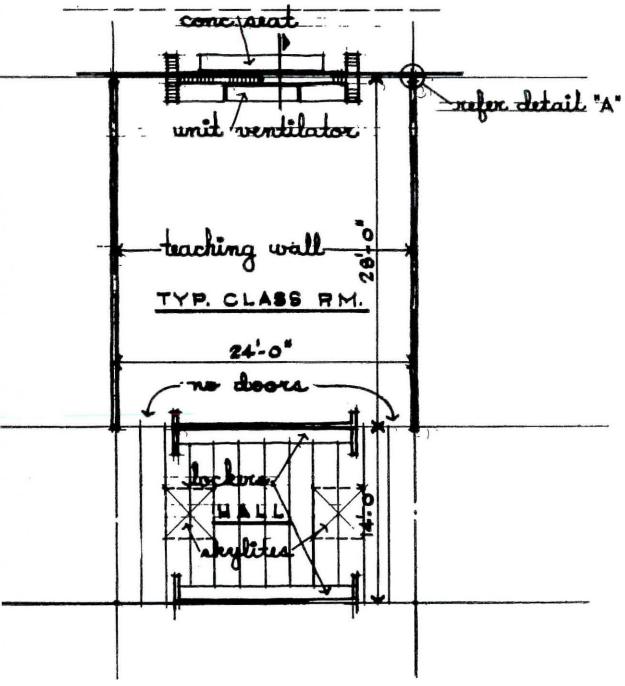
The gym, for example, is noteworthy for its sunken play court, which not only reduced volume but allowed the stage area to double as cafeteria and provided an inexpensive way to get bleacher seating along the sides, with activity area for small games or additional seating segregated from the main floor. The excavation, incidentally, provided needed fill for part of the site.

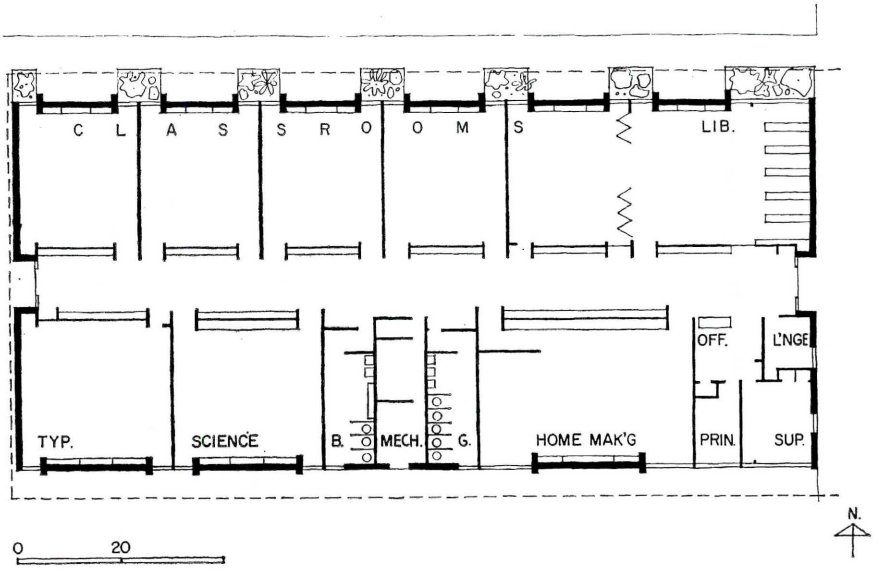
Heavy mechanical facilities are grouped; pipes are run in trenches rather than in tunnels; unit type heaters with fans for forced ventilation are located in classrooms.

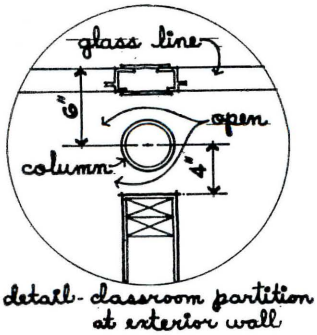
Slab on grade with concrete grade beams and piers form the base for a repetitive bay structural system consisting of steel beams on pipe columns, 12 feet on centers. Wood joists support a wood deck with built-up roofing. Exterior walls combine face brick with steel sash carrying glass and cement asbestos panels. Interior finish is kept simple, with plywood and exposed brick walls.



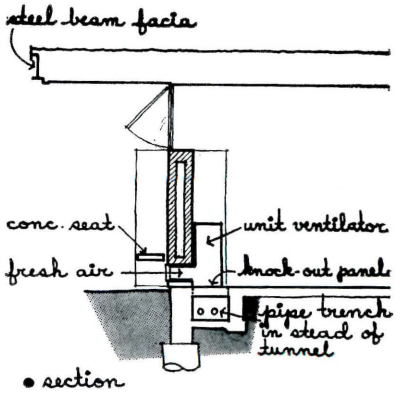
Classrooms borrow light from skylights in corridors to permit short side on outside wall for a low perimeter building



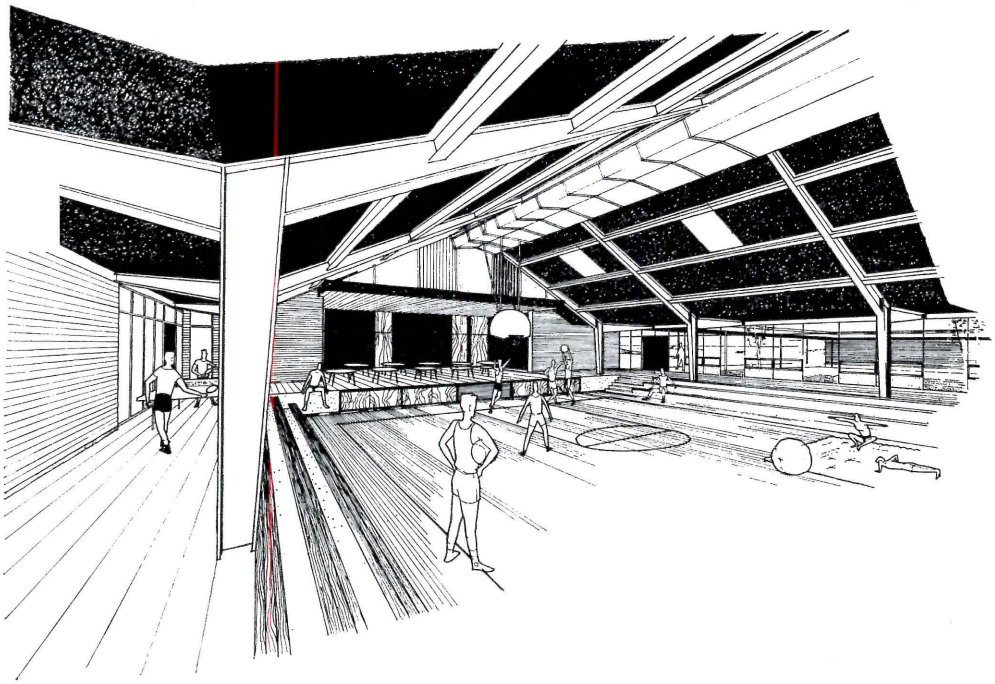


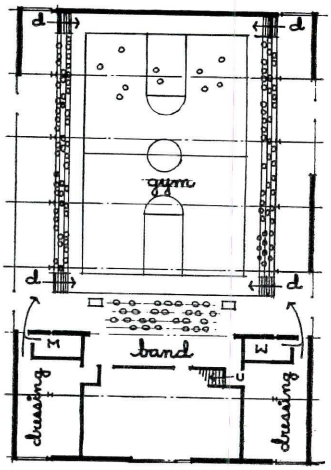


detail - classroom partition at exterior wall

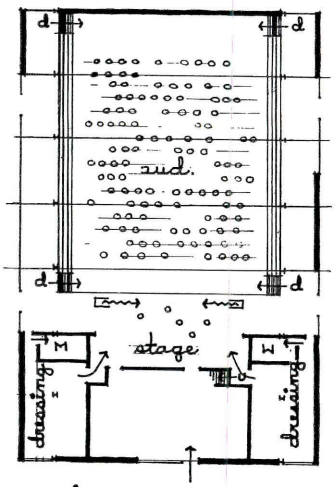


• section



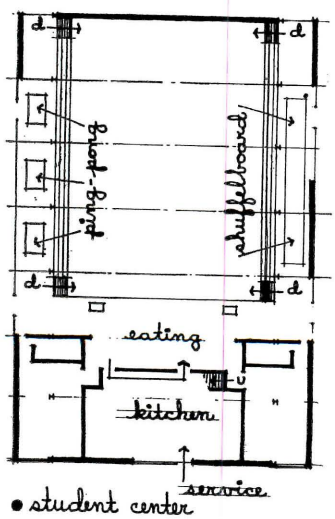


• gymnasium

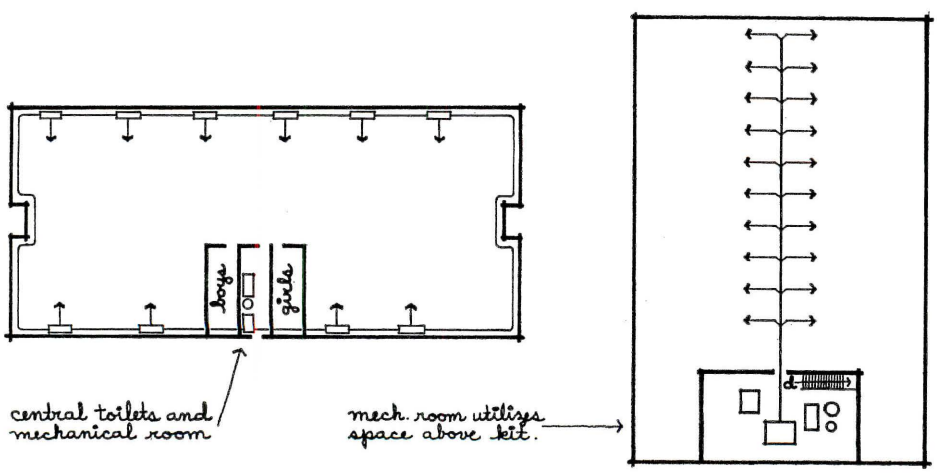


• auditorium

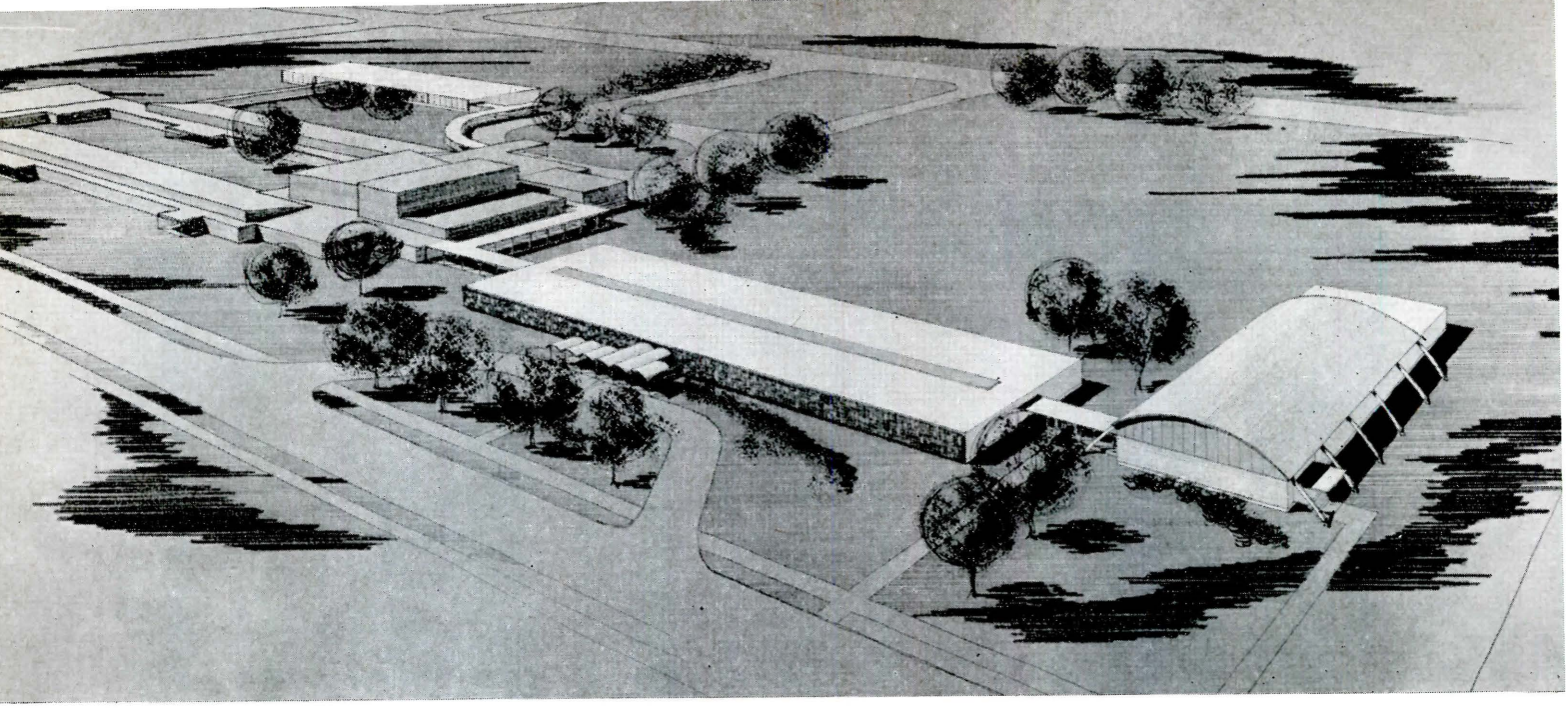
The low volume multi-purpose building includes facilities for gymnasium, auditorium and cafeteria. The architects estimate low perimeter walls save 75 per cent of masonry side walls cost over usual high wall gym. The building is shown in perspective above, and plan arrangements for the different functions at right

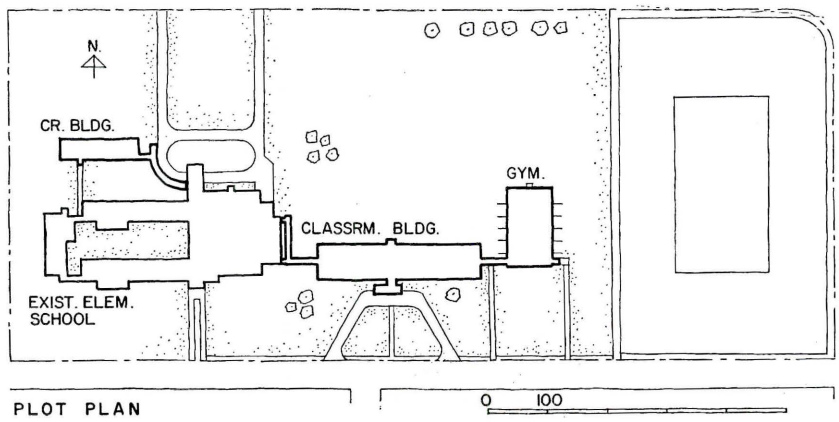


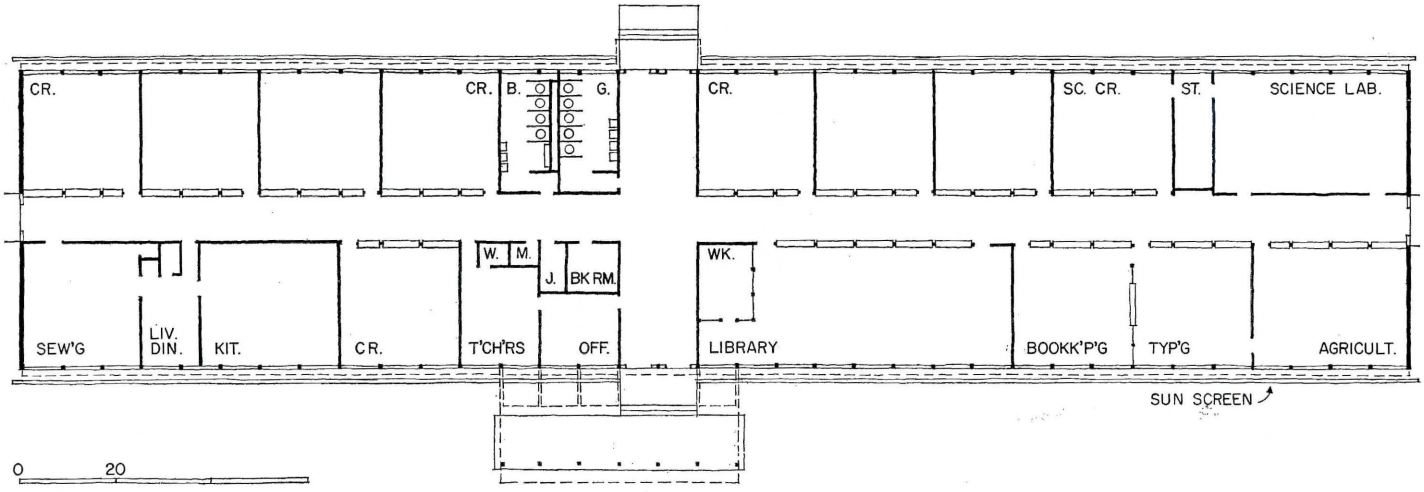
• student center



Utilities and plumbing are planned for greatest simplicity and direct runs.




N.
CR. BLDG.
GYM.
CLASSRM. BLDG.
EXIST. ELEM. SCHOOL
PLOT PLAN
0 100


CR.
CR.
B.
G.
CR.
SC. CR.
ST.
SCIENCE LAB.
W.
M.
J.
BK RM.
WK.
SEW'G
LIV. DIN.
KIT.
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OFF.
LIBRARY
BOOKK'P'G
TYP'G
AGRICULT.
SUN SCREEN
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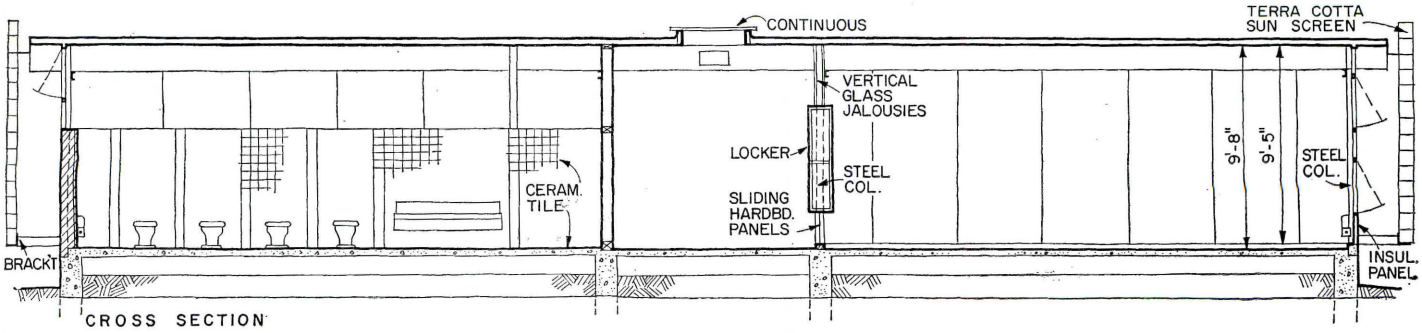

CONTINUOUS
TERRA COTTA SUN SCREEN
VERTICAL GLASS JALOUSIES
LOCKER
STEEL COL.
SLIDING HARDBD. PANELS
CERAM. TILE
9'-8"
9'-5"
STEEL COL.
BRACKT
INSUL. PANEL
CROSS SECTION

Savings were made in this school addition by striving for great order and simplicity throughout in plan, structure, detailing and finish. Everything is modular and no waste is apparent in either space or materials. Structural materials are frankly exposed where possible and finish materials are few and well chosen for easy maintenance.

High School Added to Existing Elementary School

High School for Jefferson Davis Parish, Welsh, Louisiana

Curtis & Davis, Architects and Engineers

Murphy & Perkins, Associated Architects

Ogle-Rosenbohm and Associates, Consulting Structural Engineers

This handsome school adds a 33,000 square foot high school for 700 pupils to an existing elementary school. Total cost of the new buildings is $417,545. In the classroom building, rooms are coordinated with the 4-ft module and an 8-foot structural bay system, and are typically 24 by 24 feet, with special rooms larger or smaller by modular increments to suit.

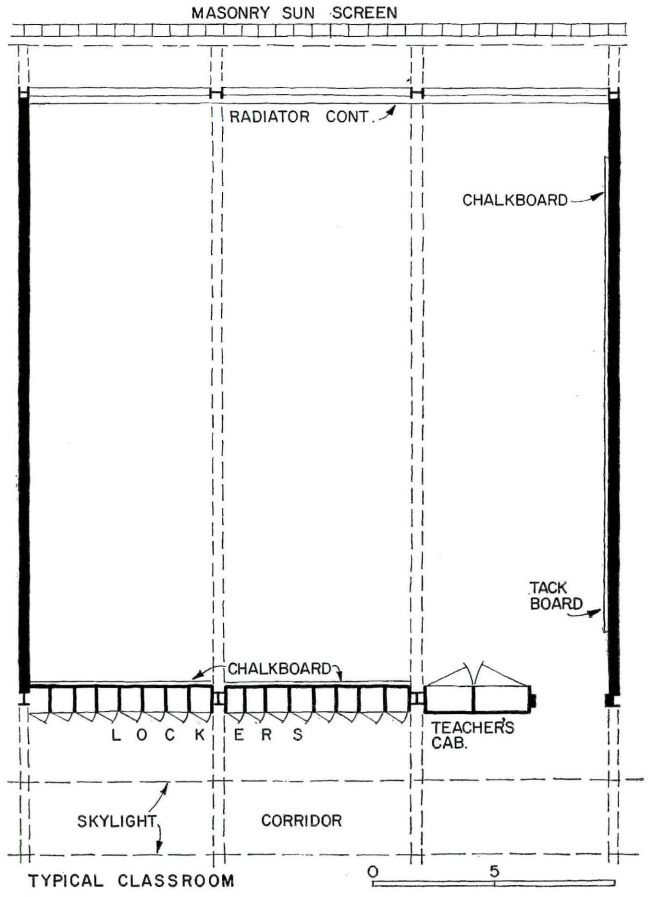
Concrete piers and grade beams support concrete rib slabs laid over fill with disposable forms left in place, with floor level to 2-feet, 4-inches above grade. The building is framed by 4-inch steel columns supporting laminated wood beams. The roof is built-up over 2-inch decking and 1-inch rigid insulation. Partitions are plywood on wood studs, and are non-bearing. End walls are concrete block faced with brick on the exterior; the long sides have continuous steel window panels with two rows of awning type projected sash.

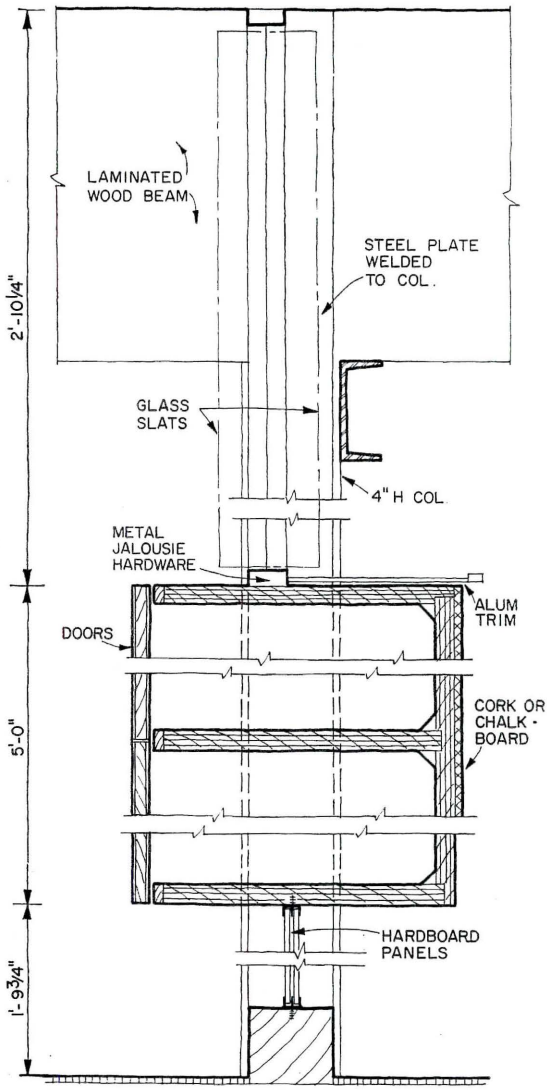
Continuous corrugated plastic skylight over the corridor spills some light through the jalousies into the rooms. Principal dependence is placed upon artificial lighting, which is fluorescent. Heating from an existing boiler plant is distributed through convector radiators along the base of the window walls.

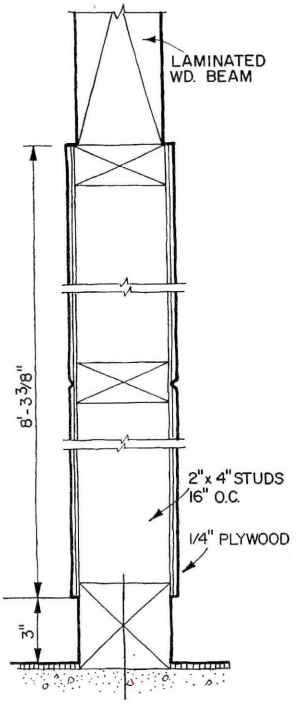
The gymnasium design is just as simple and direct, with concrete for foundations, laminated wood arches for the big span, and steel framed walls with brick panels and projected steel sash above the brick on three sides for ventilation. A continuous plastic skylight admits diffused light from above.

Throughout the design there is a maximum of natural cross ventilation and protection from sun and glare. To shade the glass walls from the heat and intense light, the architects provided outrigged sunscreens of terra cotta tile extending full length along both north and south sides of the 280 foot long classroom building.

Below: plan of a typical classroom shows multiple use of structure as finish—at corridor wall and window wall. The corridor wall *(right)* combines space division with student lockers, teacher cabinets, two-level ventilation, and borrowed light. The detail of a typical partition *(below right)* shows the extreme simplicity of construction used in the building







"CUSTOM" LIGHTING WITH STANDARD EQUIPMENT

Ketchum and Sharp combine standard fixtures, non-standard ideas, to make school lighting functional—and more expressive

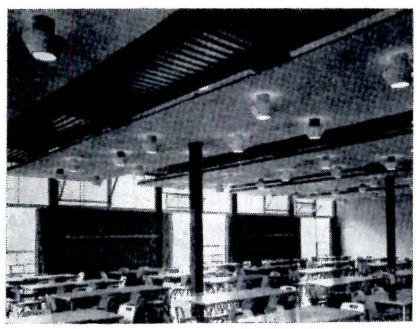
Perhaps because they are accustomed to thinking of "light" and "fixtures" interchangeably, architects are prone to attribute uninspired lighting to unsuitable equipment. And it is true that, if the equipment determines the design, lighting is likely to remain little more than a necessary appendage to our buildings. However, when a distinction is made between light —the design element, and lighting equipment—the design tool, good lighting *can* be achieved with the tools at hand.

A case in point is the consistently effective school lighting planned by Ketchum and Sharp and illustrated on these pages. Working in a notoriously tight-budgeted area, the firm has not had recourse to extra funds for study and experimentation. Their techniques have evolved not from tests and mockups, but from a painstaking examination of each individual problem, and a willingness to apply to each new project the lessons learned from the last. The fixtures used might, with few exceptions, be found in any school anywhere; but they have been used with imagination and with a clear understanding of what they are expected to do.

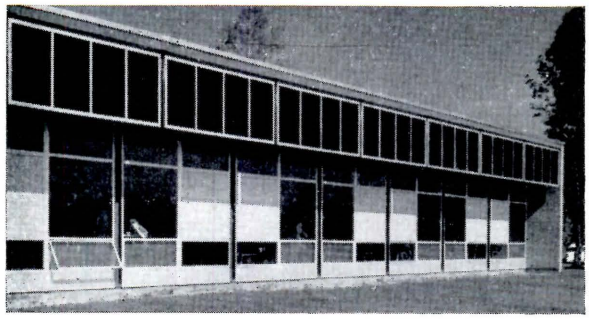
Ketchum and Sharp's goal is well-defined: to provide adequate light, of course; but, more than that, to create an appropriate atmosphere for the activity to be lighted. It has been accomplished for the most part with standard fixtures—and methods no more elaborate than concealed fluorescents in a classroom, "spot" lighting in a corridor, gaily-painted fixtures in a cafeteria, or an occasional incandescent globe dropped from the high ceiling of a commons.

SPECIAL PURPOSE AREAS

Cafeterias, lounges and libraries may or may not require less *light than do classrooms, but they require a different* kind *of light if they are to provide the desired contrast to more formal teaching spaces. In many instances, although their uses are quite different, the physical enclosure of such rooms may be so similar that lighting must assume the key role in establishing the character of the space. The challenge lies in providing an appropriate quality of light, as well as an adequate quantity—without resorting to elaborate lighting schemes or expensive custom fixtures.*

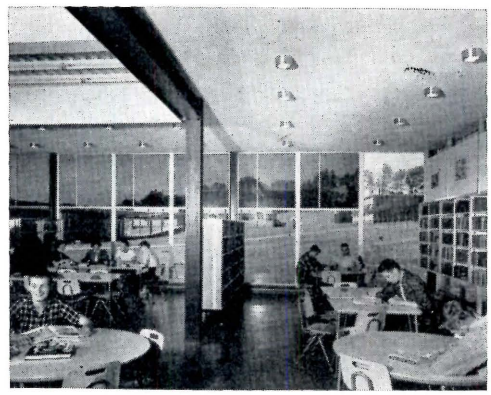


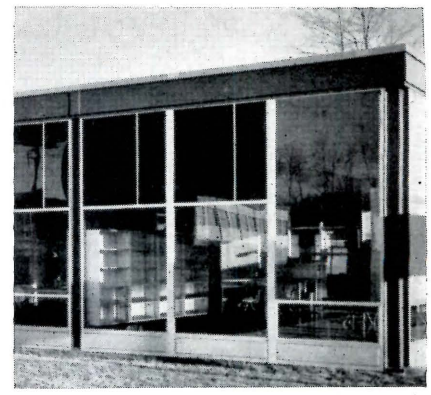
CAFETERIA for Middleville Road High School, Northport, N.Y., features dropped ceiling panels highlighted by a decorative random pattern of gaily colored "spots" adapted from a standard fixture. Fluorescent tubes mounted atop the panel edges supplement the downlighting by casting an even glow over the bright orange-painted cellular decking; above



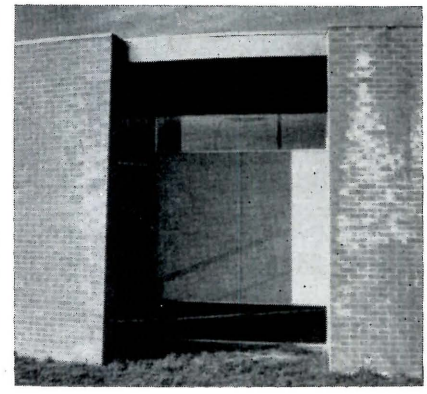
At John Jay High School, Cross River, N.Y., a strip of glare-reducing glass is dropped from the overhang to control sky glare on the cafeteria window wall. The semi-recessed downlights that form the base for the interior lighting are accented by low-hanging clusters of vari-sized incandescent globes

LIBRARY at John Jay features a wall detail similar to that used in the cafeteria: a high strip of glare-reducing glass—in this case framed into the wall itself—is used to control sky glare. Where the glass intersects with the solid end wall, the tinted panel is omitted so that maximum light is thrown on bookshelves. Semi-recessed downlights illuminate the periphery of the room; in the center where natural light is less intense, the light level is raised by fluorescent fixtures ceiling-mounted above a birch baffle (not in place when photo was taken)

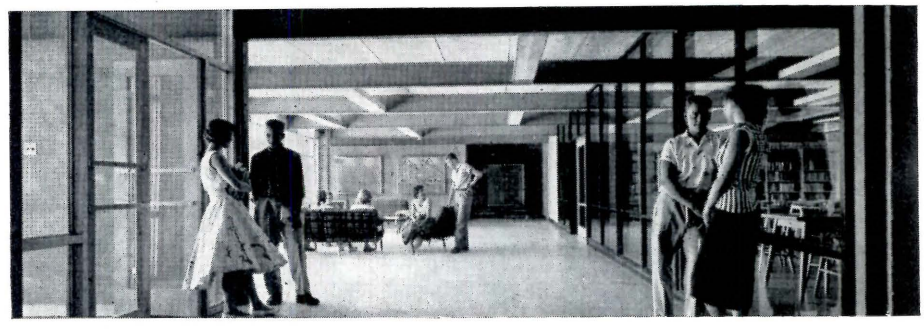




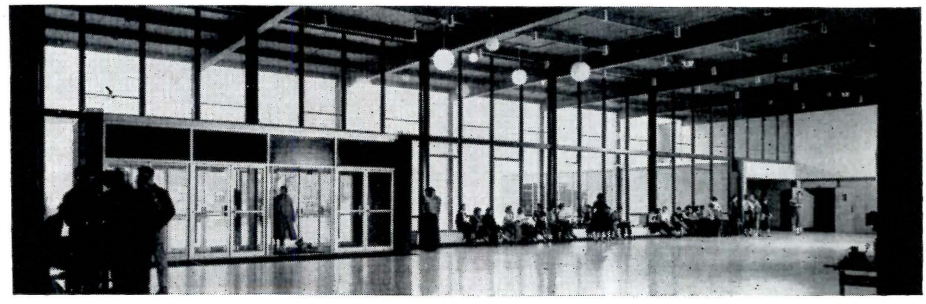
At the Northport school library, inverted "bay windows" form an overhang that controls sun and glare on the glass at the top of the inset wall and provides shade for the floor-to-ceiling glass side panels that serve as the primary source of natural light. Shielded fluorescent tubes over the bookcases on the inset walls direct light upward to reduce contrast between the ceiling and the top light of glass, downward to light the shelves. Spot fixtures focus on the shelf-lined solid walls between bays; recessed lights scattered over the ceiling accent the room's strong circular form



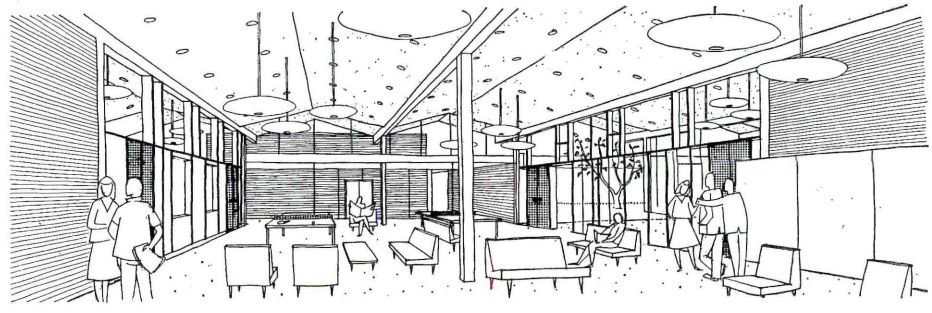
LIBRARY and COMMONS at the Taylor Avenue Junior High School in Greenlawn, N.Y., are separated only by floor-to-ceiling glass. To preserve the visual unity of the two spaces—and at the same time accent the difference in their character and functions—identical fixtures are suspended between the beams in both rooms, but those in the commons are arranged in an irregular pattern and painted bright colors



STUDENT COMMONS and lobby area at the recently completed Baldwin High School in Baldwin, N.Y., features a random arrangement of incandescent globes suspended at varying heights to add a decorative accent in the center of the large open area. Overall illumination is provided by can-type downlights mounted in regular rows on a dark-painted ceiling

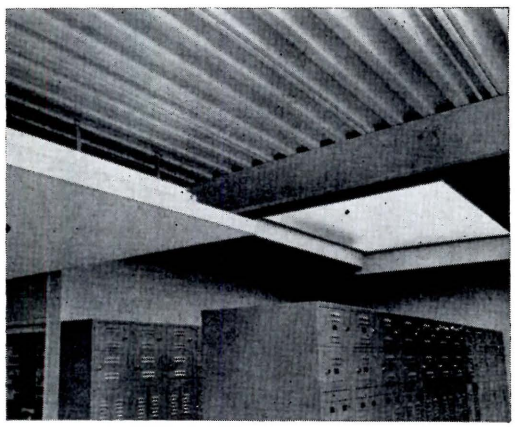


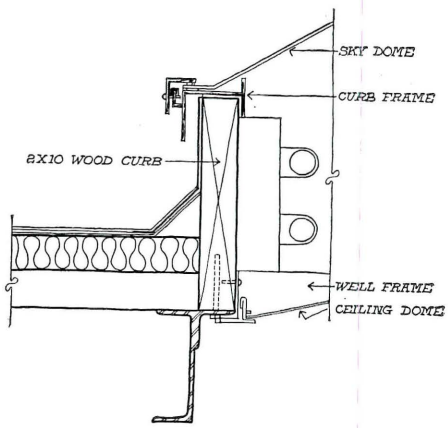
A similar scheme is used for the commons of a junior-senior high school now under construction at Smithtown, N.Y. General lighting will be from recessed fixtures calculated to give sharp definition to the strong form of a folded-plate roof. Dropped incandescent fixtures will again provide accent lighting—but in this case the globes have been flattened into luminous "flying saucers," each forty-five inches across



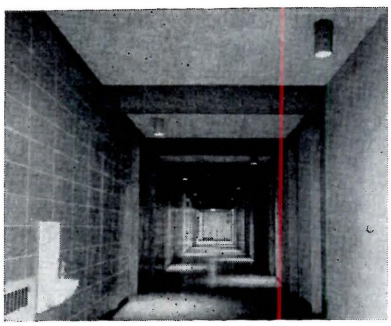
CORRIDORS

Taking advantage of the relatively low illumination level required in corridors, Ketchum and Sharp have used corridor lighting to create a visual, as well as an actual, change of pace between the working areas of the school and the spaces which connect them. Pupils move from the crisp, even brightness of the classroom to the more relaxed atmosphere of a hallway whose, on the whole, dimly-lit length is broken by pools of light at just those places where they are wont to congregate —display areas, bulletin boards, and the open spaces at the ends of the corridors.

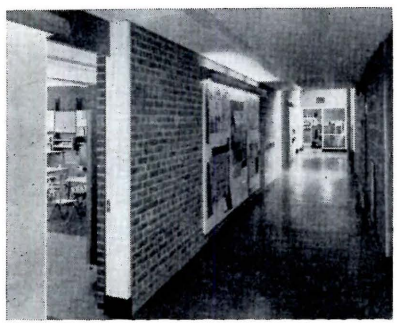




Entrance brightness at Northport is achieved by a fluorescent tube concealed above the dropped ceiling, and a double-shelled skylight which admits natural light during the day and uses fluorescent strips mounted between the shells to maintain the same lighting pattern at night

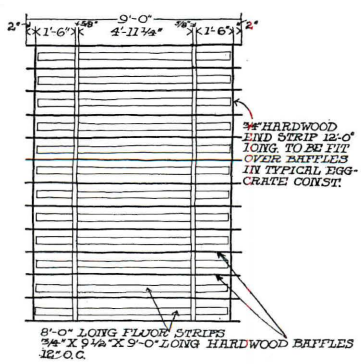


At the Greenlawn junior high school, "can" downlights placed alternately on opposite sides of the corridor brighten a long stretch of hallway with scattered pools of light

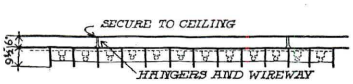


The same concept is broadened at the Meadow Drive Elementary School, Mineola, N.Y., where "pools of light" from valances over the bulletin boards do double duty as display lighting

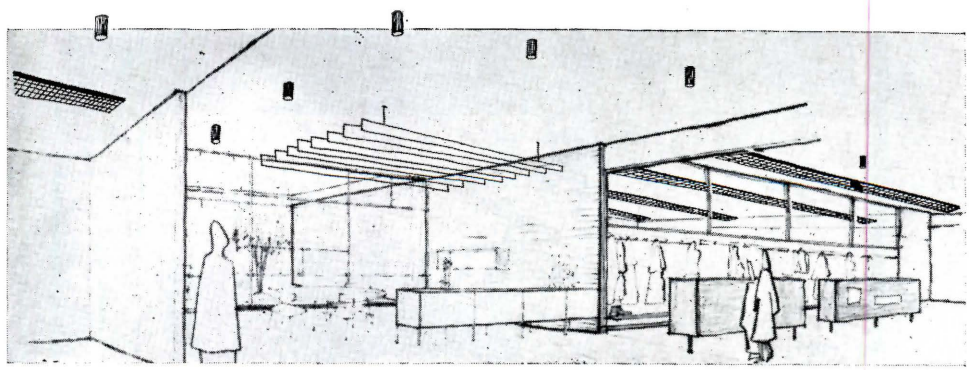
At Northport, a dropped ceiling at the end of the hall conceals mechanical equipment, and heightens the contrast between the uneven light from wood-baffled fluorescents over display boards in the corridor itself and the brightly-lit entrance at the end



PLAN LOOKING DOWN FROM CEILING



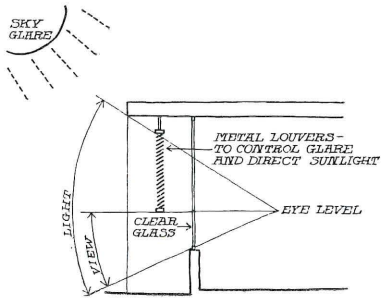
LIGHTING PANEL IN CONFERENCE AREAS

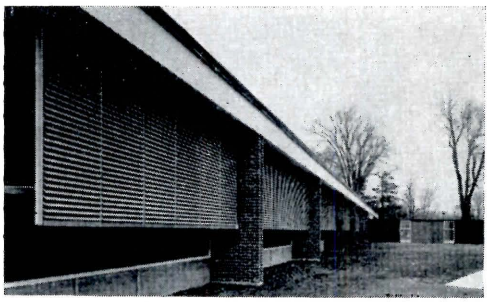


Ketchum and Sharp's design for the new Smithtown High School calls for the classroom lighting to be carried out several feet into the corridor—visually through the use of a glass panel at the top of the dividing wall, and actually through the use of the same fixture—to light a row of leaning-height lockers which the architects hope will be a focal point for between-class conversation. Low-level illumination provided by downlights in the center of the corridor will be intensified as the corridor widens into "conference areas" at several points along its length. Designed for lounging, for teacher-pupil and teacher-parent conferences, and for small meetings, these areas will be lighted by a dropped panel with fluorescent strips mounted between birch baffles

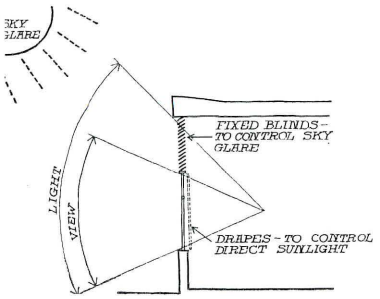
CLASSROOMS: THE WINDOW WALL

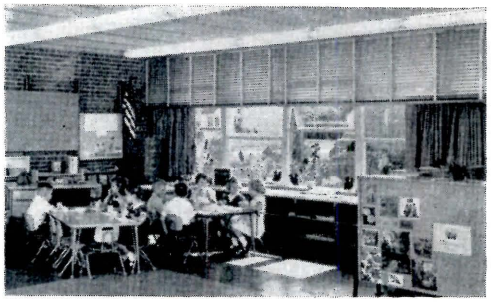
"Many devices used to increase and control natural light in the classroom have proved not only to be costly—both in initial cost and maintenance—but have often not been effective because the users did not understand their function and the proper use of artificial light with them. . . . Audio-visual shades are left closed, and the electric lights remain on even when the natural illumination is adequate. . . . Because artificial light gives more constant illumination and can be more easily and economically controlled, expensive control devices for natural light have been eliminated, the glass area reduced to a vision strip, and artificial light used almost exclusively for the working light in the classroom." KETCHUM AND SHARP



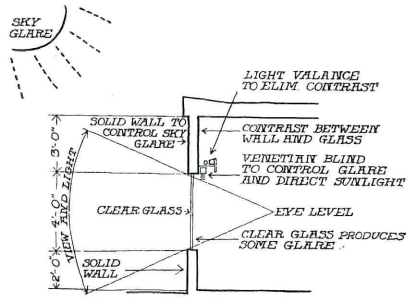


Louvered sunshade outside window wall at Darien (Conn.) Junior High School extends down far enough to control sun as well as glare, not so far that pupils' view is obstructed

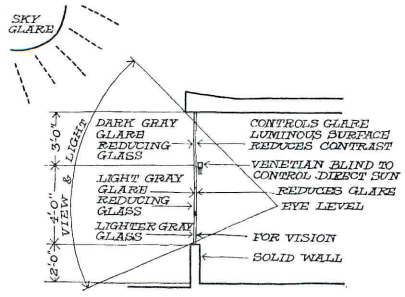


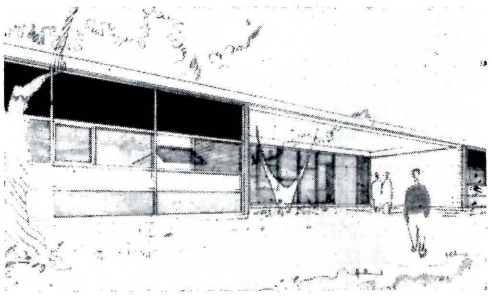


At the Meadow Drive School in Mineola, fixed interior blinds at the top of the windows control sky glare; movable drapes below can be closed to block direct sun, opened for vision



Valance at Greenlawn reduces contrast between "vision strip" and wall. Outer row of fixtures can be cut off when combined light from valance and windows makes them unnecessary





Glass at top of Smithtown window wall is dark enough to control glare, luminous enough to minimize contrast with lighter gray strip below. Lowest section is almost-clear gray glass

Ketchum and Sharp's "vision strip" approach to classroom lighting stemmed for the most part from an effort to reconcile a seemingly irreconcilable set of requirements. They began by following, as do most school planners, the unwritten (and sometimes written) law that classrooms must be illuminated by natural light —from windows, skylights, clerestories and/or a host of other devices for coaxing daylight to enter the confines of the classroom. And, reasoning that those devices which involve structural modifications are often more costly than is justified, they first approached the problem by simply running the classroom windows from sill to ceiling. This provided enough glass area for adequate natural lighting, but the light still had to be made usable by proper control of glare and sunlight.

At the Darien Junior High School, Darien, Conn., a metal louver was installed just outside the window, below a moderate overhang, to block sky glare and direct sun without obstructing a seated pupil's view. This scheme gave adequate, controlled natural light, but it failed to solve a basic problem: sunlight is cheap; the devices necessary for using it effectively are not.

The obvious answer seemed to be to retain the relatively inexpensive glass wall construction, and find a less costly way to control the sunlight it admitted. At the Meadow Drive Elementary School in Mineola, Long Island, the overhang and the exterior louver were replaced by a fixed interior blind that blocked sky glare visible through the critical area at the top of the window; and by movable drapes that could be closed to control direct sunlight, opened for an unobstructed view.

Further development in this direction halted when Ketchum and Sharp discovered that their efforts to surmount the problems posed by providing and controlling natural light were, in many cases, unnecessary. Regardless of the quantity and quality of natural light available, the artificial lights in the classroom burned all day long.

So another tack was taken. The

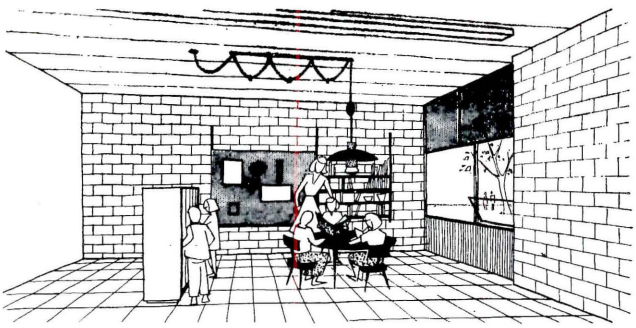
attempt to provide natural light via ceiling-high windows and elaborate control devices was abandoned; the window head dropped back to a standard 6 ft height; and artificial light became the working light for the classroom. The advantages gained by this facing of the facts of actual use are obvious. The added electrical cost was negligible since fixtures had to be installed for night lighting in any case. Control devices, often including the overhang, were eliminated entirely. And by the time all factors (wall construction, glazing, heating plant, blinds) had been taken into account, the total wall cost was reduced by 10 per cent for metal frame walls and as much as 20 per cent for masonry cavity walls.

The new scheme, however, was not flawless. Sky glare had been eliminated—but it was replaced by equally annoying contrast between the window and the opaque wall above. For the Middleville Road High School in Northport, N. Y., one of the first to employ the "vision strip" idea, a switching arrangement was planned which allowed for more light at the window wall (to reduce contrast), and at the corridor wall (the area farthest from the supplementary natural light source), than in the center of the room. This system was modified slightly at the Taylor Avenue School in Greenlawn, N. Y. where a valance light was used over the windows to reduce contrast, and circuits were so arranged that the exterior row of fixtures could be cut off when the combination of reflected light from the ceiling above the valance and natural light from the win-

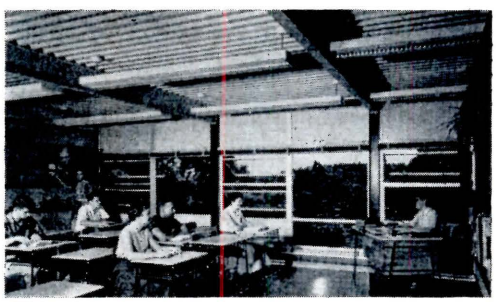
continued on page 282

CLASSROOMS: THE FIXTURES

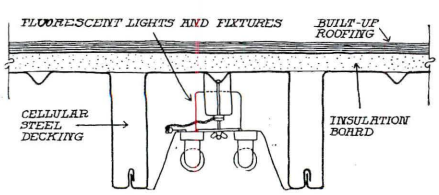
"The artificial lighting used in the classroom for general illumination must always work with the natural light. When it forms the primary source of light, the design of the fixtures and their placement both vertically and horizontally takes on a new importance . . ."



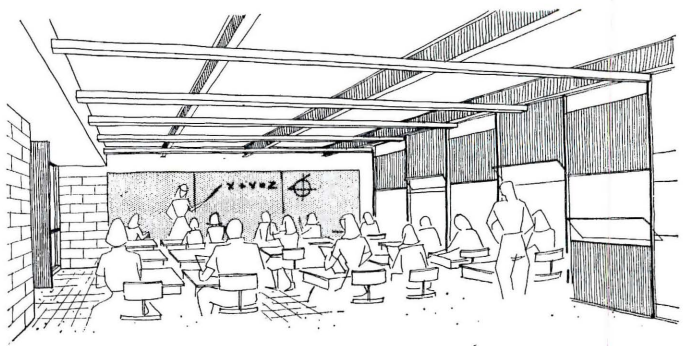
"Suspended incandescent fixtures or spots may be introduced over special work areas to add sparkle and variety to the overall lighting." Library corner of classrooms in Smithtown elementary school is accented by a mobile suspended fixture

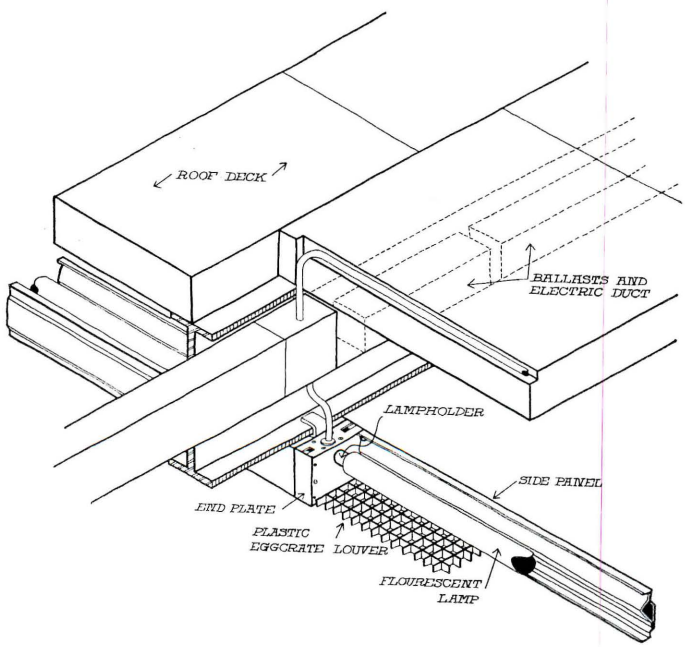


"If fixtures are pendant-mounted, contrast with the ceiling can be reduced, although there may still be light and dark streaks at the spacing commonly used." At John Jay, beam-level fixtures cast light up on ceiling, down on work surfaces



At the new East Wallingford (Conn.) Elementary School, ceiling-fixture contrast will be eliminated by concealing the light source. Fluorescent strips will be mounted across the line of vision within the corrugations of the cellular roof deck





"Single-tube fluorescent fixtures suspended on 5½ ft centers between exposed beams will give an almost completely luminous ceiling and materially reduce both brightness contrast and consequent eye fatigue." At the new Harborfields Central High School, Greenlawn, N. Y., single-tube classroom fixtures with "egg-crate" bottoms and open tops are hung at beam level. Uplight on ceiling and closer-than-standard spacing add up to even, low-contrast illumination

CODES EASE UP ON CURTAIN WALLS

A survey of 100 major cities shows that nearly 80 per cent of them either now permit, or are considering code amendments which will allow, unrated, non-combustible curtain wall panels.

Of 100 large U. S. cities recently surveyed, half of them now permit non-combustible curtain walls without fire-resistive backup. Twelve per cent more of these cities are considering specific amendments to their building codes which will permit modern curtain wall construction. Another 17 per cent are in the process of adopting the latest edition of one of the national building codes which permit unprotected, non-combustible construction when there is adequate distance between buildings. This was revealed in a survey of 211 cities having a population over 100,000 conducted by the Committee on Building Research and Technology of American Iron and Steel Institute, and announced by William G. Kirkland, Chief—Engineering Division.

Codes of the remaining 22 per cent of these cities either require 1- to 4-hour fire resistance or masonry materials for wall construction regardless of exposure distance. These codes generally would permit either unlimited or large areas of glass installations in such walls in lieu of the fire-resistive construction.

Advocates of curtain wall (or, more aptly, panel wall) construction have long argued that building codes didn't make sense which permitted large areas of glass for windows but required other areas (considered as walls) to have 4-hour fire ratings. The new model codes of the National Board of Fire Underwriters and of the several building code officials' organizations acknowledged this paradox, and now require only that panel walls be non-combustible, when exposure distances are sufficient.

Apparently this change plus growing curtain wall technology and consumer acceptance have given the impetus for cities to modernize their codes covering this construction.

Following are excerpts from the AISI report:

Many building codes formerly contained outmoded descriptive exterior wall regulations and restrictions based on materials and methods in vogue when the older codes were written. The conventional requirements of older "Specification Codes" dictated the kind and thickness of material to be used instead of specifying the standards of performance to be met by the walls.

A common regulation of these older codes required that exterior walls of fire resistive buildings be constructed of reinforced concrete or masonry having a 4-hour fire resistive rating. Also, no differentiation was made between load-bearing and a non-load-bearing wall. Such outmoded regulations are still in existence in some localities.

Early code writers did not consider the fact that exposure temperatures created by a fire in an adjacent building, although capable of igniting exposed combustible materials over a wide distance, represent a relatively low severity of fire exposure, i.e., only a few minutes duration (severity) of the standard ASTM fire test exposure, which is the commonly accepted test by which fire-resistance ratings of walls are evaluated. Fire protection authorities now agree that, when adequate separation distances are provided, no prescribed minimum fire resistance is necessary for non-combustible panel walls to provide adequate fire safety.

Provisions for the use of modern panel wall constructions now appear in building code standards which receive national or wide regional recognition. It is estimated that one or another of these code standards is followed in more than 75 per cent of the jurisdictions, including cities, counties, townships and states, in the United States that have building code regulations.

These codes now differentiate between the fire resistance requirements for load-bearing exterior walls and those for non-load-bearing panel or curtain walls. The latter are now generally required to be of "non-combustible construction" and not a specific material. Also, their fire resistance requirements are varied according to the distance of separation from fire exposure. A 2-hour fire resistance is generally required in those locations where the code does not permit wall openings and a 1-hour fire resistance is required in less-exposed locations where protected wall openings are required. Where unprotected wall openings are permitted, exterior panel walls of unprotected noncombustible construction are now permitted.

Following is a list of one hundred cities having a population of 100,000 or more and the status of the requirements for exterior non-bearing panel or curtain walls in those cities. These requirements as listed are only those applying within the First Fire Districts of those cities. Generally, the requirements in the outer Fire Districts are less restrictive. Further, these requirements apply to fire resistive type of construction. References to national building code standards included in this list are:

1. Building Officials Conference of America—**Basic Building Code**
2. National board of Fire Underwriters—**National Building Code**
3. Southern Building Code Congress—**Southern Standard Building Code**
4. International Conference of Building Officials—**Uniform Building Code**

For the codes of BOCA, NBFU, and SBCC, zero fire resistance rating is required when the horizontal separation is 30 ft or more. The Uniform Building code of ICBO has this provision:

Exterior panel walls fronting on streets having a width of at least 50 feet in Fire Zone No. 1 or 30 feet in Fire Zones No. 2 and No. 3 may be of unprotected non combustible construction (Section 1803(a) for Type I (2-hour) and Section 1903(a) for the Type II (1-hour) Noncombustible Fire Resistive Constructions).

1. NEW YORK, N. Y.: Exterior panel walls on buildings are required to have a fire resistance rating of 2-hours by the New York City Building Code.

2. CHICAGO, ILLINOIS: Exterior panel walls are required to have a minimum of 2-hours fire resistance by the Chicago Building Code. A revision to provide for unprotected noncombustible panel walls is presently under consideration by the City of Chicago.

3. PHILADELPHIA, PENNA.: Exterior panel walls are required to be of masonry or other incombustible material having 4-hours fire resistance by the Philadelphia Building Code. A code revision to provide for the use of unprotected noncombustible panel walls was passed in June by

the city council, and was signed by the mayor in the middle of July.

4. LOS ANGELES, CALIFORNIA: The Los Angeles Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

5. DETROIT, MICHIGAN: Unprotected noncombustible panel walls are permitted in the City of Detroit when a separation distance of 30 ft. or more is provided.

6. BALTIMORE, MARYLAND: Unprotected noncombustible panel walls are permitted in the City of Baltimore when a separation distance of 50 ft. or more is provided.

7. CLEVELAND, OHIO: Exterior panel nonbearing walls are required to have a minimum of 1-hour fire resistance by Cleveland Building Code. A code revision to provide for the use of unprotected panel walls has been approved by the Board of Standards and is being considered by the Cleveland City Council.

8. ST. LOUIS, MISSOURI: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the St. Louis Building Code. St. Louis is presently revising its building code and is using the Basic Building Code as a basis for this revision. Unprotected noncombustible panel walls are permitted by the latest revision of the Basic Building Code.

9. WASHINGTON, D. C.: Exterior panel walls are required to have a minimum of 2-hours fire resistance by the District of Columbia Building Code. The District of Columbia is presently revising its building code and provisions to permit the use of unprotected noncombustible panel walls have been proposed.

10. BOSTON, MASSACHUSETTS: The Boston Building Code permits the use of unprotected noncombustible panel walls in locations where openings in exterior walls are not required to be protected.

11. SAN FRANCISCO, CALIF.: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the San Francisco Building Code. A code revision to permit the use of unprotected noncombustible panel walls has been proposed.

12. PITTSBURGH, PENNA.: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Pittsburgh Building Code. A revision to the code to permit the use of unprotected noncombustible panel walls is presently being considered by the City of Pittsburgh.

13. MILWAUKEE, WISCONSIN: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Milwaukee Building Code. A revision to permit the use of unprotected noncombustible panel walls is under consideration by the City of Milwaukee.

14. HOUSTON, TEXAS: Exterior panel walls are required to have a minimum of 2-hours fire resistance by the Houston Building Code. Houston is reported to be revising its building code.

15. BUFFALO, NEW YORK: The Buffalo Code requires that all exterior walls be of masonry construction and shall have a fire resistance of not less than 4-hours except that panel walls not over 9 ft. in height may be of 4-inch solid masonry facing with 4-inch hollow masonry backing with plaster on one face. A revision of the code to permit the use of unprotected noncombustible panel walls has been proposed.

16. NEW ORLEANS, LOUISIANA: The New Orleans Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

17. MINNEAPOLIS, MINNESOTA: The Minneapolis Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

18. CINCINNATI, OHIO: The Cincinnati Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

19. SEATTLE, WASHINGTON: The Seattle Building Code provides for the use of unprotected panel walls when a separation distance of 25 ft. or more is provided.

20. KANSAS CITY, MISSOURI: The Kansas City Building Code is presently being revised. The 1955 Edition of the National Building Code has been used as the basis of this revision and unprotected noncombustible panel walls are permitted by this edition when a separation distance of 30 ft. or more is provided.

21. NEWARK, NEW JERSEY: All exterior walls are required to be of masonry construction having a fire resistance of 4-hours by the Newark Building Code. Newark is presently considering revision of its building code to provide for the use of unprotected noncombustible panel walls.

22. DALLAS, TEXAS: All exterior walls are required to have a fire resistance of 4-hours by the Dallas Building Code.

23. INDIANAPOLIS, INDIANA: The Indianapolis Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

24. DENVER, COLORADO: The Denver Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

25. SAN ANTONIO, TEXAS: The San Antonio Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

26. MEMPHIS, TENNESSEE: Exterior walls are required to have a 4-hour fire resistance by the Memphis Building Code. It has been reported that a variance to permit the use of unprotected noncombustible panel walls may be secured through the Advisory Board of that city.

27. OAKLAND, CALIFORNIA: The Oakland Building Code provides for the use of unprotected noncombustible panel walls when a separation tance of 50 ft. or more is provided.

28. COLUMBUS, OHIO: The Columbus Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

29. PORTLAND, OREGON: The Portland Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

30. LOUISVILLE, KENTUCKY: Louisville has adopted the 1949 Edition of the National Building Code. Revisions permitting the use of unprotected noncombustible panel walls in accordance with the provisions of the 1955 Edition of the National Code will be proposed.

31. SAN DIEGO, CALIFORNIA: The San Diego Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

32. ROCHESTER, NEW YORK: Exterior panel walls are required to have a minimum of 2-hours fire resistance by the Rochester Building Code. It is reported that Rochester is considering a revision of its entire building code.

33 ATLANTA, GEORGIA: Although the Atlanta Building Code is based on the 1949 Edition of the National Building Code provisions are included to provide for the use of unprotected noncombustible panel walls when a horizontal separation of 50 ft. or more is provided.

34. BIRMINGHAM, ALABAMA: Unprotected noncombustible panel walls are permitted in the City of Birmingham when a separation of 30 ft. or more is provided.

35. ST. PAUL, MINNESOTA: St. Paul has adopted the 1949 Edition of the National Building Code. Revisions permitting the use of unprotected noncombustible panel walls in accordance with the provisions of the 1955 Edition of the National Code will be proposed.

36. TOLEDO, OHIO: All exterior walls are required to have a 4-hour fire resistance by the Toledo Building Code.

37. JERSEY CITY, NEW JERSEY: Jersey City has adopted the 1949 Edition of the National Building Code. Consideration is being given to permitting the use of unprotected noncombustible panel walls in accordance with the provisions of the 1955 Edition of the National Building Code.

38. FORT WORTH, TEXAS: All exterior walls are required to be of masonry construction by the present Fort Worth Building Code. A building code committee is currently revising the Fort Worth Code and is using the 1958 Edition of the Uniform Building Code as a basis for the revision. Unprotected noncombustible panel walls are permitted by the Uniform Building Code.

39. AKRON, OHIO: All exterior walls are required to be of masonry construction having 3-hours fire resistance by the Akron Building Code.

40. OMAHA, NEBRASKA: Unprotected noncombustible panel walls are permitted in the City of Omaha when a separation distance of 30 ft. or more is provided.

41. LONG BEACH, CALIFORNIA: The Long Beach Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

42. MIAMI, FLORIDA: The Miami Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

43. PROVIDENCE, RHODE ISLAND: Exterior panel walls are required to have a minimum of 1½ hours fire resistance by the Providence Building Code.

44. DAYTON, OHIO: The Dayton Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

45. OKLAHOMA CITY, OKLA.: Oklahoma City Code is based on the 1949 Edition of the National Building Code. The 1955 Edition of the National Code is presently being considered for adoption by that city. Unprotected noncombustible panel walls are permitted by this Edition of the National Building Code.

46. RICHMOND, VIRGINIA: Unprotected noncombustible panel walls are permitted by the City of Richmond when a separation distance of 30 ft. or more is provided.

47. SYRACUSE, NEW YORK: Unprotected noncombustible panel walls are permitted by the

City of Syracuse in locations where openings in exterior walls are not required to be protected.

48. NORFOLK, VIRGINIA: It is reported that the use of unprotected noncombustible panel walls in accordance with the provisions of the 1957-1958 Southern Standard Building Code is under consideration by the City of Norfolk. The present Norfolk Code is based on a previous Edition of the Southern Code.

49. JACKSONVILLE, FLORIDA: Unprotected noncombustible panel walls are permitted in the City of Jacksonville when a separation distance of 30 ft. or more is provided.

50. WORCESTER, MASS.: Unprotected noncombustible panel walls are permitted in the City of Worcester in locations where openings in exterior walls are not required to be protected.

51. TULSA, OKLAHOMA: Exterior panel walls are required to have a minimum thickness of 6 inches by the Tulsa Building Code.

52. SALT LAKE CITY, UTAH: The Salt Lake City Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

53. DES MOINES, IOWA: The Des Moines Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

54. HARTFORD, CONNECTICUT: Unprotected noncombustible panel walls are permitted in the City of Hartford when a separation distance of 30 ft. or more is provided.

55. GRAND RAPIDS, MICHIGAN: The City of Grand Rapids is presently revising its building code and is using the Basic Building Code as a basis for this revision. Unprotected noncombustible panel walls are permitted by the latest revision of the Basic Building Code.

56. NASHVILLE, TENNESSEE: The Nashville Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

57. YOUNGSTOWN, OHIO: Exterior panel walls are required to have a minimum of 2-hour fire resistance by the Youngstown Building Code. It is reported that Youngstown is considering adoption of the Ohio State Building Code which permits unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

58. WICHITA, KANSAS: The Wichita Building Code permits the use of unprotected noncombustible panel walls when a separation distance of 40 ft. or more is provided.

59. NEW HAVEN, CONNECTICUT: The New Haven Building Code requires that exterior panel walls have a minimum of 2-hour fire resistance.

60. FLINT, MICHIGAN: Exterior panel walls are required to be of masonry construction having a minimum thickness of 8 inches by the Flint Building Code.

61. SPOKANE, WASHINGTON: The Spokane Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

62. SPRINGFIELD, MASS.: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Springfield Building Code. Amendments to the code to provide for the use of unprotected noncombustible panel walls have been proposed.

63. BRIDGEPORT, CONNECTICUT: Exterior panel walls are required to be of masonry construction having a minimum thickness of 8 inches by the Bridgeport Building Code.

64. YONKERS, NEW YORK: The use of unprotected noncombustible panel walls is permitted by the City of Yonkers.

65. TACOMA, WASHINGTON: The Tacoma Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

66. PATERSON, NEW JERSEY: The Paterson Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

67. SACRAMENTO, CALIF.: The Sacramento Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

68. ALBANY, NEW YORK: The use of unprotected noncombustible panel walls in fire resistive buildings is not covered specifically in the Albany Building Code. It is reported that construction that conforms with nationally recognized good practice can be submitted for approval to the Board of Building and Zoning Appeals.

69. CHARLOTTE, NORTH CAROLINA: The use of unprotected noncombustible panel walls is permitted by the City of Charlotte when a separation distance of 30 ft. or more is provided.

70. AUSTIN, TEXAS: All exterior walls are required to be of masonry construction having a 4-hour fire resistance by the Austin Building Code. Austin is presently considering adoption of the Uniform Building Code. Unprotected noncombustible panel walls are permitted by the Uniform Building Code.

71. CHATTANOOGA, TENNESSEE: The Chattanooga Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

72. ERIE, PENNSYLVANIA: The City of Erie is presently adopting the Basic Building Code including amendments through 1957 which permits the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

73. EL PASO, TEXAS: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the El Paso Building Code.

74. KANSAS CITY, KANSAS: The Kansas City Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

75. MOBILE, ALABAMA: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Mobile Building Code.

76. SHREVEPORT, LA.: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Shreveport Building Code. It is reported that consideration is being given to adopting the 1957-58 Edition of the Southern Standard Building Code which permits the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

77. BATON ROUGE, LA.: The Baton Rouge Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

78. SCRANTON, PENNA.: The Scranton Building Code is based on the 1934 Edition of the National Building Code. Revisions to permit the use of unprotected noncombustible panel walls in accordance with the provisions of the 1955 Edition of the National Code will be proposed.

79. KNOXVILLE, TENNESSEE: Exterior panel walls are required to have a minimum of 1-hr. fire resistance by the Knoxville Building Code. It is reported that consideration is being given to adopting the 1957-58 Edition of the Southern Standard Building Code which permits the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

80. TAMPA, FLORIDA: The City of Tampa has adopted the 1949 Edition of the National Building Code. Adoption of a later standard providing for the use of unprotected noncombustible panel walls is being considered by Tampa.

81. CAMBRIDGE, MASS.: It has been reported that the City of Cambridge permits the use of unprotected noncombustible panel walls.

82. SAVANNAH, GEORGIA: The City of Savannah has adopted the 1949 Edition of the National Building Code. The 1955 Edition of the National Building Code which provides for the use of unprotected noncombustible panel walls is presently being considered for adoption by Savannah.

83. CANTON, OHIO: The Canton Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

84. SOUTH BEND, INDIANA: The City of South Bend is presently adopting the Basic Building Code including amendments through 1957 which permits the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

85. BERKELEY, CALIFORNIA: The Berkeley Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft. or more is provided.

86. ELIZABETH, NEW JERSEY: Unprotected noncombustible panel walls are permitted in the City of Elizabeth when a separation distance of 30 ft. or more is provided.

87. FALL RIVER, MASS.: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Fall River Building Code.

88. PEORIA, ILLINOIS: The Peoria Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

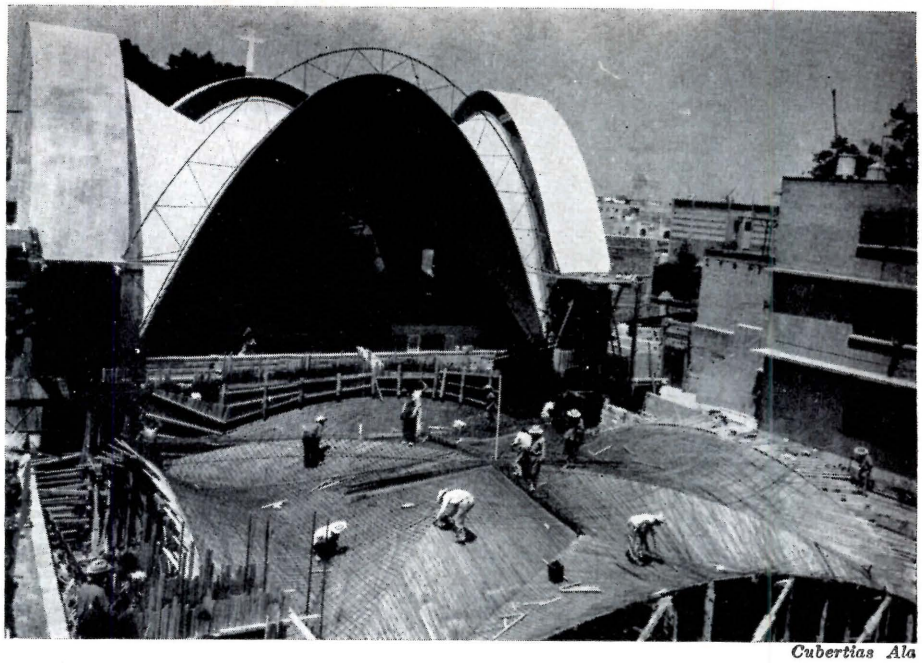
89. WILMINGTON, DELAWARE: Unprotected noncombustible panel walls are permitted in the City of Wilmington when a separation distance of 30 ft. or more is provided.

90. READING, PENNSYLVANIA: The City of Reading is presently adopting the Basic Building Code including amendments through 1957 which permit the use of unprotected noncombustible panel walls when a separation distance of 30 ft. or more is provided.

91. NEW BEDFORD, MASS.: All exterior walls are required to be of masonry construction having a 4-hour fire resistance by the New Bedford Building Code.

92. CORPUS CHRISTI, TEXAS: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Corpus Christi Building Code. It is reported that consideration is being given to adopting the 1957-58 Edition of the Southern Standard Building Code which per-

continued on page 278



Cubertias Ala

Church San Antonio de las Huertas, Enrique de la Mora, Architect, is roofed with three groined vaults. Over the crypt are two star-type vaults of a more complicated nature, formed by combinations of hyperbolic paraboloid sections

Understanding the Hyperbolic Paraboloid: Part 2

STRESS ANALYSIS FOR ANY HYPERBOLIC PARABOLOID

By Felix Candela

Even when the shape for a thin shell can be defined simply, as with the hyperbolic paraboloid, stress analysis involves a quite tedious and boresome process of geometry, trigonometry and arithmetic. For this reason, Candela questions the wisdom of trying to pick just any free shape for a thin shell surface. Nevertheless he still is in favor of, and shows how to analyze, a graceful thin shell in which the outer edges are kept paper thin by thickening the shell at other boundaries

Whoever applies the process of analysis given in this article must confront the hardships of geometry and trigonometry that make it a lengthy and boresome task. After following through the analysis for the hyperbolic paraboloid, the reader will appreciate that it is almost impossible to choose those shapes which have no simple definition and which require the use of higher mathematics to resolve the equations for the basic stresses.

In view of this and in view of the actual existing methods of practical analysis we can employ, I am very pessimistic about the use of entirely free forms in architecture, and I believe architects should consider them a little more soberly, if only to spare themselves much distress and disappointment. *Free surfaces defy simple analysis.*

Some people claim that if the mathematics are too hard, we can always revert to the testing of scale models or photoelasticity. I have never resorted to such means myself, because the problem is never to discover the internal stresses in a structure (which are normally very low) but to find the forces at the edges. These determine the dimensions of the edge members. I cannot see how this can be done by means of small scale models. Moreover the material used in models is always different from the real thing, and at the same time the size and disposition of the edge members have a fundamental influence on the distribution of internal stresses; so we enter a vicious circle.

The only way is to *calculate* the stresses. But we must employ methods on which we can rely, not the vague hypotheses or theories about the deformability of materials. So I personally only believe in statics and geometry. And in order to disregard the deformation of a structure, we must use doubly-curved or compound surfaces.

But the hyperbolic paraboloid is the *only* compound surface which can be analysed by simple statics. This is its real justification and a far more valid one than the beauty of its form.

Membrane Stress Analysis [1]

General equations of membrane stresses [2] in a surface represented by z = f(xy) in a system of birectangular axes (ω can be any angle) are obtained by expressing the equilibrium along x, y, z of the forces acting in the surface element shown in Fig. 8, neglecting the differentials of second order. [Note: The first part of the article gave Equation (1) as z = kxy where k is a constant representing warp of the surface]. These general equations are:

$$\frac{\delta v_x}{\delta x} + \frac{\delta \tau}{\delta y} = -X \sin \omega \quad \ldots\ldots (2a)$$

$$\frac{\delta \tau}{\delta x} + \frac{\delta v_y}{\delta y} = -Y \sin \omega \quad \ldots\ldots (2b)$$

$$r v_x + t v_y + 2s\tau = (pX + qY - Z) \sin \omega \quad \ldots (2c)$$

WHERE,

$$p = \frac{\delta z}{\delta x};\ q = \frac{\delta z}{\delta y};\ r = \frac{\delta^2 z}{\delta x^2};\ s = \frac{\delta^2 z}{\delta x \delta y};\ t = \frac{\delta^2 z}{\delta y^2} \quad \ldots (3)$$

besides, v_x, v_y and τ are projections of real stresses σ_x, σ_y and T upon plane xy (Fig. 8)

$$v_x = \sigma_x \sqrt{\frac{1+q^2}{1+p^2}};\ v_y = \sigma_y \sqrt{\frac{1+p^2}{1+q^2}};\ \tau = T \quad \ldots\ldots (4)$$

[1] We will use for this analysis the general formulas of membrane stresses in a surface of any shape at all which were developed by Pucher. Pucher, A. "Ueber den Spannungszustand in doppelt gekrummten Flachen". Beton und Eisen (Berlin) V. 33, no. 19, Oct. 5, 1934.—p. 298.

[2] It must be understood that stresses in this exposition are, strictly speaking, stresses times the shell thickness.

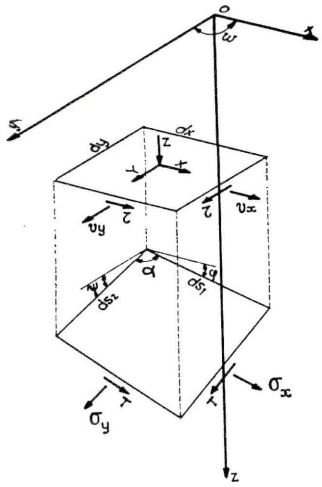


Figure 8: Forces and stress acting on a surface element

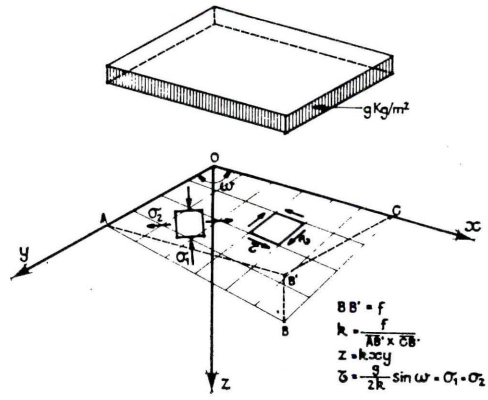


Figure 9: Uniformly distributed load on a horizontal projection

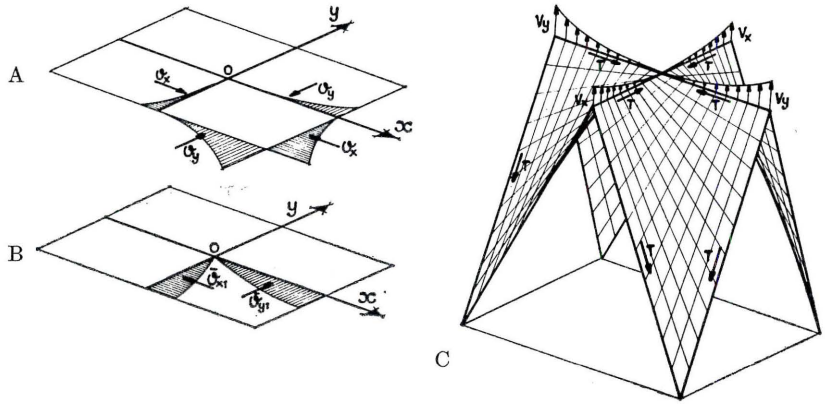


Figure 10: [*a.*] Basic normal stresses resulting from Eqs. (13a,13b) [*b.*] Stresses at the ridges after annulling them at the edges [*c.*] Nonequilibrated vertical forces at the ridges resulting from the stresses at both sides

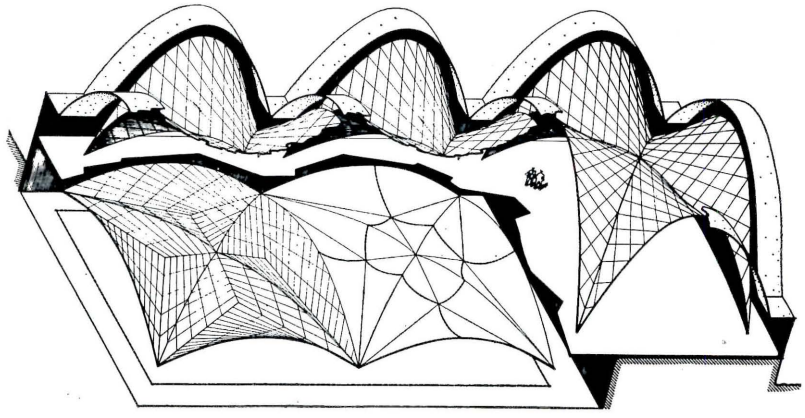


Figure 11: "Exploded" perspective of the Church San Antonio de las Huertas, Mexico

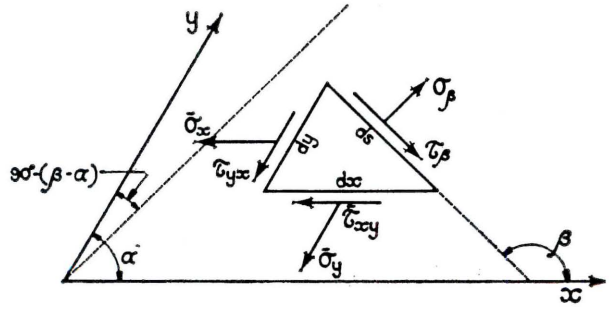


Figure 12

and X, Y and Z are the coordinate components of external forces, measured by unit of surface projection on plane xy. All forces, stresses and directions of coordinate axes represented in Fig. 8 are taken as positive.

Applications of General Expressions

Since the hyperbolic paraboloid is represented by z = kxy, (Eq. 1),

$$p = ky\,;\ q = kx\,;\ r = t = 0\,;\ s = k \quad \ldots\ldots (5)$$

AND EQUATION (2c) BECOMES

$$2k\tau = (kyX + kxY - Z)\sin\omega$$

OR:

$$\tau = \left(\frac{y}{2}X + \frac{x}{2}Y - \frac{1}{2k}Z\right)\sin\omega \quad \ldots\ldots (6)$$

Differentiating Eq. (6) with respect to x and y, substituting both differentials in Eqs. (2a) and (2b), and integrating the resulting expressions, the general solutions for v_x and v_y are obtained, containing, respectively, arbitrary functions of integration of either y or x which must be determined by the boundary conditions.

We can exemplify the method by applying it to the most usual type of loading, that is the dead load of the shell itself.

I am afraid the scope of this paper does not allow me to include the full derivation or justification of the formulas that appear here. (A book on this work is now being prepared by Colin Faber, in which the development of the formulas and the trigonometrical considerations explaining them will be set out in full.)

But I believe it is absolutely essential that these general formulas be made available immediately; because the early French papers on the hyberbolic paraboloid and even the book of Issenmann Pilarski[3] give the impression that one of the simplified formulas, pertaining only to a very special type of loading and surface disposition, can be employed to calculate *any* paraboloid, no matter what the loading. Nothing has been done to correct this utterly mistaken impression, for all the semi-popular papers persist in it indeed.

Dangerous errors can result from this situation, as inexperienced designers try to calculate stresses indiscriminately, without sound judgment of the scope to which the simplified expressions can be applied and with practically nobody to consult.

Uniformly Distributed Surface Load (Dead Load)

With the z axis in "selected" position (non-vertical)

Let g = load per unit surface with

[3] Issenmann Pilarski, L. "Calcul des voiles minces en beton armé." Ed. Dunod, Paris, 1935.

three components X_1, Y_1, Z_1 along the axes x, y, z of the paraboloid. These three components of the load are tied to the three forces X, Y, Z (per unit of projection xy) that appear in Eqs. (2a), (2b) and (2c) by means of the relation between the surface element and the area of its projection on plane xy (Fig. 8).

$$X\,dx\,dy\,\sin\omega = X_1\,ds_1\,ds_2\,\sin\alpha \quad \ldots\ldots (7)$$

ANGLE α IS GIVEN BY THE EXPRESSION

$$\cos\alpha = \frac{pq + \cos\omega}{\sqrt{(1+p^2)(1+q^2)}} \quad \ldots\ldots (8)$$

OR:

$$\sin\alpha = \sqrt{1-\cos^2\omega} = \sqrt{\frac{\sin^2\omega + p^2 + q^2 - 2pq\cos\omega}{(1+p^2)(1+q^2)}} = \frac{\sqrt{\phi}}{\sqrt{(1+p^2)(1+q^2)}} \quad \ldots\ldots (9)$$

BUT

$$\frac{ds_1}{dx} = \sec\phi = \sqrt{1+p^2}\,; \quad \frac{ds_2}{dy} = \sec\psi = \sqrt{1+q^2} \quad \ldots\ldots (10)$$

SUBSTITUTING IN EQUATION (7)

$$X\sin\omega = X_1\sqrt{\sin^2\omega + p^2 + q^2 - 2pq\cos\omega} = X_1\sqrt{\phi}.$$

SIMILARLY:

$$Y\sin\omega = Y_1\sqrt{\phi}\,; \quad Z\sin\omega = Z_1\sqrt{\phi} \quad \ldots\ldots \Big\} (11)$$

& EQUATIONS (2a)(2b)(2c) CAN BE WRITTEN:

$$\frac{\delta v_x}{\delta x} + \frac{\delta \tau}{\delta y} = -X_1\sqrt{\phi} \quad \ldots\ldots (12a)$$

$$\frac{\delta \tau}{\delta x} + \frac{\delta v_y}{\delta y} = -Y_1\sqrt{\phi} \quad \ldots\ldots (12b)$$

$$\tau = \left(\frac{y}{2}X_1 + \frac{x}{2}Y_1 - \frac{1}{2k}Z_1\right)\sqrt{\phi} \quad \ldots\ldots (12c)$$

To obtain v_x, the differential of Eq. (12c) with respect to y is substituted in Eq. (12a) and the resulting expression is integrated with respect to x, giving

$$v_x = \left[\frac{1}{4}(\cos\omega\,Y_1 - 3X_1)\,x + \left(\frac{5}{4}\cos\omega X_1 - \frac{1}{2}Y_1 + \frac{3}{4}\cos^2\omega\,Y_1\right)y - \frac{1}{2k}\cos\omega Z_1\right]\sqrt{\phi}$$
$$+\left[\left(-\frac{5}{4}k\sin^2\omega X_1 - \frac{3}{4}k\cos\omega\sin^2\omega Y_1\right)y^2 + \left(\frac{1}{2}Z_1\sin^2\omega\right)y - \frac{1}{4k}\sin^2\omega(3X_1 + \cos\omega\,Y_1)\right] Le\,(kx - ky\cos\omega + \sqrt{\phi})$$
$$+ f_1(y) \quad \ldots\ldots (13a)$$

SIMILARLY

$$v_y = \left[\frac{1}{4}(\cos\omega X_1 - 3Y_1)\,y + \left(\frac{5}{4}\cos\omega Y_1 - \frac{1}{2}X_1 + \frac{3}{4}\cos^2\omega X_1\right)x - \frac{1}{2k}\cos\omega Z_1\right]\sqrt{\phi}$$
$$+\left[\left(-\frac{5}{4}k\sin^2\omega Y_1 - \frac{3}{4}k\cos\omega\sin^2\omega X_1\right)x^2 + \left(\frac{1}{2}Z_1\sin^2\omega\right)x - \frac{1}{4k}\sin^2\omega(3Y_1 + \cos\omega X_1)\right] Le\,(ky - kx\cos\omega + \sqrt{\phi})$$
$$+ f_2(x) \quad \ldots\ldots (13b)$$

Eqs. (12c), (13a) and (13b) give *the basic values of the stresses at any point of the surface.* It can be seen that these direct integrations of the system of partial differential equations (2a, 2b, 2c) have been made possible by the fact that the equation of the paraboloid is extremely simple. If we try this method with any other equation of second degree, representing any other surface, the system is not directly integrable.

Simplifications of Eqs. (12c), (13a) and (13b) for other dispositions of the axes with respect to the vertical are easily obtained by annulling the corresponding values in the general expressions.

If, for instance, the paraboloid is equilateral $\omega = 90°$, $\sin\omega = 1$, $\cos\omega = 0$ and a substantial reduction of the length of the formulas is obtained.

The most common simplifications are:

Uniformly Distributed Surface Load, *With the z axis vertical*

$X_1 = 0$; $Y_1 = 0$; $Z_1 = g$

& EQUATIONS (12c), (13a), (13b) ARE SHORTENED TO:

$$\tau = -\frac{g}{2k}\sqrt{\phi} \quad \ldots\ldots (14a)$$

$$v_x = -\frac{g}{2k}\sqrt{\phi}\cos\omega + \frac{g}{2}x\sin^2\omega\,\log_e(kx - ky\cos\omega + \sqrt{\phi}) + f_1(y) \quad \ldots\ldots (14b)$$

$$v_y = -\frac{g}{2k}\sqrt{\phi}\cos\omega + \frac{g}{2}y\sin^2\omega\,\log_e(ky - kx\cos\omega + \sqrt{\phi}) + f_2(x) \quad \ldots\ldots (14c)$$

Uniformly Distributed Load on Horizontal Projection

With the z axis vertical (Fig. 9)

$X_1 = 0$; $Y_1 = 0$; $Z_1 = Z = g = \text{constant}$

$$\tau = -\frac{g\sin\omega}{2k} = \text{constant} \quad \ldots\ldots (15a)$$

$$v_x = f_1(y) \quad \ldots\ldots (15b)$$

$$v_y = f_2(x) \quad \ldots\ldots (15c)$$

$f_1(y)$ and $f_2(x)$ being arbitrary functions of integration can have any value, including 0, which gives $v_x = 0$, $v_y = 0$.

This very particular case is the only one commonly known, but we must remember that it can only be applied in a very limited number of cases, where the axis is vertical and the surface is flat enough to let us consider the real load as uniformly distributed on plane xy. As soon as the rise is increased substantially, or the z axis is not vertical, more complicated formulas must be employed.

It must be noted that in all these cases the value of τ is definitely fixed by Eq. (12c), but values of v_x, v_y and σ_y, σ_x can be variable depending on the choice of values for the arbitrary functions of integration $f_1(y)$ and $f_2(x)$ that appear in Eqs. (13a) and (13b). This means that normal stresses in an unlimited surface are statically indeterminate or hyperstatic. To freeze them we must recur to the boundary conditions. This property gives us some freedom in the choice of the boundary or support disposition.

Boundary Conditions

Paraboloid limited by straight generators (not necessarily rectangular or equilateral).

By giving convenient values to the arbitrary functions of integration $f_1(y)$ and $f_2(x)$ it is possible to leave two contiguous sides of any warped quadrangle free of normal stresses. But of course the stresses at the opposite two sides are frozen or determinate, and these edges are subjected to normal forces which must be absorbed by providing a continuous support along them. This means that in practice it suffices to find the numerical value which must be added to the stresses along each generator (of the lattice which we may want to consider) to comply with the support conditions at a certain edge. We may, for instance, cancel the normal stress component along one edge, introducing, as Δv_x or Δv_y, a set of stresses equal and opposite to those resulting at this edge from Eq. (13a) or (13b), but this involves the introduction of the same additional stresses at the opposite edge, as if each generator were a tie or strut, and it will produce, of course, alterations in the state of stress at the interior points of the surface.

From these considerations it becomes clear that a single warped quadrangle, under this type of load, cannot be in equilibrium, except if at least two contiguous sides have edge members or support elements able to resist loads of any direction. Considerations of symmetry in associations of several warped quadrangles may lead to simplifications of the necessary support conditions, but there will always remain nonequilibrated stress components along certain edges (Fig. 10).

Since the shear stresses along the generators are frozen, the tangential forces resulting from the addition of the shear stresses along the edge must be taken by this edge working in tension or compression.

Paraboloid with "selected" curved boundaries (Fig. 11).

Normal and tangential stresses σ_β, τ_β on any section forming an angle β with the x generator passing through the point under consideration are obtained by expressing the equilibrium in σ_β, τ_β directions respectively (Fig. 12).

$$\sigma_\beta = \sigma_x\frac{\sin^2\beta}{\sin\alpha} + 2\tau\frac{\sin\beta\sin(\beta-\alpha)}{\sin\alpha} + \sigma_y\frac{\sin^2(\beta-\alpha)}{\sin\alpha} \quad \ldots\ldots (16a)$$

$$\tau_\beta = -\sigma_x\frac{\sin\beta\cos\beta}{\sin\alpha} - \tau\frac{\sin(2\beta-\alpha)}{\sin\alpha} - \sigma_y\frac{\sin(\beta-\alpha)\cos(\beta-\alpha)}{\sin\alpha} \quad \ldots\ldots (16b)$$

Angle α formed by the two intersecting generators is obtained by Eq. (8). Since p and q represent the inclination with respect to xy plane (or trigonometrical tangents) of both generators, angle β is obtained by a similar formula in which q is substituted by the inclination or trigonometrical tangent q_β of the tangent to the curved boundary, and ω is substituted by the angle ω_β formed by the xy projections of the x generator and the tangent to the section.

$$\cos\beta = \frac{pq_\beta + \cos\omega_\beta}{\sqrt{(1+p^2)(1+q_\beta^2)}} \quad \ldots\ldots (17)$$

continued on page 215

Product Reports

more products on page 240

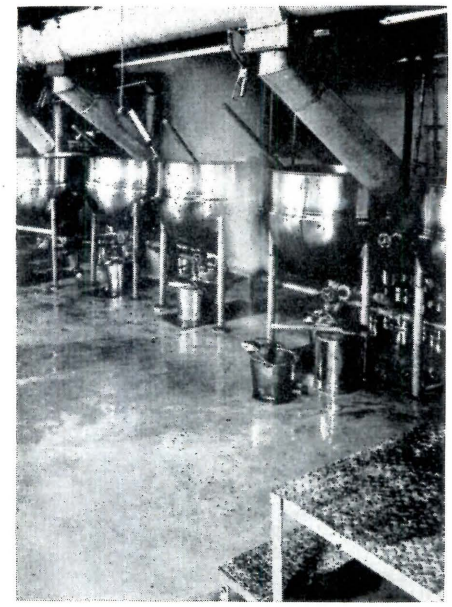
Epoxy Toppings: New Life for Old Concrete

A pair of new topping materials, said to be among the first to employ a workable, 100 per cent solids, completely reactive epoxy system, offer an effective and economical way of guarding concrete surfaces against chemical attack and traffic wear. The two materials, a trowelling mix and a liquid spray, utilize similar epoxy resins, but differ in the types of curing agents and fillers used. Both reportedly have excellent resistance to abrasion, impact, and corrosive attack by most chemicals and acids; and because of the epoxy's exceptional adhesive qualities, cannot be separated from the concrete surface without tearing up the concrete itself.

The trowelling mix, used primarily where unusually high chemical resistance and impact protection are needed, is applied to either old or new concrete surfaces in thicknesses varying from ⅛ to ¼ in., depending upon anticipated severity of usage. Its texture, hardness, resilience and color can also be varied to specific needs.

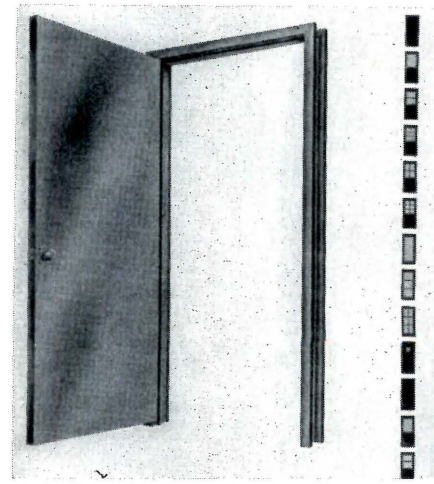
The liquid epoxy material, also highly resistant to chemicals, has the added advantage of curing to a skid- and slip-proof "sandpaper" finish. Particularly applicable to large areas of concrete, the spray method is less costly and time-consuming than trowelling.

Setting time for both mixes is normally from 12 to 24 hours, but can be cut down by heat curing. *Hodges Chemical Co., Redwood City, Calif.*



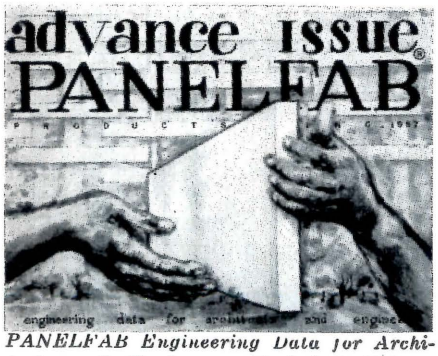
Packaged Steel Doors

A new series of metal door and buck combinations, featuring many variations by different combinations of stock details, is available under the label of *Aetnapak*. Any of hundreds of door, buck and hardware combinations can be shipped within 48 hours of receipt of order according to the manufacturer. Flush doors with many combinations of window and/or louvered vents are available with many types of hardware ready to install. The doors, sound-deadened with mineral wool, are 1¾ in. thick. *Aetna Steel Products Corp., 730 Fifth Ave., New York 19, N. Y.*



Office Literature

more literature on page 270



PANELFAB Engineering Data for Architects and Engineers, Technical Volume Number 1 "Advance Issue" gives detailed information on the construction, properties, characteristics, and advantages of *Panelfab* stressed-skin structural panels. The extensive illustrative material includes charts, details, sketches, and photos of typical *Panelfab* installations. 104 pp. *Panelfab Products, Inc., 2000 Northeast 146 St., Miami, Fla.*

ACI Concrete Primer

Revised edition, like the earlier one, develops basic principles and logical procedures for proportioning concrete mixtures, and demonstrates the application of these principles to concrete structures. Added emphasis is given to air entrainment, reactive aggregates, cement types and concrete placement, mixing and testing. 72 pp. $1.00. *American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Mich.*

Westinghouse Puts Air to Work

Booklet D-5199 covers treatment and distribution of air, with descriptions of applicable products and pertinent application data. 32 pp. *Westinghouse Sturtevant Div., Dept. T-189, 200 Readville St., Hyde Park, Boston 36, Mass.**

Creative Playthings Catalog

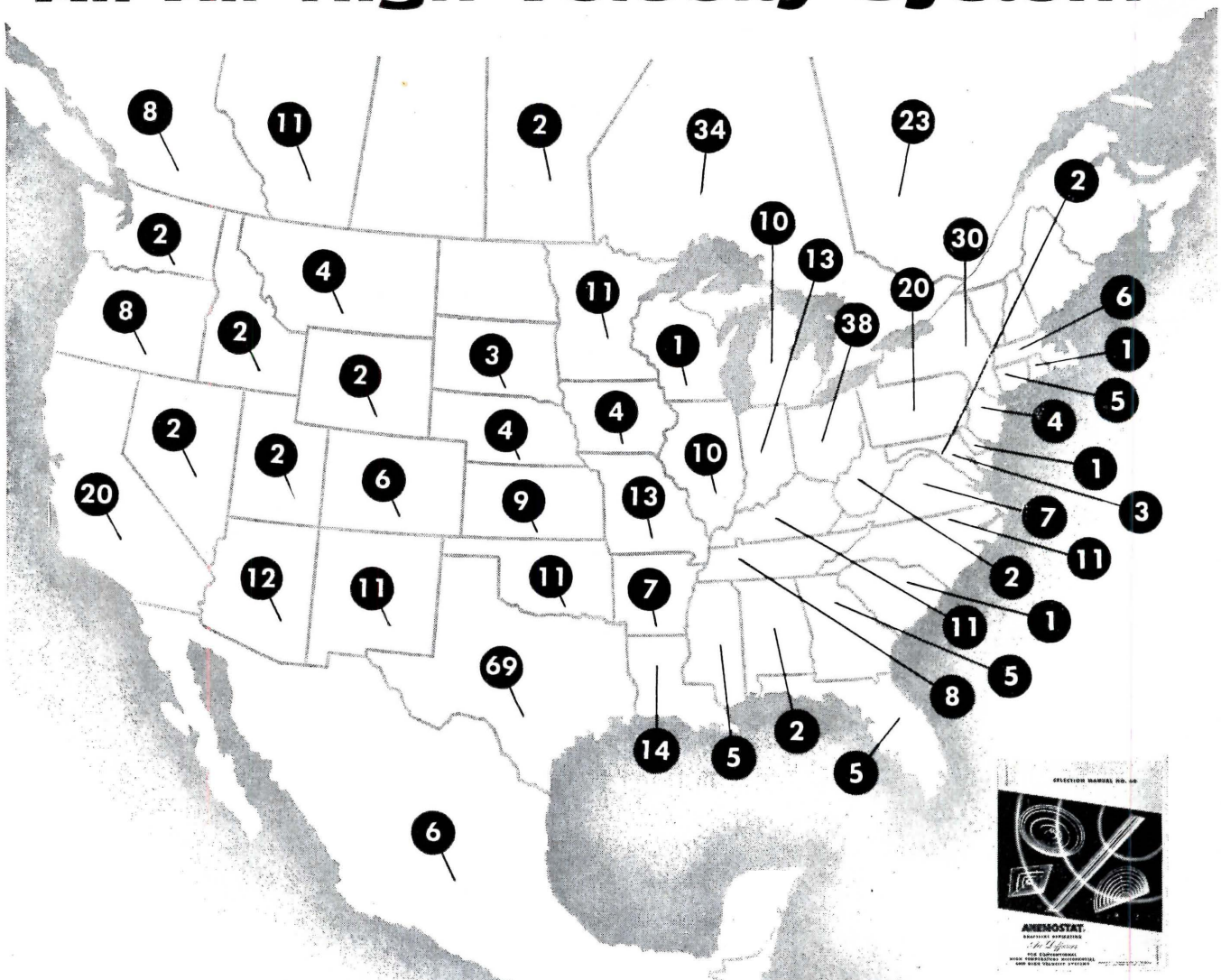
Features playground items, classroom furnishings, toys, and similar items for pre-school, kindergarten and primary grades in schools and institutions. 80 pp. An eight page leaflet on playground designs and equipment is also available. *Creative Playthings, Inc., 5 University Place, New York 3, N. Y.*

Electro-Channel Steel Joists

(A.I.A. 13-G) Lists advantages of underfloor electrification with *Electro-Channel* steel joists, describes typical installations, and gives detailed instructions on *E/C* joist construction. 25 pp. *Ceco Steel Products Corp., 5601 West 26th St., Chicago 50, Ill.**

**Additional product information in Sweet's Architectural File, 1958*

ANEMOSTAT reports on All-Air High Velocity System



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COOLING LOADS DUE TO SOL-AIR* TEMPERATURES: 1

From a report by Princeton University School of Architecture for Committee of Stainless Steel Producers, American Iron and Steel Institute†

A number of interrelated design factors influence the cooling costs due to heat transfer through walls of buildings having various degrees of glass area:

1. Building orientation
2. Proportion of transparent and opaque wall surfaces
3. Extent of sun control in the transparent areas of the wall, either by use of heat-resistant glass or by shading
4. Insulation of opaque areas

NOTE: In order to deal with cooling loads on a generalized basis, representative of a national average condition, the comparisons in the graphs are based on the "summer design data" temperatures (for peak conditions—July 21) given in the 1956 Guide of the American Society of Heating and Air Conditioning Engineers. The Guide recommends that these may safely be used for design estimating purposes throughout the United States, and that correction for latitude is necessary only when a high degree of accuracy is essential.

The specific heat gains through several types of glass, both shaded and unshaded are shown in the four charts on this page.

Building Orientation

The direction a wall faces makes a considerable difference in the heat impact it receives. To illustrate these differences, a long narrow building with bilateral glazing may be assumed, and comparison is made in Table 1, Sheet 2 of the cooling tonnage which will be required for optional east-west or north-south orientation of its length.

These comparisons are based on average sol-air temperature, and would of course involve slightly differing values in each region. The amount of solar heat gain on the east, west and north walls differs little throughout the United States, but the impact on south-facing walls varies considerably.

Data shown for the 100 per cent shaded condition might indicate that orientation has little significance when glass is completely shaded. Provision of total shading on east and west walls, however, is a relatively complex and expensive procedure.

Cooling Tonnage

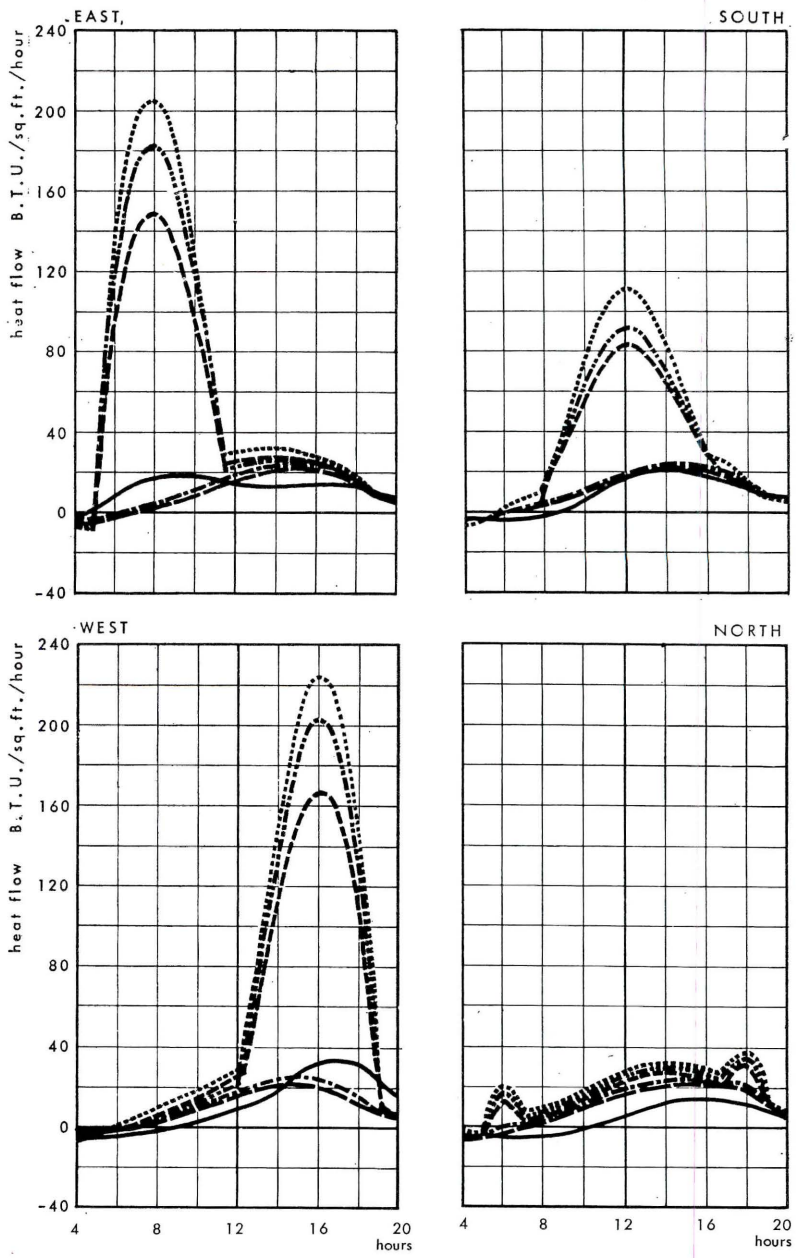
The required cooling tonnage per square foot of wall surface, to counteract the solar heat impact, depends upon:

a. the cooling loads imposed due to the heat conductivity characteristics of the opaque and transparent materials.

b. the ratio of areas of these opaque and transparent materials.

**Sol-air temperature reduces joint effect of solar radiation and air temperature to a single value*

HEAT TRANSMISSION THROUGH MATERIALS AT SUMMER PEAK CONDITIONS



†THERMAL BEHAVIOR OF METAL CURTAIN WALLS, Study No. 6 in the investigation of the use of Stainless Steel in Curtain Wall Construction, based on studies by Victor and Aladar Olgyay, Research Associates and Associate Professors, Princeton University

Charts on Sheet 2 indicate the cooling tonnages required to offset the heat gains imposed by the summer sol-air design temperatures on walls facing each of the four orientations. For each wall, values are indicated for a variety of transparent areas and a range of transparency ratios.

The ratio of transparent surface area to total wall area is seen as a highly significant factor in cooling costs, with almost a linear relationship indicated. In general, with any type of unshaded glass, or with shading of any amount up to 50 per cent, a tripling of the transparent area approximately doubles the cooling load.

The cooling load contributed by the opaque surface is shown by the trapezoidal shaded area in each of the charts.

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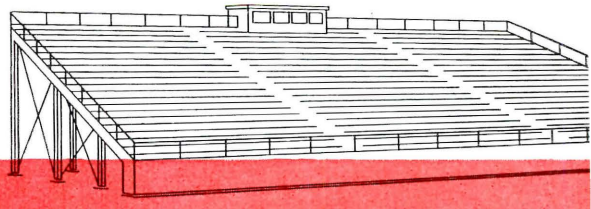

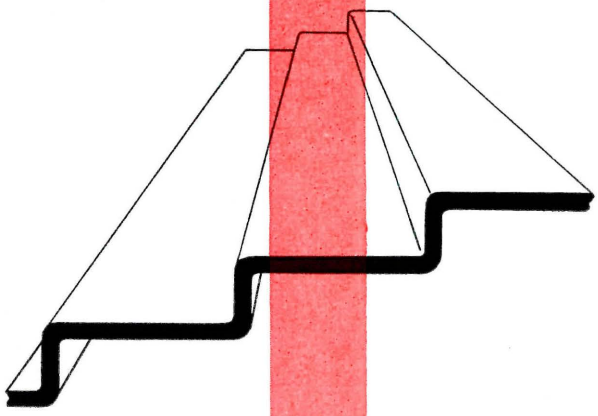

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COOLING LOADS DUE TO SOL-AIR TEMPERATURES: 2

TABLE 1: EFFECT OF BUILDING ORIENTATION ON COOLING LOAD

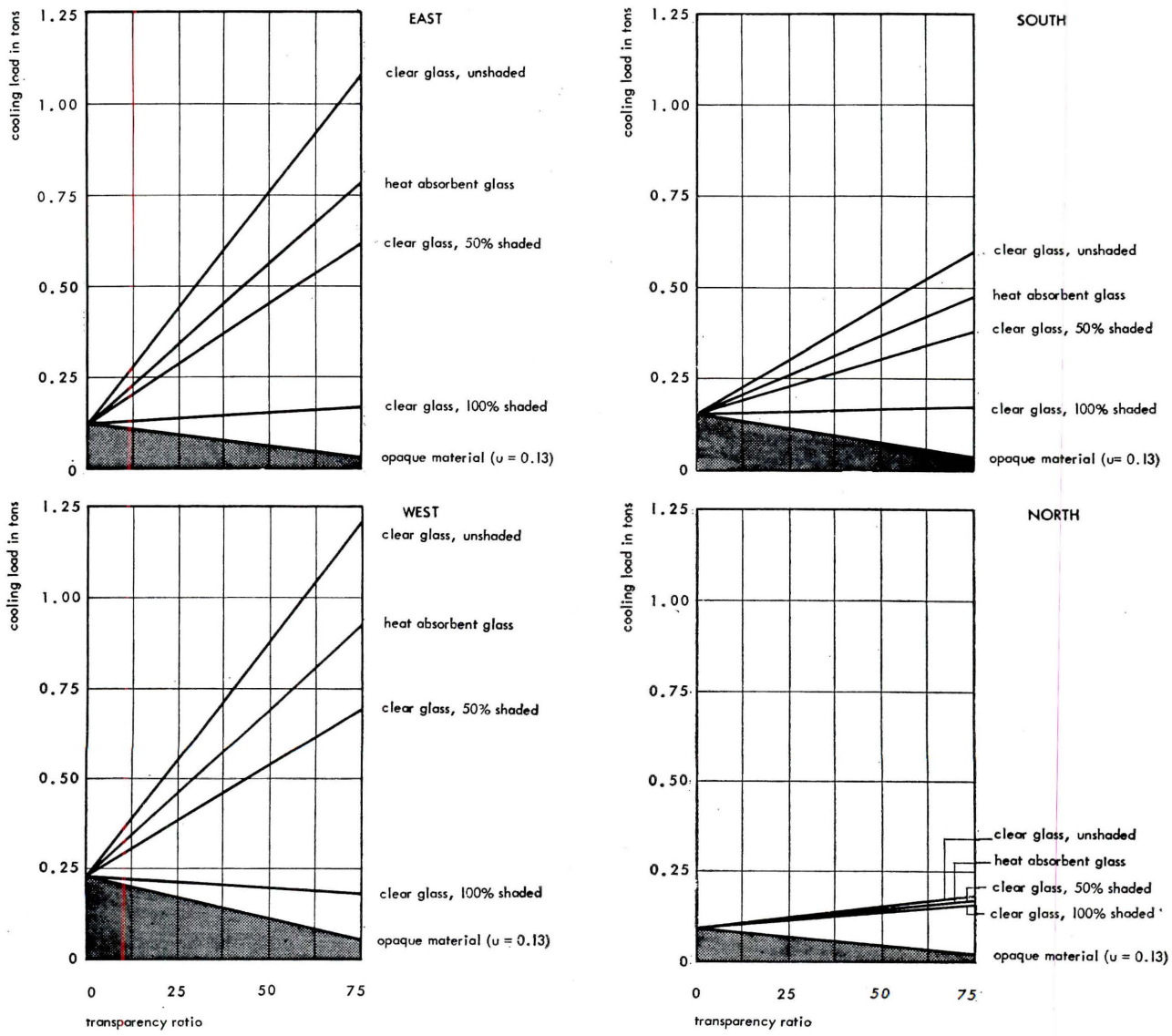
Tons of Refrigeration for 100 sq ft of wall

	North-South Orientation of Long Glazed Walls		East-West Orientation of Long Glazed Walls		Preference Ratio of North-South to East-West Orientation
Clear Glass Unshaded	N .15	S .45	W .87	E .76	2.7 to 1
Heat-Absorbing Glass	N .14	S .37	W .67	E .56	2.4 to 1
Clear Glass 50% Unshaded	N .14	S .30	W .54	E .45	2.3 to 1
Clear Glass 100% Unshaded	N .13	S .17	W .21	E .15	1.2 to 1

Note: Walls with glazing, 50% transparent, 50% opaque. Heat impact on solid end walls neglected

COOLING LOADS ON WALLS AT SUMMER PEAK CONDITIONS

Per 100 sq ft of surface



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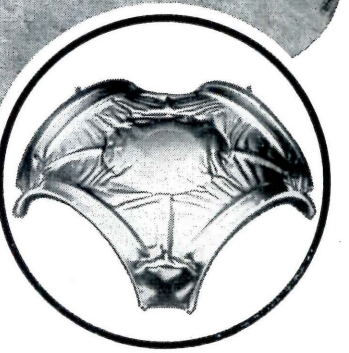

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STRESS ANALYSIS FOR ANY HYPERBOLIC PARABOLOID

continued from page 207

Since in formulas (16a) and (16b) σ_x and σ_y (obtained from Eqs. (13a) and (13b)) can have any arbitrary value, that is they are variables, it is possible in this case to annul σ_β and τ_β. When σ_β and τ_β are annulled along one edge, it is clear that this edge, being free of stresses, does not require any stiffening member. This can result in an extremely graceful border. The values of σ_x and σ_y to annul σ_β and τ_β are obtained by making Eqs. (16a) and (16b) equal to zero:

$$\overline{\sigma_x} = -\tau \frac{\sin(\beta-\alpha)}{\sin\beta} \quad \text{(18a)}$$

$$\overline{\sigma_y} = -\tau \frac{\sin\beta}{\sin(\beta-\alpha)} \quad \text{(18b)}$$

Once the values of $\overline{\sigma_x}$ and $\overline{\sigma_y}$ at the boundary points have been determined, their values along the generators intersecting this edge are frozen and no longer indeterminate. When these generators intersect another edge, the resultant edge stresses (σ_β and τ_β, obtained by Eqs. (16a) and (16b)) must be taken care of by means of a complete support, i.e. a support able to resist forces in any direction. Symmetrical arrangements of several paraboloids may lead to simplifications of the necessary support conditions (Fig. 11).

There are some important considerations with regard to the practical analysis. We must bear in mind, for instance, that we are using a method of finite differences in which the real length of each interval changes with its position, but the stresses acting at each point of intersection are unitary stresses or stresses by unit of length. When translating stresses from one to the other end of a generator, the difference of length of the interval on which these stresses are acting at each end must be taken into account.

On the other hand, if we use the projections of the stresses v_x, v_y and the projections of the intervals on plane xy we are dealing with a uniform grid, in which the intervals are constant. To translate the stresses we must first find v_x from σ_x at one end, translate v_x to the other end, and then find σ_x from v_x at this end.

Calculating a Groined Vault

Finally, to illustrate the practical procedure, let us consider the steps we must take to calculate the simple groined vault (formed by the intersection of two paraboloids) seen in Fig. 13.

When the plan of the structure is a square (Fig. 13), our task is much simpler and we need only investigate the triangle 1, 5, 9, 1 (that is an eighth of the structure). The basic steps are:

1. Find the basic values of τ, v_x, v_y at the points 1 to 12, from Eqs. (12c, 13a, 13b).
2. Find the values of $\overline{\sigma_x}$ and $\overline{\sigma_y}$ that annul σ_β and τ_β at the free edge 5, 9 from Eqs. (18a, 18b). To do this we must know the values of α at every point (Eq. 8) and the values of β_1, at the edge 5, 9 from Eq. (17).
3. Find the values of the functions of integration $f(y) = \Delta\sigma_x$, $f(x) = \Delta\sigma_y$ at the points 5, 9, as differences between the basic values of σ_x and σ_y and the ones found in step 2.
4. Transform $\Delta\sigma_x$ and $\Delta\sigma_y$ in Δv_x, Δv_y using Eq. (4).
5. Add these values of Δv_y and Δv_y to the corresponding values of v_x and v_y found by step 1 at the points 9, 12, 1.
6. Transform the result of step 5 in $\overline{\sigma_x}$, $\overline{\sigma_y}$ at the points 9, 12, 1, using Eq. (4).
7. Find the values of β_2 at the points 9, 12, 1 from Eq. (17).
8. Determine σ_β and τ_β at points 9, 12, 1 from Eq. (16).
9. Multiply τ_β in points 9, 12, 1 by the real length Δl of each corresponding interval, in order to find the tangential forces at each point.
10. Solve $\tau_\beta \Delta l$ in their horizontal and vertical components.
11. c_β is acting along the normal to the parabola 9, 12, 1 in each point, but being a membrane stress must be contained in the plane tangent to the hyperbolic paraboloid at each point. That is, it is acting along the intersection of the plane tangent to the paraboloid with the plane normal to the parabola 9, 12, 1 at each point. This means that in general its horizontal projection will not be normal to the projection of the groin 9, 12, 1.

Once this direction is found (problem of descriptive or analytical geometry) we can solve σ_β in its vertical and horizontal components. The latter have in their turn one component normal and another tangential to the projection of the groin. Of these the normal is equilibrated by the forces coming from the contiguous symmetrical part of the structure.

12. Add up the vertical components of τ_β and σ_β at the points 9, 12, 1 of the groin (by which *all* the loads are transmitted to the support) and compare this with the total weight of the triangle 1, 5, 9, 1, as a first check that the calculations are correct.
13. Calculate the groin 9, 1, 9 with the loads transmitted to it from both sides, i.e. σ_β and τ_β. In this case the groin can be considered as a three-hinged arch, since its V section becomes almost flat at the crown, producing a practical hinge. It is usually necessary to increase the thickness of the shell at both sides of the groin a small amount, to get a stronger member. In the groined vault of Las Huertas church, the groins increase in thickness to 4 in., in a width of 2 ft on each side.
14. If the vault is very large, it may be necessary to find the values of principal stresses at several points in the shell, so as to check the concrete stresses and provide an appropriate tensile reinforcement.

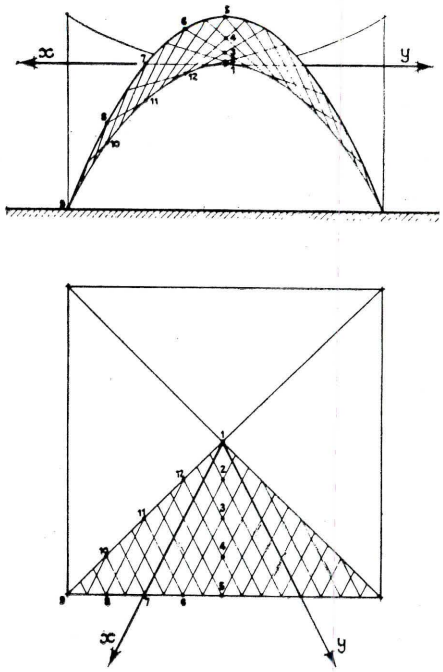


Figure 13: Calculating a groined vault

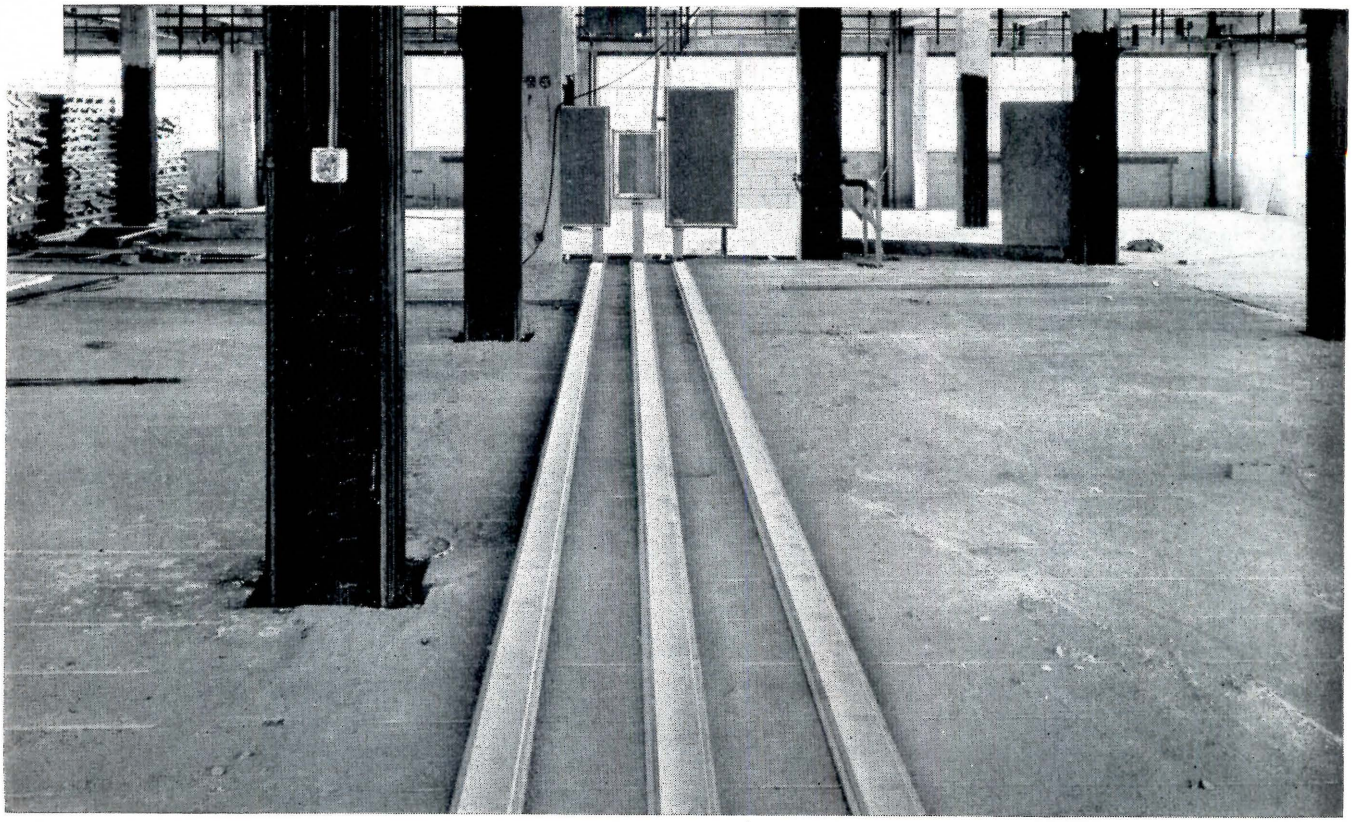
Once we know the values of τ, $\overline{\sigma_x}$ and $\overline{\sigma_y}$ at the selected points, the expressions for the principal stresses are:

$$\sigma_I = \overline{\sigma_x}\frac{\sin^2\theta}{\sin\alpha} + 2\tau\frac{\sin\theta\sin(\theta-\alpha)}{\sin\alpha} + \overline{\sigma_y}\frac{\sin^2(\theta-\alpha)}{\sin\alpha} \quad \text{(19a)}$$

$$\sigma_{II} = \overline{\sigma_x}\frac{\cos^2\theta}{\sin\alpha} + 2\tau\frac{\cos\theta\cos(\theta-\alpha)}{\sin\alpha} + \overline{\sigma_y}\frac{\cos^2(\theta-\alpha)}{\sin\alpha} \quad \text{(19b)}$$

in which $\overline{\sigma_x}$ and $\overline{\sigma_y}$ are the stresses along the generators after we have frozen them by considering the boundary conditions, and angle θ is obtained by the expression:

$$\tan 2\theta = \frac{2\tau\sin\alpha + \overline{\sigma_y}\sin 2\alpha}{\overline{\sigma_x} + 2\tau\cos\alpha + \overline{\sigma_y}\cos 2\alpha} \quad \text{(20)}$$



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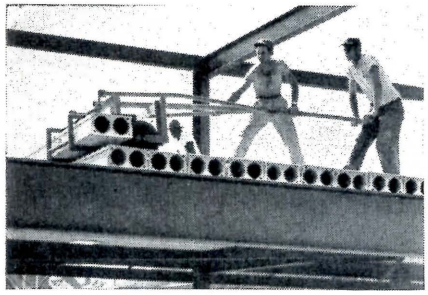

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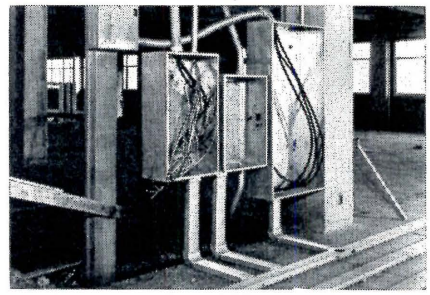
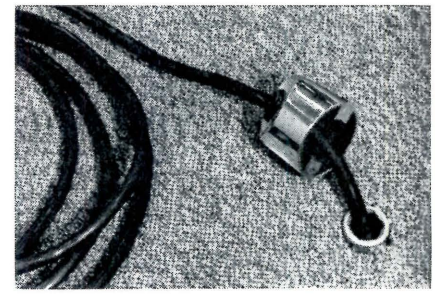
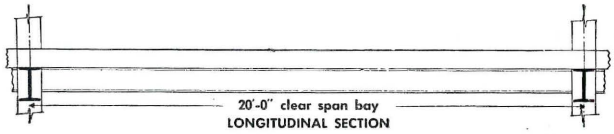
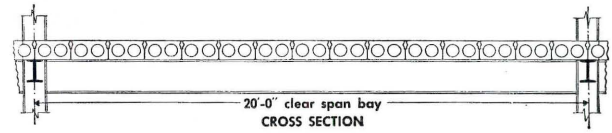


Header ducts install on precast slab floor before topping is poured, and feed into cells in floor. Unlimited electrical distribution is available.



Floor outlets, like telephone outlet above, install quickly at any point above a cell. Electrical fittings manufactured by Conduflor.





Flexicore precast floors permit 20' x 20' clear span bays as shown above. For 32-page manual on Flexicore Electrified Floors write any manufacturer listed below, the Conduflor Corporation, 3338-G Warren Rd., Cleveland, Ohio, or The Flexicore Co., Inc., Dayton 1, Ohio.

flexicore® ELECTRIFIED FLOORS
with Conduflor® ELECTRICAL FITTINGS

ALABAMA, Birmingham 1
The Alabama Cement Tile Co.

FLORIDA, Tampa, PO 2189
American-Marietta Company

ILLINOIS, Chicago, Franklin Pk.
American-Marietta Company

INDIANA, E. Chicago, PO 539
Calumet Flexicore Corporation

MICHIGAN, Livonia, PO 2006
Price Brothers Company

MINNESOTA, St. Paul E-4
Molin Concrete Products Co.

MISSOURI, *E. St. Louis, Ill.*
St. Louis Flexicore Inc.

NEW JERSEY, Camden
Flexicore Div. of Camden Lime

NEW YORK, Buffalo 6
Anchor Concrete Products, Inc.

NEW YORK, New York 17
Flexicore Precast Inc.

NORTH CAROLINA, Lilesville
W. R. Bonsal Company, Inc.

OHIO, Akron-Cleveland
Lake Erie Flex., Kent, Ohio

OHIO, Columbus 22
Arrowcrete Corporation

OHIO, Dayton 1, PO 825
Price Brothers Company

PENNSYLVANIA, Monongahela
Pittsburgh Flexicore Company

RHODE ISLAND, Lincoln
Durastone Flexicore Corporation

TEXAS, Deer Park, LaPorte, Rd.
Flexicore of Texas, Inc.

WEST VIRGINIA, Wheeling
American-Marietta Company

WISCONSIN, Beloit, PO 809
Mid-States Concrete Products Co.

CANADA—Richvale, Ontario
Murray Associates, Limited

CANADA—Montreal, Quebec
Creaghan & Archibald Ltd.

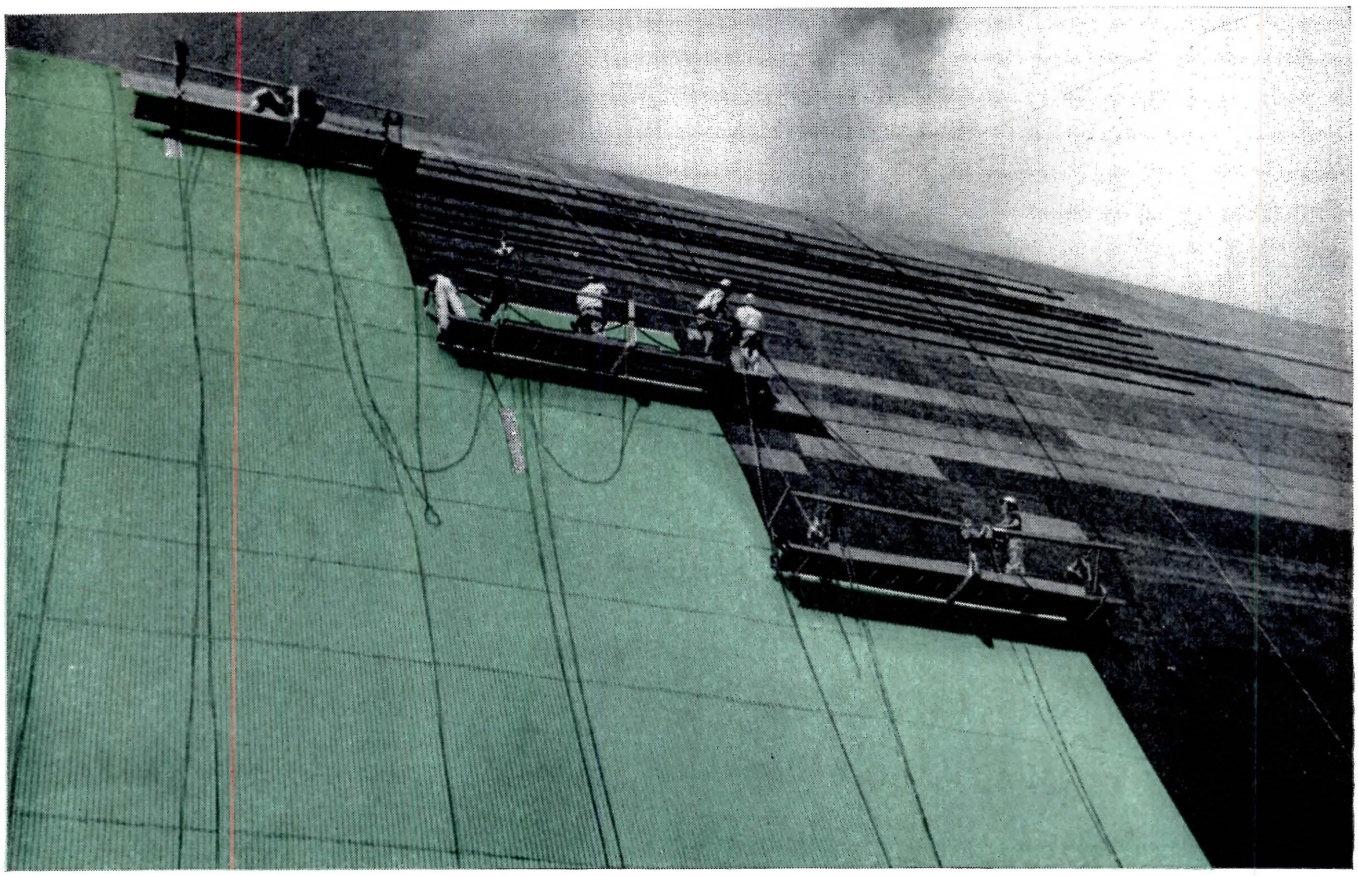
CANADA, Woodstock, Ontario
Schell Industries Ltd.

CANADA, Supercrete Ltd.
St. Boniface, Man.; Regina, Sask.

PUERTO RICO, Hato Rey
Flexicore Co. of Puerto Rico.

U.S. Navy Solves Costly Maintenance Problem with Alodized Aluminum Roofs

Installs more than 600,000 lb. of ACP ALODINE treated Kaiser Aluminum corrugated roofing and flashing sheet on roofs of two big humpbacked hangars at Moffett Field



Engineering study at Lakehurst recommended industrial corrugated aluminum roofing for three reasons: it is comparatively inexpensive and provides a durable and permanent-type roofing; it requires lowest expenditure for maintenance; it can usually be installed without changes in the existing structural framework.

At Moffett Field, the Alodized Kaiser Aluminum industrial corrugated aluminum sheeting was attached to the asphalt covered wood sheathing of the hangars. It was applied by Dale Benz, Inc., under the supervision of the Navy's Bureau of Yards and Docks and Leo W. Ruth, consulting engineer and general partner of Water, Ruth and Going, with the technical assistance of Kaiser Aluminum & Chemical Corporation engineers.

The ACP ALODINE chemical conversion coating on the aluminum sheeting was recommended for the Moffett Field installation because it increased the already high corrosion resistance of the metal and because its green color materially reduced the reflectivity of the stucco embossed corrugated Alclad alloy aluminum.

Complete information about ACP ALODINE is available upon request. Write us at Ambler.

★ALODINE is a registered trademark of Amchem Products, Inc.

MORE THAN 600,000 lb. of industrial corrugated aluminum sheet was used to roof two huge hangars at Moffett Field. All were treated with ACP ALODINE.

Amchem Products, Inc. Ambler 22, Pa.

Formerly AMERICAN CHEMICAL PAINT COMPANY

CHEMICALS ACP PROCESSES

DETROIT, MICH. • ST. JOSEPH, MO.
NILES, CALIF. • WINDSOR, ONT.

New Chemical Horizons for Industry and Agriculture

continued from page 204

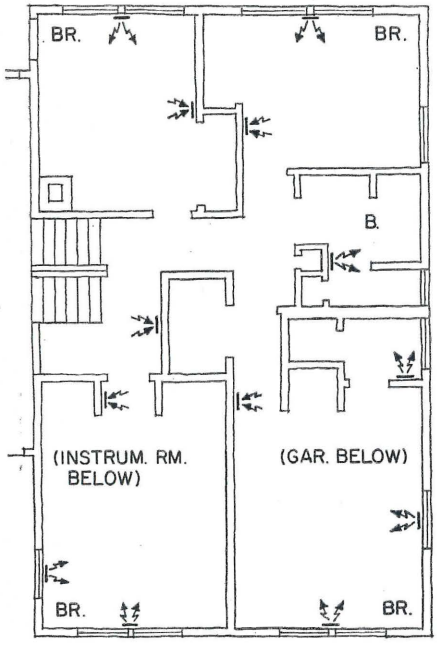
Research House to Test Heating-Cooling Systems for Split Levels

A 2000 square foot research house being built at the University of Illinois by the National Warm Air Heating and Air Conditioning Association will be used to investigate heating-cooling systems for the often difficult to heat split level home. The latest in a series that began with a ten room, warm air heated house built in 1924, Research Residence No. 4 will be a "side-to-side" split with the living-dining-kitchen area located over a crawl space, and four bedrooms over an ongrade recreation room and garage.

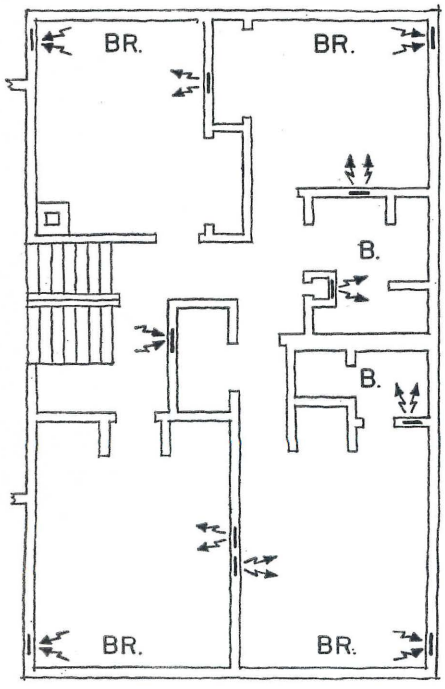
A perimeter system will be installed in the living room area, and provision made for heating the crawl space, so that studies can be made to determine the relative comfort conditions produced with the crawl space heated and unheated. The adequacy of, and need for, moisture-proofing can also be investigated under both summer and winter conditions. On the upper level of the house, two independent systems—one a perimeter system and the other an inside wall supply system with high sidewall and ceiling outlets—will be installed. In addition, individual return intakes in each room and a central return located in the upstairs hall will be installed for use with either supply system.

Studies will focus on the internal movement of air between levels, seasonal load variation on each level, the problem of heating rooms over a garage, and the feasibility of zone control systems for split-level homes.

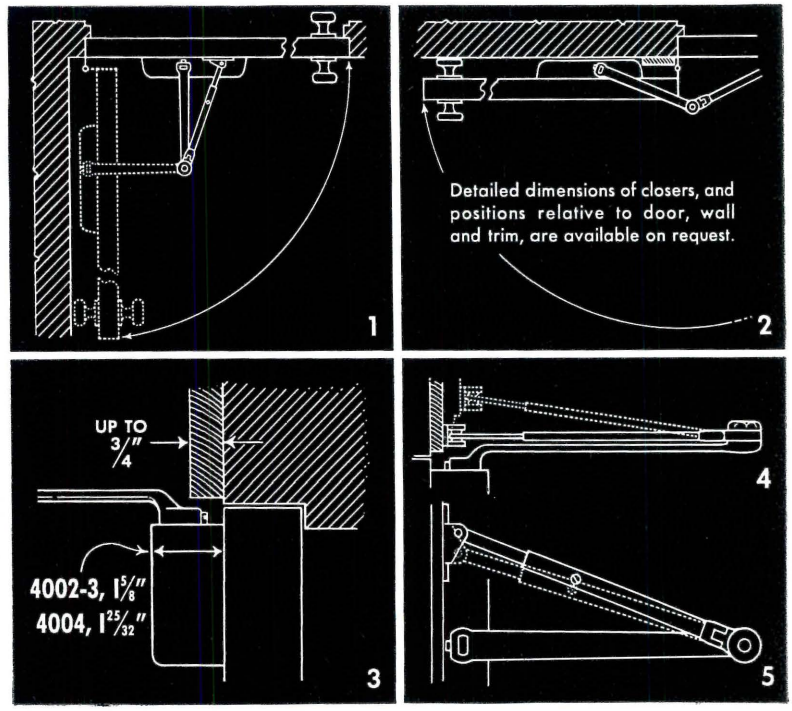
more roundup on page 223



Perimeter Supply System



Inside Wall Supply System



APPLICATION DETAILS

for the New LCN "Smoothee" Exposed Door Closer Shown on Opposite Page

As Demonstrated in Drawings Above:

1. The LCN "Smoothee" takes less space than most doorknobs between door and wall.
2. Degree of door opening possible depends mostly on type of trim and size of butt used.
3. Arm of LCN "Smoothee" is curved to avoid conflict with almost any conventional trim.
4. Joints in arm and shoe make it easy to vary the height of shoe as needed for beveled trim.
5. Power of closer is increased or decreased by simply reversing position of shoe.

May we send a descriptive folder? Or a complete LCN Catalog, if you like? Address

LCN CLOSERS, INC., PRINCETON, ILLINOIS

Canada: Lift Lock Hardware Industries, Ltd., Peterborough, Ontario

Modern Door Control by *LCN*

THE NEW "SMOOTHEE" DOOR CLOSER

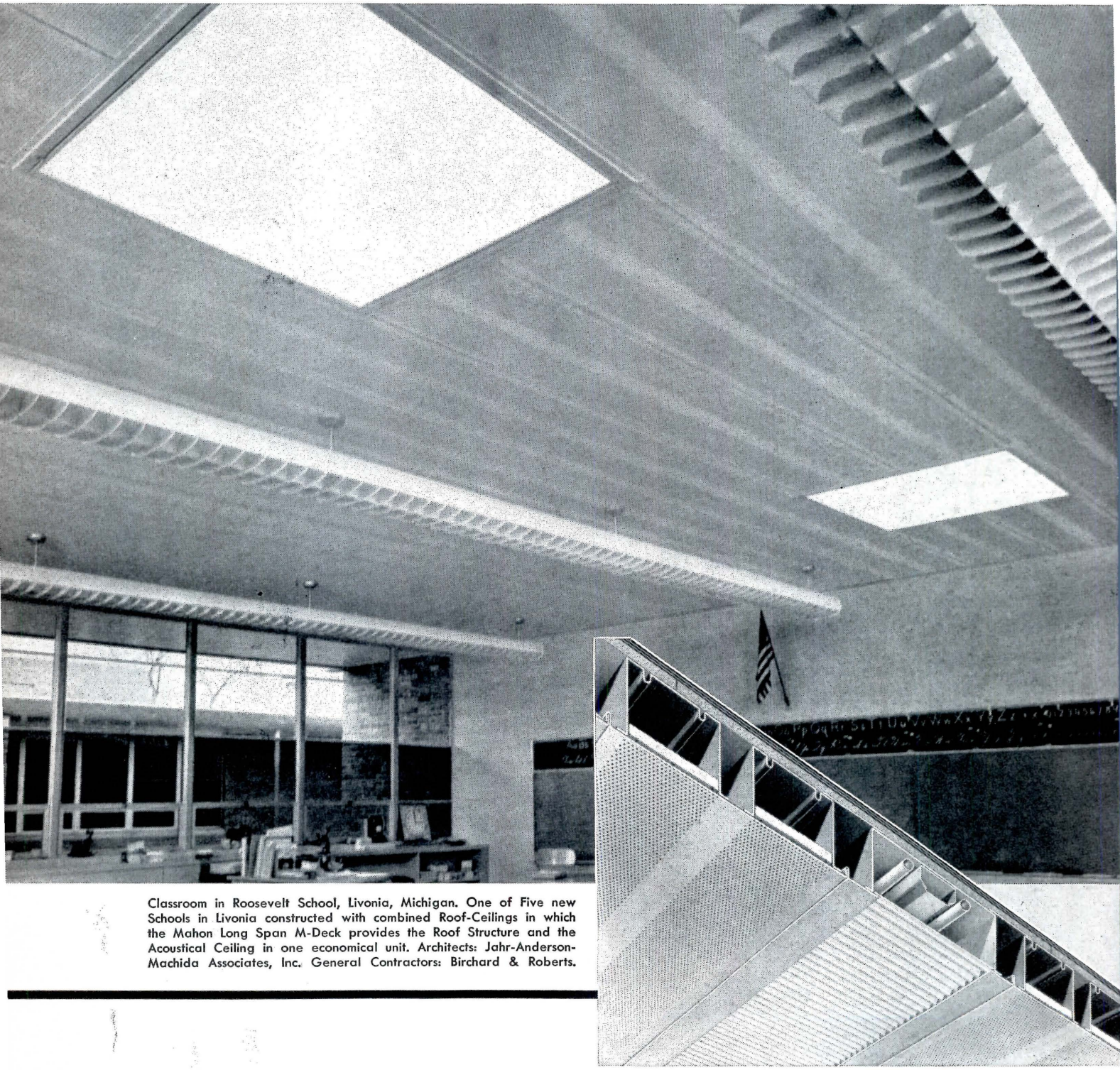
INLAND STEEL BUILDING
CHICAGO, ILLINOIS

Application Details on Opposite Page

LCN CLOSERS, INC.
PRINCETON, ILLINOIS

Skidmore, Owings & Merrill
Architects and Engineers

Long Span M-DECKS Provide



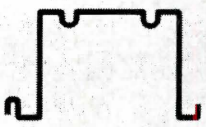
Classroom in Roosevelt School, Livonia, Michigan. One of Five new Schools in Livonia constructed with combined Roof-Ceilings in which the Mahon Long Span M-Deck provides the Roof Structure and the Acoustical Ceiling in one economical unit. Architects: Jahr-Anderson-Machida Associates, Inc. General Contractors: Birchard & Roberts.

Serving the Construction Industry Through Fabrication of Structural Steel, Steel Plate Components, and Building Products

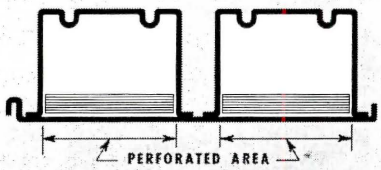
the Structural Roof, Finished Ceiling Material and Acoustical Treatment!

Cel-Beam Sections Span from Wall to Wall or Truss to Truss . . . Eliminate Purlins

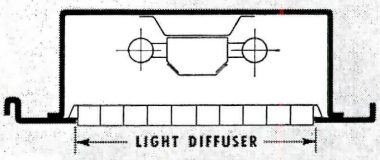
MAHON
Long Span
M-DECK SECTIONS



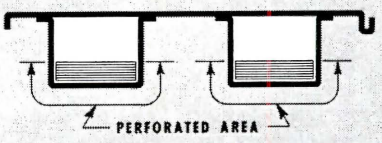
SECTION M1-OB
OPEN BEAM DEPTH 3", 4½", 6" or 7½"



SECTION M2SR (Acoustical)
CEL-BEAM DEPTH 3", 4½", 6" or 7½"



SECTION M1T (Troffer)
DEPTH 6" or 7½"



SECTION M2 (Acoustical)
CEL-BEAM DEPTH 1½", 3", 4½", 6 or 7½"

At Left: Cross Section of Long Span M-Deck Combined Roof-Ceiling with Troffer Lighting.

☆ OTHER MAHON BUILDING PRODUCTS and SERVICES:

- M-Floors (Electrified Cellular Steel Sub-Floors)
- Insulated Metal Curtain Walls
- Underwriters' Rated Metalclad Fire Walls
- Rolling Steel Doors (Standard or Underwriters' Labeled)
- Steel Roof Deck
- Permanent Concrete Floor Forms
- Acoustical and Troffer Forms
- Acoustical Metal Walls and Partitions
- Acoustical Metal Ceilings
- Structural Steel—Fabrication and Erection
- Steel Plate Components—Riveted or Welded

☆ *For INFORMATION See SWEET'S FILES or Write for Catalogues*

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Sales-Engineering Offices in Detroit, New York and Chicago
Representatives in all Principal Cities

of Steel and Aluminum

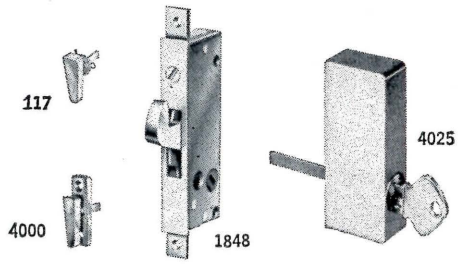
MAHON

narrow stile lock specialists

...at the service of the sliding-door industry

ADAMS-RITE established the concept that sliding glass doors can and should be secured with locking devices as modern and as functional as the doors themselves. Only ADAMS-RITE locking devices fulfill the most rigid requirements—heavy, hooked-shaped deadbolts that are adjustable, that fit *inside* the door rail, that are operated by positive turn action and, when necessary, controlled by standard cylinders. Residential front door keying or commercial master systems are optional.

The ADAMS-RITE 1848 Deadlock provides each of these important features to satisfy the needs of architect, manufacturer, contractor and final user alike.



The 1848 Sliding Wall Deadlock shown above measures only 3 3/16" x 1 1/8" x 1/2", has a collapsible bolt for protection of door and lock, and operates with positive "feel appeal". To compensate for possible misalignment of door and jamb, bolt projection can be adjusted a full 3/16" by simply turning a screw in the lock face. The 4025 cylinder group is a clean-lined outside pull, offering key control that can be keyed-in with most popular cylinder systems.

Specialists in Narrow Stile Locking Devices for Sliding and Swinging Glass Doors

ADAMS-RITE
MANUFACTURING COMPANY

Dept. AR-88, 540 West Chevy Chase Drive, Glendale 4, California

In addition to being the leading manufacturer of narrow stile sliding and swinging door locking devices, ADAMS-RITE also supplies virtually all the locking devices and handles for commercial and military aircraft in the United States—an overwhelming testimonial to the superiority of ADAMS-RITE design and the lasting strength of ADAMS-RITE products.

The sliding door manufacturers listed below are representative of those in the industry who provide ADAMS-RITE extra quality locking devices as standard equipment.

ABC SLIDING GLASS DOORS
Adams Engineering Company, Dept. G2
P. O. Box 875
Ojus, Florida

ADOR
ADOR THERMODOOR
Ador Sales, Inc.
2345 W. Commonwealth Ave.
Fullerton, California

CUSTOM-G
The Alumiline Corporation
Pawtucket, Rhode Island

ALUMINAIRE
Aluminaire Company
1743 No. Country Club Drive
Mesa, Arizona

PATI-DOR
Aluminum Metals Company
1733 Sebastopol Road
Santa Rosa, California

CRESTVIEW
Aluminex, Inc.
2408 Forney Street
Los Angeles 31, California

VACOL
V. E. Anderson Mfg. Co., Inc.
P. O. Box 430
Bradenton, Florida

NU-VU
Bailey-Kelleher Company
500 Bellevue
Detroit 7, Michigan

BELLEVUE DELUX STEEL
BELLEVUE DELUX ALUMINUM, RAMONA
Bellevue Metal Products
1314 E. First Street
Los Angeles 33, California

GULFSPRAY LONE STAR
Binswanger & Co. of Texas
P. O. Box 3051
Houston 1, Texas

BRITT DELUXE
Britt Sliding Door Corporation
2501 Wroxton Road
Houston 5, Texas

BELLA VISTA, BELLA'S CHAMP
Bur-Val Mfg. Co., Inc.
1012 No. Lake Street
Burbank, California

FLEETLITE
Fleet of America, Inc.
2015 Walden Avenue
Buffalo 25, New York

G. S. D.
Glass Shower Door Co., Inc.
105 W. Wacker Drive
Chicago 1, Illinois

CORONA
H & D, Inc.
6515 Highway 99 So.
Everett, Washington

ARTDOR BY BASCO
Hecker Mfg. Co.
758 Clementina Street
San Francisco, California

THE HELLER DOOR, EL PATIO
The Heller Company
715 Francis Street
Houston, Texas

CAPISTRANO, MALIBU
Malibu Mfg. Corporation
P. O. Box 413
El Monte, California

CONTINUED . . . listing of major sliding door manufacturers who provide ADAMS-RITE locking devices as standard equipment:

MARSHALL PRESTIGE
Marshall Aluminum Products
3400 Fowler Street
Los Angeles, California

ARISLIDE
Michel & Pfeffer Iron Works, Inc.
212 Shaw Road
South San Francisco, California

MODERNVIEW
Modern Shower Door Company
1804 E. 40th Street
Cleveland 3, Ohio

NUDOR, d'COR
Nudor Mfg. Corporation
7326 Fulton Avenue
North Hollywood, California

PITTCO
Pittsburgh Plate Glass Company
One Gateway Center
Pittsburgh 22, Pennsylvania

ROMAN, CHALLENGER
Roman Metal Products, Inc.
P. O. Box 4477
Tucson, Arizona

RUSCO DELUXE, RUSCO THERMODOOR
F. C. Russell Company
P. O. Box 26
Columbiana, Ohio

TODA VISTA
Samuels Glass Company
221 Newell Avenue
San Antonio 6, Texas

VUE LUME, BON AIR, DE VILLE and EL DORADO
Shower Door Company of America
1 Permalume Place, N.W.
Atlanta 18, Georgia

SLIDEVIEW
Slideview Door & Window Company
P. O. Box 409
El Monte, California

CUSTOM, CUSTOM INSULATED
Smithcary Corporation
P. O. Box 596
Magnolia, Arkansas

IMPERIAL, SENIOR & JUNIOR
Sun Valley Industries, Inc.
8354 San Fernando Road
Sun Valley, California

SPECIALUME
Specialume Products, Inc.
P. O. Box 126
Sarasota, Florida

ALL STEEL QUALITY, STEEL FRAME ALUMINUM
Steelbilt, Inc.
18001 So. Figueroa
Gardena, California

SILVERNAIL
St. Petersburg Glass & Mfg. Co.
2201 First Avenue So.
St. Petersburg, Florida

VISTA
Vista Sliding Doors
7052 Laurel Canyon
North Hollywood, California

CAPRI CONTINENTAL
T. V. Walker & Son, Inc.
217 No. Lake Street
Burbank, California

AER-LITE
Wood-Land Mfg. Co.
1510 W. Broadway
Phoenix, Arizona

ADAMS-RITE
MANUFACTURING COMPANY

Technical Roundup

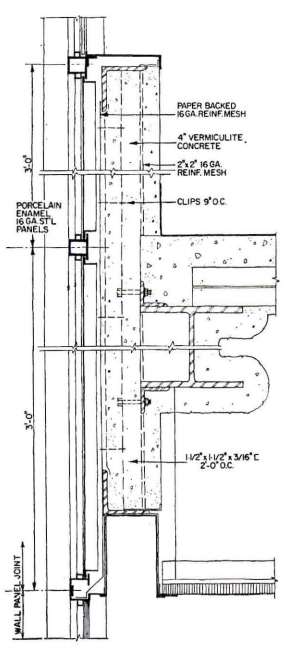
Plaster-Backed Curtain Wall Adds Fireproofing, Cuts Building Costs

By using a machine-applied cement plaster backup in combination with porcelain enameled steel spandrel panels, architects Wolff & Zimmer provided the First National Bank building in Portland, Oregon, with a fireproof curtain wall that cost under six dollars a square foot, added 600 square feet of usable floor space as compared with a standard 8 in. wall, and weighed just slightly over 19 lbs per sq ft.

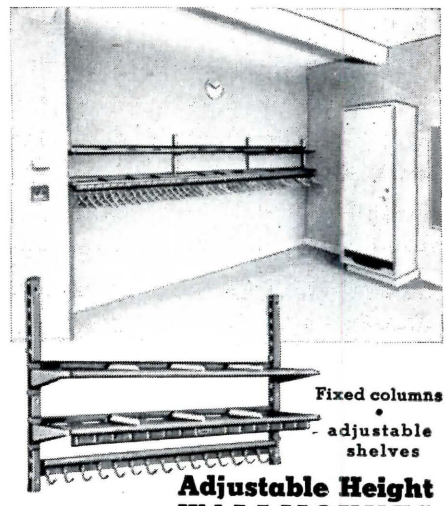
The blue-gray spandrels which form the outer face of the wall are set into aluminum sash and reinforced by ¾ in. channels clipped to the back of the panels at 12 in. centers. The backup, a continuous self-supporting wall of sprayed vermiculite cement plaster extending from the top of the window units on one floor to the bottom of the window sills of the floor above (a total height of 6 ft), also serves as fireproofing for the outside face of the spandrel beams. Four successive coats of the material were sprayed, from inside the building, onto paper-backed wire fabric supported by steel angles attached to the spandrel beams. Wire spacer clips secure the fabric to the outside of the angle, holding the fabric one inch away from the porcelain enamel skin to provide an air space for condensate venting. On the inside of the spandrel, the backup is reinforced with welded wire mesh.

Fireproofing was similarly sprayed onto floors, girders and beams; and applied manually to the columns.

more roundup on page 228



Section thru Exterior Wall



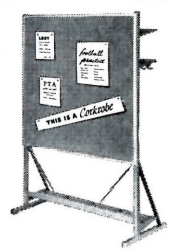
Adjustable Height WALLMOUNTS

Schooline®
WARDROBE SYSTEMS

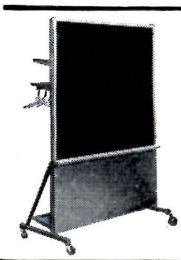
Solve the pupil wraps problem efficiently with Wallmount Coat and Hat Racks. Mount on any available wall space. Hat shelves and hanger bar adjustable on permanently attached columns to height for any age group. Double hat shelves and double row of spaced coat hooks accommodate 6 pupils per running foot. Basic 3′ 2″ or 4′ 2″ units interlock to make continuous racks to fit any space or capacity requirements.

OTHER Schooline® UNITS

CHALKROBE®
Dual-purpose wardrobe rack. Provides two 4 ft. hat shelves, 4 ft. Hook and Hanger rails for coats adjustable in height to all age groups. 4 ft. overshoe shelf. And, on other side a 50″ x 48″ chalkboard. Portable or stationary.



CORKROBE®
Identical to Chalkrobe but with pin-up cork board instead of "Chalkboard". These units permit complete flexibility in use of floor space. Can be anchored to floor, or wheeled about on casters. Hold wraps out of the way in orderly and efficient manner.

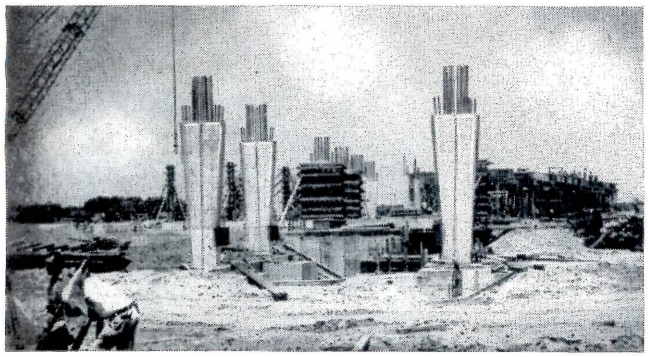


CLOSURE UNITS
With closure panels (as original equipment or add-on units) Chalkrobe and Corkrobe units serve as flexible room dividers, movable walls or screens. Widely used to enclose temporary class rooms, to "build" cloak rooms, meeting rooms, etc.

OVERSHOE RACKS
Matching units for Wallmount. Keep overshoes off-the-floor in an orderly manner.

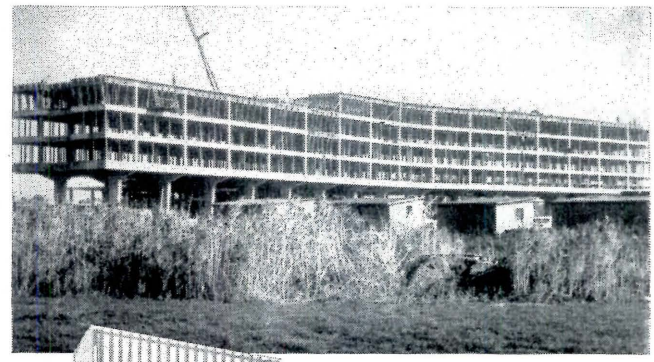
Write for "Schooline" Catalog SL-52

VOGEL-PETERSON CO.
1127 West 37th Street • Chicago 9, Illinois



By July, 1957, several hundred reinforced concrete cantilever piers had been built upon the foundation of reinforced concrete, completing the substructure of the International Hotel at New York City's Idlewild International Airport.

By September, 1957, the upper frame structure of reinforced concrete was being completed at a fast pace (note illustration below). In March, 1958, the exterior walls of glazed white brick were completed (see large illustration below).



Reinforced Concrete speeds construction

Another notable example of the trend toward reinforced concrete construction is the new International Hotel at New York International Airport. The handsome 320-room hotel, located 2.5 miles from the new Arrivals Building, was built by the Port Authority of New York and designed by Architect William Tabler. The new hotel stands on reinforced concrete piers to give it an "air-borne" appearance. Important among the reasons for utilizing reinforced concrete construction for this new structure were speed of construction, ease of cantilevering, and the inherent fireproof qualities of reinforced concrete making possible lower insurance rates. The ready availability of reinforcing steel permitted the job to get under way at the earliest possible date. Before you build, investigate this economical, flexible, and timesaving medium of construction. Compare—and you will design for Reinforced Concrete.

Concrete Reinforcing Steel Institute
38 South Dearborn, Chicago 3, Illinois

CONCRETE REINFORCING STEEL INSTITUTE
C.R.S.I.
FOUNDED 1924

INTERNATIONAL HOTEL, New York City
Builder: Port of New York Authority
Management: Knott Hotels Corporation
Architect: William Tabler
Contractors: George F. Driscoll Company; Moccia Construction Corporation

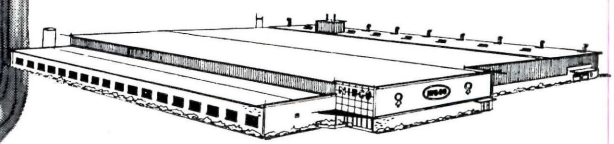
You're covered!

PLUMBING CONTRACTORS

are enthusiastic about NIBCO's full line of fittings because they appreciate the time and effort saved by "one-stop" ordering, complete deliveries from one wholesaler. Also, they appreciate the security of buying nationally advertised products that are manufactured to the industry's most rigid specifications. They know they are protected from every angle.

PLUMBING WHOLESALERS

appreciate the rapid service NIBCO offers from 23 strategically-located factory supply points. And, they appreciate the NIBCO policy of protecting inventory, honesty in values, pricing, and leadership in new product development. NIBCO wholesalers never worry about "rainy days"... they know they're covered!



NEW NIBCO PLANT — THE MOST MODERN, MOST PRODUCTIVE IN THE ENTIRE PLUMBING WORLD

NIBCO

NIBCO INC. Dept. H-2108, **ELKHART, INDIANA**

Gentlemen: I would like to know more about NIBCO. Please have representative call.

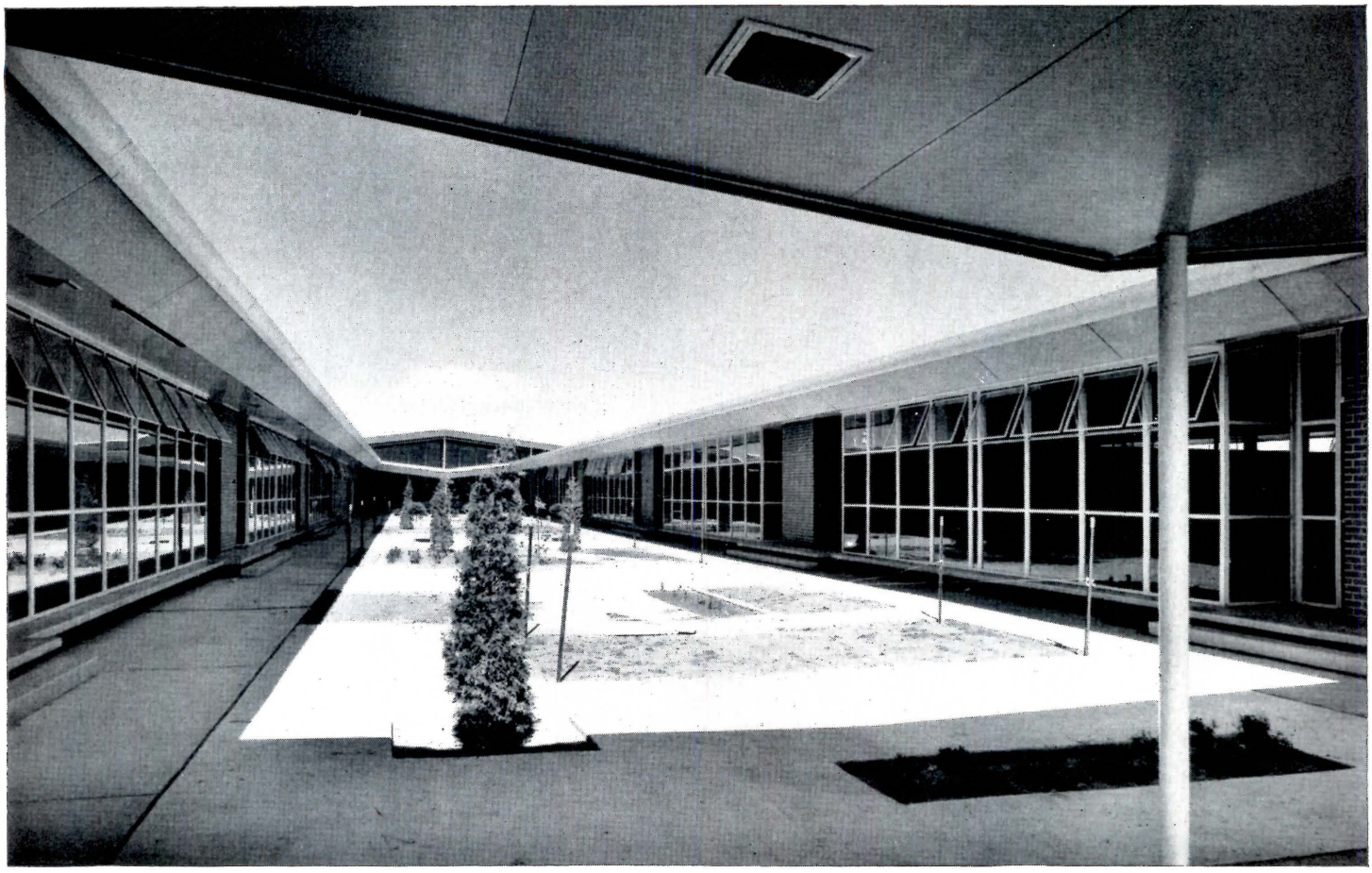
name

firm

address

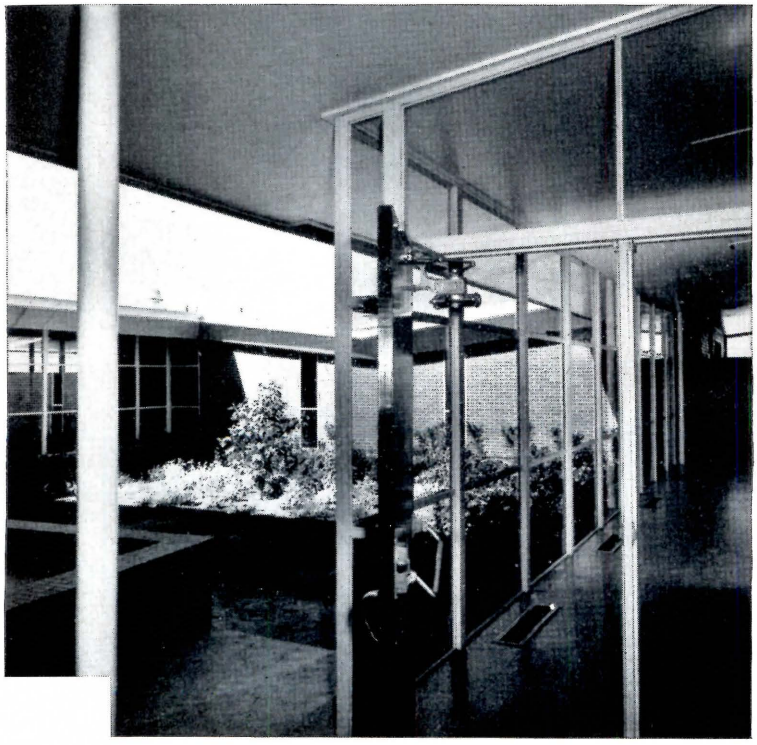
city, state

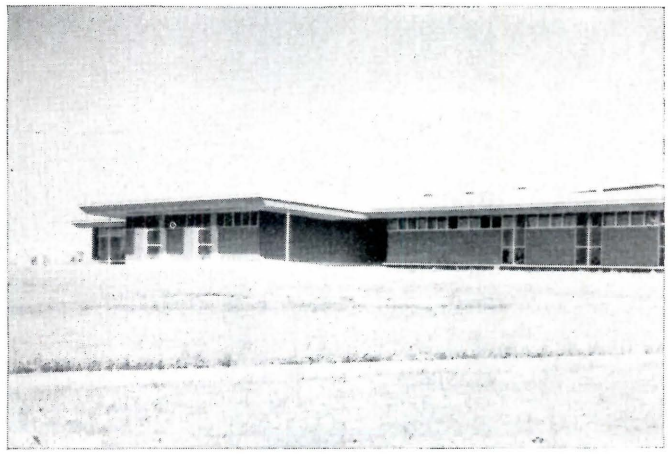
I am ☐ contractor ☐ wholesaler.



San Andres Elementary School, *Andrews, Texas*

Architects: ***Caudill, Rowlett, Scott & Assocs.,*** *Bryan, Texas*





Glare Reduction *—Notice in photo at left how effectively Lustragray reduces sun's glare reflected by brick wall in background. It does this without disturbing the exterior's true color values.*

A.I.A. File No. 26-A

Another AMERICAN Lustragray Installation

. . . the glass that controls sun glare and heat without sacrificing vision

What other glass offers so much—for so little?

Glare Reduction—minimizing eyestrain and fatigue.

Heat Absorption—for greater comfort.

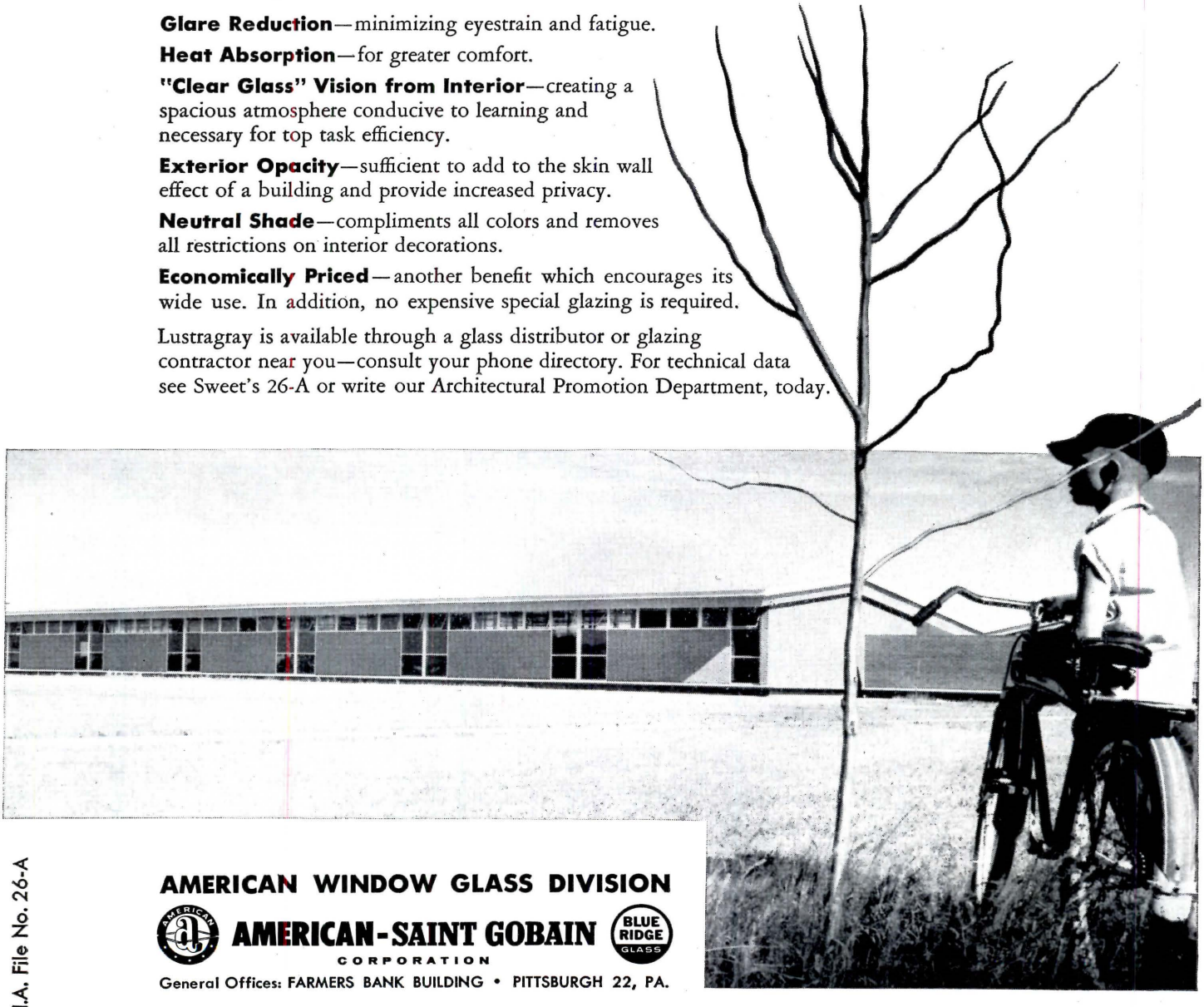
"Clear Glass" Vision from Interior—creating a spacious atmosphere conducive to learning and necessary for top task efficiency.

Exterior Opacity—sufficient to add to the skin wall effect of a building and provide increased privacy.

Neutral Shade—compliments all colors and removes all restrictions on interior decorations.

Economically Priced—another benefit which encourages its wide use. In addition, no expensive special glazing is required.

Lustragray is available through a glass distributor or glazing contractor near you—consult your phone directory. For technical data see Sweet's 26-A or write our Architectural Promotion Department, today.



AMERICAN WINDOW GLASS DIVISION

AMERICAN-SAINT GOBAIN CORPORATION

BLUE RIDGE GLASS

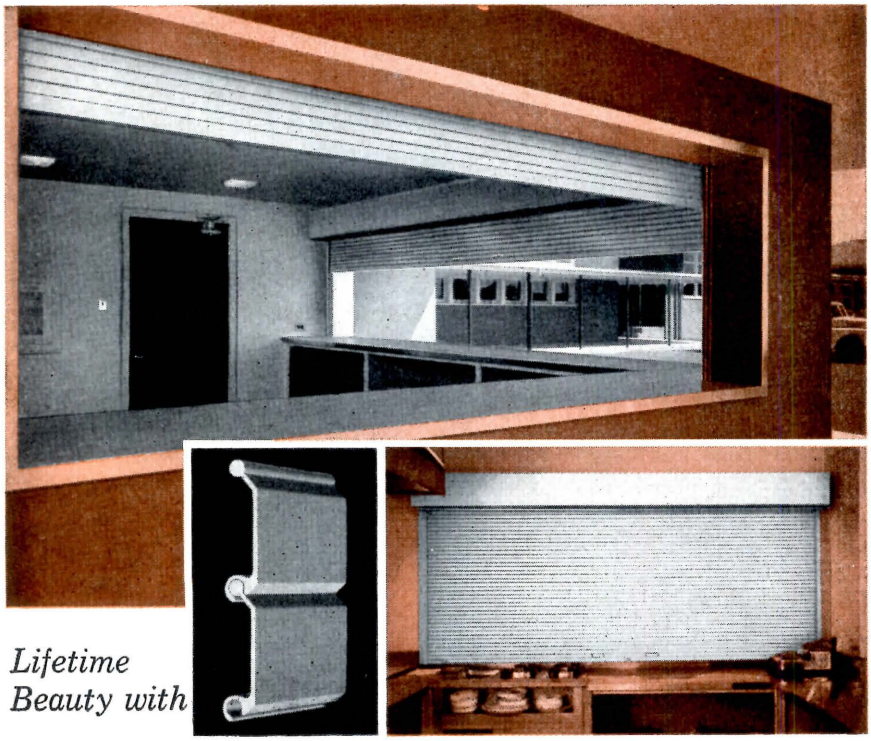
General Offices: FARMERS BANK BUILDING • PITTSBURGH 22, PA.

AMERICAN-SAINT GOBAIN CORPORATION is a merger of the former American Window Glass Company, Pittsburgh, Pa., and the former Blue Ridge Glass Corporation, Kingsport, Tenn. (which was a wholly-owned subsidiary of Saint-Gobain of Paris, France). American Window Glass Division plants are located in Arnold, Jeannette, Ellwood City, Pa.; Okmulgee, Okla. Blue Ridge Glass Division plant is located in Kingsport, Tenn.

WSW 7256

A.I.A. File No. 26-A

SPECIFIED MORE THAN ANY OTHER COUNTER DOOR



Lifetime Beauty with

COOKSON

"ALUMILITED" COUNTER DOORS

Cookson Counter Doors provide the most practical and attractive answer to all counter closure applications, including schools, cafeterias, offices and ticket windows. Durable "alumilited" extruded aluminum slats and guides keep their sparkling luster indefinitely, requiring little or no upkeep. Peeling and chipping, so often associated with painted steel curtains, are entirely eliminated. Nor will you run into the many other costly problems encountered with ordinary lightweight "mill finish" aluminum. And now, Cookson introduces another "first" in counter door design: sturdy wool-pile guide stripping for smooth, noise-free, weather-proofed operation. Cookson Counter Doors are custom built for openings of 20′ wide, clear opening below coil box up to 5′6″. Request Bulletin No. 702.

An exclusive combination of features

- Locked-in wool-pile guide stripping* provides for easier operation, eliminates noisy metal-to-metal sliding contact, seals against dust, drafts, weather.
  *Pat. applied for
- Sturdy, smartly styled "Alumilited" slats of extruded aluminum have a permanent luster, are resistant to scratching, denting, cannot rust or corrode.
- Designed to roll up and out of sight for full, unobstructed opening. Lifetime lubricated ball bearings provide effortless operation.

COOKSON ®

SEE SWEET'S

THE COOKSON COMPANY

1527 Cortland Ave., San Francisco, Calif.

"Alumilited" Counter Doors
Rolling Service Doors, "Servire" Fire Doors, and Grilles
Side Coiling Wood Partitions · Specialty Doors

COUNT ON **COOKSON** DOORS . . . *"The Best Way to Close an Opening"*

Technical Roundup

Moving Air Absorbs Sound

Armour Research Foundation has completed basic study on a newly-discovered mechanism of sound absorption. It has been demonstrated that airflow through holes creates acoustic resistance and, consequently, sound absorption.

This disclosure brings to mind several possible commercial applications, including a combined sound absorption and air circulating system with one side of a perforated metal ceiling acting as supply and the other side as return.

Sound is usually thought of as being absorbed when it is converted into heat by being dispersed into small holes and crannies of a material and there losing energy in friction with itself or with the walls of the hole, or by physically moving minute fibers of the material. The several forms of fiberboard and fiber glass use these mechanisms in varying degree. In some cases, notably that of thin plywood, low frequency sound waves will lose some energy to heat by moving the material itself.

The newly-discovered mechanism might be described as friction loss at an orifice through which flows a continuous stream of air. In common terms a surface full of small holes will absorb sound when there is a steady flow of air through the holes. The actual mechanism is not known in detail, but it is known that the effect occurs at the surface and not in the hole so that the thickness of the material behind the surface is not critical. The report of the Foundation does not mention the effect of direction of air flow and directly-usable information on the absorption coefficient is not yet available. According to the report (Project No. A-968) the mechanism was inferred from studies on the pressure loss through an orifice in a liquid medium.

New Ballasts May Need Over-Heat Protection To Prolong Life

Ballasts, inherently, are generators of heat. And for many years they were built to handle this heat under normal loads, with a comfortable reserve for abnormal conditions. Now, however the trend toward shallow fixtures has caused a reduction in the size of the ballast. At the same time, the currents handled by the ballast have been increased. The resulting demand for more and more power output from smaller and smaller ballast packages has raised the normal

continued on page 232

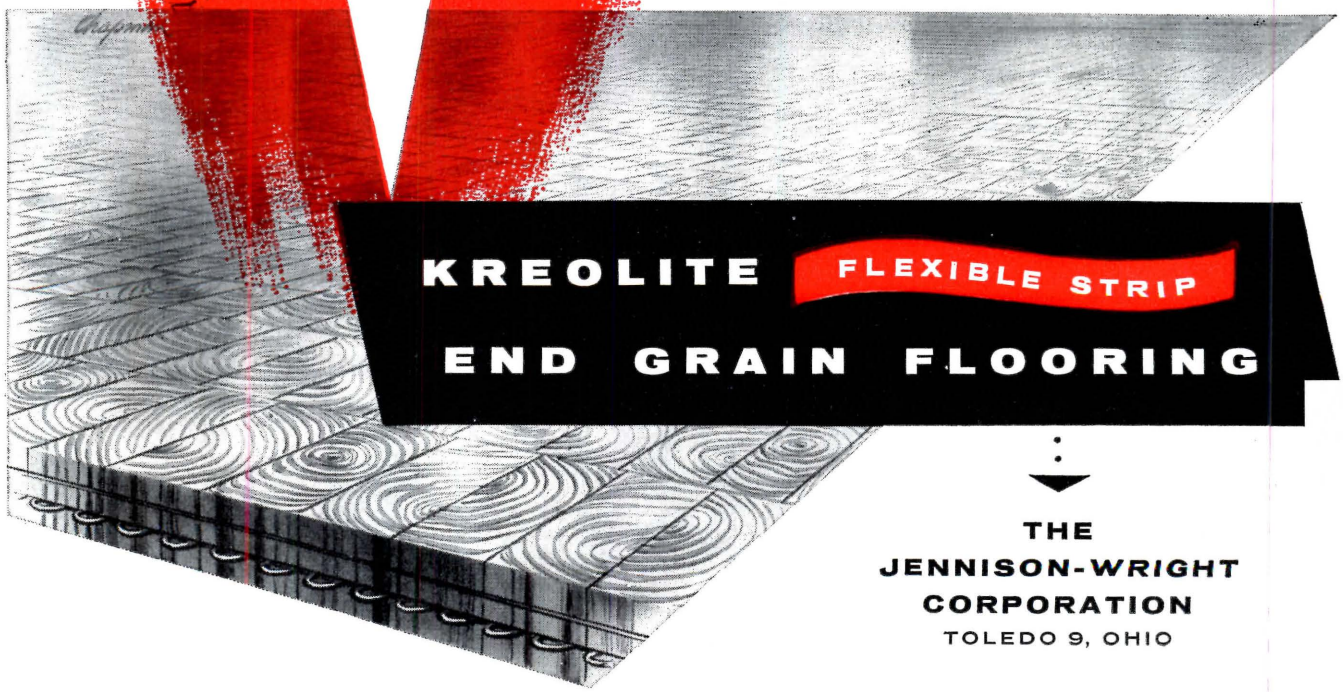
Any action is welcome

on Kreolite Gym Floors with the Built-In Cushioned Flex

Typical gym floors are subject to many kinds of activities, some of which can mar and scar ordinary flooring. But, with Kreolite Flexible Strip End-Grain Wood Floors, you have flooring that welcomes *any* kind of action and retains its original beauty.

Durable Kreolite gym floors are also noted for their extra resiliency which makes them kinder to feet and less fatiguing. Besides being easier on the feet, Kreolite floors are also much easier on school budgets because they require less maintenance and last longer.

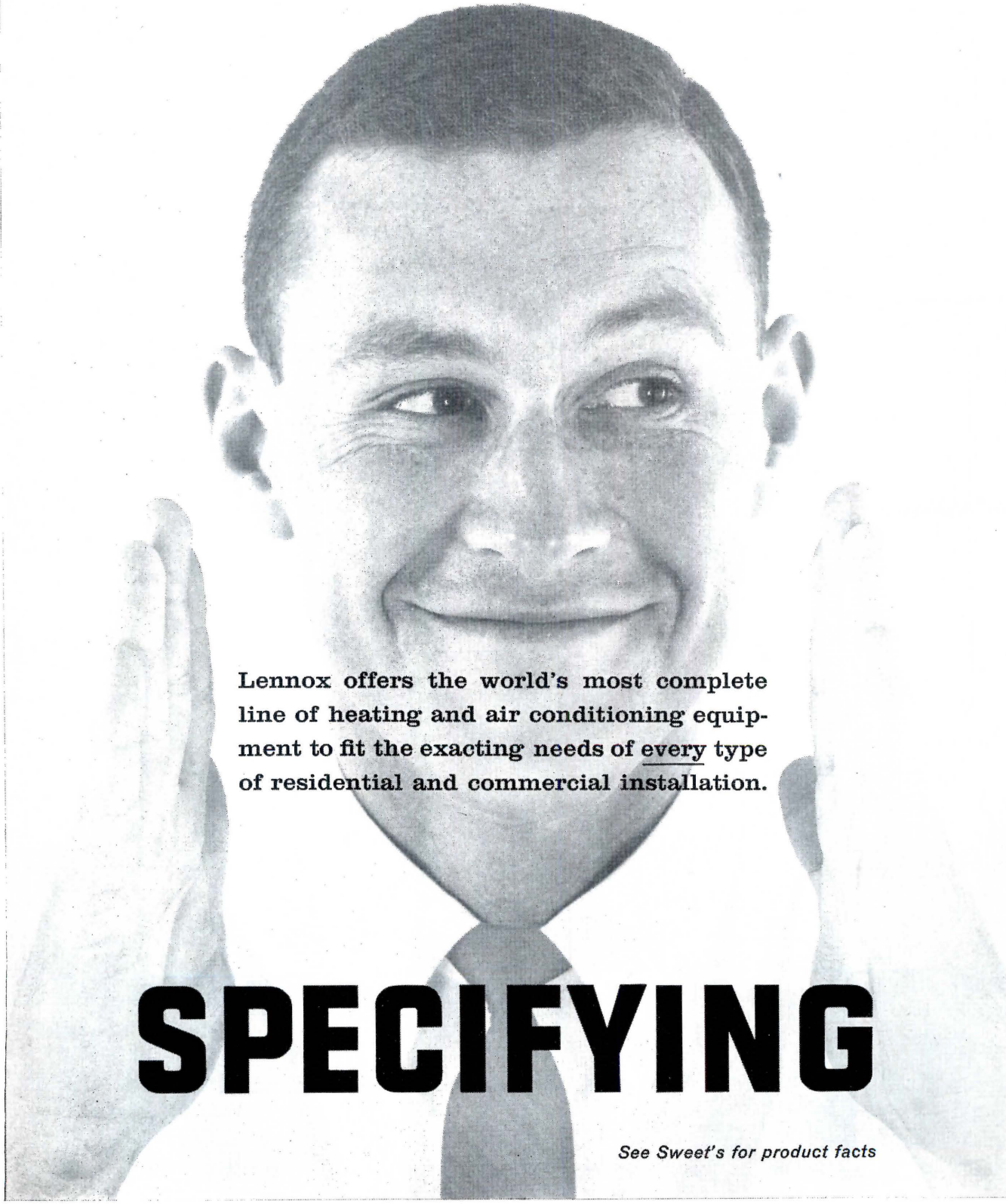
Write today about new Kreolite installation or replacement floors.



KREOLITE FLEXIBLE STRIP **END GRAIN FLOORING**

THE JENNISON-WRIGHT CORPORATION
TOLEDO 9, OHIO

TWO BIG

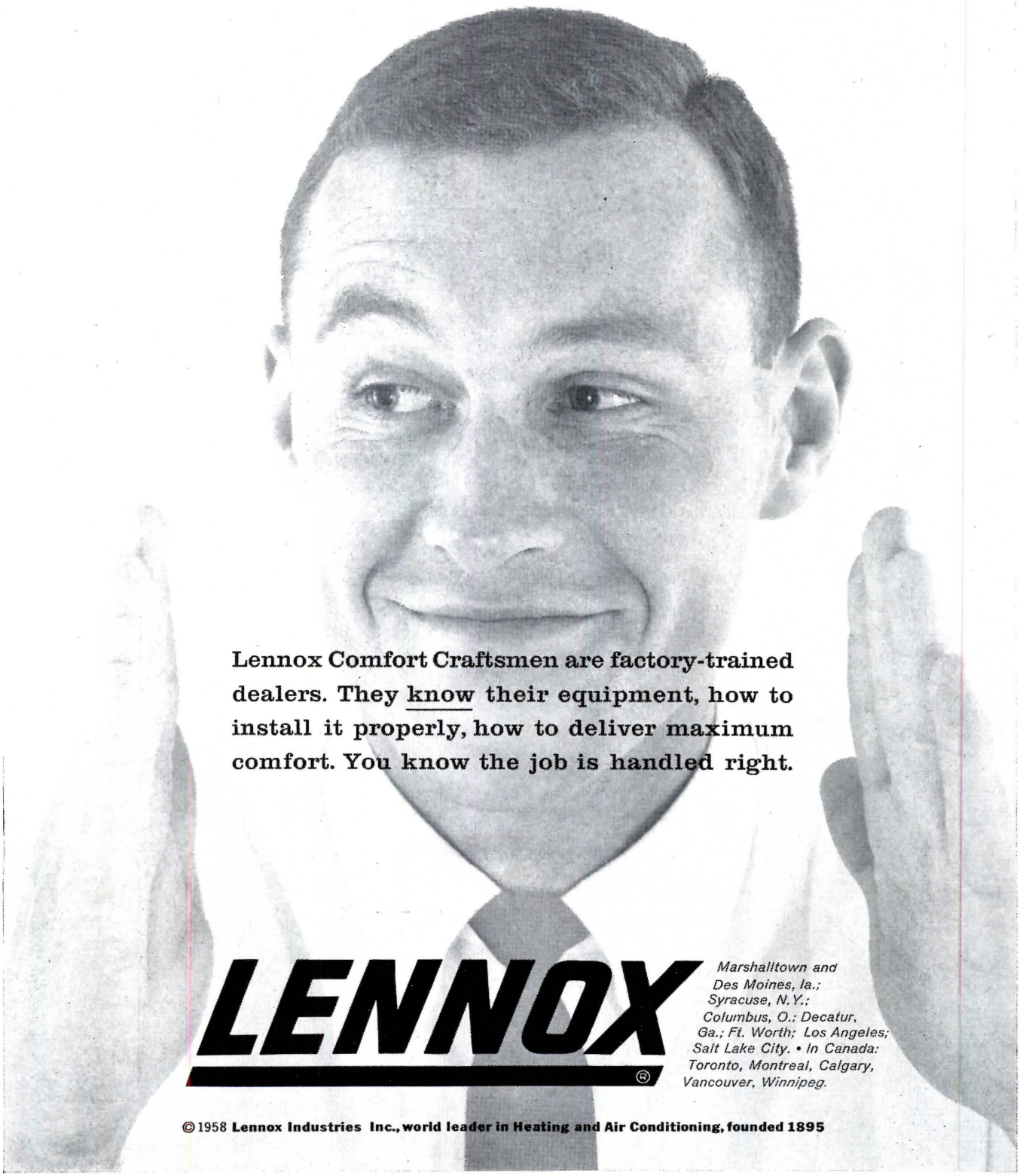


Lennox offers the world's most complete line of heating and air conditioning equipment to fit the exacting needs of every type of residential and commercial installation.

SPECIFYING

See Sweet's for product facts

REASONS FOR



Lennox Comfort Craftsmen are factory-trained dealers. They know their equipment, how to install it properly, how to deliver maximum comfort. You know the job is handled right.

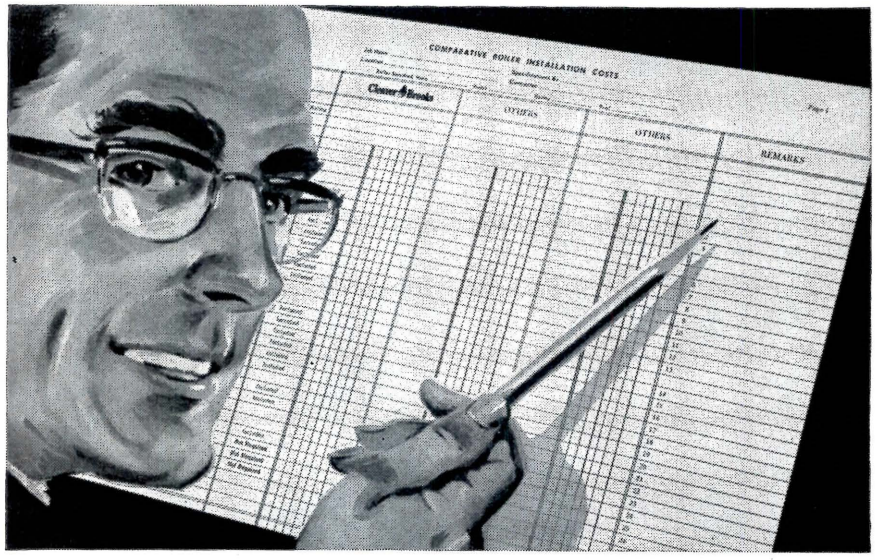
LENNOX®

Marshalltown and Des Moines, Ia.; Syracuse, N.Y.; Columbus, O.; Decatur, Ga.; Ft. Worth; Los Angeles; Salt Lake City. • In Canada: Toronto, Montreal, Calgary, Vancouver, Winnipeg.

© 1958 **Lennox Industries Inc., world leader in Heating and Air Conditioning, founded 1895**

fore you buy any boiler

compare quoted prices with REAL COSTS



w Cleaver-Brooks cost analyzer clears "quotation" confusion — reveals ALL costs

Get *all* the costs . . . the *real* costs . . . down on paper before you recommend or specify a boiler to your clients. On many boiler installations "quoted prices" seldom agree with the total costs, as you may have learned. This is frequently the case with so-called "built-up" boilers assembled on the site.

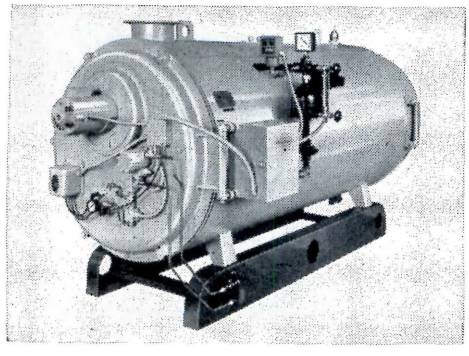
Cleaver-Brooks' cost analysis enables you to compare all material costs (boiler, steam trim, burner, refractory, controls and other equipment) and installation labor costs. You'll know the "real costs" on the complete installation before you start.

Real eye-opener

The figures you'll see may be startling. In most cases the cost analysis proves a Cleaver-Brooks costs *less*. On-job time is drastically reduced because Cleaver-Brooks packaged units are fully assembled, ready to install. Cleaver-Brooks boilers give you more in performance, too . . . each boiler is fully fire-tested at the factory under load, tuned to peak economy. Starting service and on-the-job operator training by authorized field engineers further decreases your over-all costs.

Contact your Cleaver-Brooks agent

Once you add up all the benefits of a Cleaver-Brooks "one-cost" package . . . the proved trouble-free economy of exclusive four-pass, forced-draft design, you'll find it pays over and over to analyze costs carefully before you buy. See your Cleaver-Brooks agent for details or write Cleaver-Brooks Company, 362 East Keefe Avenue, Milwaukee 12, Wisconsin, Dept. J.



Choose from 19 sizes, 130 models, 15 to 600 hp. Oil, gas and combination oil/gas fired — steam or hot water for heating or processing.

Cleaver Brooks

ORIGINATORS OF SELF-CONTAINED BOILERS

Technical Roundup

continued from page 228

operating temperature of the ballast, and cut down its reserve capacity so that many ballasts now run at near maximum temperatures even on normal loading. The margin of safety is slim at best: the insulation used has an operating limit of 105 degrees C. and coil tempereatures range between 90 and 100 degrees C., leaving a maximum reserve of 15 degrees.

Since ballast failure is in almost all cases caused by deterioration of the insulation—and since ballast replacement may cost as much as the fixture itself, some sort of overheat protection seems indicated. Ballast overheating can be traced to a number of causes, among them lamp failure, lamp rectification, failure of ballast components, improper installation, and insufficient heat dissipation. None of these (with the exception of component failure) will materially raise the current, but they will increase temperatures, thus shortening ballast life.

One answer seems to be a built-in protective device, now commercially available, which responds to internal temperature rise caused by either increasing ambient or overload current. In operation, it allows winding temperatures to reach the 105 degree C minimum under normal operating conditions in a 40 degree ambient, then opens the circuit to the primary winding. After the temperature has dropped to 85 degrees C., the protector resets and the ballast resumes normal operation.

Plastic-Coated Wood Won't Rot

Wood coated with reinforced plastic has become a considerable factor in many structural and shelter applications where the plastic has been used as weather protection and skin-strengthening. The most wide-spread use has been in the boat-building industry where plastics with or without wood core material have supplanted wood in a large segment of the industry. The question of wood rot, intrinsic or induced, has been put aside, probably on the basis of "save the surface and you save all."

This question of rot has recently been examined in some detail by a pair of researchers under the auspices of the Balsa Ecuador Lumber Co. of New York. Richard Mark and Dr. Bert Zuckerman, respectively timber engineer and wood pathology consultant, have completed extensive studies of the effects of several strains of rot fungi on coated and uncoated

continued on page 236

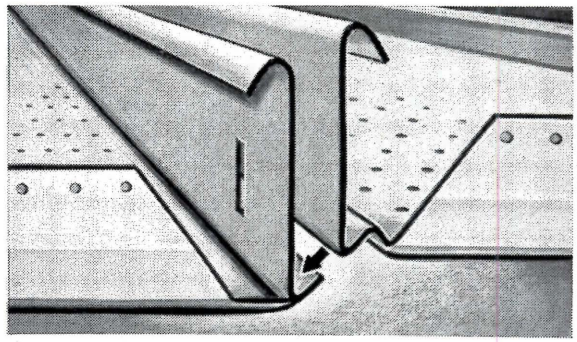
NEW TRIUMPH IN ACOUSTICAL CEILING CONSTRUCTION!

Every major improvement imaginable is built into Eastern's all-new, all-metal, all-in-one "Silent Ceiling" . . . to give you more sound control for less!

This new concept in acoustical ceiling construction is exclusive in every way . . . all panels are actually locked together by a unique "locking lip" which assures a vibration-proof, micro-smooth surface.

Designed to speed and simplify installation . . . to save time, labor and maintenance costs . . . "Silent Ceiling" modules are offered in lengths up to 12-feet—all complete with pre-fitted sound absorbing pads!

What's more, the entire "Silent Ceiling" System is rated Class "A" in flame resistance . . . unequalled in architectural advantages.



Exclusive self-locking panels keep Eastern's all-metal "Silent Ceiling" level-perfect

Eastern
Products Corporation
(formerly Eastern Venetian Blind Co.)

Mail this coupon today for details

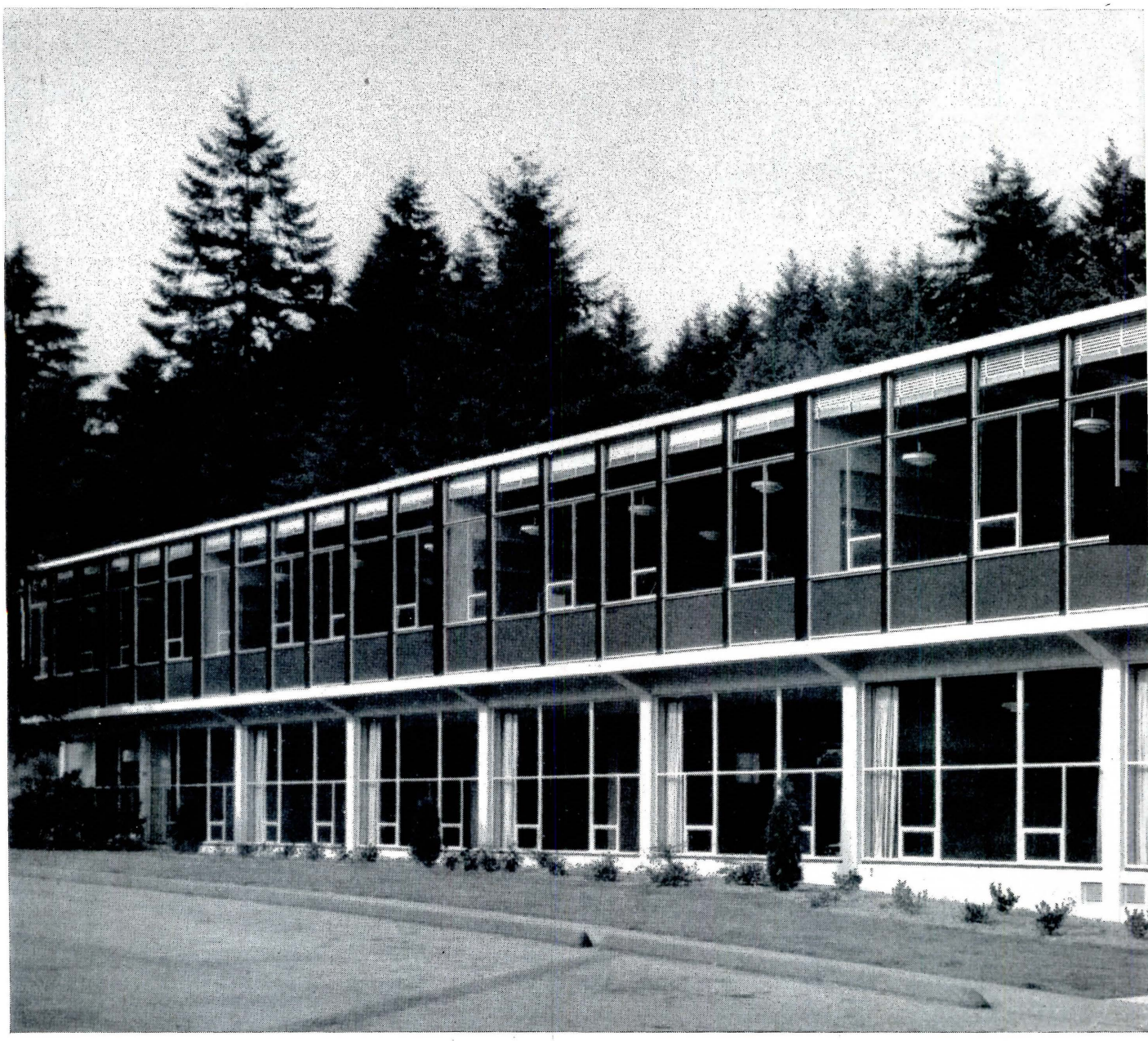
Acoustical Division, Eastern Products Corp.
1601 Wicomico St., Baltimore 30, Md.

Please send, without obligation, full details on the New Eastern "Silent Ceiling."

NAME

STREET

CITY, ZONE, STATE



Can you picture this school without glass?

It would still be St. Luke's School in Seattle, Washington. But it wouldn't be the same *building* by any stretch of the imagination.

Here's why: The school is glazed with panels of Spandrelite, heat-strengthened glass with an eye-appealing color—Cavalier Red—fused to the back. Spandrelite and the expanses of transparent glass that complement it contribute enormously to the building's appearance—its crisp styling, its splendid ability to bring nature into the classroom; while keeping inclement weather outside.

Furthermore, the large areas of clear, heavy-sheet Pennvernon Window Glass improve the over-all natural lighting of the classrooms. The result is a cheerful, spacious atmosphere in which to work.

Pennvernon and Spandrelite are the perfect combination . . . bringing to life the modern educator's dream of light and beauty in the school.

Design your schools better with PITTSBURG

Architect: Roger Gotteland, A. I. A. and Associates, Seattle, Washington

CONSULT YOUR ARCHITECT

for information about the use of these famous Pittsburgh Glasses in school construction:

Solex®. heat-absorbing and glare-reducing plate glass

Herculite®. . . . . shock-resisting tempered plate glass

Twindow®. . . . . the world's finest insulating window

Polished Plate Glass. . . . for clear, undistorted vision

Pennvernon®. . . . . window glass at its best

Spandrelite®. . . . . glass in color

GLASS

75th ANNIVERSARY 1883—1958

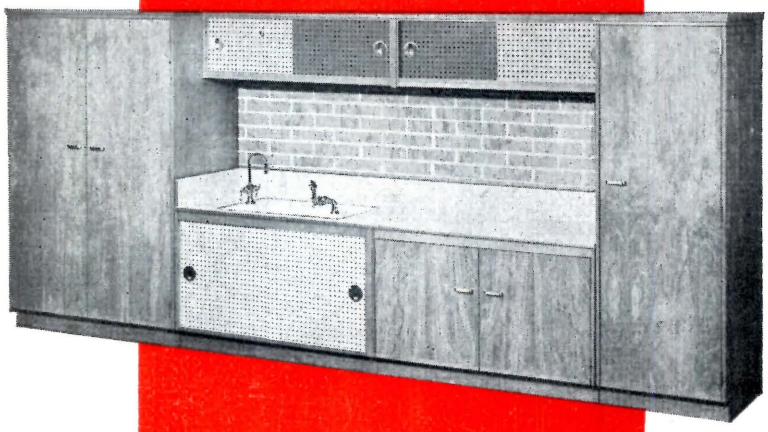
SYMBOL OF SERVICE FOR SEVENTY-FIVE YEARS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

SPECIFY...

Educators



1 ELIMINATE UNNECESSARY DETAILING

2 QUALITY WITH MINIMUM FIRST COST

3 LASTING BEAUTY AND UTILITY

4 ADAPTABLE TO FUTURE EXPANSION

Educators classroom units are built better to last longer. And, Educators proven design saves planning time because units can be used in any combination to meet specific requirements.

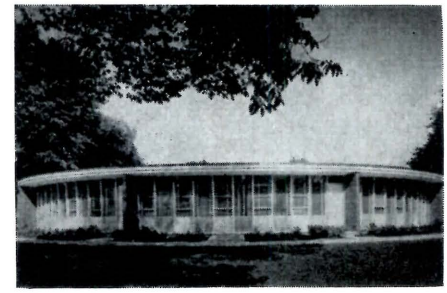
Write today for information and name of your nearest distributor.

Educators MANUFACTURING COMPANY
P. O. BOX 1261, TACOMA, WASHINGTON

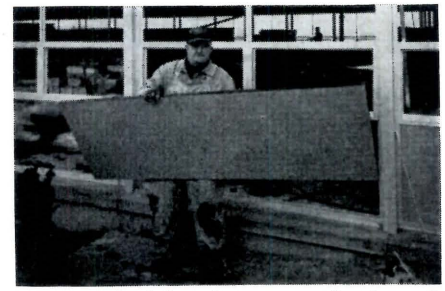
Technical Roundup

continued from page 232

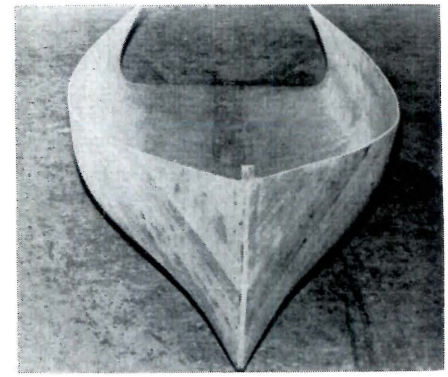
balsa wood. Balsa was chosen because it is often used as a core material and because it has no natural defense against rot. The researchers proved that kiln-dried wood can be protected from the attack of several species of fungus by application of homogeneous coatings of plastic or glass-reinforced plastic. The studies also proved that the fungi in contact with food and air will be either inhibited in their growth or killed by contact with the commonly-used plastics. The implications of this work are plain to the marine construction field and investigations are beginning in connection with pilings and other waterside construction. Building panels and curtainwall materials can be re-examined with these findings in mind. It is possible that soil fungi may be equally repelled, making it possible to use wood in contact with the ground, a hitherto unadvisable step.



St. Joseph School, Ft. Edward, N. Y.—one of the first to use plastic-coated wood



Strong, colorful, and now proved rot-proof, plastic-wood panels are gaining acceptance



Plastic may be used to protect and strengthen molded wood products of all kinds

Now! CHOOSE FROM A RAINBOW OF COLOR IN LIGHTING!

A wide choice of colors, diffusing media and shapes available in one ceiling system for complete aesthetic freedom in lighting design

View of test ceiling at our plant.

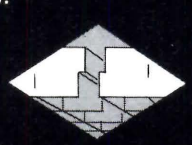
Electro Silv·A·King **LUMENAREA** ceiling system

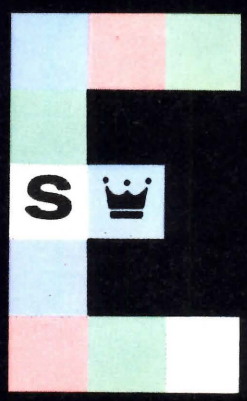
The simplest, most versatile installation system ever developed!

Here is the world's first large area lighting system that gives you practically unlimited variety of form, as well as color and diffusing media. Now you can design lighting layouts, from the conventional to the abstract, curved or straight in any combination of louver, molded forms, glass and accent lighting . . . in soft pastel pink, blue, green and white . . . in a ceiling completely free of any visible screws, bolts or mechanical devices.

And with all that, the new Electro Silv-A-King LumenArea System, incorporates Slide Adjustment and Adjusto-Lok hanging devices which adjust for spacing and depth *without tools!*

Design of our Overlap Polycube® Louver (½" cube), on 2-ft. wide modules eliminates the necessity for crossbars, regardless of how long the run . . . also provides 45° x 45° shielding for optimum seeing comfort.





Dished plexiglas ceiling with perimeter of green "Polycube" Louvers helps give this office a distinctive appearance.

For your Free Specification and Data Bulletin, write to:

Electro Silv-A-King Corporation, 1535 SO. PAULINA ST., CHICAGO 8, ILL. • SPRUCE & WATER STS., READING, PA. • REDWOOD CITY, CALIF.

Call the man from Fenestra for

Classroom doors at the lowest installed cost!

It looks like a costly custom-made door, but this is a *stock* door by Fenestra®, specially engineered for school use.

These new Fenestra Hollow Metal Doors swing open smoothly, close quietly. There's "quiet", built into every Fenestra door. You save year after year on maintenance because Fenestra Doors can't warp, swell, stick or splinter. They last a lifetime! And in addition, you get the lowest installed cost because:

1. You buy a *complete package*—door, frame, hardware, completely machined and fitted at the factory.

2. Erection is fast—one man with a screw driver can hang a door in minutes after the frame is installed.

3. You have a complete selection of door types (1⅜" and 1¾") of distinctive designs and features—*all mass produced.* Custom quality at *stock* door prices!

Ask your Fenestra representative (listed in the Yellow Pages) to help you in your selection and specification of doors, frames and hardware. Or, write to Fenestra Incorporated, Department AR-8, 2252 East Grand Boulevard, Detroit 11, Michigan.

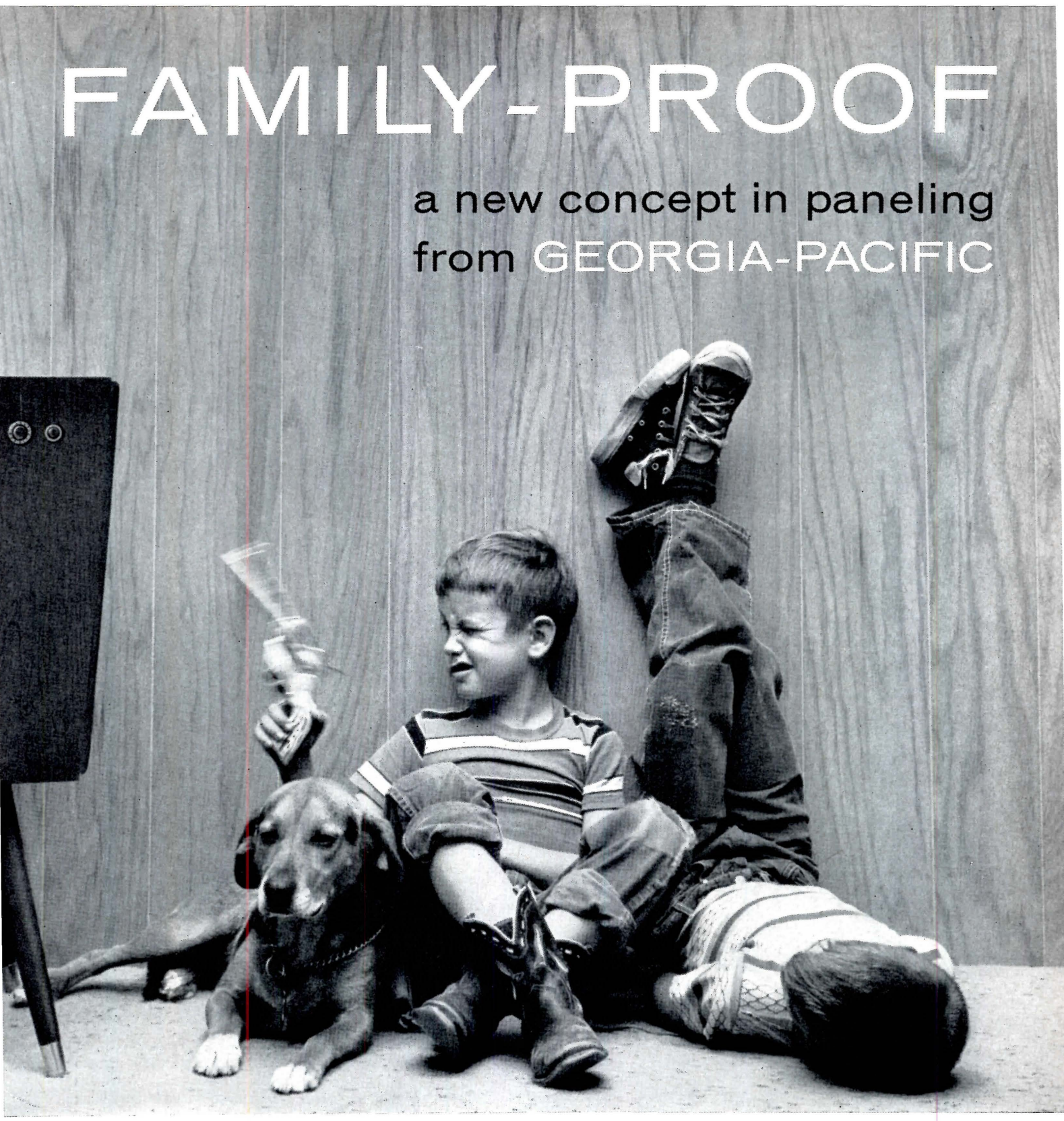
Let the man *from Fenestra be your "door man"*

Fenestra HOLLOW METAL DOOR FRAME • HARDWARE UNITS

YOUR SINGLE SOURCE OF SUPPLY FOR DOORS • WINDOWS • BUILDING PANELS • CURTAIN WALLS

FAMILY-PROOF

a new concept in paneling from GEORGIA-PACIFIC



Designed for today's homes, today's living, new G-P Hardwood Paneling is now *protected* with a special synthetic finish.

Components in the new formula build in mar resistance, give the prefinished plywood a deep, rich luster that never needs waxing. Crayons, lipstick, hair tonic, ink, nail polish, even alcohol can't penetrate the tough new topcoat. It cleans with a damp cloth. And this practical paneling costs, retail, as little as 39¢ per square foot.

Installation is fast and easy with 4′x8′ panels for regular nailing or gluing. Clip-on* panels make quick work of modernizing old walls.

V-grooves accent random-plank look in all nine handsome woods.

*PAT. PENDING

GEORGIA—PACIFIC

Plywood & Redwood • Lumber & Hardwood • Pulp & Paper

Choose from American Black Walnut, American Cherry, Honeytone Oak, Blond Oak, Flame Gum, Adirondack Birch, Greymist Ash, Blond Cativo, Philippine Mahogany.

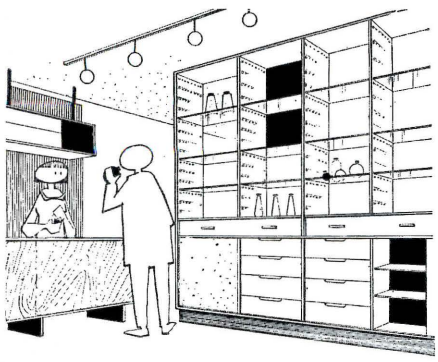
GEORGIA-PACIFIC, Dept. AR858, Equitable Bldg., Portland, Oregon.
Please send complete information on new G-P Family-Proof Paneling.

Name_____

Firm_____

Address_____

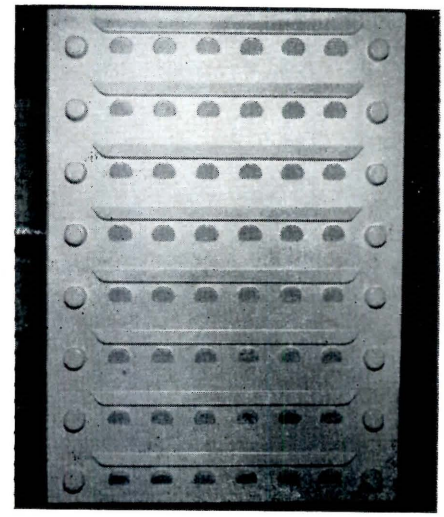
City_____ Zone____ State_____



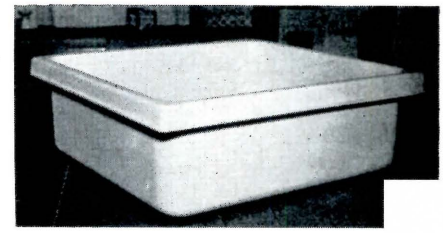
Versatile Components Convert Unused Space to Useful Storage

The new *Stratapanel* system uses only two simple, standard components to build storage units that combine a high degree of flexibility with low installation cost. A basic unit consists of two vertical slide-panels, cemented to opposite sides or supports of the space to be enclosed, and two or more modular drawers which are supported by, and glide on, the coordinated "slides" on the panels. Both components are made of a high-impact plastic, molded by a special thermoforming process.

The panels themselves come in only one size—17⅛ in. deep by 24 in. high—but may be cut into smaller sizes in any multiple of three inches. Each standard unit will accommodate eight 3 in. drawers or four 6 in. drawers, or any combination. Or, for still greater variety of function and appearance in large units, they may hold glass or sliding shelves as well as drawers. Designed to be interchangeable (no left or right), the



panels can be attached permanently to any stiff material. Because they entirely cover the sides of the unit, no interior coating is needed, and plywood finished on one side only can be used for the backing material. In many cases, an existing wall will serve as one side of the new unit.

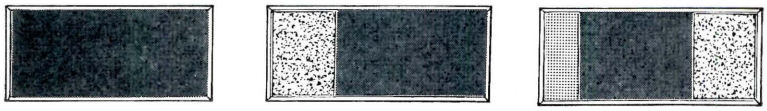


The drawers, all 17⅛ in. deep and 3 or 6 in. high, range from 16⅛ in. to 46⅛ in. in width. Standard drawers are trimmed to receive either a stock wood front, available in unfinished yellow birch or walnut, or a custom front supplied by others. However, the drawers are also made for use without wood fronts in particularly economical installations or in cabinets with doors. These drawers come in the same stock sizes as those with fronts, but have a formed pull (photo above). Although the stock drawers, like the slide-panels, come only in beige, special colors may be had on order. *Moulded Structures Div., Robt. A. Schless & Co., Inc., Elizabethtown, Essex County, N. Y.*

more products on page 244

BECKLEY · CARDY
SIMPLEX units

CUSTOM-BUILT
to your instructional needs
with chalkboard, corkboard or pegboard



– one material or any combination

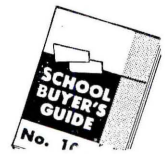
A practical solution to diversified chalkboard and mounting problems. You plan each unit according to your requirements. A simple sketch with dimensions and materials indicated is all we need.

Your units are built in our factory and delivered to you ready to hang and use. All materials of proven, durable quality. Aluminum trims and chalk troughs are expertly fitted.

write for full details or consult your B-C catalog . . .

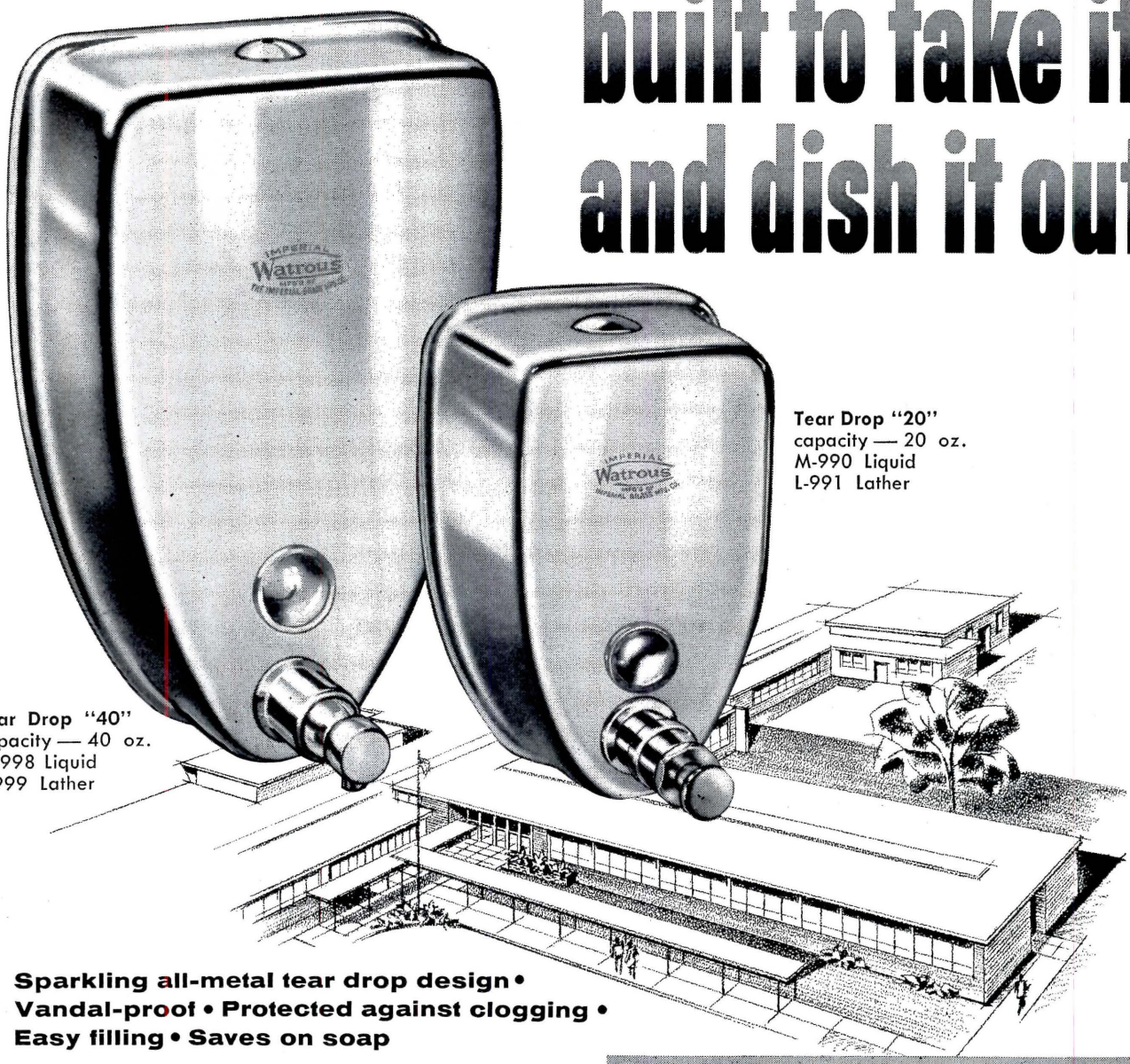
BECKLEY/CARDY

1911 no. narragansett ave. • chicago 39, ill.



IMPERIAL Watrous **TEAR DROP soap dispensers**

built to take it and dish it out



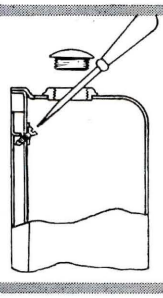
Tear Drop "20"
capacity — 20 oz.
M-990 Liquid
L-991 Lather

Tear Drop "40"
capacity — 40 oz.
M-998 Liquid
L-999 Lather

Sparkling all-metal tear drop design • Vandal-proof • Protected against clogging • Easy filling • Saves on soap

New soap dispenser beauty, plus economy and durability. *Handsome, tear drop styling!* Gleaming copper-nickel-chromium plate over rugged, all-steel case. Copper and nickel-plated inside.

Push-in chrome-plated bronze valve with vital working parts of corrosion-resistant stainless steel. Delivers a measured amount of liquid or lather soap. No waste. Transparent soap level indicator tells when to refill. Two sizes: 20 or 40 oz. Write for Bulletin 905-WA on Tear Drop, and Catalog 471.

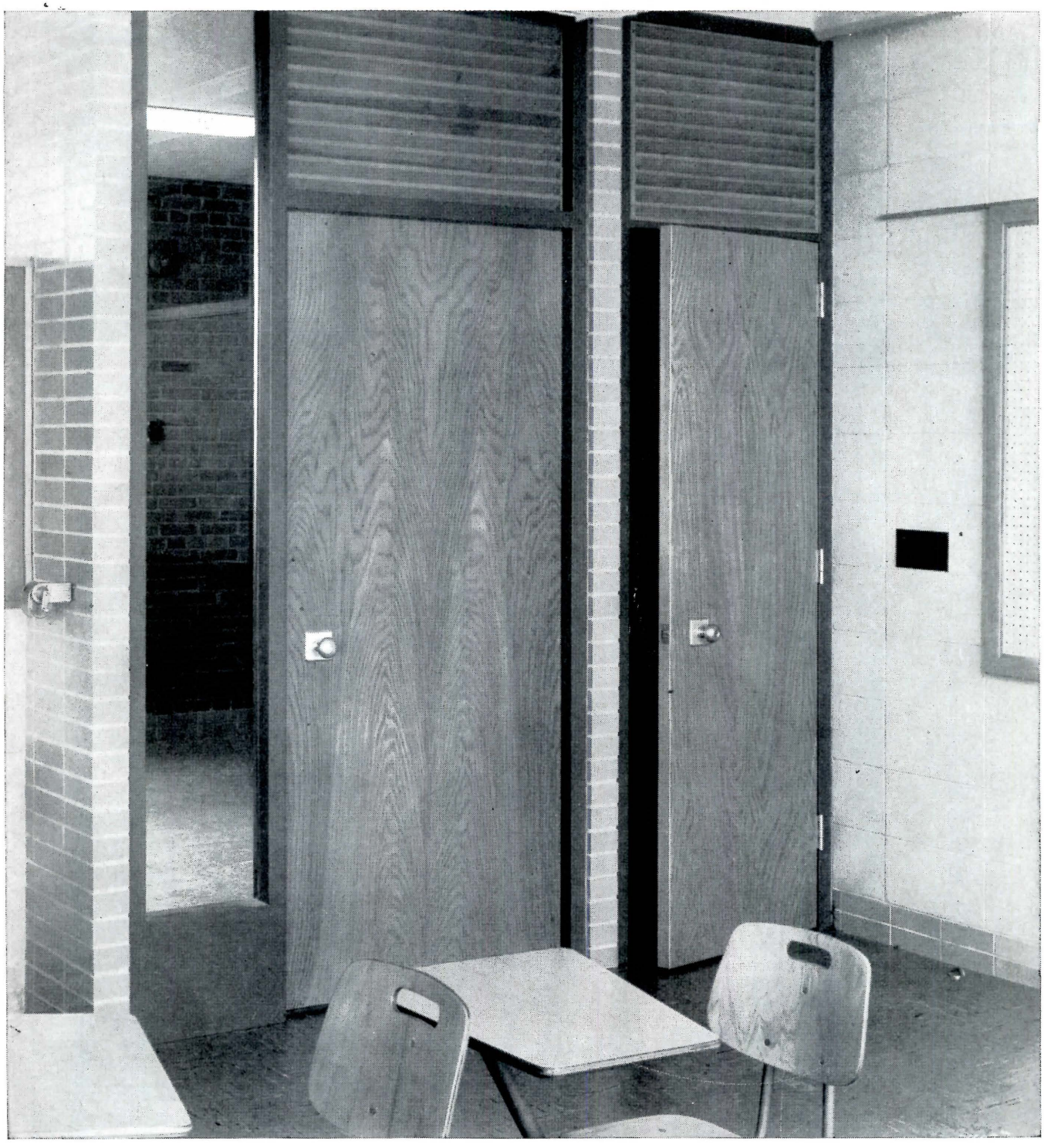


Vandal-proof! Dispenser interlocks with concealed mounting plate. Retaining screw is inside. Cap can be removed only with special wrench provided.

Always specify Watrous flush valves with the preferred features that win customer confidence.

IMPERIAL Watrous

Products of THE IMPERIAL BRASS MFG. CO., 6300 W. Howard St., Dept. AR88, Chicago 48, Illinois



Interior in Brookfield Union Free High School, Brookfield, Wis. Grassold & Johnson Associates, architects.

The natural beauty of wood—in the carefully selected New Londoner door panels shown above—blends perfectly with the warm tints of brick in this modern school interior. Of *guaranteed quality*, proved in thousands of installations, Curtis New Londoner doors are first choice of many of the nation's top-ranking architects and builders.

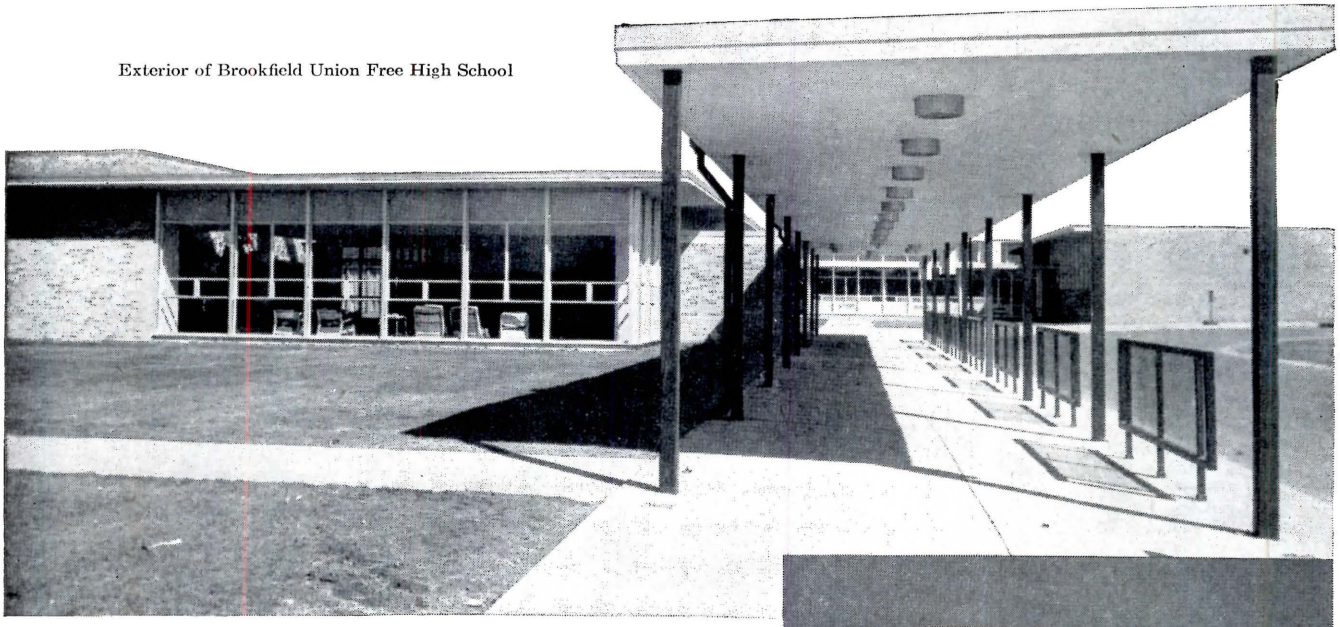
CURTIS

WOODWORK *heart of the home*

1865 CURTIS NEW LONDONER HOLLOW-CORE FLUSH DOORS

Chosen for beauty and endurance —Curtis New Londoner flush doors

Exterior of Brookfield Union Free High School

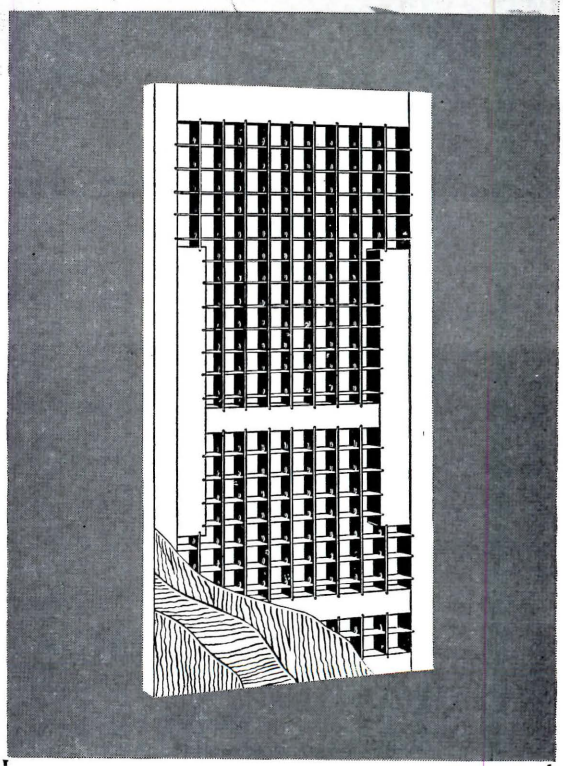


Whenever you see a wood flush door of outstanding beauty, which deserves the term "picture in wood," chances are that the door is a Curtis New Londoner or Curtis American.

And New Londoner doors are not hard to find! For years architects have specified these superior hollow-core and solid-core flush doors for schools, churches, hospitals and other public buildings throughout the country. In turn, New Londoner doors have justified this confidence by standing up year after year under every variety of public abuse.

The remarkable endurance of Curtis New Londoner doors is due to their special construction. The all-wood hollow core is locked into the stiles and rails to form a dimensionally stable, perfectly rigid unit that does not warp. Slamming, banging, temperature and humidity changes leave Curtis New Londoner doors unaffected. They are made in several woods and take all types of institutional hardware.

See your SWEET'S CATALOG, or send for literature and complete data on Curtis New Londoner and Curtis American flush doors.



CURTIS

WOODWORK *heart of the home*

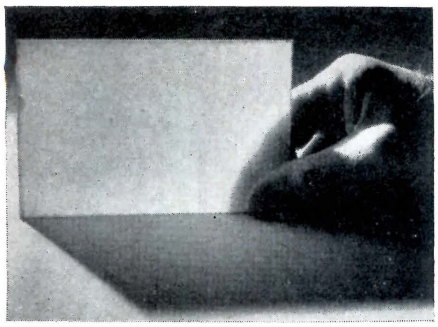
Curtis Companies Service Bureau AR-8-58
200 Curtis Building
Clinton, Iowa

Please send me information on Curtis New Londoner and Curtis American flush doors.

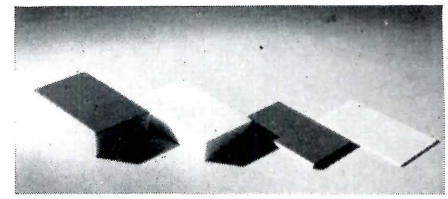
Name.....

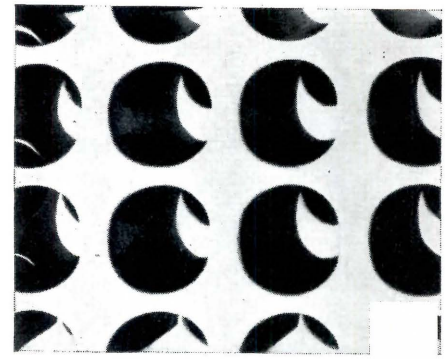
Address.....

City.....*State*.....

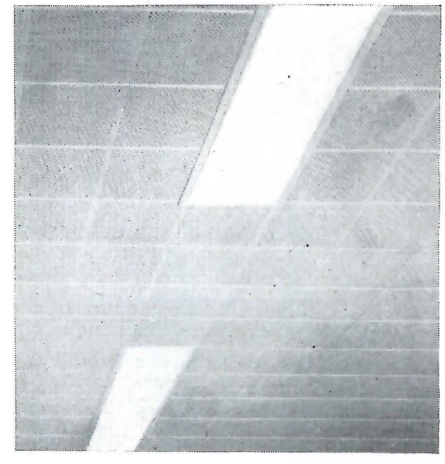


Translucent Insulated Panel
The latest addition to the *Prem-Pan* line of insulated sandwich panels is a 1 1/16 in. thick translucent panel which permits light penetration without sacrifice of insulating quality. Like the standard panels in the line, it has an inner core of *Styrofoam* and comes in sizes up to 4 by 12 ft. Other *Prem-Pan* panels are available in various combinations of such materials as polyester fiberglass, wood, metal and cement asbestos board, all laminated to an insulating plastic foam core. Standard are the *Delta* panel, which is faced with polyester fiberglass cloth over 1/8 in. cement asbestos board, and the *Beta* panel, which is faced with polyester fiberglass cloth over 1/4 in. plywood. *Premier Panels Inc., 34 N. Brentwood Blvd., St. Louis 5, Mo.*





Sculptured Concrete Blocks
Sculptor Erwin Hauer's designs for intricately convoluted and pierced concrete walls have been translated into a series of sculptured concrete blocks which can be assembled in pairs to form light-diffusing screens like that shown above. Two designs are now commercially available; the pre-cast cement block shown, and a plastic unit originally designed for a screen in the new UNESCO building. The cement module comes in 8 or 12 in. squares with a smooth ready-to-paint natural finish, and assembles into 8 by 8 by 6 3/4 in. or 11 3/4 by 11 3/4 by 5 in. units. The plastic modules measure 5 1/4 by 7 in. *Murals, Inc., 16 East 53rd St., New York 22, N. Y.*



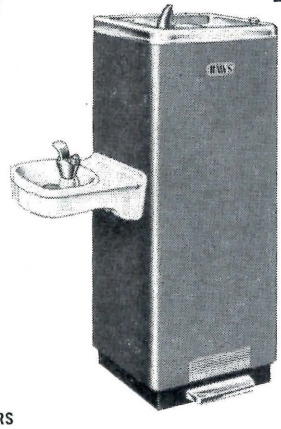
Metal-Pan Acoustical Ceiling
The new *Silent Ceiling* integrates metal-pan acoustical components into an efficient, easily installed

continued on page 248

"HOSPITALITY" IS A WISE INVESTMENT

AWS OFFERS HOSPITALITY at its *finest!*

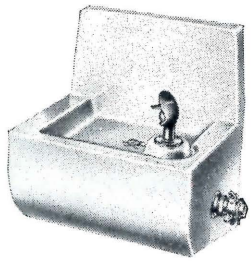
STYLE PLUS! Model 1505* in vitreous china is truly something different – an asset to any contemporary environment. The same basic design is available in fiberglass (in color!), polished aluminum, and enameled iron.



ELECTRIC WATER COOLERS
provide a constant supply of pre-cooled water, dispensed from a cabinet of striking eye-appeal. This Model HPT-13DF features a drinking fountain, mounted conveniently low for the children.

The welcoming smile of an attentive clerk is important . . . and so also is the presence of convenient, sanitary drinking water facilities. They tell the customer that *he* is first in consideration. Every retail and commercial location can benefit from HAWS' 50 years of design and engineering leadership . . . providing the finest in sanitary drinking fountains and coolers. There are hundreds from which to choose, for true hospitality that breeds customer good will – a wise investment indeed!

. . . AND THERE ARE MANY MORE AWAITING YOUR EXAMINATION IN THE NEW HAWS CATALOG. WRITE FOR YOUR FREE COPY, TODAY.

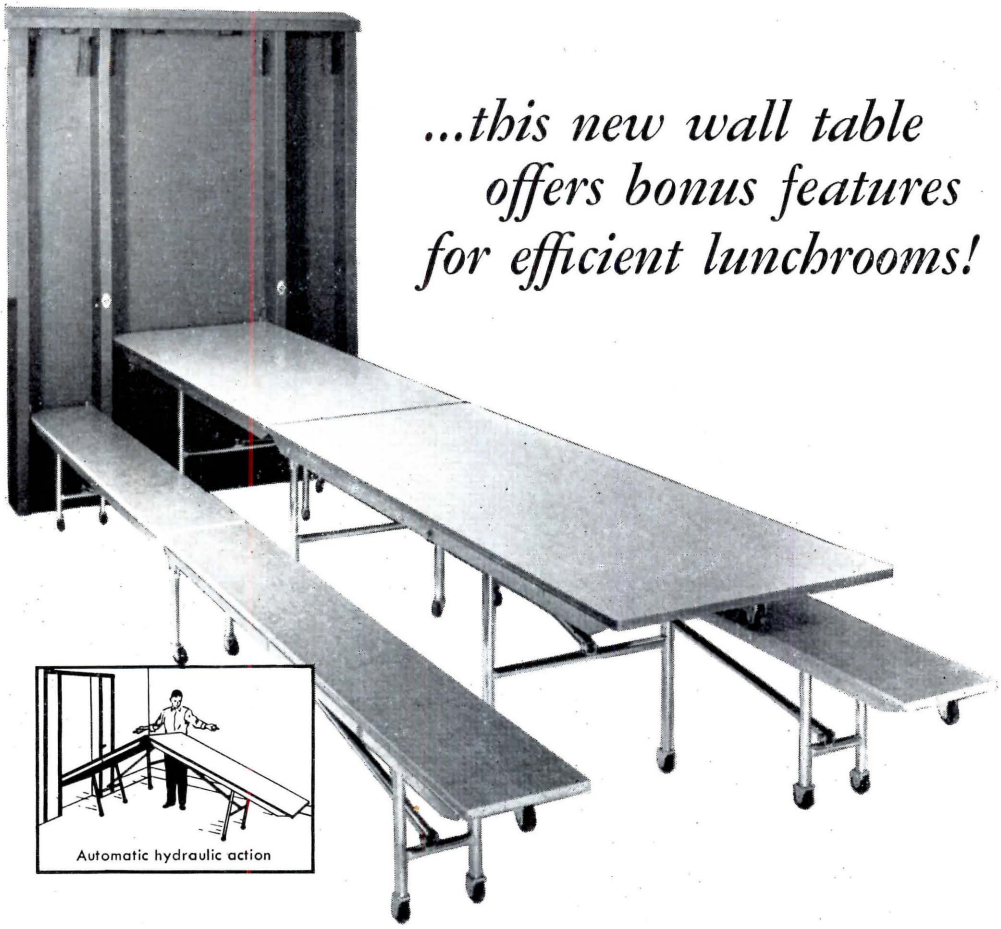


WALL HUNG CONVENIENCE
is embodied in Model 61*, in gleaming vitreous china. Simple lines denote the latest in interior styling.

* HAWS fountains may be supplied with pre-cooled water by a HAWS remote electric water cooler. Models available for all capacities.

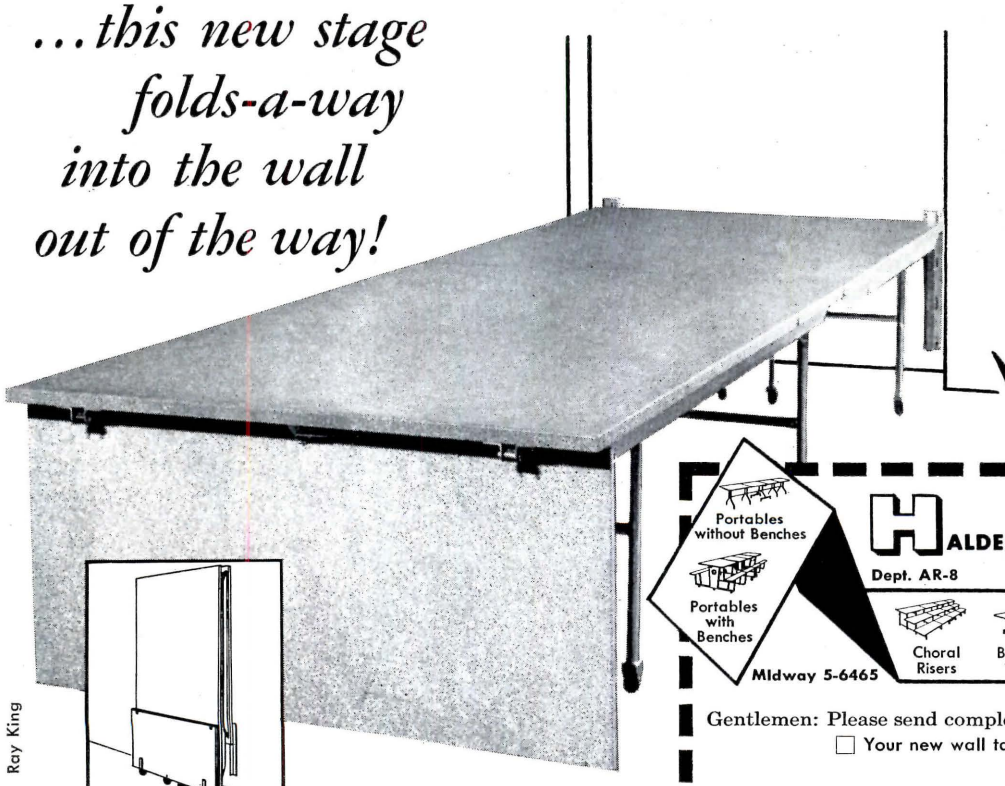
HAWS DRINKING FAUCET COMPANY
1451 FOURTH STREET • BERKELEY 10, CALIFORNIA

...this new wall table offers bonus features for efficient lunchrooms!



may we send you complete specifications?

...this new stage folds-a-way into the wall out of the way!



Ray King

Erickson FOLD-A-WAY PRODUCTS

Portables without Benches

Portables with Benches

HALDEMAN HOMME MFG. CO.

Dept. AR-8 2580 University Ave., St. Paul 14, Minn.

Midway 5-6465

Choral Risers | Banquet Tables | Portable Stages | Band—Orchestra Stands

Gentlemen: Please send complete specifications on

☐ Your new wall table ☐ Your new stage

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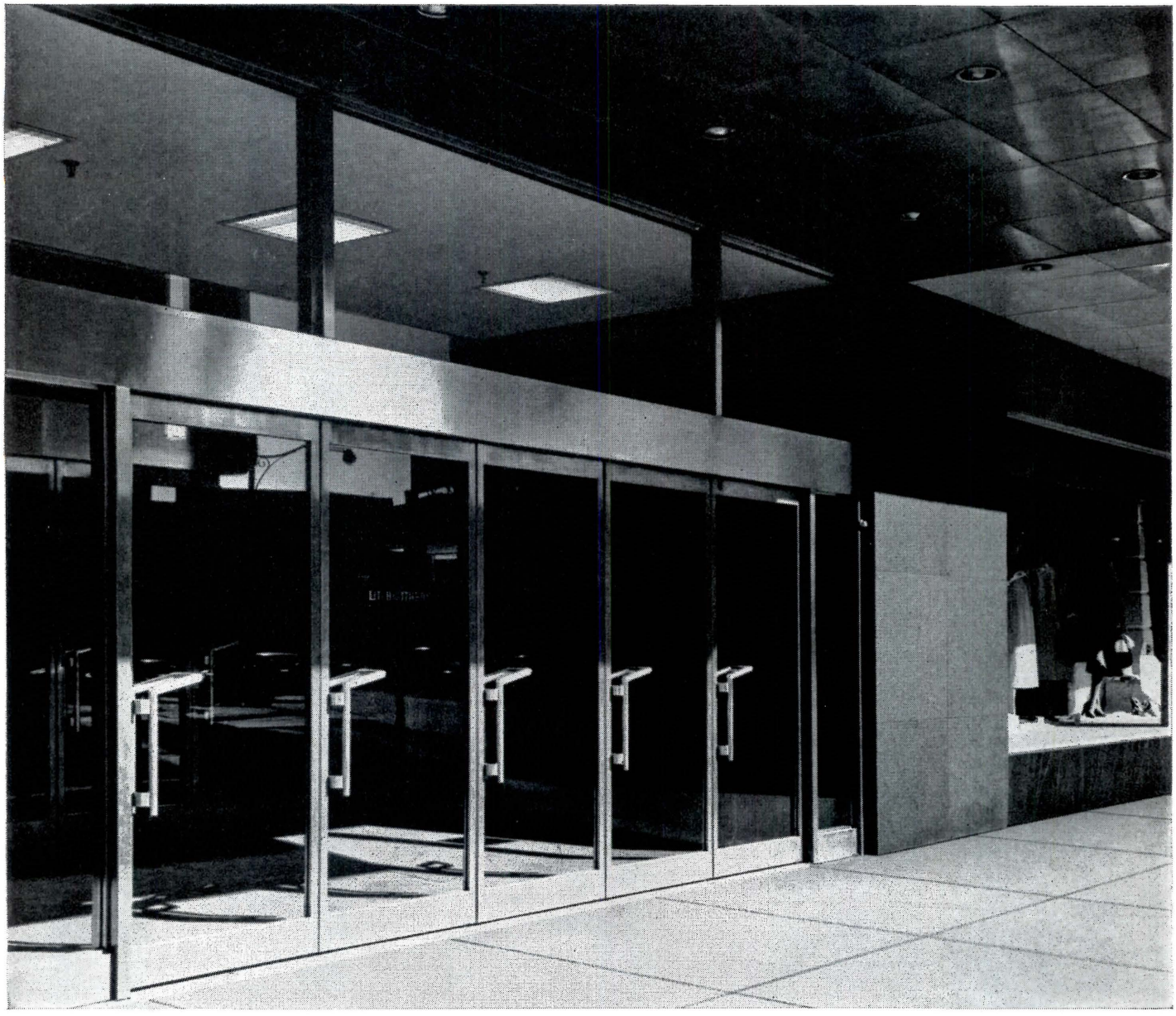
FIRM_____

ADDRESS_____

CITY_____ STATE_____

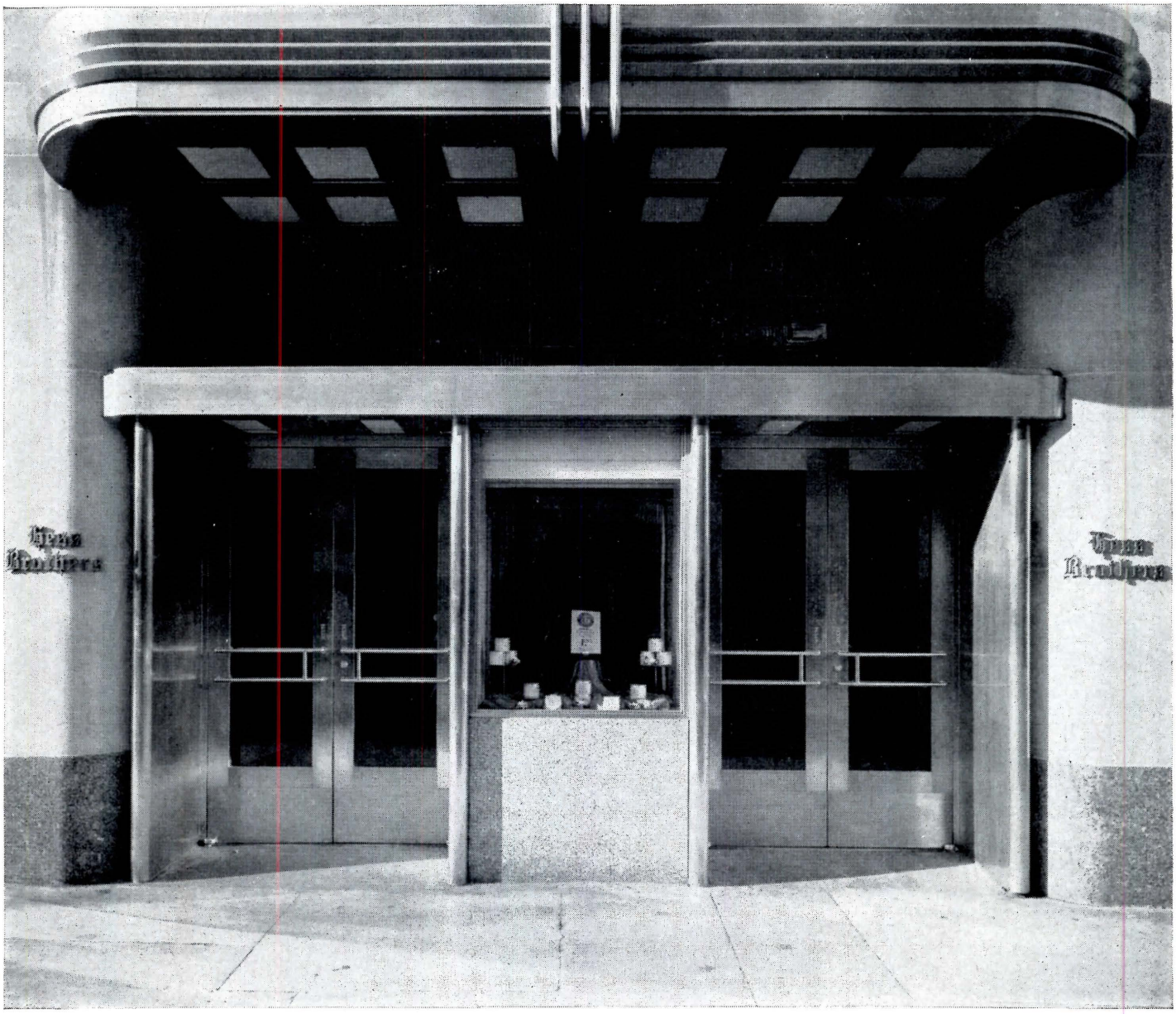
How are you at judging ages?



Lit Brothers Department Store, Camden, N.J.; Architect: Thalheimer & Weitz, Philadelphia, Pa.; Doors fabricated by: George R. Habgood Company, Philadelphia, Pa.

Stainless Steel doors will often outlast the building itself. A thousand shoes a day can kick a Stainless Steel frame but it will stay tight and rigid because (1) the steel itself is so strong and (2) Stainless Steel can be *welded* into solid joints that can't work loose. It's almost impossible to dent or scratch it unless you use a steel tool. Even then you couldn't chip or peel away the shine on a Stainless Steel door because

Look at the unretouched pictures of these Stainless Steel doors. One set is 21 years old, the other is 3 years old. They've received no maintenance except for an occasional washing. Truly, they all look brand new, but the doors on the right were installed back in 1937!



Hess Brothers Department Store, Allentown, Pa.; Architect: Thalheimer & Weitz, Philadelphia, Pa.; Doors fabricated by: John G. Leise Metal Works, Philadelphia, Pa.

it's solid—the shine is as thick as the door itself. Floor cleansers or sidewalk dirt won't hurt it because Stainless Steel resists corrosion. That's why you never have to polish Stainless . . . just wash it off with water and it gleams.

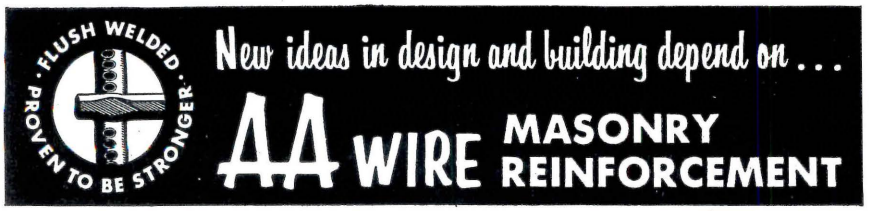
A Stainless Steel door costs a little bit more, but how else could you have such an attractive doorway for so long—*and only pay for it once.*

USS is a registered trademark

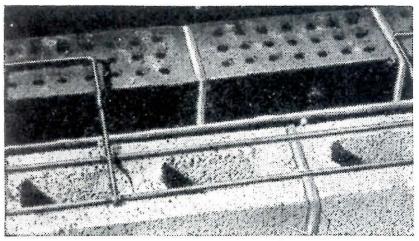
United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

USS



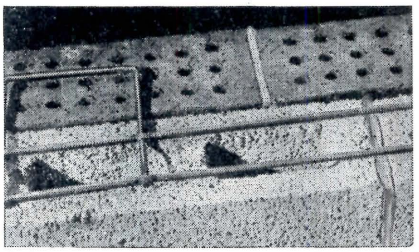
SEE 1958 SWEET'S ARCH. 4h/Aa & IND. CONST. 3c/Aa



ECONO CAVITY-LOK * ®

(For cavity walls of block and brick)

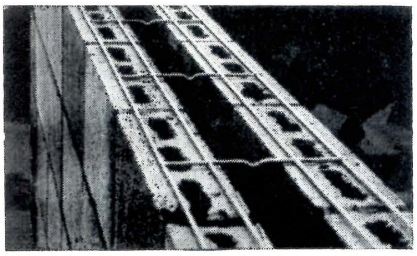
Two parallel reinforcing wires of 3/16" high tensile steel wire, control shrinkage cracking in the concrete block backup. Flush-welded rectangular ties, spaced 16" O. C., of 3/16" high tensile steel wire (to comply with building code requirements), tie facing to backup; permitting some movement between wythes. Made in 12' lengths and packaged 15 pieces to a bundle.



ECONO-LOK * ®

(For solid walls of block and brick)

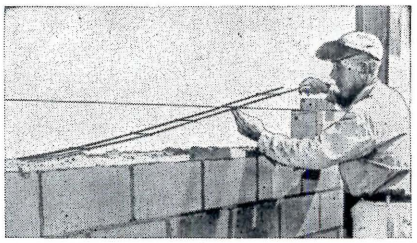
Report G-585 from Armour Research Foundation of I. I. T. proves ECONO-LOK tied walls are stronger than two wythe walls using masonry headers. (Write for your copy of the full report.) Available in No. 9 high tensile steel wire, for curtain walls, and all 3/16" high tensile steel wire, for bearing walls, per A. S. A. Code requirements for metal bonders. Made in 12' lengths (9 rectangular ties each) and packaged 15 pieces to a bundle.



CAVITY-LOK * ®

(For cavity walls of block and block)

Four parallel reinforcing wires control shrinkage and settlement cracking and add lateral and tensile strength to both inner and outer wythes of a cavity wall. (Flush welded cross ties spaced 16" O. C. tie inner wythe to outer wythe.) Made of all 3/16" high tensile steel wire to comply with building code requirements. Made in 10' lengths and packaged 10 pieces to a bundle.



BLOK-LOK ®

(For all masonry walls)

Flush-welded design controls shrinkage, settlement and temperature cracks by the principle of steel in tension and by increasing transverse strength. Also used with glass block and clay brick and to strengthen weak points of masonry walls. Available in various gauges. Made in 10' or 12' lengths; packaged 25 pieces per bundle; end-wrapped and marked for easy identification and handling.

ALL OF THE ABOVE AVAILABLE IN THE FOLLOWING FINISHES: All brite basic finish — Brite basic finish on side rods with cross ties of mill galvanized wire — All mill galvanized wire — Hot dipped galvanized after fabrication.

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☐ I am interested in becoming a BLOK-LOK distributor or dealer.

☐ I am an ☐ Architect ☐ Engineer ☐ Other

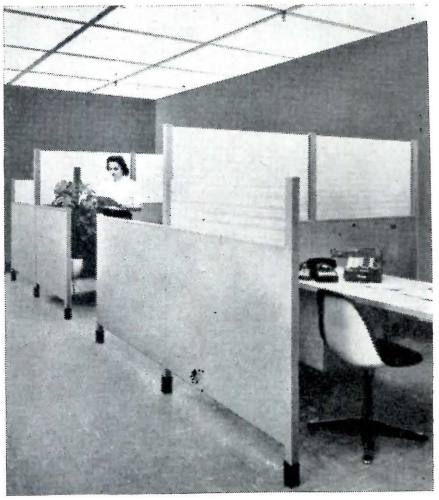
☐ Send me literature and prices. ☐ Send me (FREE) new block and BLOK-LOK calculator.

* Pat. Pending © 1957 AA Wire Products Company

Product Reports

continued from page 244

sound reduction system. Its modular panels, which come in lengths up to 12 ft, go up quickly and easily because they eliminate the need for time-consuming clipping of individual tiles to a T-bar. Instead, the ceiling is hung directly from 1½ in. channels or, using panel nailing clips, from wood joists or other flat surfaces. This enables the *Silent Ceiling* to be installed without unnecessary loss of room height. The panels themselves are washable, noncombustible, and extremely durable. Sound absorbing pads are pre-packaged for easier handling. *Acoustical Div., Eastern Products Corp., 1601 Wicomico St., Baltimore 30, Md.*



Free-Standing Modular Partitions

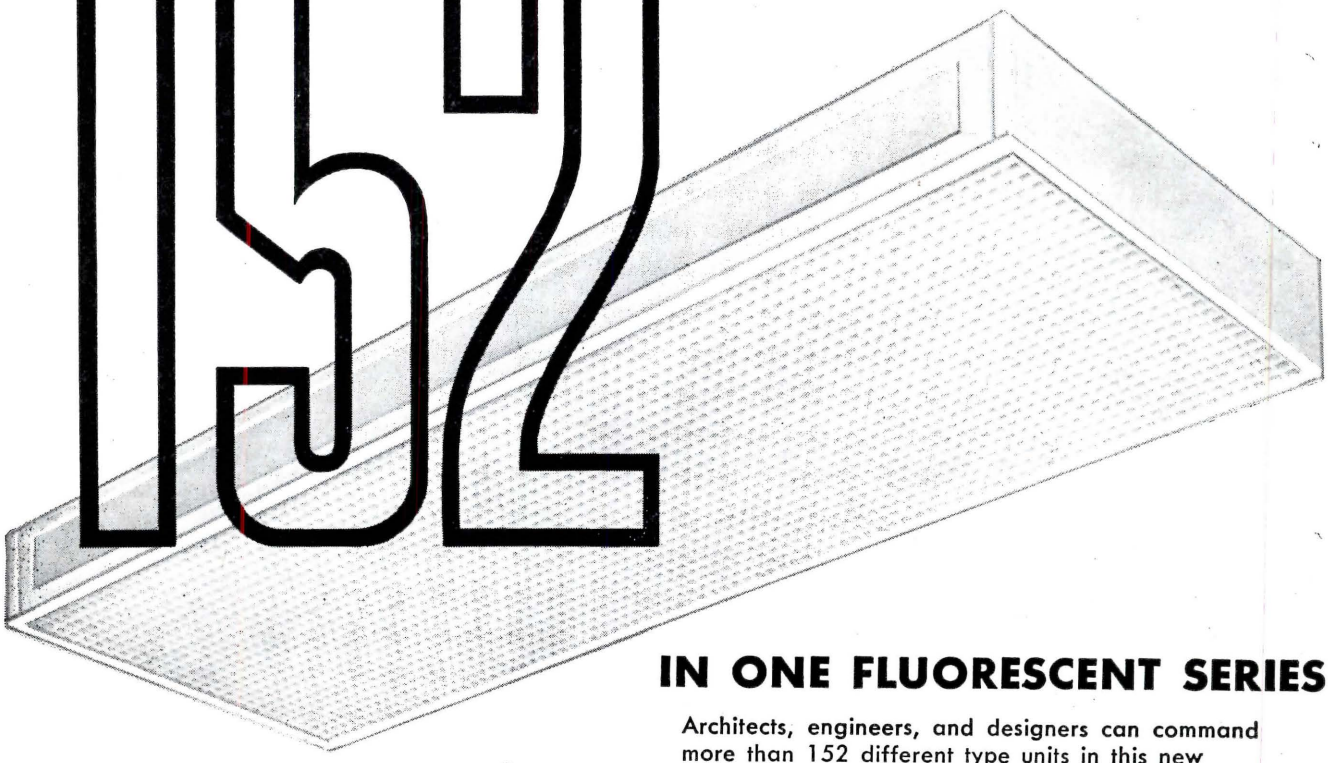
The new *Mainliner* series of metal partitions features complete interchangeability of partition sections and accessories, thus enabling the user to re-route traffic at any time, alter floor layouts quickly or add to existing facilities. Available in panel heights of 42, 54, 68 and 84 inches and in widths from 12 to 66 inches (in 6 in. increments), the partitions can be quickly assembled or rearranged with tools no more complex than a screwdriver. A concealed leveling foot permits a 2 in. adjustment for uneven floors and provides a positive friction-lock to prevent movement. Wiring can be hidden in an integral raceway channel. The panels themselves are 1½ in. thick units insulated with a rigid honeycomb core. Supplied in six colors, they can (when partitions are over 42 in. high) be combined with matching or contrasting top panels of glass, fiberglass, chalkboard, tackboard or acoustical material. *The Mills Co., 980 Wayside Rd., Cleveland 10, Ohio*

more products on page 252

new...LPI...VERSATAIRE

BRINGS YOU

152 different type units



IN ONE FLUORESCENT SERIES

Architects, engineers, and designers can command more than 152 different type units in this new LPI Versataire Series. Versataire offers unlimited possibilities to satisfy most all design and engineering demands and illumination benefits. Whenever you specify or consider fluorescent lighting be sure to consider the versatility of Versataire.

- **direct or direct-Indirect**
- **for 2 and 4 lamps**
- **in 4 and 8 foot lengths**
- **with solid and luminous sides**
- **with 6 different diffusers**
- **12" - 18" - 24" wide**
- **for close-ceiling or pendant mounting**

6 different diffusers

Ventrolens

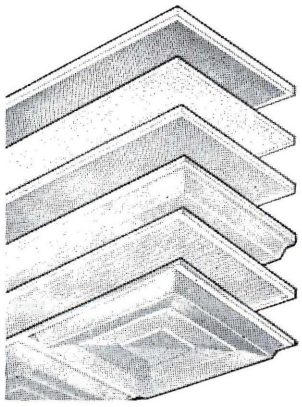
Polystyrene

#70 Corning Glass

Formed Acrylic

#93 Alba Lite Glass

Pattern Vinyl



most lighting per dollar

lighting products, inc.
Highland Park, Illinois

LPI

LIGHTING PRODUCTS INC.,
Dept. 7-H, Highland Park, Ill.

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City_____ State_____

Versataire.

announcing! Roddis

7/16" architectural craftwall . .

FACTORY-FINISHED WOOD PANELING

installs direct on studs...no underlayment!

Another Roddis "first"! New, veneered paneling of exceptional strength and rigidity . . . with a new "solid feel". Gives many of the advantages of ¾" material yet costs far less!

Now! Many of the characteristics of the finest ¾" plywood paneling . . . at real cost savings . . . with Roddis' new 7/16" Architectural Craftwall!

Sturdy and solid-feeling, Architectural Craftwall is made from choice, hardwood veneers bonded to a ⅜" center of Timblend, Roddis' amazing man-made board.

This exclusive Timblend center makes the big difference! A unique, wood blend shavings board, Timblend gives extra strength and rigidity . . . assures maximum freedom from movement after installation. Architectural Craftwall stays put!

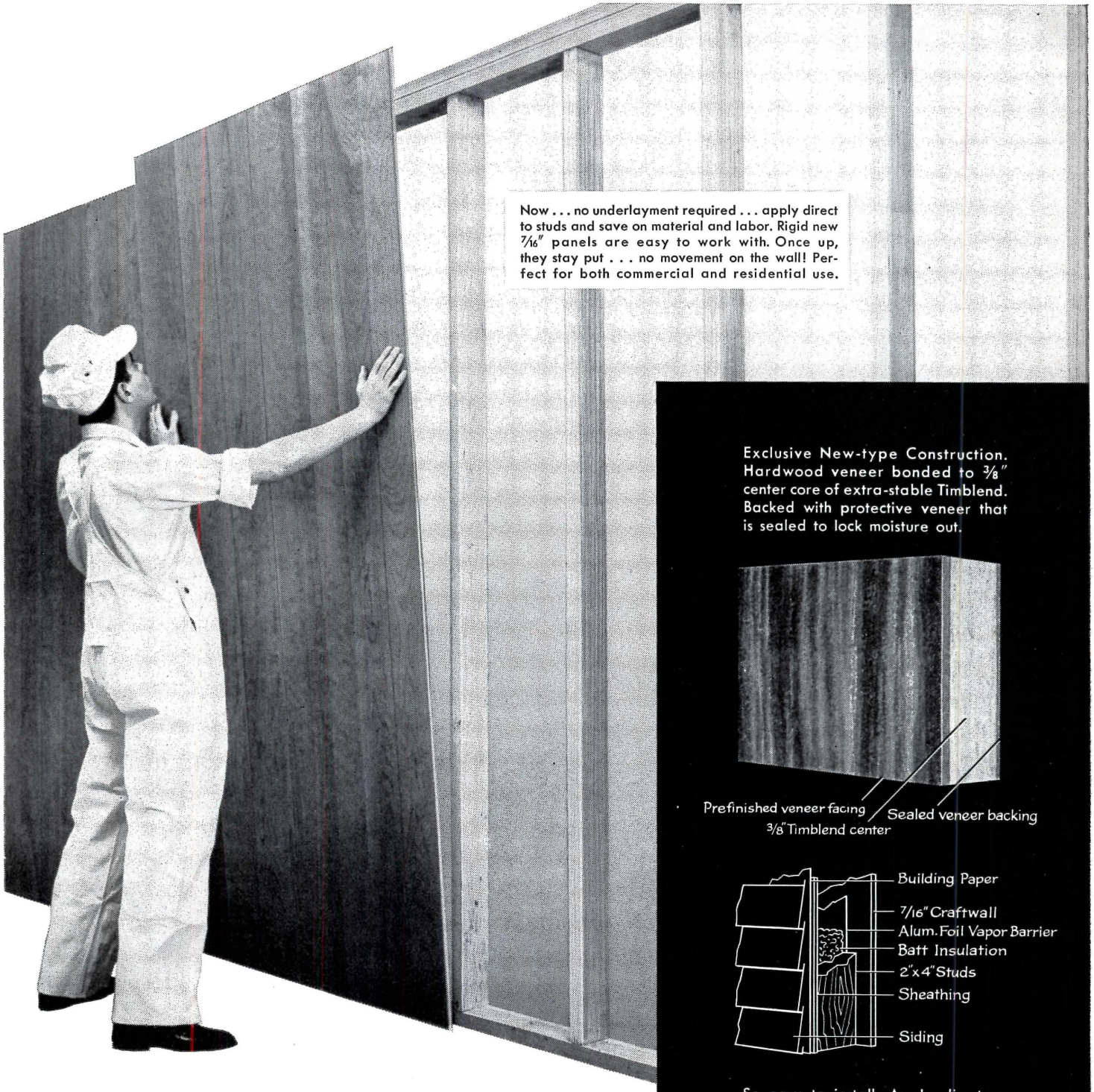
Installation is simplicity itself. Architectural Craftwall goes up fast . . . directly on studs or furring strips. No costly, time-consuming underlayment needed. Install with Roddis Contact Cement. Or use nails if preferred.

Sound reduction properties are impressive, too. Tests prove acoustical values of Architectural Craftwall are comparable to plaster or drywall construction.

A wide choice of woods and styles enhance your design possibilities. Select from Birch, Silver Birch, Maple, Oak, Walnut, Elm, Cherry or Mahogany. *Each is completely factory-finished, ready to install.* Available V-grooved at 16" intervals or V-grooved, cross scored and pegged. All panels V-grooved at veneer joints also. In regular plywood sizes . . . *plus lengths to sixteen feet.*

Architectural Craftwall *is also* available in standard or special size panels, *without grooves,* with matched flitches in the wood of your choice.

For free sample and information on how Roddis' 7/16" Architectural Craftwall can give any paneling installation new beauty, greater strength—at lower cost, just send the coupon. ----



Now . . . no underlayment required . . . apply direct to studs and save on material and labor. Rigid new 7/16" panels are easy to work with. Once up, they stay put . . . no movement on the wall! Perfect for both commercial and residential use.

Exclusive New-type Construction. Hardwood veneer bonded to 3/8" center core of extra-stable Timblend. Backed with protective veneer that is sealed to lock moisture out.

So easy to install. Apply *direct on studs* with Roddis Contact Cement or nails, if preferred.

ARCHITECTS AND DESIGNERS

Roddis 7/16" Architectural Craftwall is a NEW kind of wood paneling! There is nothing else like it in the market. You get deep-grooved beauty and true "solid feel" at a price that will please the most cost-conscious client. And remember, this new Roddis product actually works and handles like costly 3/4" materials. Send coupon for details and sample.

RODDIS PLYWOOD CORPORATION
Marshfield, Wisconsin

Roddis Plywood Corporation
Marshfield, Wisconsin, Dept. AR-958

Please send free sample and information on 7/16" Architectural Craftwall.

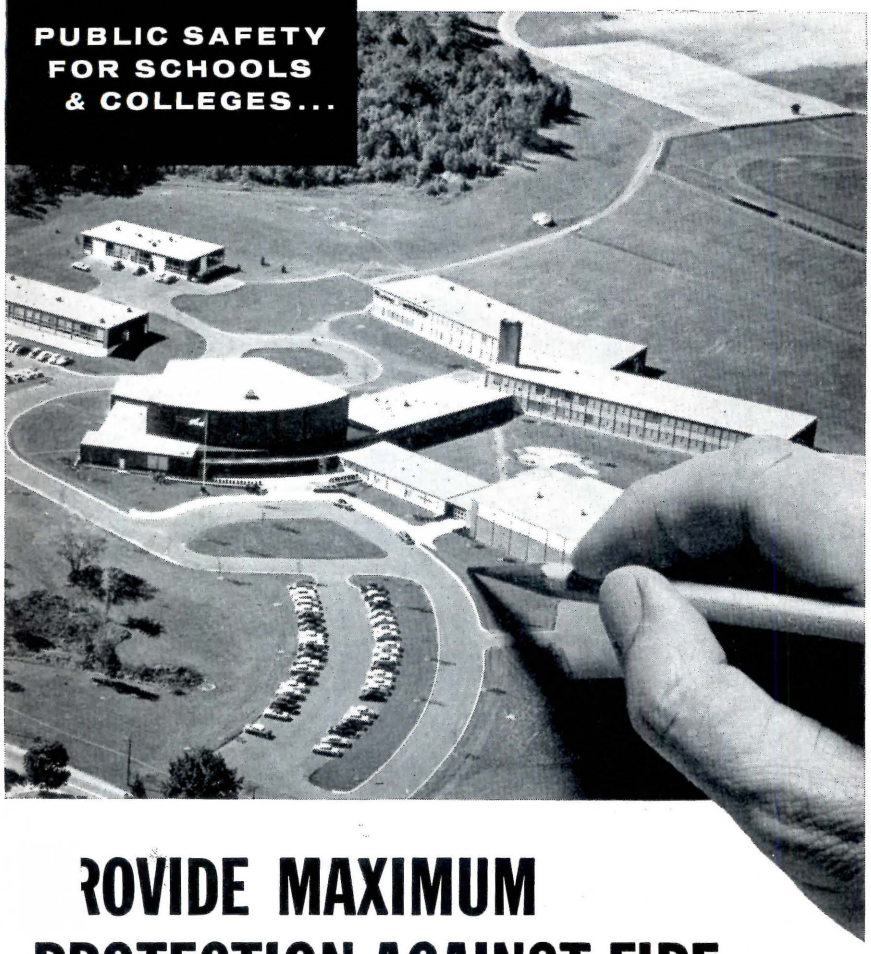
NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

PUBLIC SAFETY
FOR SCHOOLS
& COLLEGES...



ROVIDE MAXIMUM PROTECTION AGAINST FIRE th GAMEWELL FLEXALARM!

Schools and Colleges, like all public buildings, have special requirements for fire alarm systems and fire defense.

No combination or "catch-all" system can really give adequate protection! Maximum fire alarm coverage must provide 24-hour protection, be properly zoned, and engineered to life hazard and fire defense plans.

Flexalarm is the modern, all-in-one fire alarm system that can be precisely tailored to your building and its requirements. It features building-block design and unit type components for simplicity in satisfying all types of construction, fire codes and life hazards. It is easy to specify and economical to buy because of extensive pre-engineering and simplified unit-by-unit installation. Saves money all down the line . . . all from one source, one line of equipment — with complete engineering help if needed.

Send for New Flexalarm Manual. Clients and customers expect the best in fire alarm protection. This specialized, easy-to-use Manual will help you give them maximum protection against fire. Send for your copy, today.

Ask for catalog F249.

Gamewell Fire Alarm Systems For All Types of Life Hazards and Fire Defense Plans

Flexalarm
Dualarm
Localarm
Sprinkler Watchman
Master Box
Direct Municipal Connections

THE GAMEWELL COMPANY
Dept. BB, Newton Upper Falls 64, Mass.

GAMEWELL®

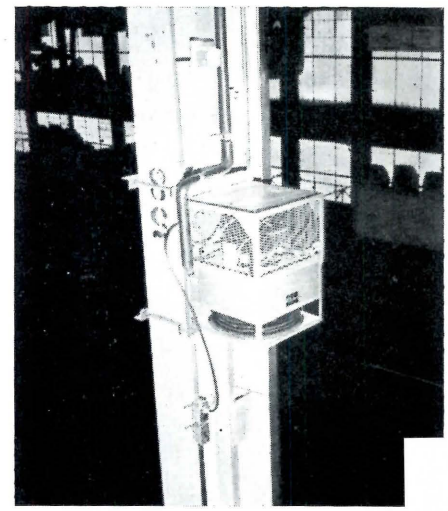
SPECIALISTS IN PUBLIC SAFETY

GA 8-11

Product Reports

Water-Based Vinyl Latex Paint

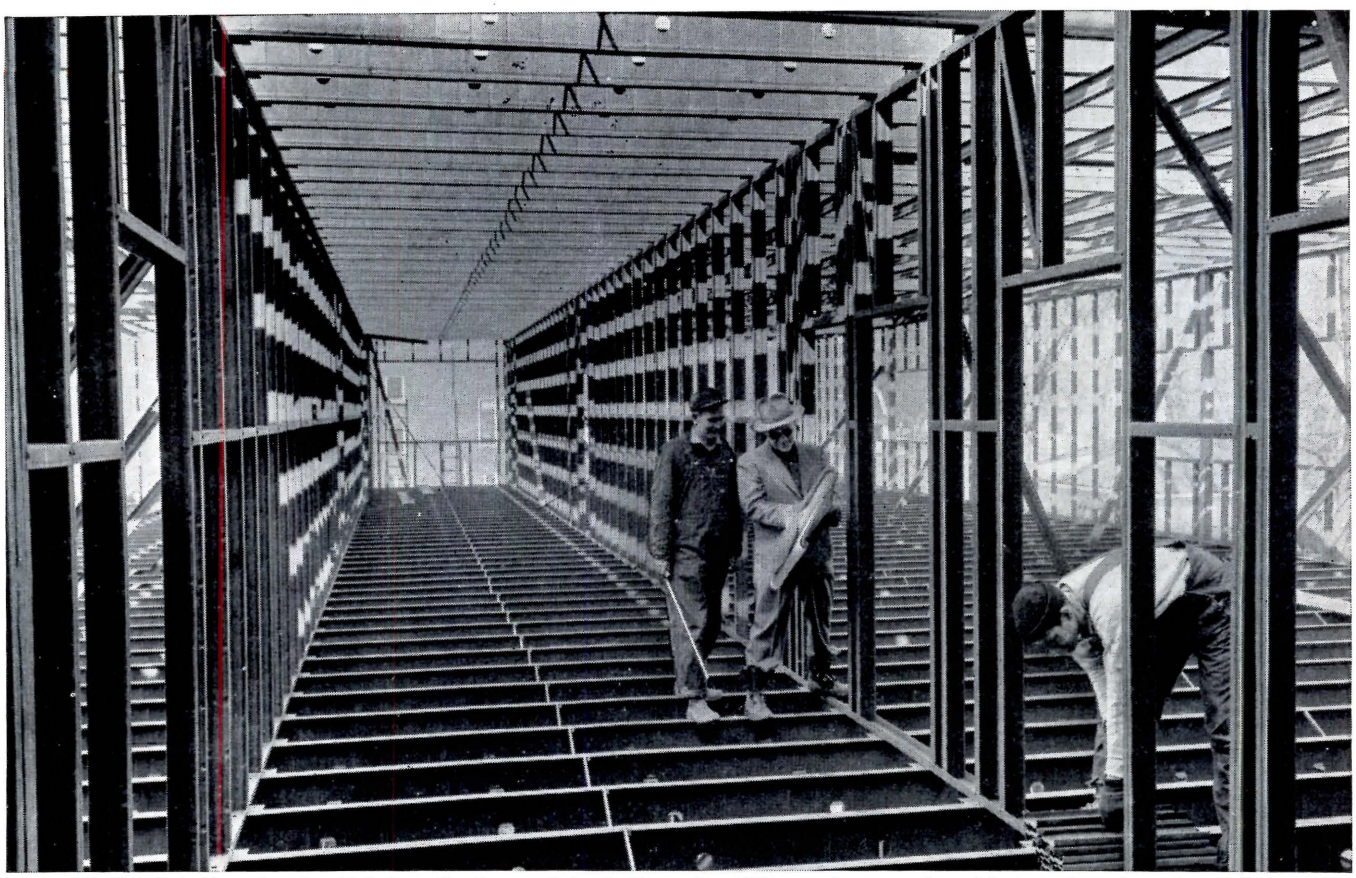
A water-based latex paint for outdoor use is being tested on some 20 houses and buildings across the country to determine its resistance to a variety of climatic conditions. Similar paints based on a *Bakelite* vinyl acetate resin have already gained wide acceptance as indoor coatings: they are easy to apply, quick-drying, fire- and moisture-resistant and easily-cleaned. Preliminary test results indicate that they retain these characteristics even under severe weathering conditions. *Bakelite Co., 655 Madison Ave., New York, N. Y.*



Overhead-Mounted Water Cooler

A unique method of supplying industrial plants with large quantities of refrigerated drinking water uses a compact remote cooler in combination with any type of bubbler, fountain or dispensing outlet. To save floor space that would otherwise be required to accommodate water coolers, and to prevent the units themselves from being damaged by contact with heavy plant equipment, *Sunroc* remote coolers can be bolted to a column as above, supported on an overhead shelf, or mounted in any small out-of-the-way location. The refrigerated water line is then run from the unit to the dispensing outlet. Models suited for remote installation are available in sizes ranging from a 5 gph unit which can be built into a wall to a 42 gph unit which can serve as a central cooling system. The 16 gph-capacity model shown features a "chimney effect" condenser that rapidly dissipates heat from the unit to provide maximum cooling efficiency. *Sunroc Corporation, Glen Riddle 1, Pa.*

more products on page 256



Much of the framing for Friedens Lutheran School, Kenosha, Wisconsin, was shop fabricated ready to be set into place.

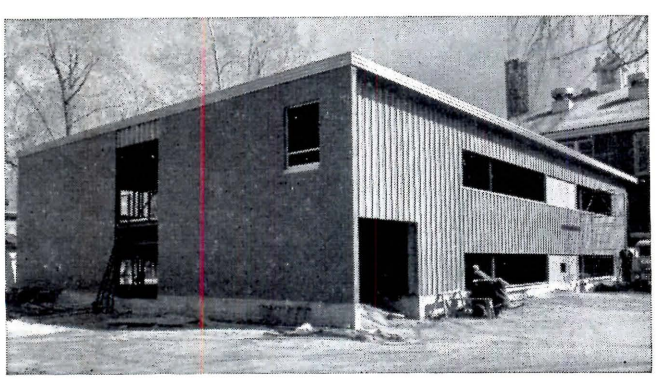
With Stran-Steel framing— KENOSHA SCHOOL GOES UP FAST TO SAVE COST

In less than 1,600 man-hours, the 8-room addition to Friedens Lutheran School, Kenosha, Wisconsin, was closed in, ready for interior finishing, according to architect Walter Trapp, A.I.A.

"We selected Stran-Steel nailable joists, studs and wide flange beams partly because of flexibility, but principally because of speed of erection," Mr. Trapp states, "for fast erection means savings many ways. For instance, we can fasten channel runners directly to the joists. Then acoustical ceiling panels just snap into place. It's really easy and saves a lot. And by using the Stran-Steel lightweight framing system we were able to reduce foundation material and labor costs at least 20 percent."

With a Stran-Steel building system you can stay ahead of construction crews by shop fabricating sections and delivering them to the site as needed. At the Friedens School all the non-bearing walls were pre-fabricated and dropped into place as the floors were completed. Plumbing and electrical work is simplified, too, because joists and studs are punched to receive piping and wiring.

Save your clients money by saving construction time. All-steel Stran-Steel components are easy to handle, easy to use. Structures go up fast. And the job you build with a Stran-Steel framing system is durable, fire-safe and flexible in design. Send the coupon for more facts.



Stran-Satin curtain walls helped speed erection of this 8-room addition to Friedens School.

Stran-Steel Architectural Products Mean Construction Savings For You

JOISTS and STUDS BEAMS ROOF DECK C-SECTIONS COLUMNS CHANNELS

Dept. 23-51

STRAN-STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

Stran-Steel Corporation, Dept. 23-51
Detroit 29, Michigan

Please send your Architectural Products Catalogs.

Name_____

Title_____ Phone_____

Firm_____

Address_____

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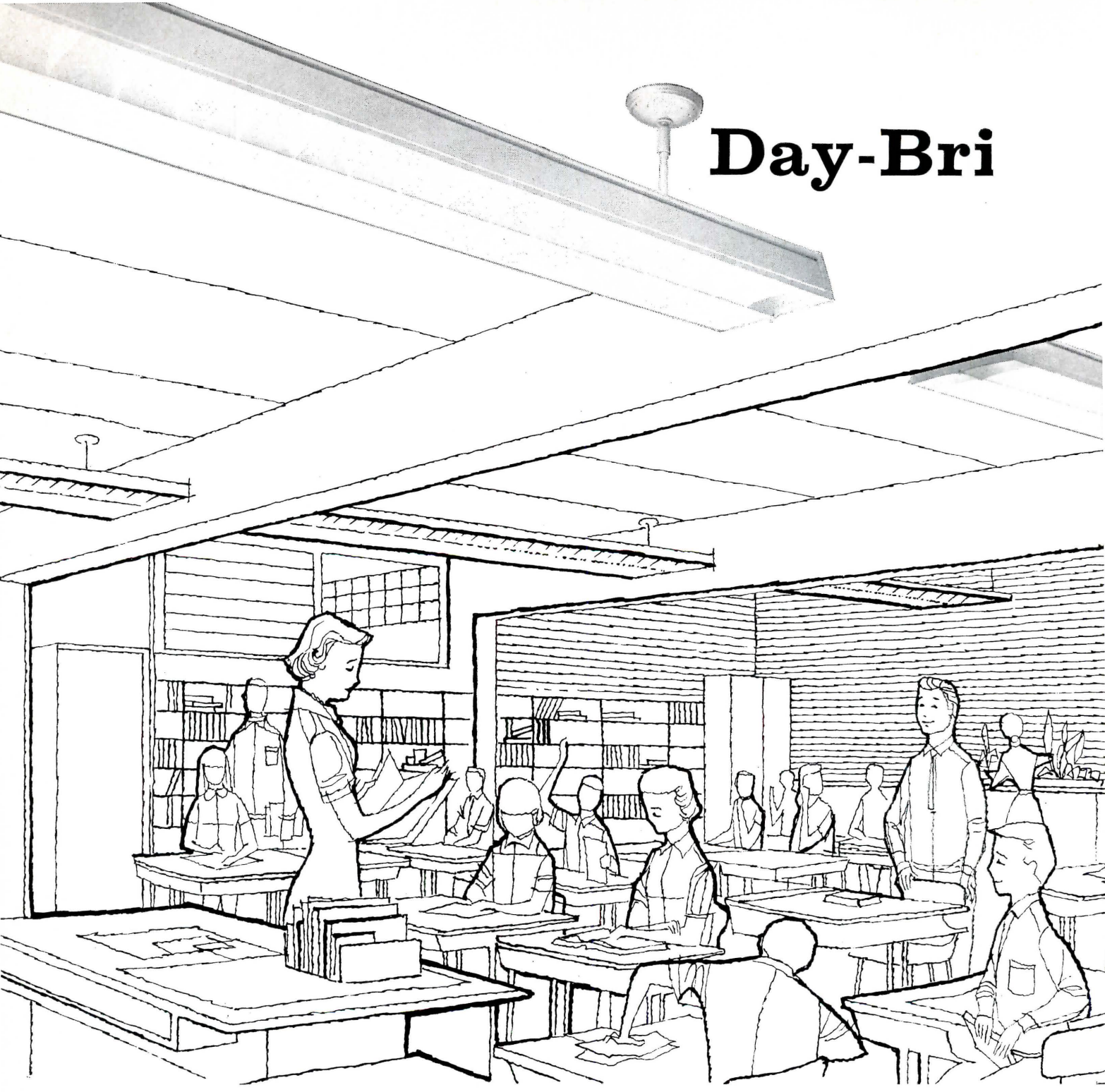


DAY-BRITE LUVEX®, America's most popular school lighting fixtures, are suspended with patented Day-Brite "A-J" adjustable stem hangers from Tectum Deck slab roof. Furnish 60 footcandles in this typical classroom.

Great for Children . . . and Taxpayers, too!

Today there is no reason for compromising on school lighting, regardless of budget limitations.

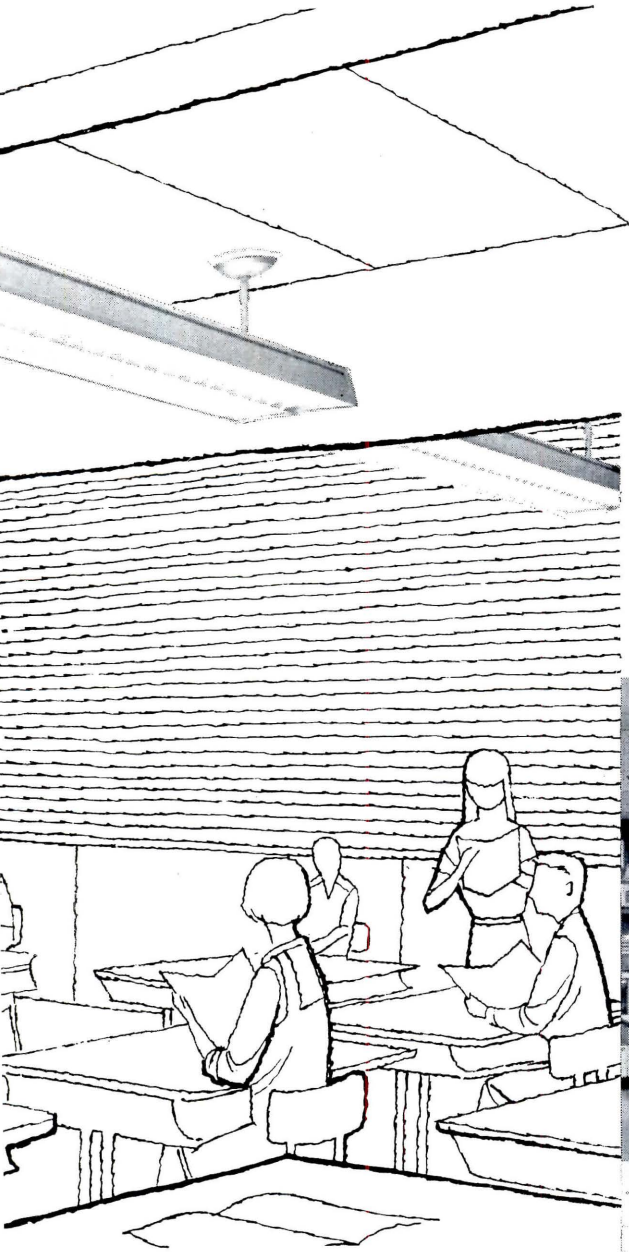
In the school shown here, for example, construction costs were *only $10.59* per square foot, with *Day-Brite* lighting used throughout!

Factory pre-assembly and simplified installation make Day-Brite fixtures competitive with lighting equipment that only attempts to imitate Day-Brite in name or appearance, but *never* in performance or quality.

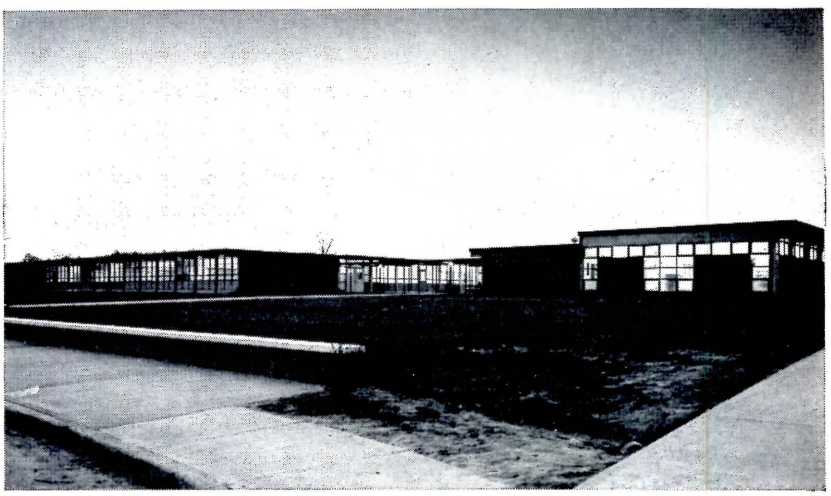
And because Day-Brite fixtures are designed for ease of cleaning and relamping, they keep on saving the taxpayers money throughout the long life of the fixtures.

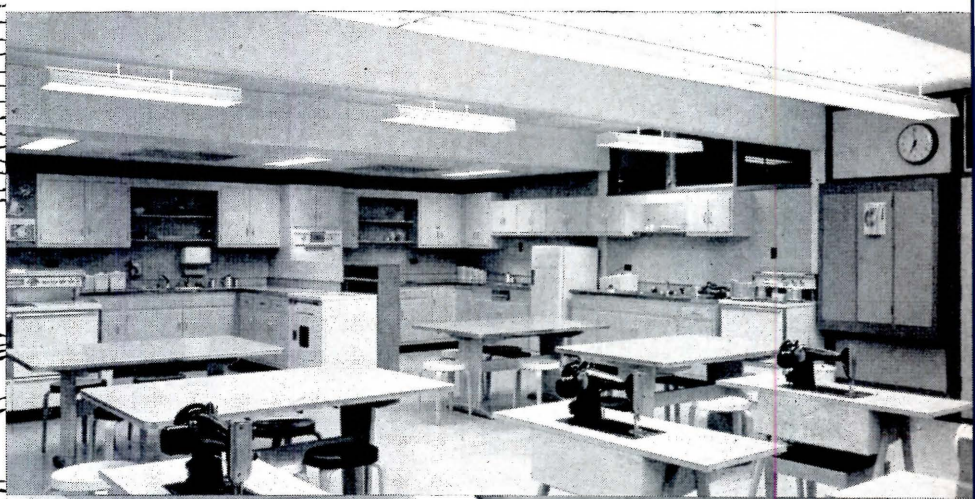
Call your Day-Brite representative, listed in the Yellow Pages, for the *facts* and the *fixtures*. Compare *installed* costs and maintenance economies. Then you will know why there is no legitimate reason for accepting an "or equal" substitute for Day-Brite lighting.

Lighting for Schools...



Herbert Spaugh Junior High School at Charlotte, North Carolina.
J. A. MALCOLM, A.I.A., *Architect;* ALEXANDER SPRINGS, *Engineer;*
F. E. ROBINSON CO., INC., *Electrical Contractor.*





SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE OR WRITE FOR COPY

DECIDEDLY BETTER
DAY-BRITE
LIGHTING FIXTURES

Day-Brite Lighting, Inc.
6252 N. Broadway, St. Louis 15, Mo.

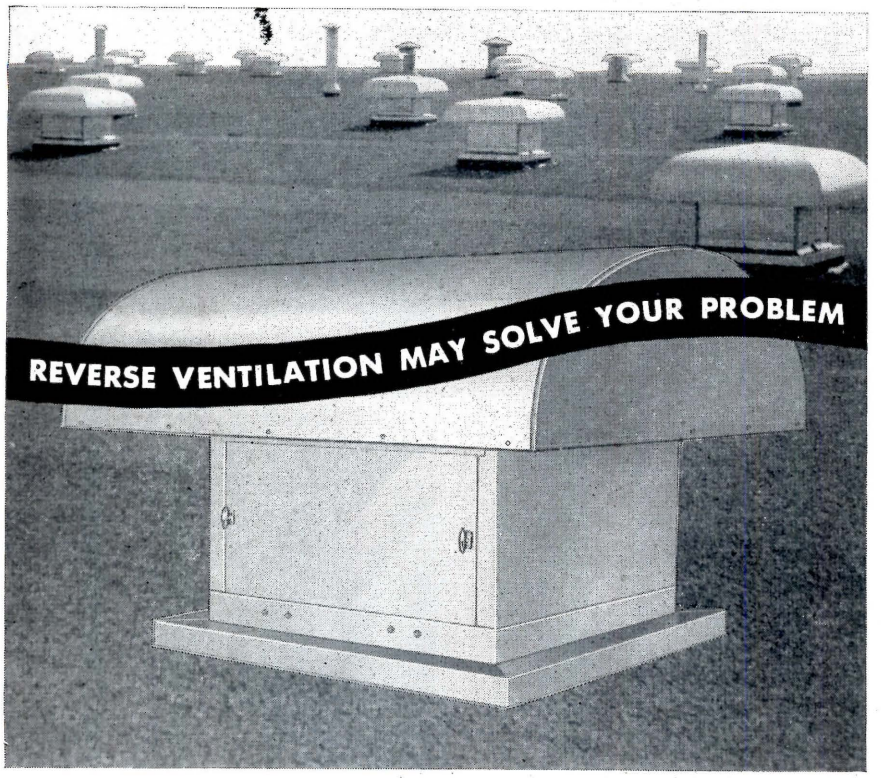
Day-Brite Lighting, Inc., of Calif.
530 Martin Ave., Santa Clara, Calif.

ABOVE: DAY-BRITE LUVEX® and recessed Troffers reduce shadows and glare, help future homemakers learn good work habits in this home economics classroom.

BELOW: Here's proof that hallways don't have to look like dark, narrow tunnels. Day-Brite CORRALOUVERS® give corridors a wide, spacious appearance.

Z-379 ©1958

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT



't Low Type Ventilators, Supply and Exhaust Air for Aluminum Co. America Blow Down Fresh Air to Blanket Floor Area

Wide, low-roofed, modern single-story plants are often difficult to ventilate properly with conventional methods. Perimeters are comfortable but other areas may not be.

Aluminum Company of America's new Screw Machine Products Plant at Lancaster, Pa., with neither cross ventilation nor natural ventilation, solved this problem with "reverse" ventilation. Forty-nine 48" all-aluminum Burt Low Type Roof Ventilators maintain a year-round pleasant working atmosphere.

Twenty-five of the Burt Ventilators operate in *reverse* to blow a blanket of fresh air over the entire working floor. Adjustable diffusers circulate the air at floor level to meet seasonal needs. Strategically located over various hot areas, these Burt supply ventilators need no long horizontal duct runs to reach air intakes on outside walls.

The other twenty-four Burt ventilators exhaust the considerable heat and oil mist from production operations.

The cost of these Burt units was less than one-fourth that of a centralized duct system.

For fresh air at low cost in your plants, why not investigate Burt's complete line of modern, efficient roof ventilators now!

Send for **FREE** *Data Book!*

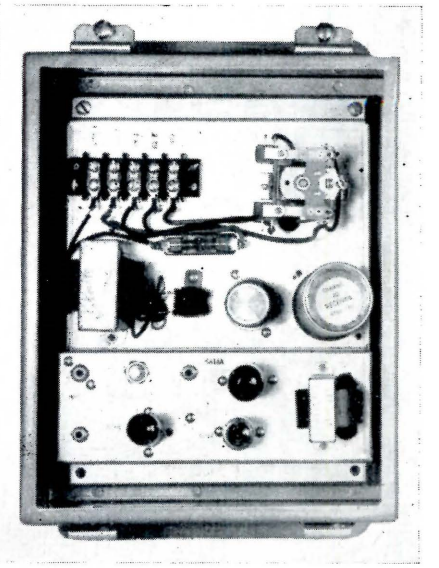
Write for Burt Data Book SPV-101-G.
It supplies quick data on Burt's
complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

48 E. South St. AKRON 11, OHIO
MEMBER AIR MOVING & CONDITIONING ASSOCIATION, INC.

Product Reports



Radio Remote Control Systems

Designed to provide reliable, inexpensive medium range radio remote control for any electrical device, *Perma-Power* remote signal systems make it possible to eliminate wires, phone lines or cables wherever they are difficult to install and costly to maintain. Actually a radio-controlled switch, the system operates over distances ranging from a few feet to over one mile (using fixed, roof-mounted transmitting antennae). Transmitters or receivers are available for operation from 115v AC sources for fixed station controls, or from 6v or 12v DC storage batteries for mobile control. For special applications, multiple channel units can be had with up to 12 non-interfering channels. *Perma-Power Co., 3100 N. Elston Ave., Chicago 18, Ill.*

Woodgrained Plastic Laminates

Two new woodgrains, Brown Fiddleback Walnut (above) and Natural Teak, have been added to the *Pionite* line of plastic laminates. Like others in the line, these new grains are particularly effective for cabinetwork, panelling, and vertical applications of all kinds. *Pioneer Plastics Corp., Sanford, Maine*

more products on page 260

CANADA HOUSE

is equipped with

POMEROY

MONUMENTAL TYPE DOUBLE-HUNG

ALUMINUM WINDOWS

•

STEEL DOUBLE-HUNG SELF CLOSING

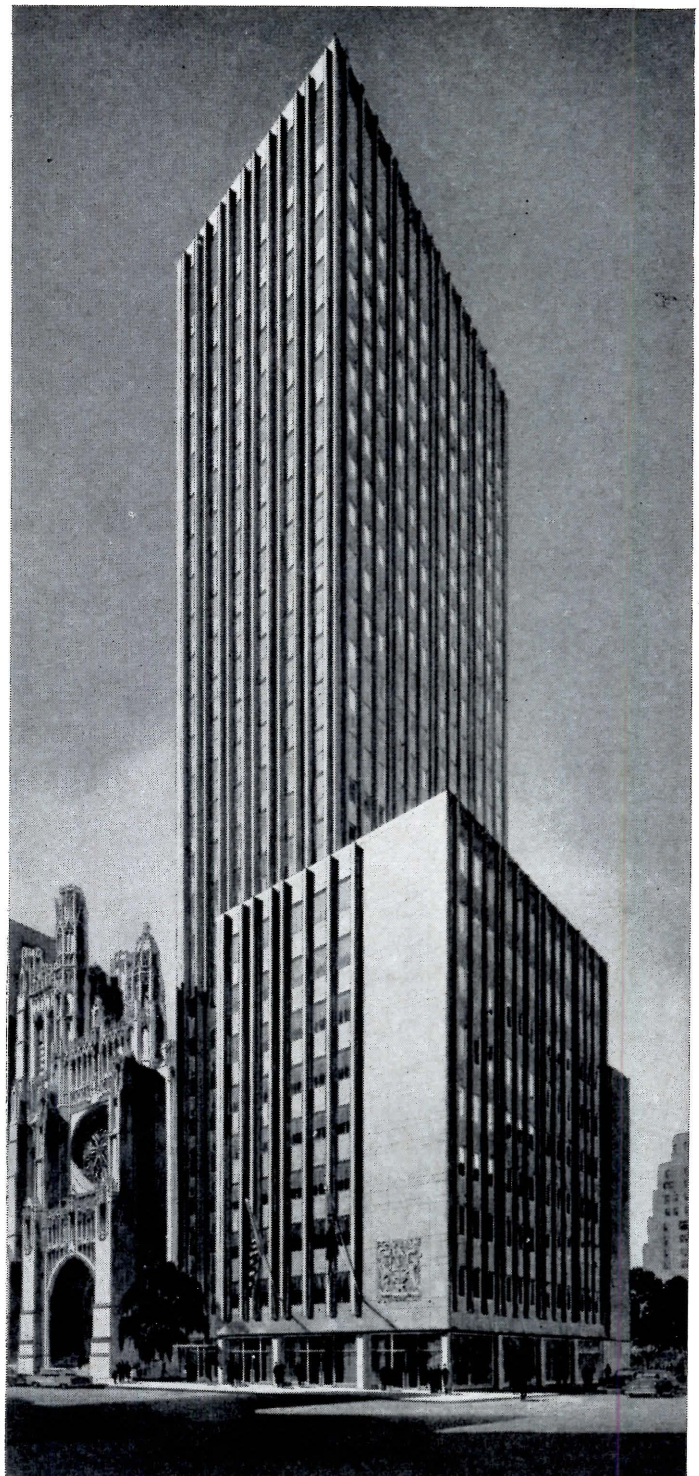
FIRE WINDOWS

•

CUSTOM-BUILT AIR-CONDITIONING

ENCLOSURES

The present comprehensive line of Pomeroy Products (custom-built Windows fabricated in aluminum, steel and stainless steel; inside window treatment together with air-conditioning Enclosures) have been selected for many current outstanding buildings including CANADA HOUSE. During the planning stage of your next project, commercial or institutional ask for POMEROY to offer their Engineering Services. Specialized designers and engineers are available to assist you for any size project.



Architect: EGGERS & HIGGINS General Contractor: WALSH CONSTRUCTION CO.

SINCE **POMEROY** 1897

For complete specifications
See the new '58 SWEET'S CATALOG

S. H. POMEROY COMPANY, 25 BRUCKNER BOULEVARD, NEW YORK 54, N. Y.

manufacturers of

DOUBLE-HUNG WINDOWS | 360° REVERSIBLE WINDOWS | FIXED and HINGED WINDOWS | CUSTOM-BUILT ENCLOSURES | CURTAIN WALLS | ACOUSTICAL CEILING SUSPENSION SYSTEMS

FABRICATION IN ALUMINUM — STAINLESS STEEL and COATED STEEL

Elevator doors open quickly and automatically

Guests begin to leave elevator

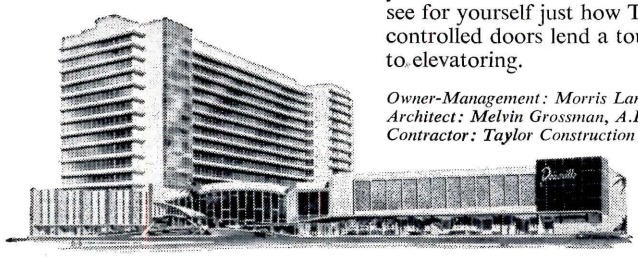
No threatening door action—doors remain open and motionless

Doors close only after last passenger leaves

THE DEAUVILLE HOTEL

in Miami Beach, Florida, not only provides the finest accommodations but also the finest elevator service for its guests. Next time you're in Miami Beach, visit the Deauville and see for yourself just how Traffic Sentinel controlled doors lend a touch of magic to elevatoring.

Owner-Management: Morris Lansburgh—Sam Cohen
Architect: Melvin Grossman, A.I.A.
Contractor: Taylor Construction Co.



MAGIC IN MIAMI

WESTINGHOUSE TRAFFIC SENTINEL®

CONTROLS ALL ELEVATOR DOORS ELECTRONICALLY AT THE DEAUVILLE HOTEL

One of Miami Beach's largest luxury hotels, the Deauville, is the first major hotel in that resort playground to install a completely *operatorless* elevator system. In addition to the sound economics of operatorless elevators, there are so many passenger benefits to be gained. For example, all passenger elevators are equipped with "magic" Traffic Sentinel door controls. This means maximum passenger convenience and safety because doors are controlled entirely by passenger movement—and not by the whim of an operator.

This is how Traffic Sentinel works: an electronic eye "sees" all passengers enter or leave the elevator. It knows just how long to keep doors open for passengers—yet never allows doors to remain open longer than necessary. Doors are thus courteously held open until the last person is safely *in*—or *out*. Only then is the door closed—all by itself, as if by magic.

If you are planning a new construction—or a modernization program—the Westinghouse Elevator Division will be happy to assist you. Just call the office nearest you for help and counsel.

YOU CAN BE SURE... IF IT'S Westinghouse

WESTINGHOUSE ELEVATORS AND ELECTRIC STAIRWAYS

J-98761-AA

Onan ELECTRIC PLANTS

ELECTRIC PLANT NEWS.

Onan ELECTRIC PLANTS

At the Elizabeth Kenny Institute . . .

nan Standby Electric Plant eeps "iron lungs" operating

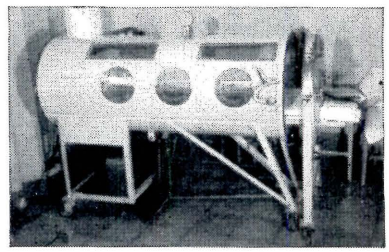
As many as 50 "iron lungs," one elevator, all essential lights, and power requirements for the boiler room are handled by the Onan 50KW electric plant during power outages.

Famed for its polio therapy, the Kenny Institute has patients in respirators at all times. The moment electric power is interrupted these patients will stop breathing . . . which makes immediate automatic starting of the emergency electric plant of vital importance.

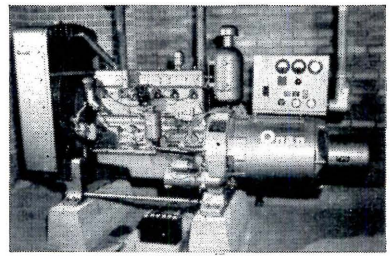
An Onan gas-powered electric plant was *specified* for this extremely critical installation. Onan gas or gasoline-powered plants, coupled with Onan line transfer controls start instantly and take over the power load *within seconds.*

Sizes for any hospital

Onan Emergency Electric Plants range from 1,000 to 150,000 watts A.C. In smaller hospitals where low initial cost is a factor, Onan air-cooled plants provide instant starting, dependable performance. Onan's Vacu-Flo cooling system eliminates complicated ducting. Automatic line transfer controls are available for all size plants.



50 respirators like this are operated by the Onan Electric Plant during power outages.



50KW Onan Model 50KA-4R8, installed adjacent to the boiler room at the Kenny Institute. Engine operates on natural gas.

Call your Onan distributor or write for information

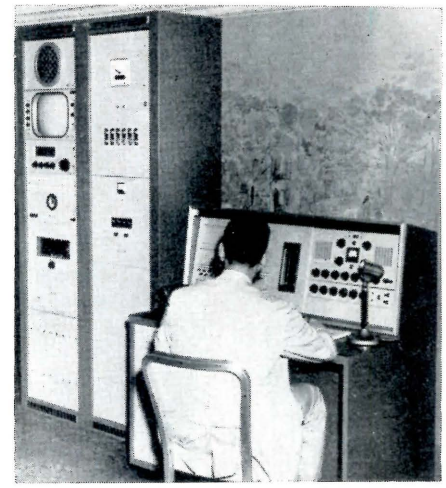
D. W. ONAN & SONS INC.

2652A University Ave. S.E., Minneapolis 14, Minnesota

ELECTRIC PLANTS • AIR-COOLED ENGINES • KAB KOOLER • GENERATORS

Onan ELECTRIC PLANTS

Product Reports



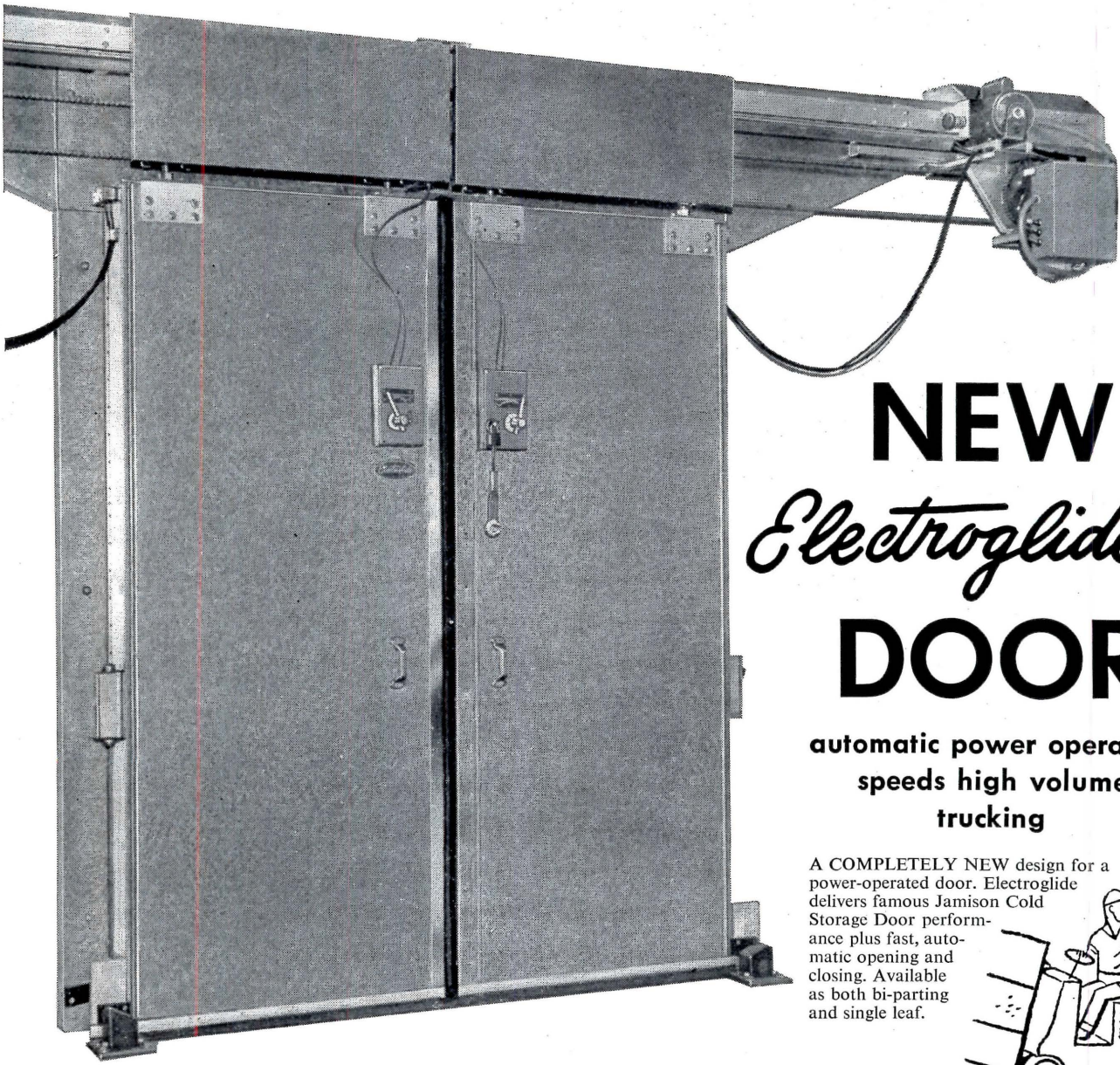
Multi-Purpose Communication and Signaling System for Schools

DuKane's new *MCS* (for Multi-purpose Communication and Signaling) system uses an ingenious electronic network to combine many of the communication, signaling and safety devices commonly used in schools into a single flexible system. Every school has a fire alarm of some sort, and most schools also have clocks, class-break signals, public address facilities and intercoms. By reducing such "parallel" services to a single system, operating through one basic set of electrical conduits and controlled from one master "nerve center," the *MCS* system not only saves on installation costs, but simplifies maintenance and improves the operation of all of its individual services.

The seven basic services combined in the system include: central sound distribution; a private automatic telephone system that permits conversation between the office and any room, or between rooms; a clock and class-break signal system; closed circuit television; a *Thermodyne* system for fire sensing and detection, humidity sensing or burglar alarm uses; a school-to-home intercom; and a voice warning system that permits an alarm, followed by an announcement, to be transmitted from strategically-located emergency telephones to every loudspeaker in the school.

According to DuKane spokesmen, the basic system can often be incorporated in a new school for the same cost as the installation of an ordinary sound system and clock system. Put together on a "building block" principle, it permits easy and economical expansion to accommodate additions to the school or to add new features and services as funds become available. *DuKane Corporation, St. Charles, Ill.*

more products on page 264



NEW *Electroglide** DOOR

automatic power operation speeds high volume trucking

A COMPLETELY NEW design for a power-operated door. Electroglide delivers famous Jamison Cold Storage Door performance plus fast, automatic opening and closing. Available as both bi-parting and single leaf.

smooth, spring cushioned no shock operation

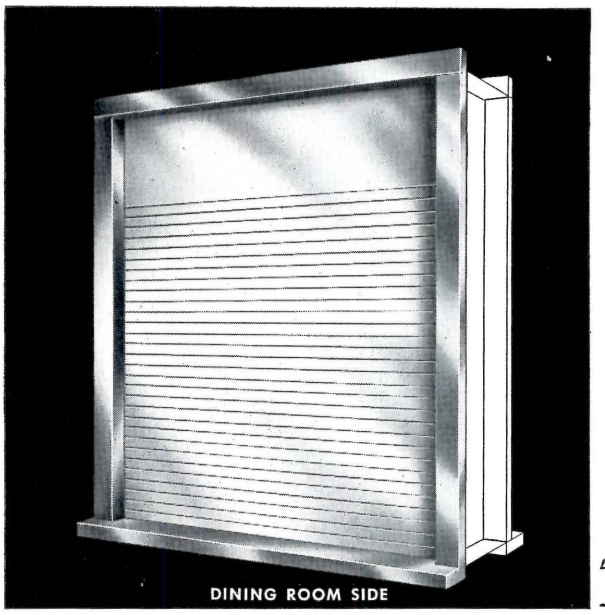
- Exclusive cam lock compression seal with "down" and "in" action assures positive gasket contact.
- Exclusive shock absorbing chain link absorbs shock of start and stop—minimizes power requirement.
- Exclusive calibrated balancing spring gives cushioned no shock closure and counterbalances weight of door for easy opening.
- Exclusive full height safety edge is sensitive full travel of door.
- Exclusive enclosed reduction gear sealed in oil.
- Emergency controls; padlocking provision; rear emergency release.
- Tough, durable gaskets. All gasket contacts visible.
- Doors are factory assembled and given operating tests before they are shipped in easily erected units.

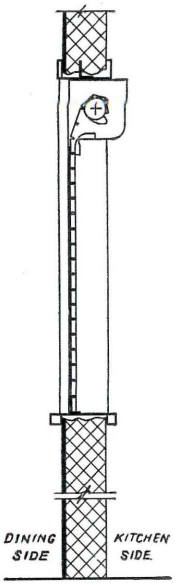
For descriptive bulletin write today to Jamison Cold Storage Door Co., Hagerstown, Md.

*JAMISON TRADEMARK

JAMISON
COLD STORAGE DOORS

for school and institutional use





PEELLE ROLLING ALUMINUM PASS WINDOW UNIT

Combined in the above completely assembled unit are a stainless steel frame, guides and a shutter of extruded aluminum flat-slats which rolls compactly into the head.

3 PEELLE PASS WINDOWS

...all with integral frames for easy installation

- **ARCHITECTS** specify Peelle Pass Windows to reduce specification and design time and to assure owner of a quality installation.
- **CONTRACTORS** like Peelle Pass Windows because they save estimating and buying time and eliminate duplication of installation—when frame is installed—panel is installed.
- **OWNERS** like Peelle Pass Windows because they give maintenance-free, EASY operation. Quality design and workmanship permit easy cleaning with no cracks and crevices to act as dirt catchers.

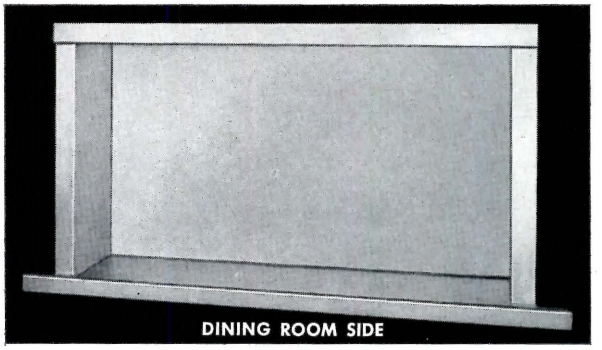
These desirable features account for the wide-spread use of Peelle Pass Windows in so many carefully planned school and institutional dining rooms and cafeterias. The three basic window designs shown at the right, allow great flexibility of choice in planning service access between kitchen and dining room.

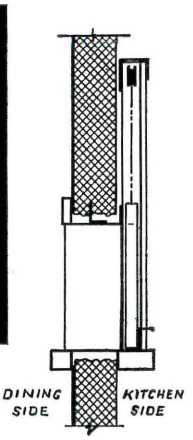
Send for complete details on all 3 Peelle Pass Windows

ENGINEERED FOR THE BUILDING INDUSTRY
PEELLE-RICHMOND PRODUCTS

THE PEELLE COMPANY

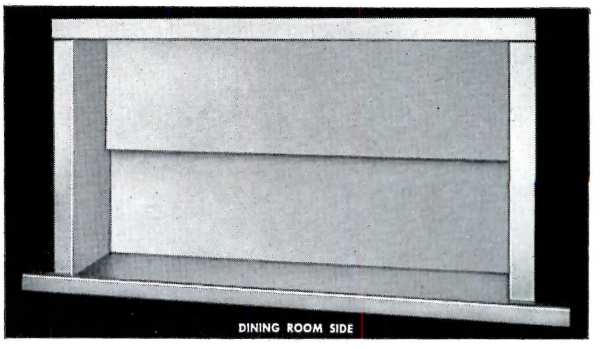
47 Stewart Avenue, BROOKLYN 37, N. Y.
4037 N. Kedzie Ave., CHICAGO 18, ILL.
34 South 17th St., PHILADELPHIA 3, PA.
OFFICES IN PRINCIPAL CITIES

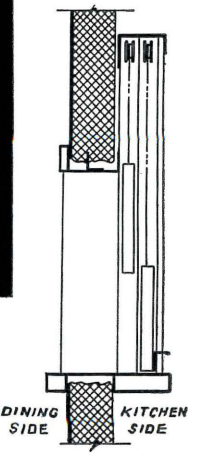




PEELLE ORIGINAL PASS WINDOW UNIT

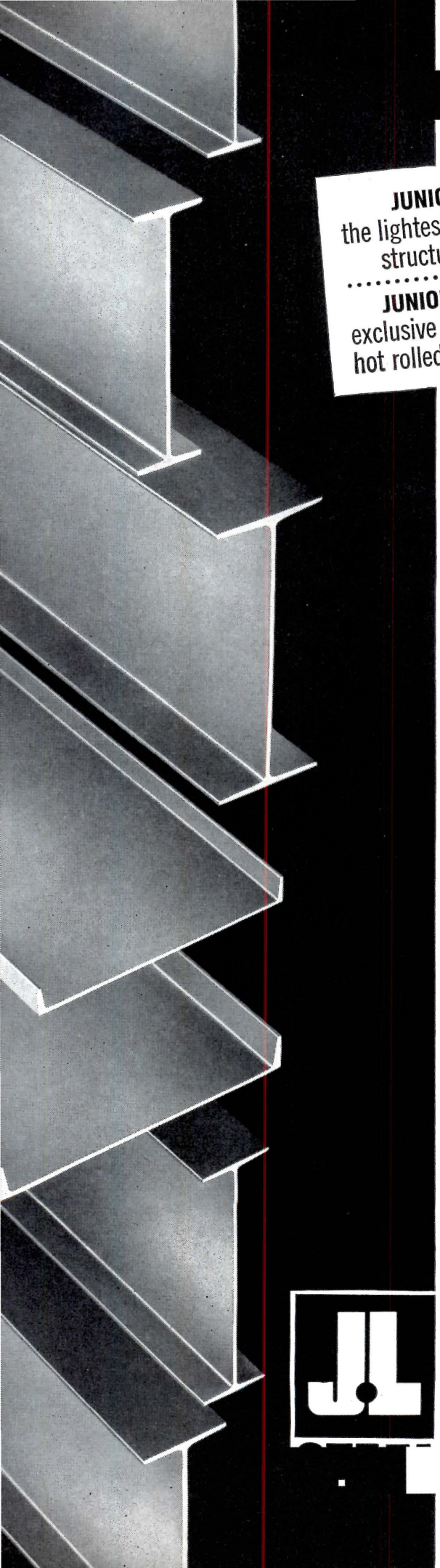
The above completely assembled unit consists of a hollow metal door with steel guides and frame, designed for quick, economical installation. Special extended sills furnished when specified.





PEELLE *TELCO* PASS WINDOW UNIT

The Telco pass window is designed for low overhead conditions. The two vertical rising panels are arranged so that both leaves arrive at fully open or closed position simultaneously.



JUNIOR BEAMS
the lightest hot-rolled steel structural available

JUNIOR CHANNELS
exclusive lightweight J&L hot rolled channel sections

Architect: Hill and Wupper, Inc. • Fabricator: Geiger & Peters, Inc.
Contractor: Cannon Construction, Inc.

"LET THE STEEL SHOW"

Indiana school illustrates functional beauty and practicability of exposed JUNIOR BEAMS

"School board members like the functional use of exposed Junior Beams in this Warren Township Elementary school," reports Hill & Wupper, Inc., AIA, Architects and Engineers, Indianapolis.

This trend to exposed steel construction is finding wide application across the country in schools, residences, shopping centers and other light occupancy structures. Versatile JUNIOR BEAMS can be adapted to a wide range of architectural designs.

JUNIOR BEAMS are economical to use. They reduce steel tonnage required and they cut labor costs because they are easily fabricated, raised and positioned.

Get complete data on these and other J&L lightweight structurals. Call your local warehouse or write Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

35 tons of 12″ JUNIOR BEAMS were used in this Warren Township Elementary School, Indianapolis, Ind. The exposed beams were covered with 3″ Tectum insulation, which was topped with roofing. Modular design has windows and columns on 4′ centers.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

and cut stallation costs too with....

Wing DRAFT INDUCERS

Savings of over 25% in installed costs are possible when Wing Draft Inducers replace ugly smokestacks. • Fuel costs are also reduced as much as 15% because you get consistent, proper draft for complete fuel combustion.

WING DRAFT INDUCERS

Eliminate Tall Stacks in:

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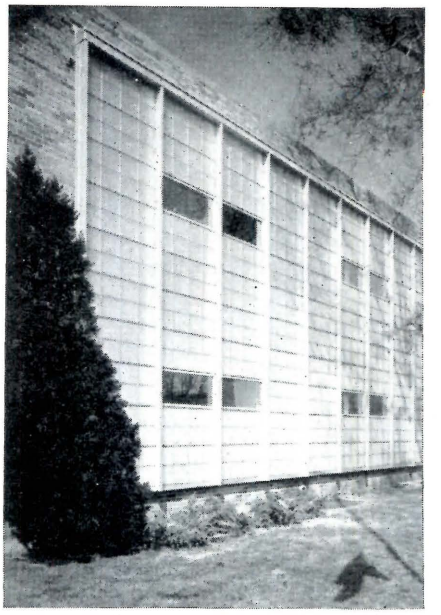
DIVISION OF AERO SUPPLY MFG. CO. INC.

151 VREELAND MILLS ROAD, LINDEN, NEW JERSEY

OTHER WING PRODUCTS: Fresh Air Supply Heaters, Unit Heaters, Fans, Turbine and Motor Blowers, Auxiliary Turbines

Product Reports

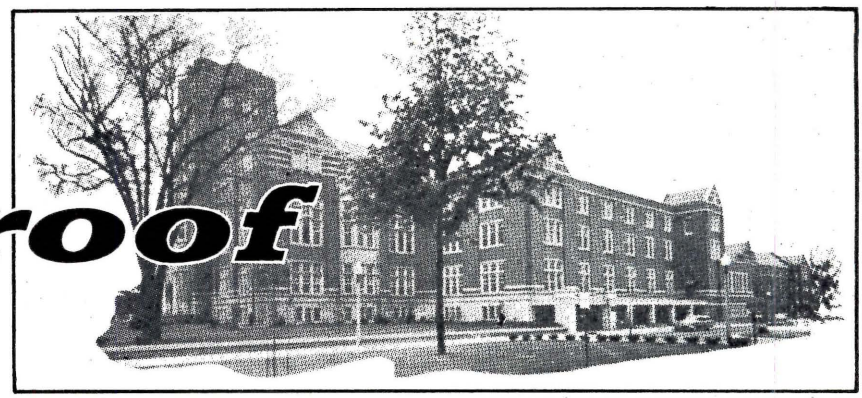


Prefabricated Glass Curtain Wall

The latest development in prefab curtain walls is a system which uses a thin (2 in.), daylight-controlling glass unit to form a finished wall inside and out. The hollow, 12 in. square *Thinlite* units are factory-assembled into panels whose extruded aluminum perimeters interlock with each other to permit quick and easy installation. Designed for either a four or five foot horizontal module, the system uses standard panels 2 ft high by 4 or 5 ft wide. Basic daylight panels—soft white for general use, blue-green for severe sunlight exposures and yellow for non-sun exposures—are interchangeable with a variety of special types, including clear panels for vision and porcelain or ceramic-faced panels for non-light transmitting areas such as spandrels or for other veneers.

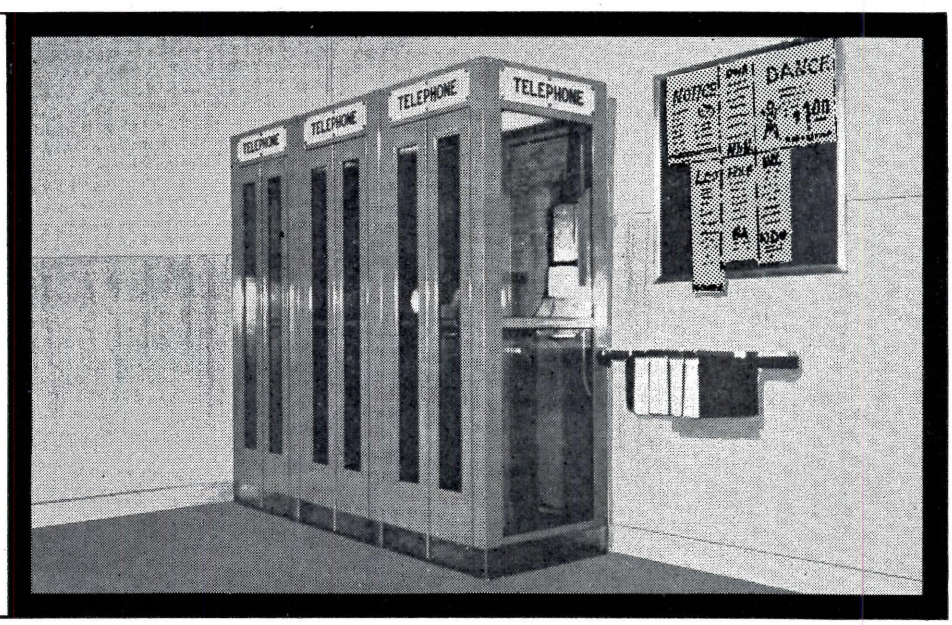
The panels, which are erected in vertical stacks, are bolted to extruded aluminum struts spaced 4 or 5 ft on center. The vertical struts come equipped with gaskets that form a weatherproof joint when the panels are bolted into place. They may be used on either the inside or outside of the building. The vertical batten strips also carry gaskets which, when used in combination with a strut, form a vertical weather seal on both sides of the panel. According to the manufacturer, the gasketing system is so complete that caulking is necessary only around the perimeter of the entire opening, and so efficient that the wall kept out weather even when subjected to wind and water tests designed to simulate hurricane conditions. *Owens-Illinois Glass Co., Toledo, Ohio*

more products on page 268



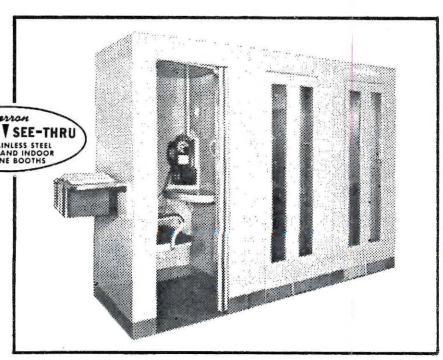
Fireproof

SHERRON STEEL PHONE BOOTHS IN SCHOOLS ARE A MUST FOR *Safety!*



Above you see Sherron steel booths with tempered, see-thru glass panels. Those shown below are built with perforated, acoustic solid clad steel panels. Either way, these Sherron booths are the last word in fireproof safety. Their installation in school corridors, dormitories, or elsewhere on school premises avoids the ever-present hazards of wood phone booths.

Sherron steel booths are available in single or multiple set-ups, in either stainless steel or zinc-coated cold rolled steel—in desired colors. Factory assembled, they are ready for service on delivery.



INDEPENDENT

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THERE'S A SHERRON BOOTH FOR EVERY LOCATION, INDOORS AND OUTDOORS, IN EITHER STAINLESS STEEL OR IN ZINC-COATED STEEL

SHERRON METALLIC CORPORATION

1201 FLUSHING AVE., BROOKLYN 37, NEW YORK

There is no substitute for safety, and Polished Misco (wired) affords proven protection for youngsters in the new Walt Disney Elementary School, at Tullytown, Pennsylvania.

Architect: John Carver,
2112 Spruce St., Philadelphia, Pennsylvania

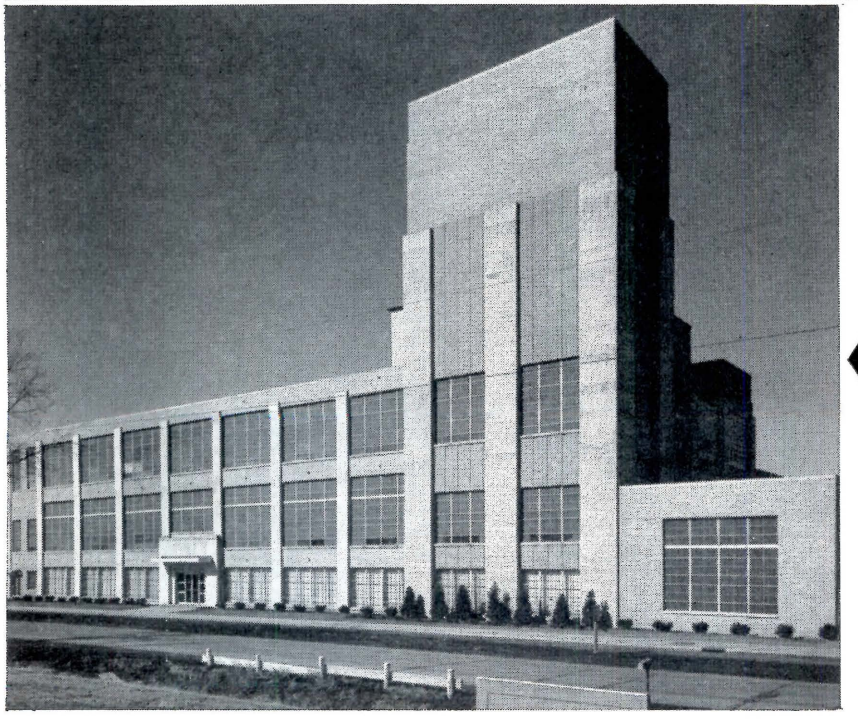
Heat absorption provided by 38,750 sq. of Mississippi Coolite glass make patients more comfortable in the John J. Kane, Allegheny County Institution District (Hospital for the Indigent Sick).

Associate Architects: Button & McLean—Mitchell & Ritchey, Pittsburgh, Pennsylvania
General Contractor: Sherry Richards Company, Chicago, Illinois
Glazing: United Plate Glass Company, Pittsburgh, Pennsylvania

At the Philadelphia International Airport, modern vistas are created by 10,000 sq. ft. of 60″ wide lights of Polished Misco (wired glass).

Architect: Carrol, Grisdale and Van Allen, Philadelphia, Pennsylvania
Glazing: Pittsburgh Plate Glass Company

ROLLED GLASS . . . .



New factory of American Chicle Company, Rockford, Ill. where 14,000 sq. ft. of Coolite Wire glass, Glare Reduced, combines heat absorption with protection.

Architect: William Higginson & Sons,
New York, N. Y.
General Contractor: Sjostrom & Sons, Inc.,
Rockford, Illinois
Glazing: National Mirror Works, Rockford, Illinois

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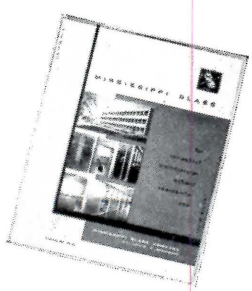
today's best buy in *Daylighting*

The versatility of Rolled Glass provides architects with a practical solution to a variety of daylighting problems. Glass for daylight control, glass that absorbs heat, glass that decorates and glass that protects—they're all available in translucent light diffusing patterns, plain or wired (the latter for obscurity or clear vision) to meet every requirement. For utility, beauty, and economy unmatched by any other glazing medium, specify Mississippi Glass. Write today for free catalog. Address Dept. 7.



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NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

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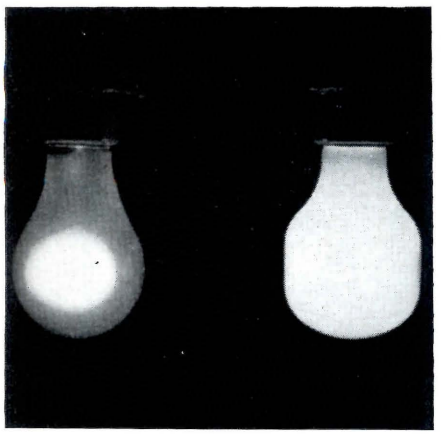
MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

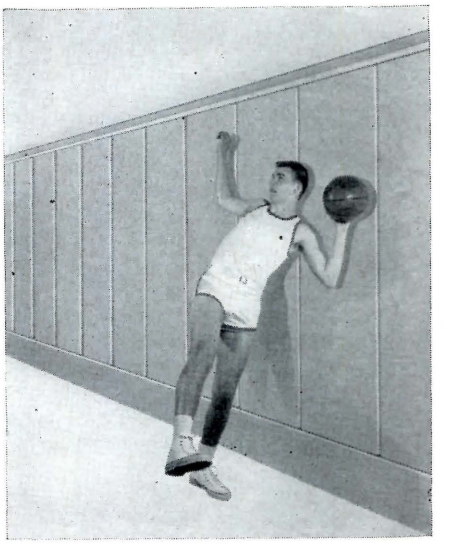


The New Look in Light Bulbs

According to Westinghouse spokesmen, the new cylindrical *Eye Saving* white bulb represents the first major change in the styling and design of standard light bulbs in more than a quarter of a century. Developed by engineers of the company's lamp division, the new bulb is said to be especially suitable for reading and close seeing tasks. A new process coats the bulb interior with millions of electrostatic silica particles which break up the usual spotlight glare from the filament. The result is soft, glarefree light radiated evenly from the entire bulb surface so that tiring harsh shadows and sharp cut-off lines of light are eliminated. To permit more silica coating on the inside and obtain better distribution of light, the bulb was reshaped to give more surface area than an ordinary bulb of the same diameter. *Westinghouse Lamp Div., Bloomfield, N. J.*

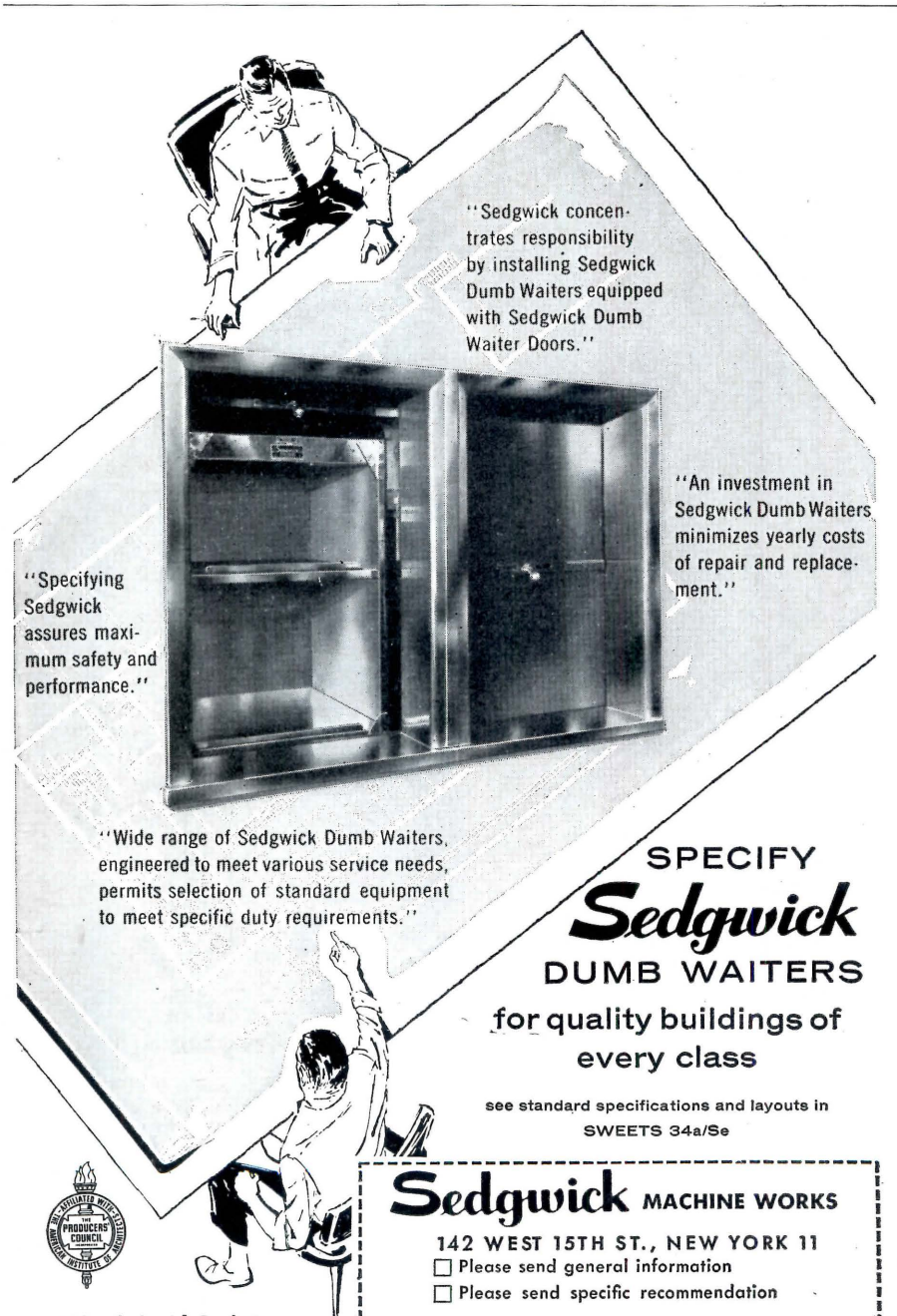
Modular Grid Paper

The making of modular drawings can be greatly simplified through the use of a modular grid paper, scale-dimensioned in 4 in. increments both vertically and horizontally, from which dimensions can be read direct. The commonly-used quarter inch scale is printed in rolls 32 in. wide on heavy glazed or unglazed paper for use as an underlay, and on tracing paper. Working drawings made on the tracing paper print without the grid lines. *The Palmer Mfg Co., 3237 Arlington Blvd., Arlington 1, Va.*

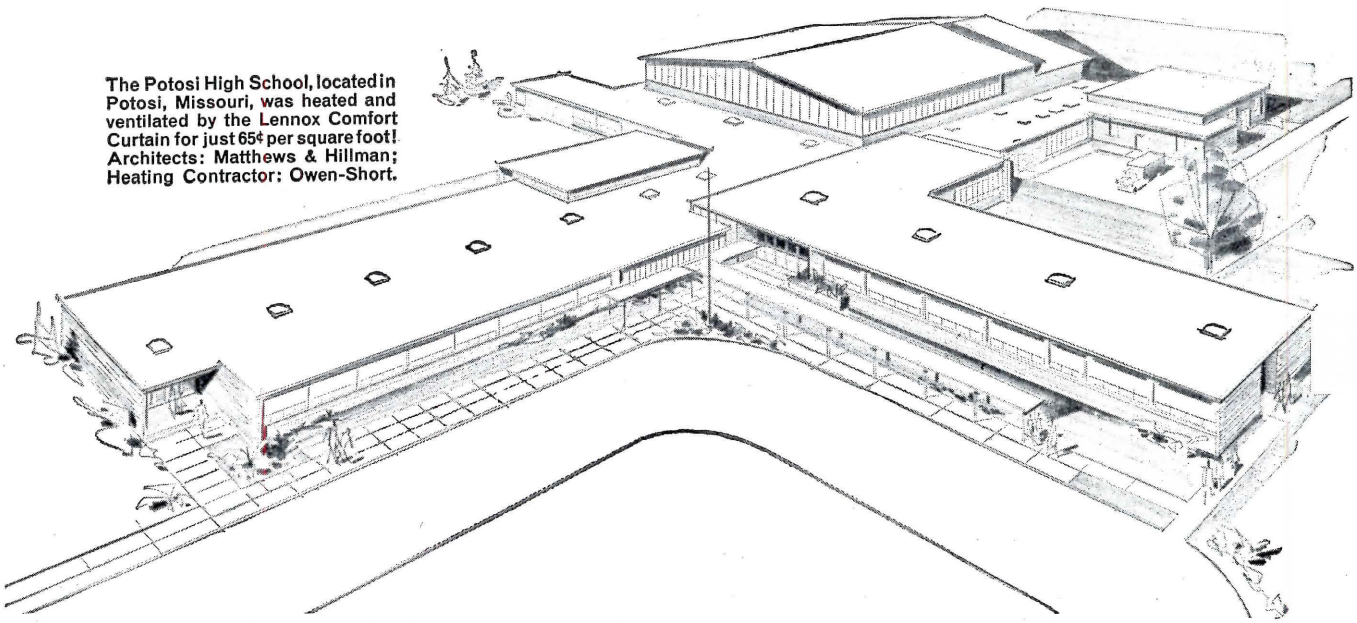


Padded Wainscot for Gyms

Designed for use in gyms, playrooms and other areas where wall crash accidents might occur, the new *Safe-Wal* padded safety wainscot is built up from an impact-absorbing cushion of polyurethane foam fastened to a strong plywood back and covered with a heavy vinyl-coated fabric. The panels, each 2 ft wide and 5, 5½ or 6 ft high, can be easily installed over unfinished walls, and cutouts for electric outlets, drinking fountains and other wall elements can be made on the job. The stain-resistant, easily maintained vinyl-coated fabric covering comes in willow-green and buff, with other colors available on special order. *Fred Medart Products, Inc., 3535 DeKalb St., St. Louis 18, Mo.*



ɔtosi school gets the finest in fresh air heating and ventilating—installed complete with automatic controls—for just 65¢ per square foot!



The Potosi High School, located in Potosi, Missouri, was heated and ventilated by the Lennox Comfort Curtain for just 65¢ per square foot! Architects: Matthews & Hillman; Heating Contractor: Owen-Short.

New Lennox Comfort Curtain System automatically draws in fresh air from outside . . . warms, cleans and circulates air quietly and evenly throughout the classroom!

Hard to believe, isn't it?—that after all these years a new and better fresh air heating and ventilating system can be installed *for a fraction of the cost* of systems used previously. Yet it's true! 65¢ per square foot was the *complete* cost of the Lennox Comfort Curtain System in the Potosi, Missouri High School. Including fully automatic controls, ductwork, labor—everything!

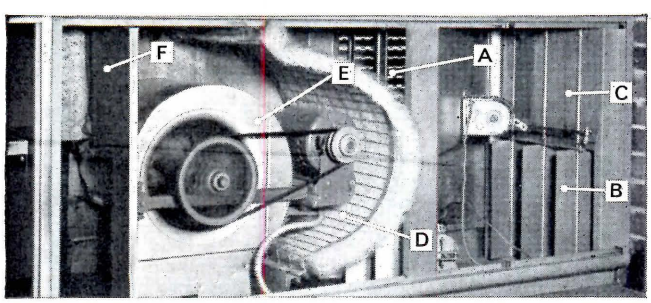
Of course, 65¢ per square foot is unusually low, even for the Comfort Curtain. But costs of $1.03 in Indiana, $1.15 in Montana, and $1.12 in South Dakota are *usual and typical* of the amazing savings offered by the Lennox Comfort Curtain.

How is this possible? The Lennox Comfort Curtain System applies to schools the sound, tested principles of warm air heating. It eliminates expensive pipes, boilers and chimneys. Moreover, it saves hundreds of dollars per classroom per year *every* year it is in use. Fuel is consumed only when heat is required, maintenance is amazingly simple and low-cost. Yet—and this is important—the Lennox Comfort Curtain System does a far better job than costlier systems used previously.

It provides a full, even flow of air throughout the entire length of the exposed classroom wall. It is amazingly quiet. And it holds room temperatures to a variance of six-tenths of one degree, circulates air continuously for perfect distribution, introduces a continuous supply of fresh air into the daytime heating cycle, and provides *tons* of needed fresh air cooling without the cost of refrigeration!

Get full information on this new low-cost system of classroom heating and ventilating. Send coupon below for free booklet, today!

LENNOX®



Lennox Air Processing Unit introduces fresh air in adjustable volumes (A); transmits warm air (B) from adjacent or remote heating unit; continuously recirculates indoor air (C); filters air clean (D). Lennox' exclusive floating blower (E) and acoustical lining (F) assure a degree of quietness never before achieved.

© 1958 Lennox Industries Inc., Heating and Air Conditioning, founded 1895; Des Moines and Marshalltown, Ia.; Syracuse, N. Y.; Columbus, O.; Decatur, Ga.; Ft. Worth; Los Angeles; Salt Lake City. In Canada: Toronto, Montreal, Calgary, Vancouver, Winnipeg.

Lennox Industries Inc., Dept. AR-81M
1701 E. Euclid Ave., Des Moines 5, Iowa

Gentlemen: Please send me your free booklet on the Comfort Curtain system of classroom heating and ventilating.

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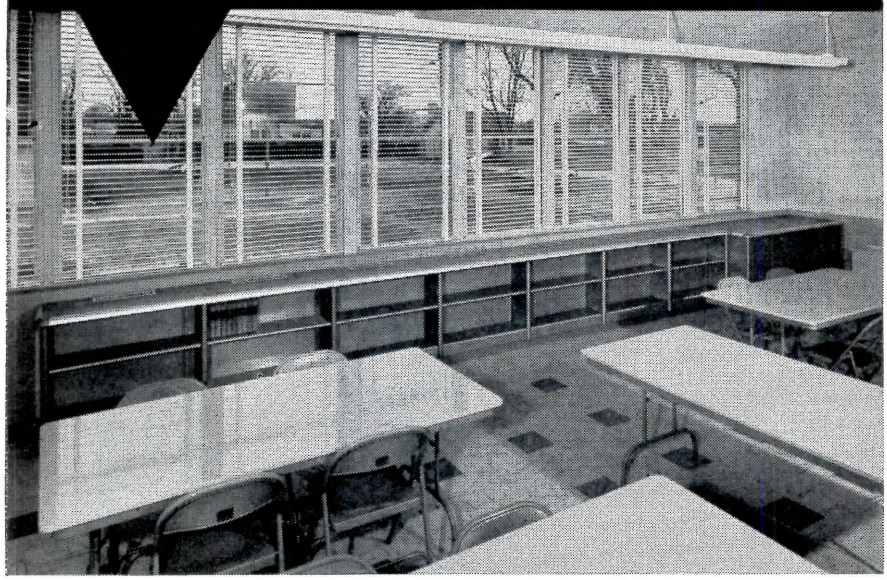
CITY_____ ZONE____ STATE_____

Complete heating and ventilating

Classroom Comfort

PLUS TRIPLE ECONOMY



The **NORMAN** Complete Individual Schoolroom Package Provides Gas-Fired Heating...Fresh-Air Ventilation... plus Important Economies Right From the Start:

ECONOMY OF INSTALLATION . . . no expensive boiler rooms, chimneys, tunnels or costly revamping of central system. Pre-wired, partially-assembled Norman Systems are installed quickly, room by room—important economy in school expansion.

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Versatile Norman Schoolroom Heating and Ventilating Systems fit any plan . . . Choice of 85,000 or 100,000 BTU/hr. inputs; Util-i-Duct Bookshelf (with or without sliding doors) or thin Wall-i-Duct comfort distribution sections.

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Photo Illustrates, Mingo School Addition, Tulsa, Okla.; Architect: Koberling and Brandborg A.I.A., Tulsa, Okla.; Mechanical Contractor: Palmer Plumbing and Heating Co., Tulsa, Okla.; Mechanical Sub-Contractor: Sand Springs Sheet Metal Co., Sand Springs, Okla.

Norman® products company

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We want to learn more about Norman Products for School Comfort. Please send complete information to:

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CITY_____ ZONE____ STATE_____

See Sweet's Arch. File 30h/No, American Sch. and Univ. Annual C-1/No

Office Literature

continued from page 208

Raymond Cylinder Piles

. . . *of Prestressed Concrete,* Catalog CP-3, describes design, construction and installation of prestressed concrete cylinder piles, with illustrations of significant applications. 24 pp. *Raymond International Inc., 140 Cedar St., New York 6, N. Y.**

School Construction

. . . *With Laminated Wood* shows the application of glued laminated wood arches, beams and trusses to the construction of modern, economical schools. 8 pp. A similar catalog deals with laminated timber in church construction. 8 pp. *Rilco Laminated Products, Inc., W-818, First National Bank Bldg., St. Paul 1, Minn.**

Protection Against Decay

. . . *and Termites in Residential Construction,* Addendum to Publication 448, reports findings on the use of treated wood to protect against termites, and the effectiveness of vapor barriers in preventing decay. 33 pp. $1.50. *Building Research Institute, 2101 Constitution Ave., Washington 25, D. C.*

Condensed Lighting Catalog

(A.I.A. 31-F-2) Presents illustrations of, and brief data on, the Electro line of lighting equipment. 8 pp. *Electro Lighting Corp., 1535 S. Paulina St., Chicago 8, Ill.*

Square and Rectangular Diffusers

Gives details and complete selection data on Titus' Series TMD square and rectangular air diffusers. 20 pp. *Titus Mfg. Corp., Waterloo, Iowa**

Industrial Lighting Fixtures

Presents specification and performance data on complete line of incandescent and mercury fixtures for industrial lighting. 4 pp. *Abolite Lighting Div., The Jones Metal Products Co., West Lafayette, Ohio*

Vampco Aluminum Doors

Gives detail drawings and specifications for the *Vampco* line of wide and narrow stile doors and frames. 8 pp. *Valley Metal Products Co., Plainwell, Mich.**

**Additional product information in Sweet's Architectural File, 1958*

more literature on page 274

GRAY CITRON YELLOW COPPERTONE SAND BEIGE CARNATION PINK CERULEAN BLUE BLACK WHITE

In New York's new International Airport Hotel

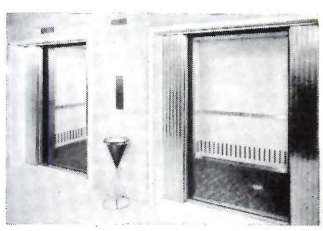
G LAXY PANELYTE OPENS NEW DIRECTIONS IN DESI N

Opposite Idlewild Airport stands this creative example of modern architecture, designed by William B. Tabler. Tastefully modern, too, is the interior where elevator cabs and telephone booths are durably decorated with Panelyte. This new and imaginative use of plastic laminate points up the versatility and adaptability of melamine Panelyte as a surface of enduring luxury. The chosen pattern is *Galaxy*.

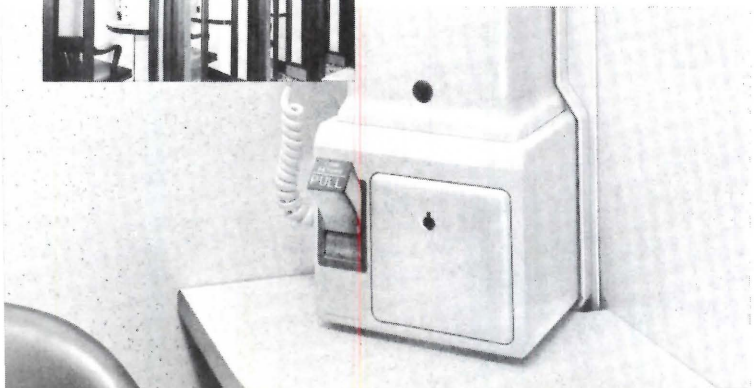
Shown here in eight radiant colors, Galaxy was styled by one of America's leading designers. It is but one of a vast, rich selection of Panelyte patterns, including popular *Princess*, exclusive *Coppertone*, authentic wood grain finishes and marble effects. See our catalogue in Sweets (14a/Pa) for installation specifications—or write us for samples. Panelyte Division, St. Regis Paper Company, 150 East 42nd Street, New York 17, N. Y.

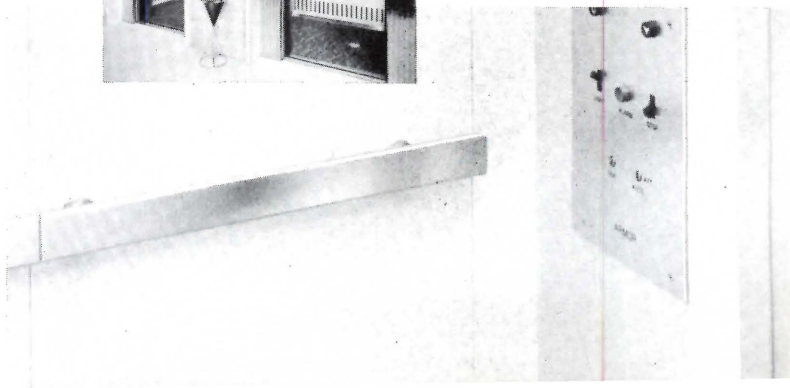
St.Regis PANELYTE

DESIGNED TO ENDURE
In phone booths, eye-appealing Galaxy combines lasting good looks with ease of maintenance.



BEAUTIFULLY PROTECTED
These elevator cabs surfaced with Panelyte stay safe from marring. Colors are sealed in.





EXPERIENCE

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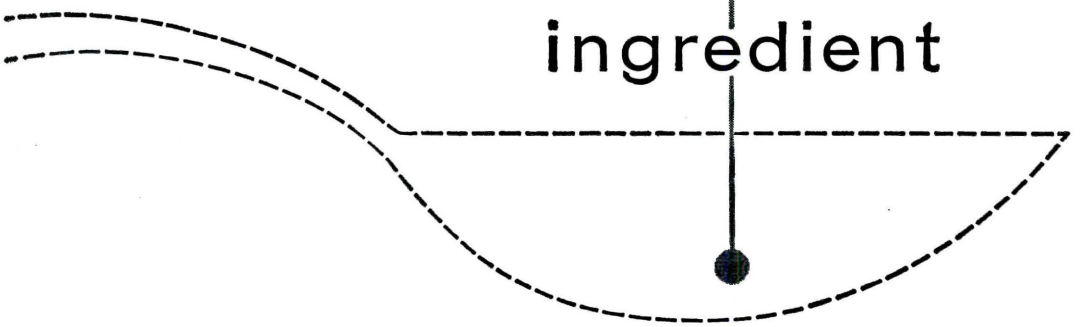
the
invisible
ingredient



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IT'S NO ACCIDENT that Rixson door closers require so little attention, maintenance or replacement. Integrity in the selection of raw materials, precision manufacturing, careful assembling and testing . . . these have been traditional with Rixson for nearly 60 years. But, EXPERIENCE, the important factor in Rixson quality, has been in the making since Rixson produced the original "checking floor hinge." In manufacturing hundreds of thousands of door closers and observing how they meet the rigors of public usage, an invaluable EXPERIENCE has been acquired. With every product improvement and new product development, this experience is a guiding hand, just as experience guides the trained Rixson representative who serves you in the field. Rixson quality is always identified with smooth, trouble-free door closer performance . . . through the years. The Rixson door closer you specify is always guaranteed, but . . .

your best guarantee is quality in the first place

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CANADIAN PLANT:
43 Racine Road
Rexdale, Ontario

The Fantasy, Wildwood, N. J.: 1700 ft Beth-Co-Weld steel pipe.

The Carousel, Wildwood Crest, N. J.: 1625 ft Beth-Co-Weld pipe.

The Twenty-Fourth St., North Wildwood, N. J.: 1835 ft Beth-Co-Weld pipe.

For these motels, Pipe Jobber: Seashore Supply Co., Wildwood and Atlantic City. P & H Contractor: Harbor Plumbing and Heating, Wildwood.

Steel pipe is economical pipe

Jersey Shore motels save from the word "go" with Beth-Co-Weld steel pipe

Motels, hotels, schools, homes—all get a head start on economy when their plans specify Beth-Co-Weld steel pipe. Beth-Co-Weld installs fast and works easily—and gives years of low-maintenance service.

There's no pipe more dependable than steel—and it's still the lowest-cost pipe you can buy!

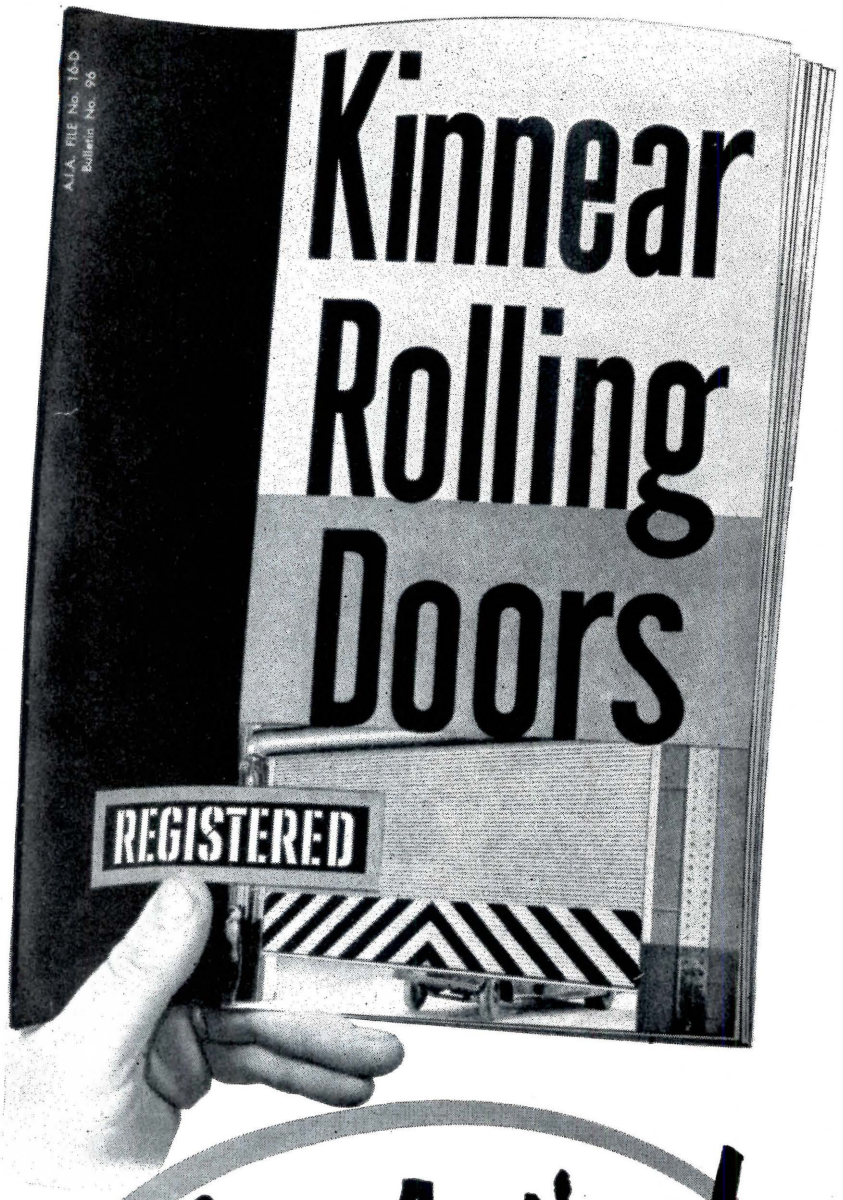
Drainage lines, ventilation, water and gas lines—Beth-Co-Weld is ideal for all of these. It's made from high-quality steel by the continuous-weld process, which means it's uniform pipe, sound and strong for easy handling. It's available, black and galvanized, in sizes from ½ in. through 4 in., and in uniform 21-ft lengths, and random lengths.

When you're ready to specify, consider the advantages of steel pipe. Then ask your jobber for Beth-Co-Weld.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem Steel *products are sold by* Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Get Action!

—The *upward action of interlocking slats that coil compactly above the opening:* That's the *action* (originated by Kinnear!) that provides an unbeatable combination of lower door costs and higher door efficiency. Kinnear Rolling Doors make all space around doorways usable at all times, open completely out of the way, give you a rugged curtain of all-steel protection against wind, weather, fire, and vandals. *Often* delivering up to 50 years or more of daily, low-maintenance service, they're also REGISTERED — all parts of every door can always be accurately duplicated from master details kept permanently in fireproof vaults. Get *all* these Kinnear Rolling Door benefits and more; write for this latest catalog, now . . Take Action!

KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.
Offices and Agents in All Principal Cities
FACTORIES:
1860-80 Fields Ave., Columbus 16, Ohio; 1742 Yosemite Ave., San Francisco 24, California

Office Literature

Concrete For Radiation Shielding
Compiles seven papers on the use of concrete for shielding nuclear radiation and the calculation of proportions and properties of various heavy concretes. 132 pp. $1.00. *American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Mich.*

Tentative Specifications
. . . *for Porcelain Enamel on Aluminum as Used for Signs and Architectural Applications,* PEI: ALS-105 (57), cite performance standards and give requirements for base metal, finish and thickness of coatings. *Porcelain Enamel Institute, 1145 Nineteenth St., N. W., Washington 6, D. C.*

Nepcozone Insulation
. . . *for Wire and Cable* describes the properties and uses of *Nepcozone* butyl insulation, and gives specification data for individual installation requirements. 28 pp. *Advertising Dept., National Electric Products Corp., 2 Gateway Center, Pittsburgh, Pa.**

Plumbing Layouts
. . . *That Save Materials, Time and Money* details a dozen economical plumbing layouts for residential construction. 8 pp. *Dept. 585, Ingersoll-Humphreys Div., Borg-Warner Corp., Mansfield, Ohio**

Adhesives and Sealants in Building
Discusses the present status of adhesives and sealants in the building industry, and predicts future trends. 160 pp. *Publications Office, National Academy of Sciences, 2101 Constitution Ave., Washington 25, D. C.*

Douglas Fir Use Book
New edition contains detailed structural data and design tables on Douglas Fir lumber. $5. *West Coast Lumbermen's Assn., 1410 S. W. Morrison St., Portland 5, Oregon**

Architectural Lighting By Gill
(A.I.A. 31-F) Catalog 58A illustrates and gives selection and specification data on Gill line of lighting fixtures. 16 pp. *Gill Glass and Fixture Co., Amber and Tioga Sts., Philadelphia 24, Pa.*

**Additional product information in Sweet's Architectural File, 1958*

more literature on page 278

LIGHTSTEEL cuts dead-weight loads in five-story seminary

Immaculate Heart Seminary, part of the multi-million dollar expansion program at San Diego University, is one of the largest concrete-block structures in the west. Of Spanish Renaissance architecture, the building contains 141,000 sq. ft. of floor space.

Stanley Burne, structural engineer for the job, says, "We used LIGHTSTEEL studs with metal lath and plaster, throughout the interior, with the object of securing lightness with strength, fireproofing, as well as freedom from deterioration and from dry rot. The open-work pattern of these studs, simplified installation of conduits, piping, etc., as well as the fibreglass insulation.

"In the stepped-back upper stories we also used LIGHTSTEEL studs for the exterior walls, to avoid excessive dead loads at these locations. Out here on the west coast, buildings must be designed to resist seismic forces, which are based upon a certain percentage of the dead weight of a structure. Hence unnecessary dead weight is an item that should be reduced where conditions permit. At the same time, walls are used as 'shear panels,' resisting lateral forces, and require shear values accordingly. It is relatively simple to install the necessary diagonal tension members in these steel studs, and get a high shear value.

"We are using this same construction in other major buildings at the university."

For full details of versatile LIGHTSTEEL — specifications, physical and structural properties and loading tables — send for 28-page catalog SS-24.

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40 Central Street, Boston 9, Mass.
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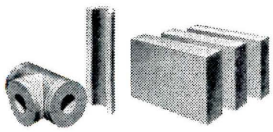
PM-187

IMMACULATE HEART SEMINARY
Architect: Edgar V. Ullrich, A.I.A.
Structural Engineer: Stanley Burne
LIGHTSTEEL **Erector:** L. A. Lathing Co.
LIGHTSTEEL **Supplier:** Chambers Steel Co.
General Contractor: L. J. Ninteman Construction Co., Inc.

METAL MARK Penmetal 1869 OF QUALITY

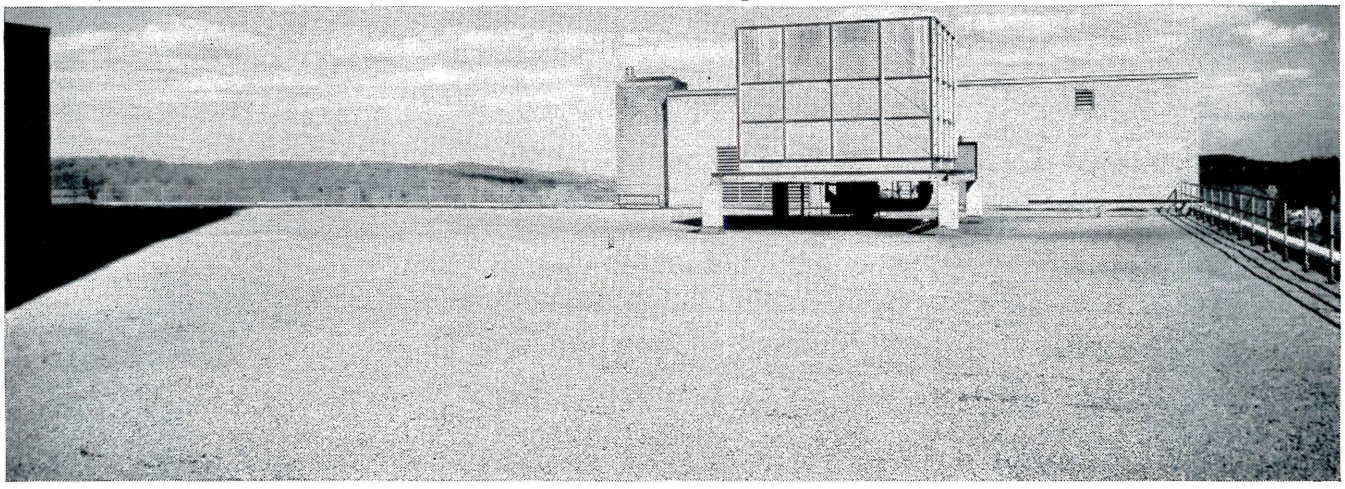
a name to remember



FOAMGLAS® INSULATION / waterproof, vapor-proof, strong, can't burn, acid-proof, vermin-proof, dimensionally stable

New AT&T Long Lines Center— where "design for survival" demanded strong, moisture-proof **FOAMGLAS** roof insulation

FOAMGLAS roof insulation forms a strong, firm base under roofing felts . . . helps prevent damage to the felts from roof traffic during and after installation. Since it can't burn, FOAMGLAS gives important extra fire protection to this AT&T building.



Typical of American Telephone and Telegraph's construction "design for survival" is the new Wayne, Pa., Long Lines center. Of bunker-style, poured concrete, the building will protect delicate electronic equipment in the severest emergency. This design called for roof insulation that was extra strong, fireproof and entirely moisture-proof. Pittsburgh Corning FOAMGLAS roof insulation was selected.

AT&T and their architects, Lorimer and Rose, New York, selected FOAMGLAS because it is strong enough to take all roof loads during and after installation. Still further protection was gained because FOAMGLAS is incombustible. Above all, its sealed glass cells form a natural vapor barrier to guarantee constant, lasting insulating value.

Your good designs deserve FOAMGLAS. Take full advantage of its many benefits. Write for complete information in our latest architectural catalog.

PC Glass Blocks are another outstanding building product of Pittsburgh Corning Corporation.

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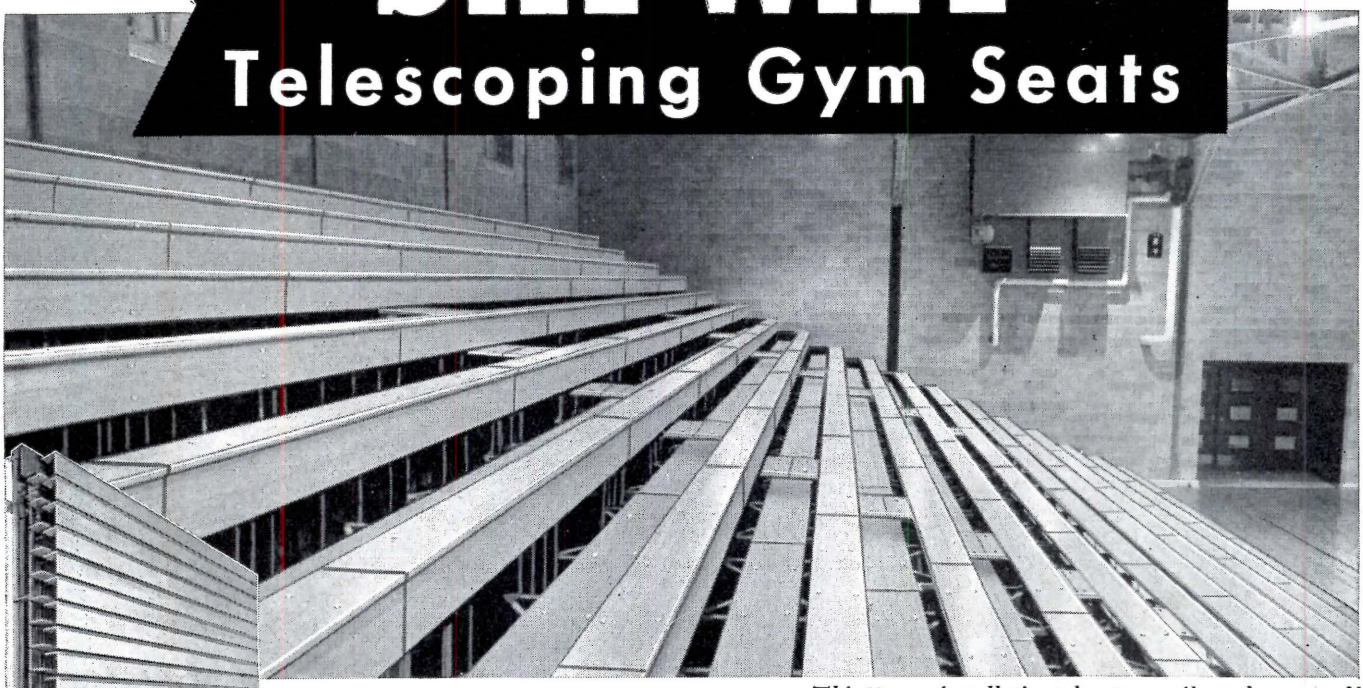
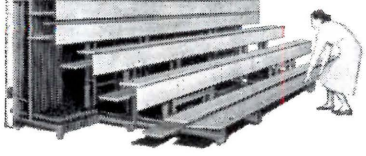
SAFWAY
Telescoping Gym Seats



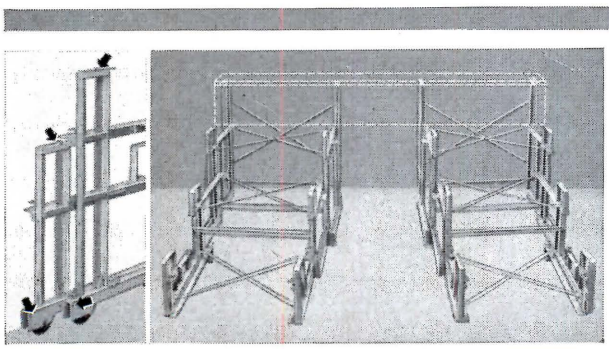
This 18-row installation telescopes easily and accurately



...assure quick, easy changes for every gym seating event

YOUR GYM SEAT SET-UP may be changed several times daily for varied gymnasium events. With frequent opening and closing, *easy operation* of seats is vital to keep your handling time and costs low.

Safway seats roll smoothly—minimize friction—reduce effort. Complete 16-ft. sections move straight in and out, without binding or cocking. The simple telescoping design eliminates jointed levers and crossarms.



FRICTION MINIMIZED BY ROLLERS; RIGIDITY INSURES STRAIGHT TRACKING

(LEFT) Rollers eliminate metal-to-metal friction at contact points. Top arrows show horizontal rollers in channel under foot boards; bottom arrows show vertical rollers between wheel assemblies.

(RIGHT) Standard 16-ft. section, showing vertical and horizontal bracing. Rigid structure keeps rows always parallel to insure straight, in-line tracking as rows telescope in or out.

Advanced Safway engineering also gives you these important advantages:

STRONG, SAFE CONSTRUCTION—8 steel columns under every row; uniform load distribution through vertical and horizontal steel bracing; 3 automatic locking devices.

SIMPLE, EFFICIENT DESIGN—Minimum of moving parts. Stable support with extra-long wheel carriages and 8 self-lubricating wheels under each row.

NO POWER EQUIPMENT NEEDED—With binding eliminated and friction minimized, there is no need for costly power equipment.

HANDSOME, FURNITURE-LIKE APPEARANCE—Seat and foot boards have a rich, glossy Golden Oak finish.

Submit your seating requirements for recommendations by experienced Safway engineers. There is no charge for this Service.

Write today for free Bulletin 168!

SAFWAY
STEEL PRODUCTS, INC.
6237 W. State St., Milwaukee 13, Wis.

Gulfspray Catalog

Illustrates full line of shower doors, tub enclosures, framed mirrors, poster and showcase doors and sliding glass walls, with detail drawings of shower and tub installations. 16 pp. *Binswanger & Co., 207 N. Main St., Houston, Texas*

Facts and Data on Resilient Floors

(A.I.A. 23-G) Revised edition covers factors to be considered in selecting resilient floors; data on *Gold Seal* floor, wall and countertop coverings; and pertinent specifications. 52 pp. *Congoleum-Nairn Inc., 195 Belgrove Dr., Kearny, N. J.**

Nibco Copper Drainage Fittings

(A.I.A. 29-B-4) Catalogs a group of fittings for use with copper drainage tube DWV and types L, M and K, illustrating installation and including charts and tables. 36 pp. Catalog No. DWV-2, *Nibco Inc., H-216X, Elkhart, Ind.*

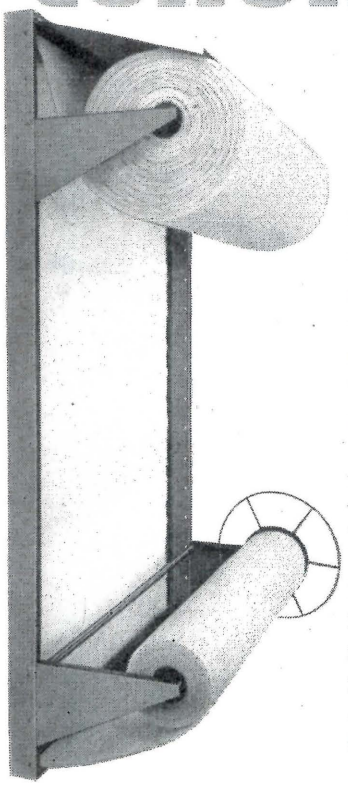
Hospital and Laboratory Casework

(A.I.A. 35-K) Describes, illustrates, and gives general specifications for a complete line of hospital and laboratory casework. A section on hospital planning shows suggested layouts for special-use areas and indicates necessary equipment. 98 pp. *Shampaine Co., 1920 Jefferson Ave., St. Louis, Mo.**

**Additional product information in Sweet's Architectural File, 1958*

Clear the Air ECONOMICALLY with . . .

CONOMANUAL



requires less attention and effort than ANY non-automatic filter system

This hand-operated, roll-away type, viscous impingement filter is particularly desirable for schools, and other buildings where use is intermittent . . . where the convenience, economy and cleanliness of roll-away, disposable-media filters are desired—but cost limitations rule out automatic equipment.

With Conomanual, simply turn the wheel a few times and you have a fresh, new filter . . . no mess . . . no bother . . . no panels to wash. When the entire roll is used, a new one is easily inserted. Conomanual is moisture-, fungus- and fire-resistant. Low resistance and unusually high dust-holding capacity extend filter life and add to CONOMANUAL'S amazing economy.

For complete details ask your local Continental Representative for Bulletin No. 850 . . . Or write direct to:

BOX 1647 — CONTINENTAL AIR FILTERS — LOUISVILLE, KENTUCKY

CONTINENTAL AIR FILTERS Inc.

Architectural Engineering

Building Codes

continued from page 204

mits the use of unprotected noncombustible panel walls when a separation distance of 30 ft or more is provided.

93. PHOENIX, ARIZONA: The Phoenix Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 30 ft or more is provided.

94. ALLENTOWN, PENNA.: Unprotected noncombustible panel walls are permitted in the City of Allentown when a separation distance of 30 ft. or more is provided.

95. MONTGOMERY, ALABAMA: Exterior panel walls are required to have a minimum of 1-hour fire resistance by the Montgomery Building Code. It is reported that consideration is being given to adopting the 1957-58 Edition of the Southern Standard Building Code which permits the use of unprotected noncombustible panel walls when a separation distance of 30 ft or more is provided.

96. PASADENA, CALIFORNIA: The Pasadena Building Code provides for the use of unprotected noncombustible panel walls when a separation distance of 50 ft or more is provided.

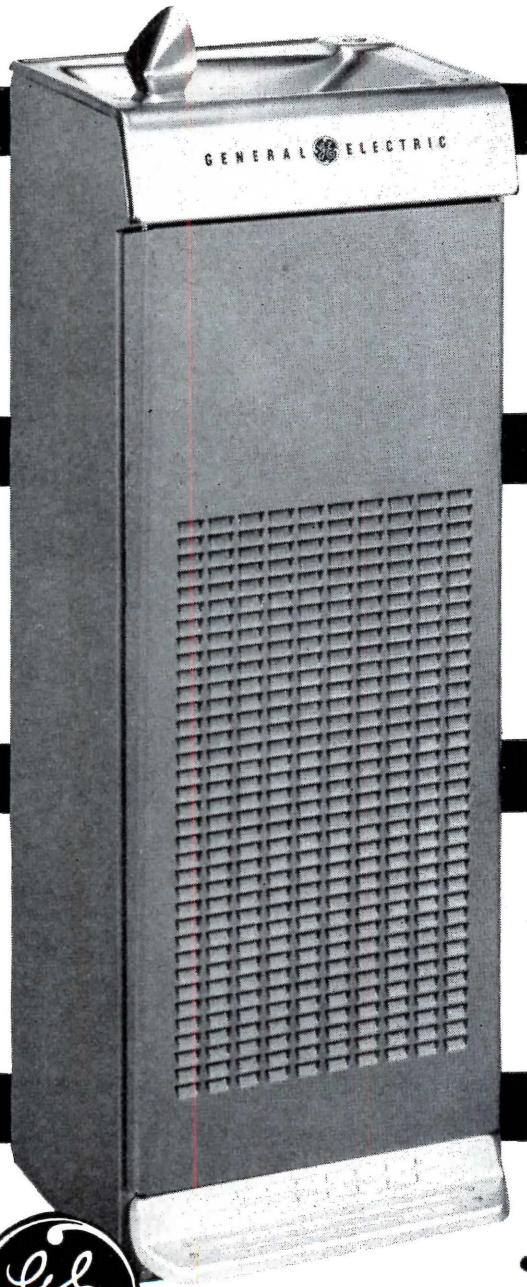
97. DULUTH, MINNESOTA: All exterior walls are required to be of masonry construction having a 4-hr fire resistance by the Duluth Building Code. It has been reported that consideration is being given to amending the Duluth Building Code to permit the use of unprotected noncombustible panel walls.

98. WATERBURY, CONNECTICUT: All exterior walls are required to be of masonry construction having a 4-hr fire resistance by the Waterbury Building Code.

99. SOMERVILLE, MASSACHUSETTS: The Somerville Building Code permits the use of unprotected noncombustible panel walls in locations where openings in exterior walls are not required to be protected.

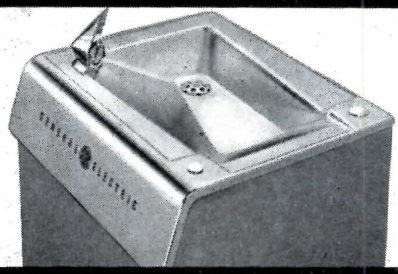
100. LITTLE ROCK, ARKANSAS: All exterior walls are required to be of masonry construction having a 4-hr fire resistance by the Little Rock Building Code. It has been reported that Little Rock is considering adoption of the 1957-58 Edition of the Southern Standard Building Code which permits the use of unprotected noncombustible panel walls when a separation distance of 30 ft or more is provided.

Make sure you get all these features... specify GENERAL ELECTRIC WATER COOLERS



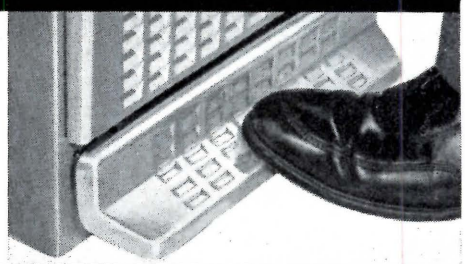
ANTI-SPLASH BASIN

Prevents splashing, spilling, splattering of bubbler stream. Stainless steel—easy to clean.



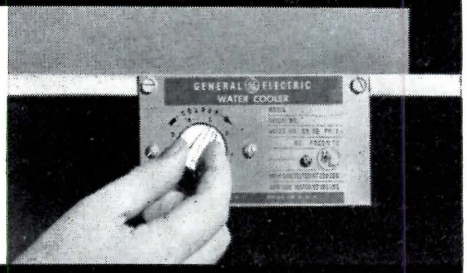
NO-GROPE PEDAL

Full width design permits water control from any point in front of cooler. Special design prevents scuffed shoes, stubbed toes.



TEMPERATURE DIAL

Just dial the water temperature you like best. Eight different settings offer wide selection.



PLUS

- ADJUSTABLE BUBBLER
- HANDSOME STYLING
- SPACE-SAVING DESIGN
- 5-YEAR PROTECTION PLAN

How many water coolers do you need and where should they be located for best results?

G-E Water Coolers are available in 14 different models with capacities from 2.85 to 21.5 gallons per hour. Call your local G-E Water Cooler dealer or write to General Electric Co., Air Conditioning Department, 5 Lawrence St., Bloomfield, N. J.

Progress Is Our Most Important Product

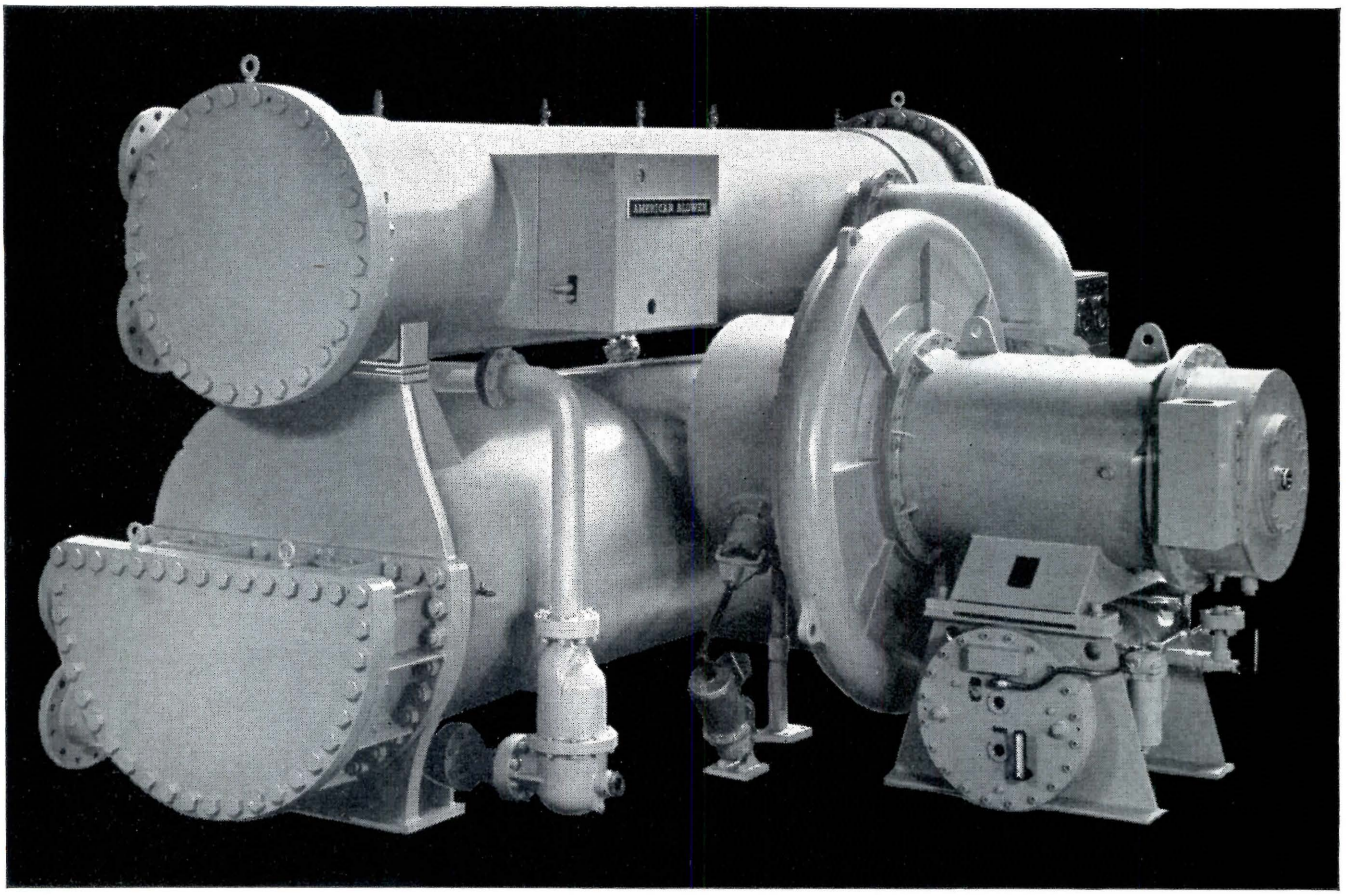
GENERAL ELECTRIC

ASK ABOUT Hot and Cold Combinations, pressure and bottle types—also refrigerated compartment models.

COMPLETE AIR CONDITIONING SYSTEM

American Blower offers a

CENTRIFUGAL REFRIGERATION MACHINES



American Blower Tonrac® maintains constant chilled water temperature . . . regardless of load. Its advanced single stage design and hermetic construction provide improved performance and quieter operation. TONRAC comes as a compact, self contained unit, easier and less costly to install with its single level construction.

You can pinpoint responsibility for equipment performance, delivery dates, user satisfaction on *any* air conditioning system you plan by using American Blower equipment . . . the *complete* line that's designed, engineered, and manufactured to work together.

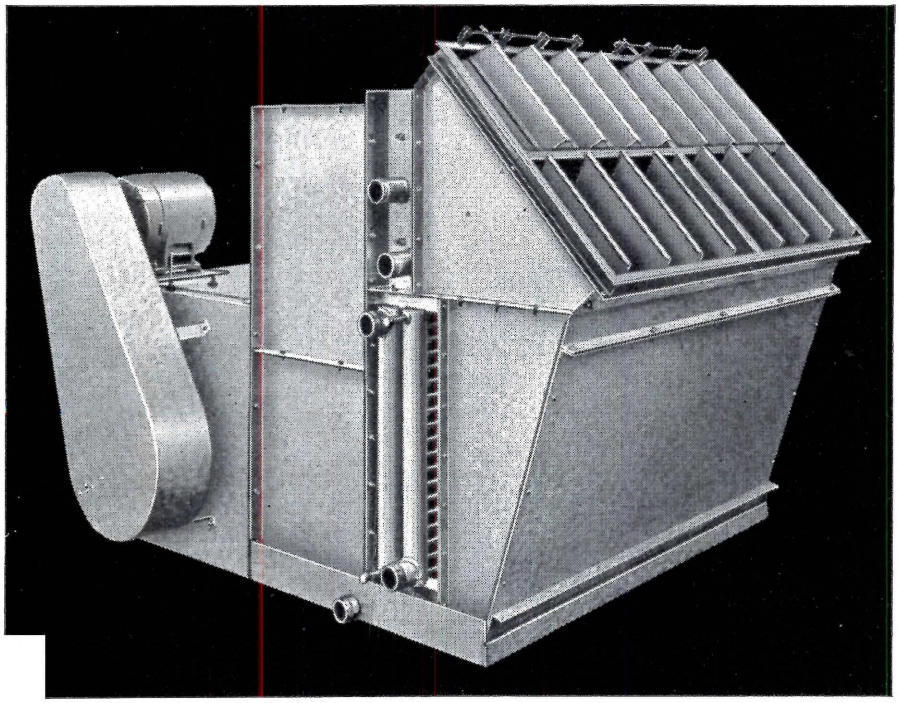
Remember, when you think in terms of American Blower, you think in terms of a manufacturing organization that supplies more of the vital components for air conditioning, refrigeration, heating, and ventilating, than any other in the world.

And 73 branch offices offer local product help or nationwide sales-service coordination. Call *your* American Blower man. In Canada: Canadian Sirocco products, Windsor, Ontario.

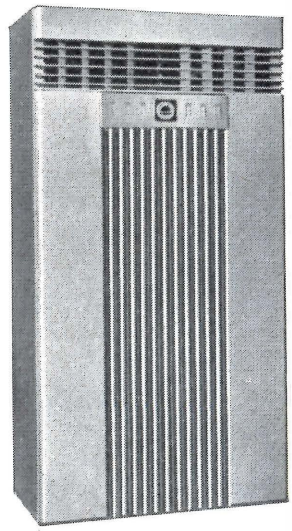
OR COMPONENT PART

onditioning equipment for any job.

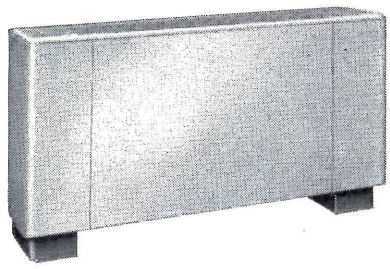
ALL COMPONENTS FOR ANY TYPE OF SYSTEM



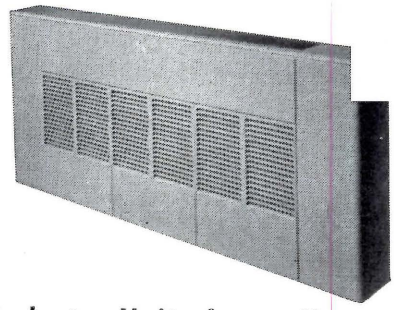
Type AB Multi-Zone Unit is in one arrangement for either horizontal or vertical air flow. A diffusion section is furnished between the fans and coils to distribute the air evenly over the entire face of the cooling and heating coils.



Packaged Air Conditioners — sizes from 3 to 20 tons; sound-insulated — a unit for every business! Air or water cooled models, for use with or without ductwork.



New Fancoil Units cool or heat individual rooms in multi-room structures. Operate on "flo-thru" principle. Save space — only 9¼" deep. Vertical or horizontal mountings.



Inductor Units for cooling or heating multi-room buildings. Can be connected in series. Mounted vertically or horizontally (without excessive casing depth). Wide range of sizes.

For further information, write: American-Standard,* American Blower Division, Detroit 32, Michigan

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AMERICAN-Standard
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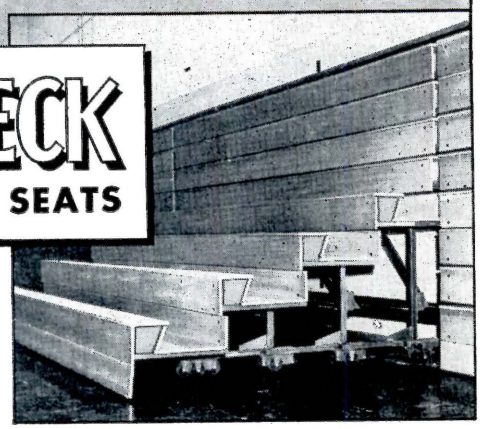
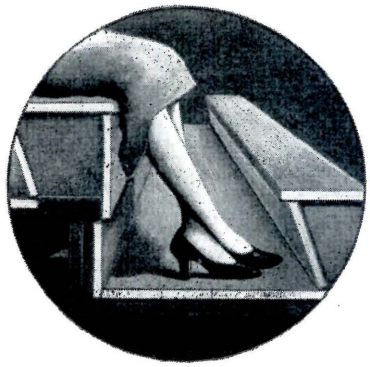
HUSSEY SAFE SEATING

CLOSED DECK
"ROLL-OUT" GYM SEATS



New Seat Lock Means Extra Safety

A new exclusive locking device holds seats firmly in place when extended —one row or all. You can specify Hussey ROLL-OUTS with the assurance that they are *Stronger* and Safer. Their completely Closed Deck (exclusive with Hussey) prevents loss of articles under the stand, reduces fire hazards and makes possible a lower insurance rating. They are also quicker and easier to clean and can be rolled back without first sweeping under the stand. This saves time and reduces janitorial costs. (A.I.A. File 35-F-11)

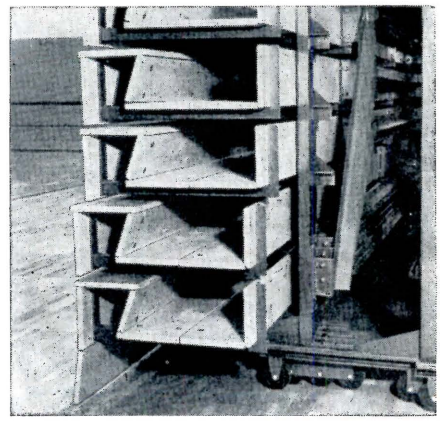


AMPLE FOOT ROOM

In Hussey Closed Deck ROLL-OUT Gym Seats there is 16¼ inches of safe, comfortable foot room. Feet rest on a wide, solid base and the spectator has the comfort of a conventional straight chair. Dangerous narrow footboards and the many hazards of open deck construction are eliminated.

STEEL WORKERS SINCE 1835

Hussey ROLL-OUTS, engineered and guaranteed by seating specialists, incorporate the latest and most improved design for this type of seating. They have a safety factor of 4 and the loading and sway forces as determined by the American Standards Association are used. Hussey ROLL-OUTS *more than meet the most rigid safety standards.*



They are good looking, too, and when closed present a beautifully finished Arkansas Pine perpendicular wall. Also available in genuine African Mahogany at additional cost.

For Specifications See Sweet's Catalog **23J**
Or Write, Wire or Phone Collect **HU**

HUSSEY SAFE SEATING

HUSSEY MANUFACTURING COMPANY, INC.
587 Railroad Avenue **North Berwick, Maine**

continued from page 201

"CUSTOM" LIGHTING

dows made them unnecessary.

The latest chapter in the saga of the "vision strip" is a user-proof window wall proposed for the Smithtown High School. (Ketchum and Sharp found that, at Northport and Greenlawn, their carefully-planned switching arrangements were virtually ignored by teachers and pupils; all the lights burned all the time.) In the Smithtown scheme, the idea of the vision strip and the accompanying dependence on artificial light are retained, but the wall itself becomes tinted glass, graded from a very dark glare-reducing gray at the ceiling through a lighter gray at mid-section to almost-clear at the sill. The architects feel that this graded glass wall is the most effective lighting control they have developed to date. But, ironically enough, they did such a thorough job of selling the original vision strip-artificial lighting idea for an earlier job in the Smithtown district that, when the new proposal was made, the school board refused to buy it.

Hand in hand with the development of a controlled environment in which to use artificial lighting went a gradual refinement of the light sources themselves. In selecting and locating fixtures, Ketchum and Sharp have tried to provide adequate light without also providing ceiling-fixture contrast, and have moved steadily toward more even overall illumination, with less differentiation between the light source and the ceiling above it.

A translucent-sided flush fixture which gave only a slight spillover onto the ceiling at the Greenlawn junior high school was supplanted at John Jay by a similar pendant-mounted fixture which gave uplight as well. For the Harborfields High School, now under construction, a more closely-spaced single tube fixture will be used to create an almost-luminous ceiling via uplighting through an open top, diffused downlighting through an "egg-crate" louvered bottom. And at the new Wallingford Elementary School in Wallingford, Conn., the contrast problem will be licked by concealing fluorescent tubes within the corrugations of a cellular roof deck.

PHOTO CREDITS: page 197—Joseph Molitor, Ben Schnall; pages 198-199—Alexandre Georges, Joseph Molitor, Marc Neuhof, Charles Payne, Ben Schnall, Ezra Stoller; pages 200-201—Lionel Freedman, Joseph Molitor, Marc Neuhof, Alexandre Georges

New Overline® TILT-A-FRONT encloses classrooms faster... saves 60% in field erection time

Tilt-A-Front is a new type of factory assembled hollow metal wall framing system which tilts into place like a ladder, fits like a glove. It has gained wide acceptance for exterior and interior use on schools, offices and commercial structures of one to three stories.

Tilt-A-Front's all-welded unit construction eliminates trial-and-error field assembly . . . cuts erection time by 60% under conventional methods of wall framing. It encloses space much more economically, is structurally sound and requires none of the usual exposed plate reinforcements, angles or stiffeners. Tilt-A-Front is available in baked enamel steel (Colorclad), stainless steel or aluminum.

We can provide detailed sections and elevations in Tilt-A-Front design for your requirements. Write us today for complete information.

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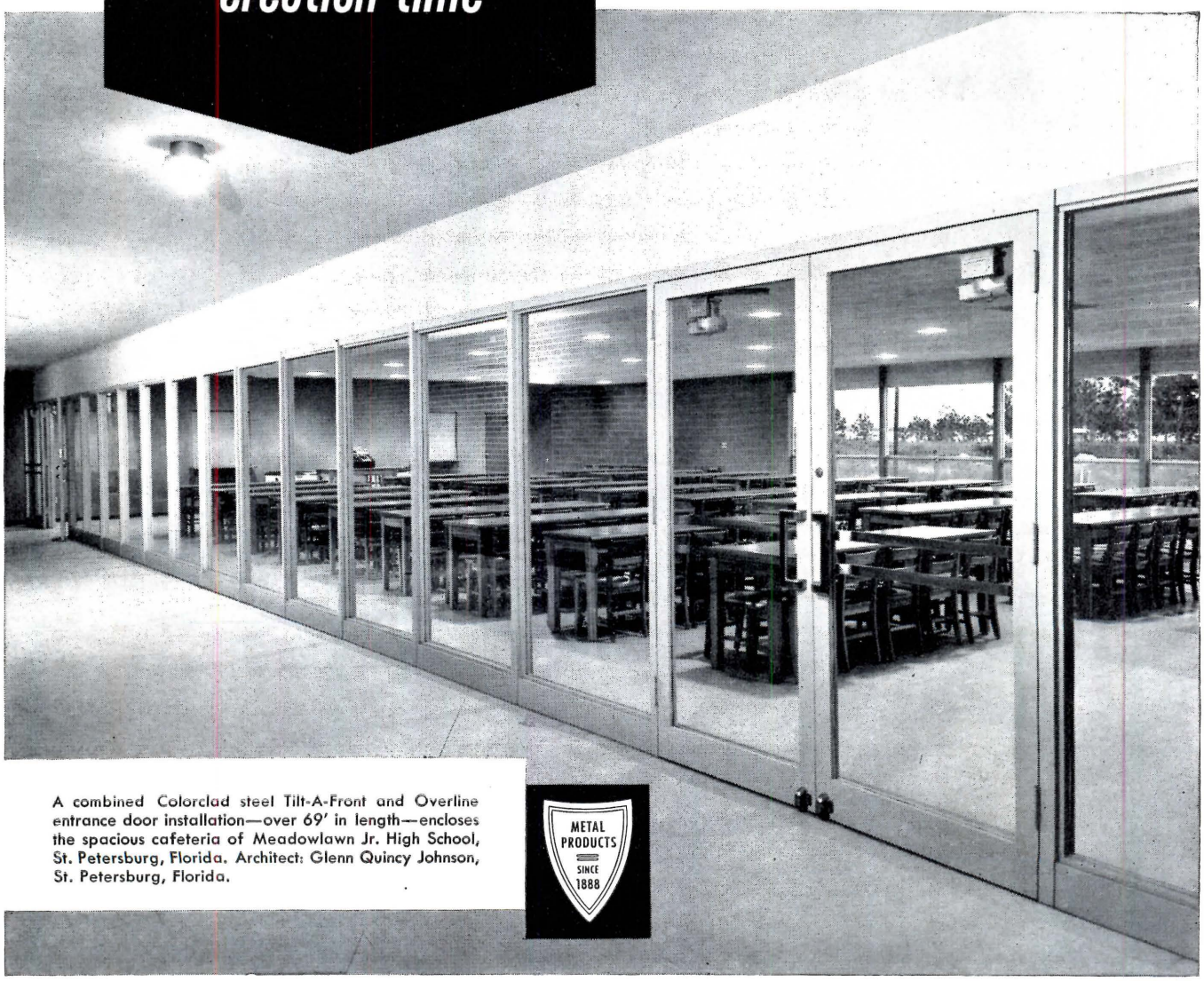
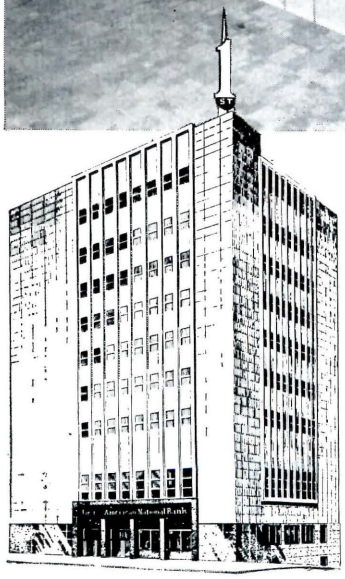


A combined Colorclad steel Tilt-A-Front and Overline entrance door installation—over 69' in length—encloses the spacious cafeteria of Meadowlawn Jr. High School, St. Petersburg, Florida. Architect: Glenn Quincy Johnson, St. Petersburg, Florida.

METAL PRODUCTS SINCE 1888

functional beauty and "linen" luxury with Continuous Cotton Towels



← New First American National Bank Building, Duluth, Minn. Architect Thomas J. Shefchik, A.I.A., Duluth. Contractor: Fowler-Veranth Construction Company and Klippen-Holm Company, Duluth.

† Recessed continuous towel cabinets with base storage units. End clutter of waste receptacles. Integrate with the modern design of the wash room. (This installation serviced by: American Linen Supply Company, Duluth.)

You provide the finest in hand drying facilities AND MORE when you specify continuous towel cabinets.

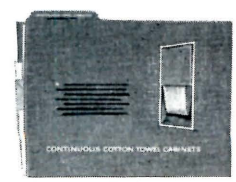
Low cost installation and service by a linen supplier . . . Reduced maintenance and janitorial costs . . . Elimination of litter, storage and disposal problems . . . Limits fire hazard and plumbing repairs.

Add to this, the fact that you do not obligate the owner to any particular service, *even* when you specify recessed cabinets like the ones pictured above. (Recesses are designed to accept any of a wide variety of cabinets.)

So, why not make sure your clients get the best? Specify the luxury and quality of cotton toweling . . . include continuous towel cabinets in your design.

✶ Send for this free Planning-for-Cloth kit

Illustrated, includes specifications for recessed unit and continuous cloth towel cabinets. ***Write****—to Linen Supply Association on your letterhead.*



Linen Supply Association of America
and National Cotton Council • 22 West Monroe Street, Chicago, Ill.

Sylva-Lume—good lighting with attractive, variable design—strikes up a warm and friendly mood at the central offices of the Hill City Savings & Loan Association, Summit, N. J. Architect: R. O. Peck, Westfield, N. J. Consulting engineers: Nordling-Dean, Inc., Summit.

Sylva-Lume Wall-to-Wall Lighting . . .

combines arresting, aesthetic design with finest quality of illumination

An aesthetic ceiling design of square modules that glow with soft, diffused light! That's the impression you get when you see Sylvania's new Sylva-Lume lighting system.

A delight for the designer's eye . . . a lasting pleasure for the man who works under it . . . Sylva-Lume wall-to-wall lighting rediscovers the ceiling as a medium of contemporary expression. Its translucent plastic squares have "sculptured" contour, with varying depth and design. Optional incidental color lends splashes of accent and variety to the pattern. Individual designs can be changed quickly and easily when desired.

Sylva-Lume enables you to combine unlimited freedom of design with the finest quality of illumination attainable. Its true shadow-free, glare-free effect is ideal for general and private offices, reception rooms, lobbies, department stores . . . wherever good lighting counts. Ask your Sylvania Fixture Specialist for his "live" demonstration, or write direct for FREE folder of complete information and specification data.

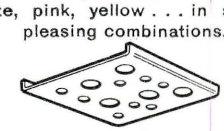
Sylvania Electric Products Inc.
Dept. H20, Lighting Division—Fixtures
One 48th Street
Wheeling, West Virginia

Custom-create over 100,000 different lighting designs using only a few standardized components:

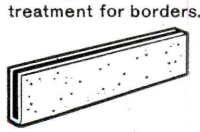
Deep panels • 4 types. In pink, yellow tints, or white.

Shallow panels • 4 types. In same two tints, or white.

Drumhead panels • 8 types. White, pink, yellow . . . in several pleasing combinations.



Perimeter panels — Interesting treatment for borders.



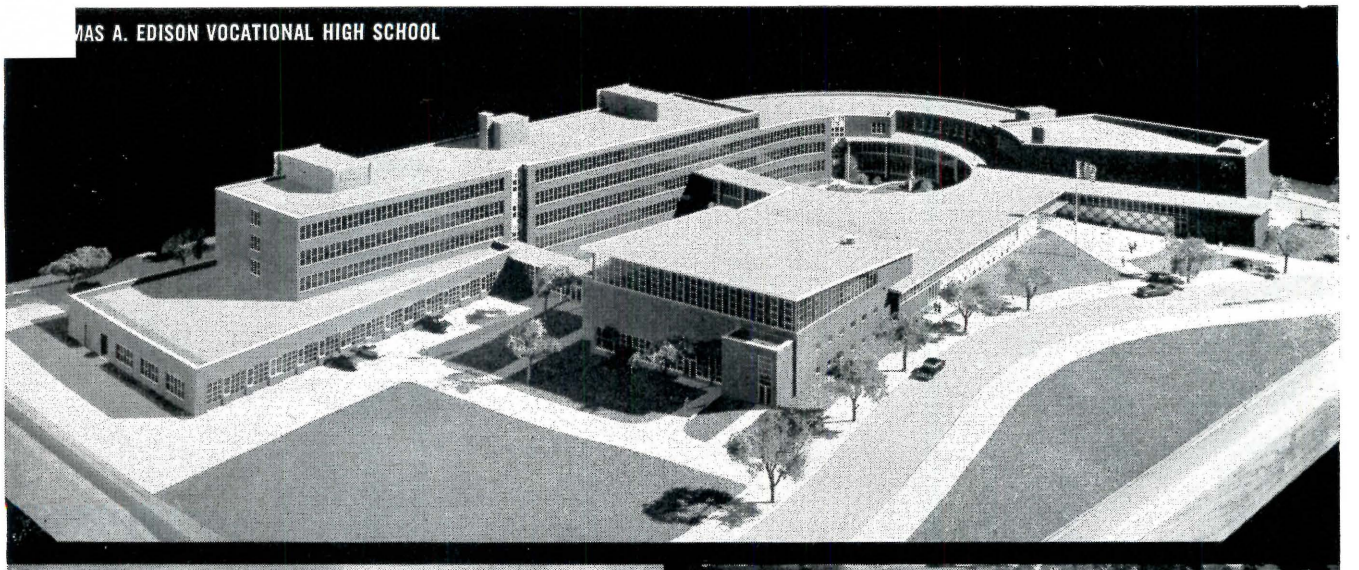
Acoustic baffles—White, yellow or blue—delineate and accent.

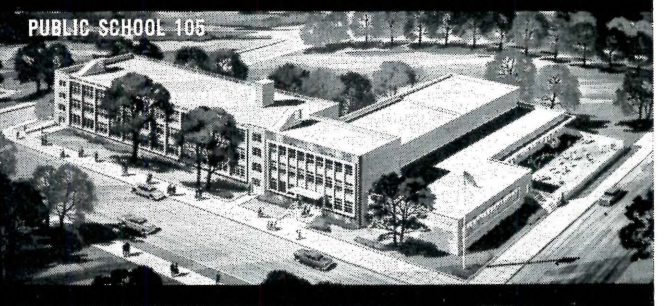
SYLVANIA

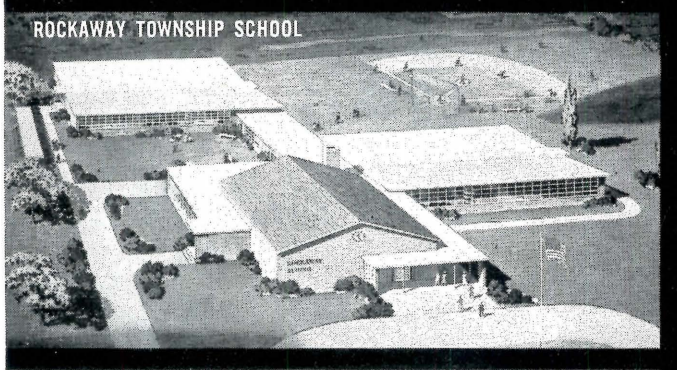
Fluorescent Lighting Fixtures and Systems

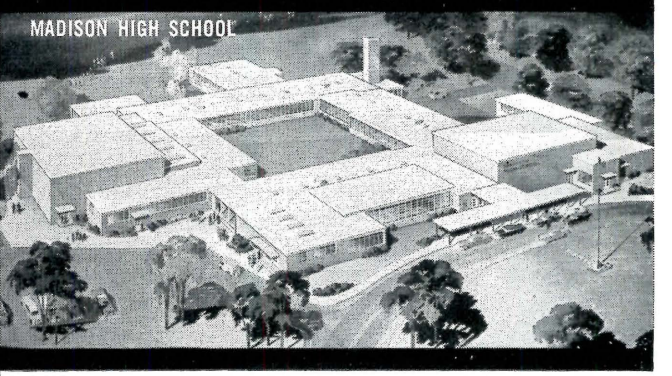
Best fixture value in every price range

LIGHTING • TELEVISION • RADIO • ELECTRONICS • PHOTOGRAPHY • ATOMIC ENERGY • CHEMISTRY-METALLURGY









These excellent examples of modern school architecture will incorporate POMEROY Custom-Built Windows!

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Architect: Fellheimer & Wagner Assoc., New York City
Contractor: Caristo Construction Corp., Brooklyn, New York

PUBLIC SCHOOL 11—Brooklyn, N. Y.
Architect: John A. Thompson, New York, N. Y.
Contractor: Colmar Construction Corp., Brooklyn, New York

PUBLIC SCHOOL 105—Queens, N. Y.
Architect: H. I. Feldman, New York, N. Y.
Contractor: Planet Construction Corp., New York, New York

ROCKAWAY TOWNSHIP SCHOOL—Rockaway, N. J.
Architect: Alfonso Alvarez, Upper Montclair, N. J.
Contractor: Wortmann Construction Co., Elizabeth, N. J.

MADISON HIGH SCHOOL—Madison, N. J.
Architect: Lawrence C. Licht, Englewood, N. J.
Contractor: Thomas Construction Co., Paterson, N. J.

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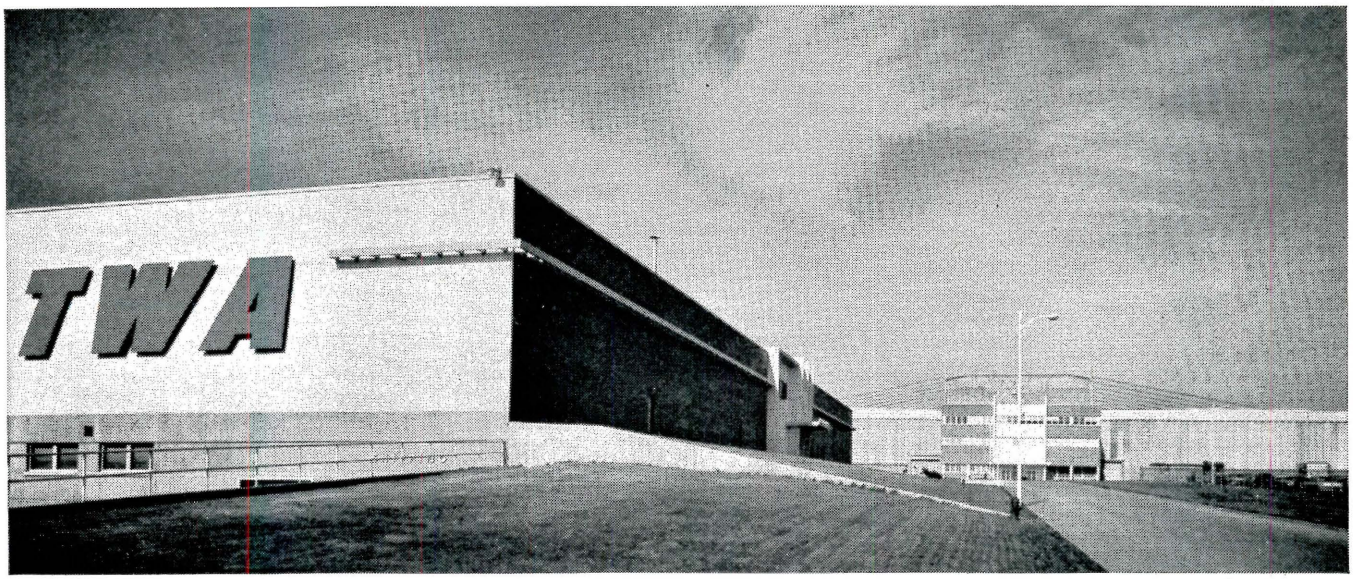
A continuing series of outstanding schools, churches, office buildings, hospitals and industrial structures using NORTON DOOR CLOSERS

TWA TRANS WORLD AIRLINES EQUIPS NEW BUILDINGS IN KANSAS CITY WITH NORTON DOOR CLOSERS



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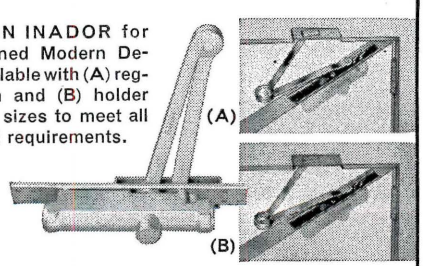
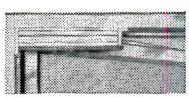
Complete Norton Line Meets Every Door Closer Need

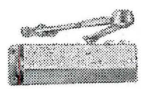
NORTON INADOR for Streamlined Modern Design available with (A) regular arm and (B) holder arm...4 sizes to meet all standard requirements.





NORTON 750: New corner design with concealed arms for all type doors, particularly narrow rail doors.

Norton Surface-type Closers are available for all installations where concealment is not essential.



NORTON 703E: Compact surface mounted type...first closer with extruded aluminum alloy shell.

An engine for an airliner or a door closer for the plant which overhauls that engine, both must have one quality in common—dependability—to be acceptable to Trans World Airlines. With that thought in mind, the engineers specified *Norton Surface-Mounted Door Closers* for buildings at Trans World Airlines' new $18,750,000 overhaul base on Kansas City's Mid-Continent International Airport.

The door closers used here by TWA are the modern counterparts of Norton Door Closers still in daily use after serving continuously 20 to 30 years and longer. Other Norton models are available as shown at the left, to serve virtually every door closer need with equal dependability. See the new Norton catalog #57 for full descriptions of the complete line, including important new models. Write for it today.

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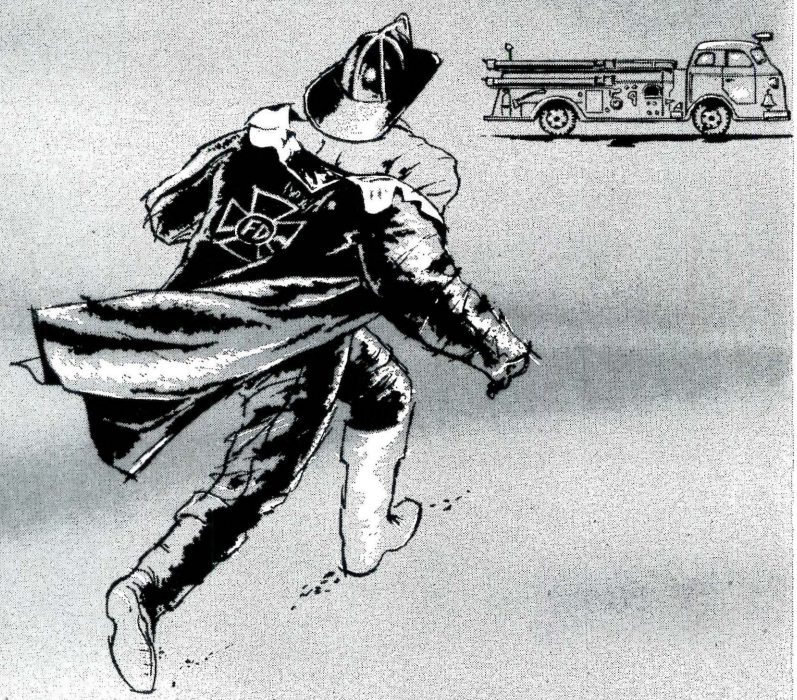


Write for

BULLETIN 131

S. H. COUCH COMPANY, INC.

NORTH QUINCY 71, MASS.

Visit COUCH Booth 830, American Hospital Association convention, Chicago, August 18-21

A Washington Report

continued from page 40

project as a good example of the "brick and mortar" type.

This undertaking, running in concert with a pilot rehabilitation project in San Juan, will develop for future application elsewhere the techniques used in self-help restitution of run-down properties. Methods of financing the improvements will be a part of the demonstration study.

Also pointed to with considerable pride by the URA office is a demonstration grant project now completed. It involved the small Georgia community of Douglas: population, 8200. This town set out to determine how a small community goes about developing a workable program for its renewal. Its report was so thorough and so well done that there have been well over 10,000 requests for it to date.

In Baltimore, the techniques of small area development as applied to large-scale renewal are under scrutiny. In the survey and planning stage is a project involving one representative block in an extensive 40-block area. This has been carved out as a demonstration grant project to apply the lessons learned in rehabilitation (involving debt-carrying capacity, raising general economic levels while leaving inhabitants' economic levels relatively undisturbed, etc.) to development of the larger tract. Completion date for the one-block redevelopment is June, 1959.

Publication of the results is expected to help other large cities as well as Baltimore in the renewal of large congested areas.

On the whole, there is a lively interest in this HHFA program. Lester M. Haddad, the slight, energetic man who is director of the administration's Demonstration Program Branch, reports that requests received by the agency during the past several months, could they all have been honored, would have consumed $10 million in demonstration grant funds, double the total authority voted by Congress initially.

Mr. Haddad said that three or four pages describing what a public body has in mind is sufficient as the first proposal. If it answers the URA criteria and fits in with the current need, it will be developed.

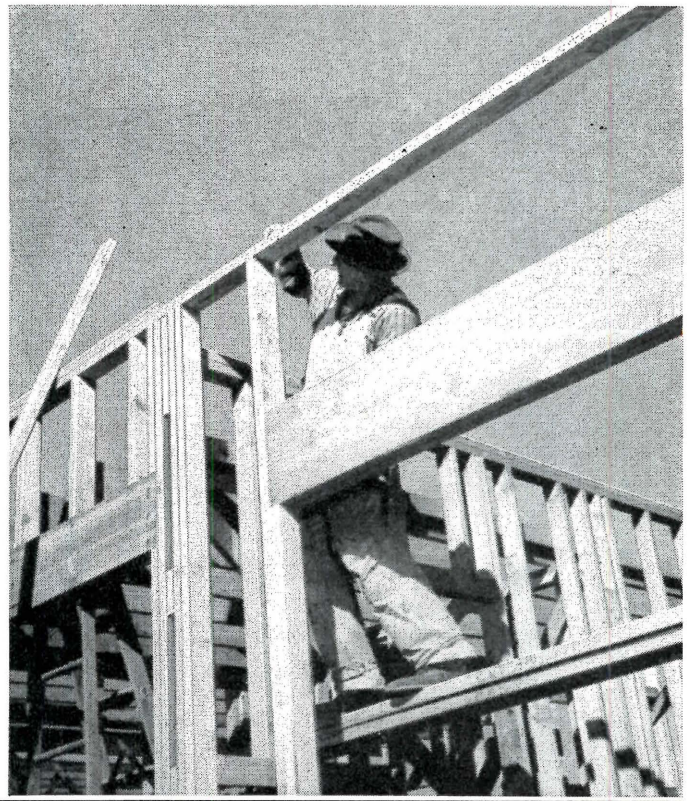
The industry advisory committee on this demonstration grant program is in the process of being reconstituted. It originally had but five members and Mr. Haddad has sent out letters of invitation to a dozen representatives in the hope that its membership can be increased to from 10 to 15.

Good Design Deserves Sound, Durable

Framing

Architects who are proud of their home designs want their work to endure . . . and to give long years of satisfactory service to their clients. They know that good framing insures structural soundness, thereby providing economical livability for generations. That's why so many architects specify Weyerhaeuser 4-Square Kiln-Dried Lumber for framing their homes.

Precision manufactured, scientifically kiln-dried 4-Square framing lumber offers superior strength, dimensional stability, and firm nail holding properties. The Weyerhaeuser 4-Square trademark helps to assure complete framing satisfaction.



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Genuine

Wood Sheathing

Adds Strength to Frame

The structural skeleton of a home is further stabilized by the application of sheathing. Here again, quality lumber serves as ideal sheathing.

Weyerhaeuser 4-Square Wood Sheathing adds strength to the structure by tying the framing together and holding it securely in place. 4-Square sheathing is available in a variety of species and grades. It also is scientifically kiln-dried for greater stability and increased nail holding power. It is a sound, durable base for exterior coverings and adds a considerable degree of natural insulation.

Architects find that Weyerhaeuser 4-Square Framing and Sheathing work together for sound construction.

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FIRST NATIONAL BANK BUILDING • ST. PAUL 1, MINNESOTA

On the Calendar

August

17-22 National Technical Conference, Illuminating Engineering Society—Royal York Hotel, Toronto

18-21 Annual Convention, American Hospital Association—International Amphitheater and Palmer House, Chicago

18-21 19th Annual North American Liturgical Week and exhibit of liturgical arts, crafts, and literature—Music Hall, Cincinnati

22-29 First International Seminar on Urban Renewal, co-sponsored by International Federation for Housing and Town Planning and Netherlands Town Planning Institute—Institute of Social Studies, The Hague

31ff 24th Bi-Annual Congress, International Federation of Housing and Town Planning; through Sept. 6—Liège, Belgium

September

1-13 Second International Conference on Peaceful Uses of Atomic Energy—Geneva, Switzerland

4-5 International Conference on Air Pollution—Hotel Statler, New York City

6-14 National Home Week, promoted by the National Association of Home Builders

15-19 13th Annual Instrument Automation Conference and Exhibit—Convention Hall, Philadelphia

17-18 Conference on Floor Construction Systems, sponsored by the Building Research Institute—Sheraton-Park Hotel, Washington, D. C.

21-24 National Planning Conference of Community Planning Association of Canada—King Edward Sheraton Hotel, Toronto

22-25 Annual Meeting, Institute of Traffic Engineers—McAllister and Columbus Hotels, Miami

22-26 40th National Recreation Congress, sponsored by National Recreation Association and allied organizations—Atlantic City, N. J.

25-27 Seventh Annual Conference, A.I.A. Western Mountain District—Continental-Denver Hotel, Denver

October

2-4 North Central A.I.A. Regional Conference—St. Paul, Minn.

8-10 Gulf States A.I.A. Regional Conference—Biloxi, Miss.

9-11 13th Annual Forum, Pennsylvania Society of Architects—Galen Hall, Wernersville, Pa.

9-12 Northwest A.I.A. Regional Conference—Harrison Hot Springs, British Columbia, Canada

15 New York District A.I.A. Regional Conference—Rochester

15-19 California Council, A.I.A., Annual Convention, and (Oct. 17 only) Cal.-Nev.-Hawaii Regional Conference—Mark Thomas Inn, Monterey Peninsula, Cal.

22-24 25th Annual Convention, Architects Society of Ohio—Sheraton-Gibson Hotel, Cincinnati

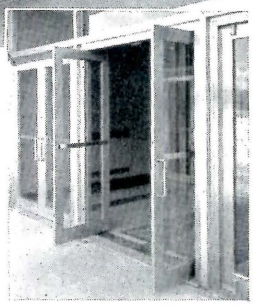
25-29 Annual Meeting, American Institute of Planners—New York City

30ff A.I.A. Central States Regional Conference; through Nov. 1—Kansas City

31ff Annual Meeting, National Trust for Historic Preservation; through Nov. 2—New Orleans

UNIVERSITY of BUFFALO
State Teachers College

New York State University Architect: MR. TEEGAN



more....

Ellison doors

14 Balanced Doors in the entrances to State Teachers College, University of Buffalo, Buffalo, N. Y.

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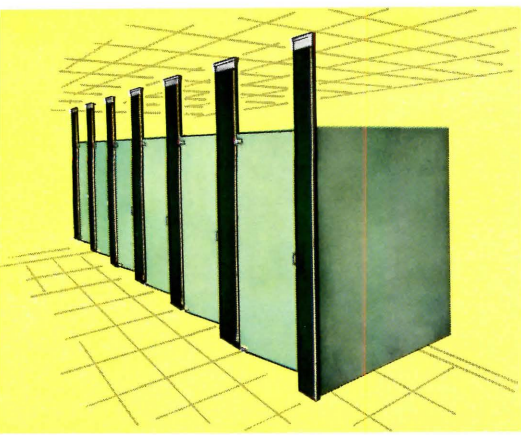
representatives in 77 principal cities in the United States, Canada and Puerto Rico

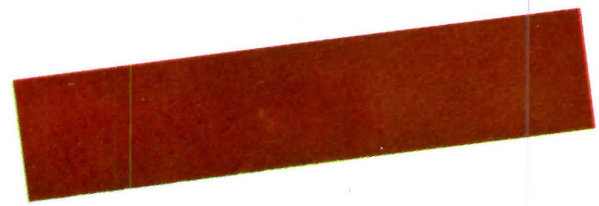
the BALANCED DOOR

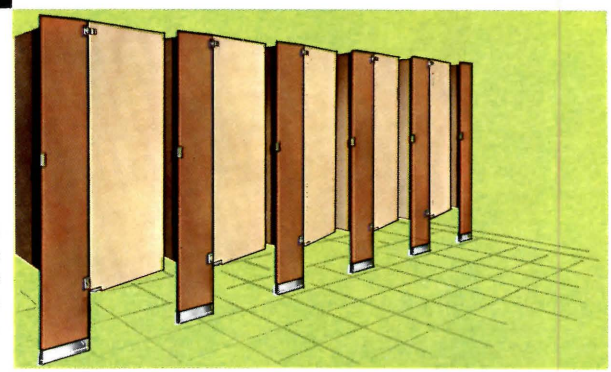
"WEIS WAS WISER!"

Architects, building owners and tenants become fully aware of WEIS toilet compartment advantages the second or third year after installation. That's when their original choice is confirmed, when they can say with firm conviction, "Our choice of WEIS was wiser!"

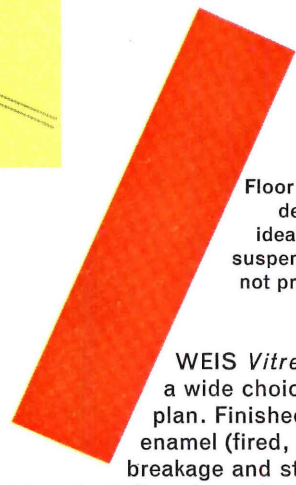
Ceiling-hung design is the ultimate for ease of floor maintenance







Floor braced design is ideal where suspension is not practical.



WEIS *Vitre-Steel* toilet compartments are available in a wide choice of colors to harmonize with any decorating plan. Finished inside and out in vitreous porcelain enamel (fired, not baked), Weis compartments are not subject to breakage and staining. Nor do they present costly installation problems. Available in both floor-braced and ceiling-hung designs. See Sweet's Architectural File, No. 22b/We—or write for complete information.

Henry Weis Manufacturing Company, Dept. H-1807, Elkhart, Indiana

Weis Vitre-Steel compartments have been selected for prominent buildings designed by the following architects: Bastille Halsey Assoc., Boston, Massachusetts; Perkins & Will, Chicago, Illinois; Raymond E. Maritz & Son, Inc., St. Louis, Missouri; John E. Ramsey, Jr., Salisbury, North Carolina; Robert E. Alexander, Jr., & Assoc., Dallas, Texas; Richer & Axt, West New York, New Jersey; C. E. Silling & Assoc., Charleston, W. Virginia; Raymond Harry Ervin, Denver, Colorado.

WEIS
VITRE-STEEL
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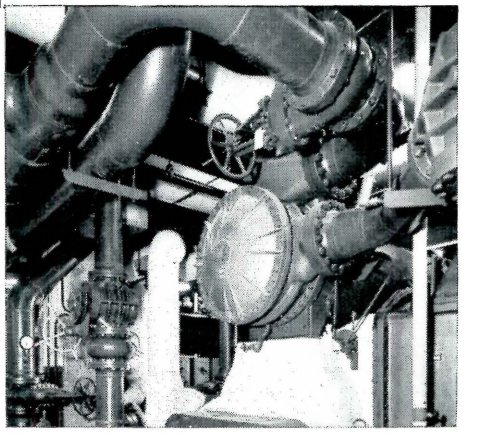
TOILET COMPARTMENTS

Air Conditioning with

USS National Pipe—

Chicago's Field Building



One of Chicago's landmarks, the towering Field Building on South LaSalle Street, recently completed the installation of a new air-conditioning system. USS NATIONAL Seamless Steel Pipe was used throughout the system—a total of 127 tons of it—in sizes from 3" O.D. to 18" O.D.

Need first-quality pipe for air-conditioning, heating and power installations? Need seamless steel pipe that will pay you back in outstanding service many times over for every dollar you spend? Then just say "NATIONAL Seamless." And, for further information or immediate assistance with your pipe problems, write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

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Von Duprin 66

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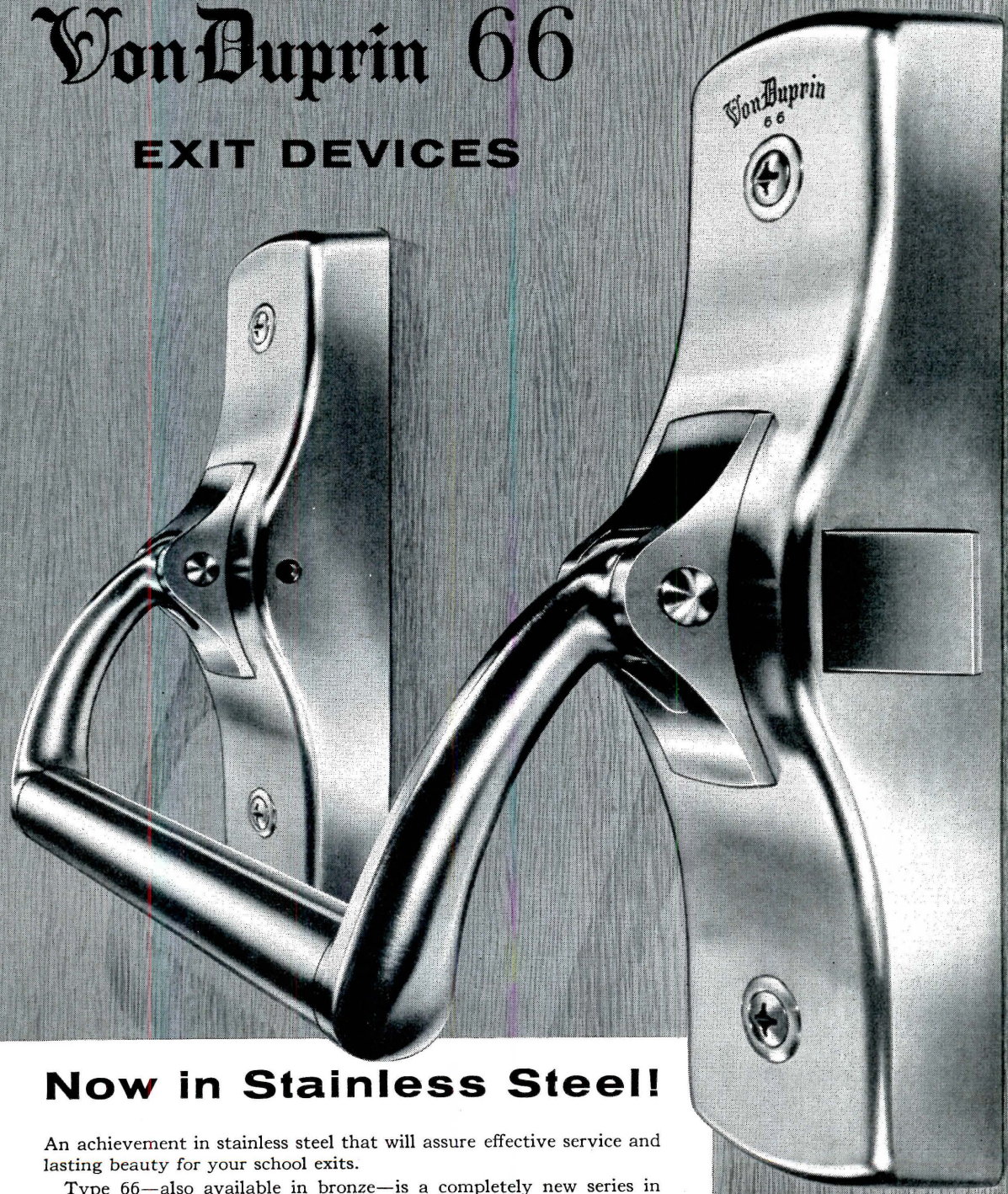

Now in Stainless Steel!

An achievement in stainless steel that will assure effective service and lasting beauty for your school exits.

Type 66—also available in bronze—is a completely new series in rim, mortise lock and vertical rod models, and features a smart new line of matching outside trims.

For the finest expression of "the safe way out!", ask your architect or hardware consultant for full details on the Von Duprin 66. Or write direct for your copy of Bulletin 581.

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Office Notes

Offices Opened

Donald Grier Hannum, A.I.A., and William Arthur Whifler, A.I.A., Architects, announce the opening of offices at 135 University Ave., Palo Alto, Cal.

Harold Keeney, Jr., Architect, has opened an office at 13251 132nd Ave., N. E., Kirkland, Wash.

Martin M. Laibow announces the opening of his office for the practice of architecture at 8 Burning Bush Lane, Levittown, Pa.

Robert George Sauter, A.I.A., and Ben M. Seaborne, A.I.A., have announced the opening of a new firm, Sauter and Seaborne, at 125 W. College Ave., Appleton, Wis.

Firm Changes

George B. Allison, F.A.I.A., and Ulysses Floyd Rible, F.A.I.A., announce the admittance to partnership of Rodney T. Robinson, A.I.A., and Raymond Ziegler, A.I.A.; the firm, Allison and Rible, is at 3670 Wilshire Blvd., Los Angeles 5, Cal.

Clas and Riggs, Architects, is the new name of the firm formerly known as A. R. Clas, Architect-George H. Riggs, Jr., Associate. The principals of the firm in the Wyatt Bldg., Washington 5, D. C., are Angelo R. Clas, F.A.I.A., and George H. Riggs, Jr., A.I.A. Associates are Leroy F. Owens, A.I.A., and Antonio C. Ramos, A.I.A.

Eckbo, Royston and Williams, Landscape Architects and Planning Consultants, announce the reorganization of their partnership with the formation of two new firms for the practice of landscape architecture: Robert Royston, Asa Hanamoto and David R. Mayes in a partnership known as Royston, Hanamoto and Mayes, at 555 Clay St., San Francisco 11, Cal.; Garrett Eckbo, Francis Dean and Edward Williams in a partnership known as Eckbo, Dean and Williams, at 1136 Clement St., San Francisco 18, Cal., and 8942 Wonderland Park Ave., Los Angeles, Cal.

Kaestner Associates announces that J. Everett Hoerner, Architect-Engineer, and Allen W. Young, Architect, formerly associates, are now principals of the firm, known as Kaestner, Hoerner & Young, Inc., Architects-Engineers, with offices at 210 N. Encina Ave., Visalia, Cal.

Carl M. Koelb and Associates, architects, announces the selection of Donaldson Ray McMullin Associates as its successor firm, because of the death of Mr. Koelb in May. The successor firm, to be known officially until 1963 as Donaldson Ray McMullin Associates, Successor to the Firm of Carl M. Koelb and Associates, is at 428 Boston Post Rd., Weston, Mass.

John B. Parkin Associates, Architects and Engineers, announces that George F. Eber, M.R.A.I.C., and Roy F. Marshall have been appointed associates. Offices of the firm are at 1500 Don Mills Rd., Postal Sta. J, Toronto 6, Ont.

New Addresses

Rex Whitaker Allen, A.I.A., Architect and Hospital Planning Consultant, 693 Mission St., San Francisco 5, Cal.

Heitschmidt and Thompson, Architects, 617 W. Seventh St., Los Angeles 17, Cal.

Addendum

Pietro Belluschi, F.A.I.A., dean of the School of Architecture and Planning at Massachusetts Institute of Technology, was architectural consultant for the additions to the First Presbyterian Church, Boulder, Colo., for which Hobart Wagener was architect. This church was shown on pages 200-202 in the June RECORD. Omission of Dean Belluschi's name is greatly regretted.

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INTEGRAL DOORS AND FRAMES

Compare D & H *PyroDor* features before specifying your next metal door requirements. Note these distinctive *PyroDor* advantages:

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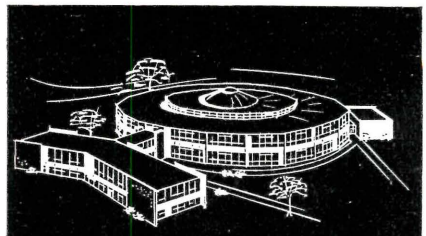

Mt. Morris High School, "The Magic Circle School of Tomorrow", Mt. Morris, Mich.

Center of Activity:

9,200 sq. ft. Edge-grain Ironbound Floor, $^{33}/_{32}$" thick, Dri-Vac treated and laid over cork in Mt. Morris High School gymnasium. Architects: Belli & Belli, Chicago. Installed by Whitcomb-Bauer Flooring, Inc., Detroit.

IRONBOUND* CONTINUOUS STRIP* HARD MAPLE FLOOR

All activity at the striking new Mt. Morris High School centers around the gymnasium. Surrounded by classrooms and situated between two wings, the gym is the focal point of the entire structure. Therefore the type of gym floor chosen for this area was especially important. A Northern Hard Maple floor was a must because of its bright, natural beauty and smooth splinter-free surface. In addition, the floor had to be shock-absorbent and uniformly resilient. An Ironbound floor not only meets all these requirements, but it offers much more to preserve the original condition of the floor.

Since the gym floor is below grade, edge-grain Ironbound was chosen because it will expand and contract less than other floors under difficult moisture conditions. The individual slats will remain smooth and tight, bound together with long, barbed steel splines. For extra protection against moisture absorption, the flooring was vacuum-treated by the Dri-Vac process. The treatment will also protect the floor against rot, fungus, and termites.

If you have had problems with excessive expansion and "cupping" of gym floors, perhaps an edge-grain Ironbound floor is the solution.

For information and name of your nearest franchised installer, write Robbins Flooring Co., Reed City, Mich., Attention: Department AR-858.

T.M. Reg. U.S. Pat. Off.

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Manufacturers of Ironbound* Continuous Strip* ooring, PermaCushion* Resilient Floors and other hardwood flooring.

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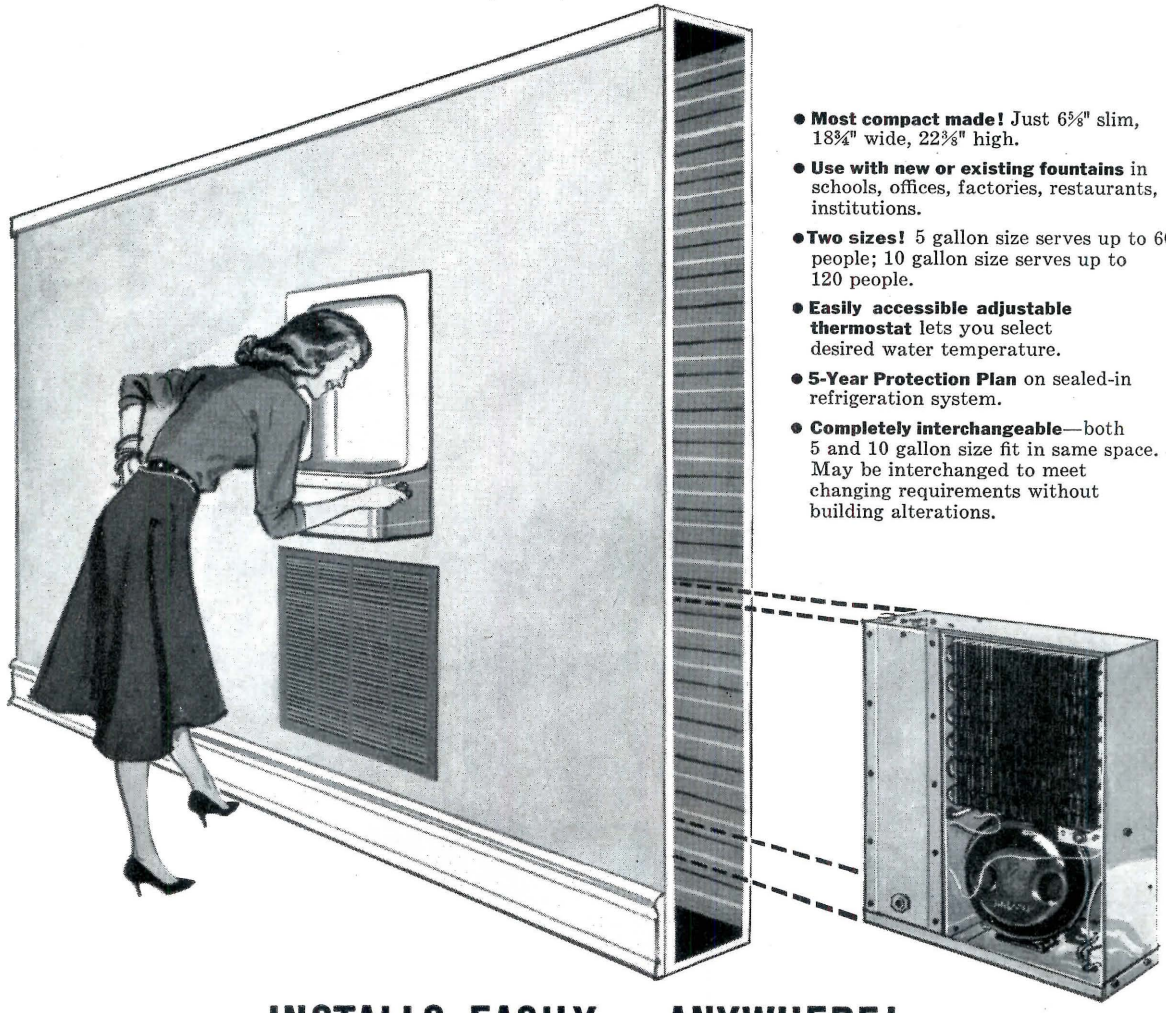

- **Most compact made!** Just 6⅝" slim, 18¾" wide, 22⅜" high.
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- **5-Year Protection Plan** on sealed-in refrigeration system.
- **Completely interchangeable**—both 5 and 10 gallon size fit in same space. May be interchanged to meet changing requirements without building alterations.

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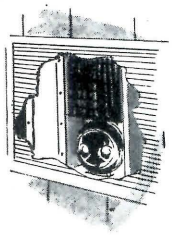
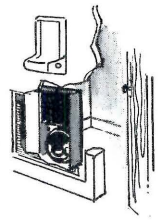
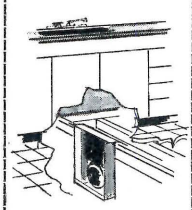


IN THE WALL

BEHIND THE WALL



IN A CLOSET



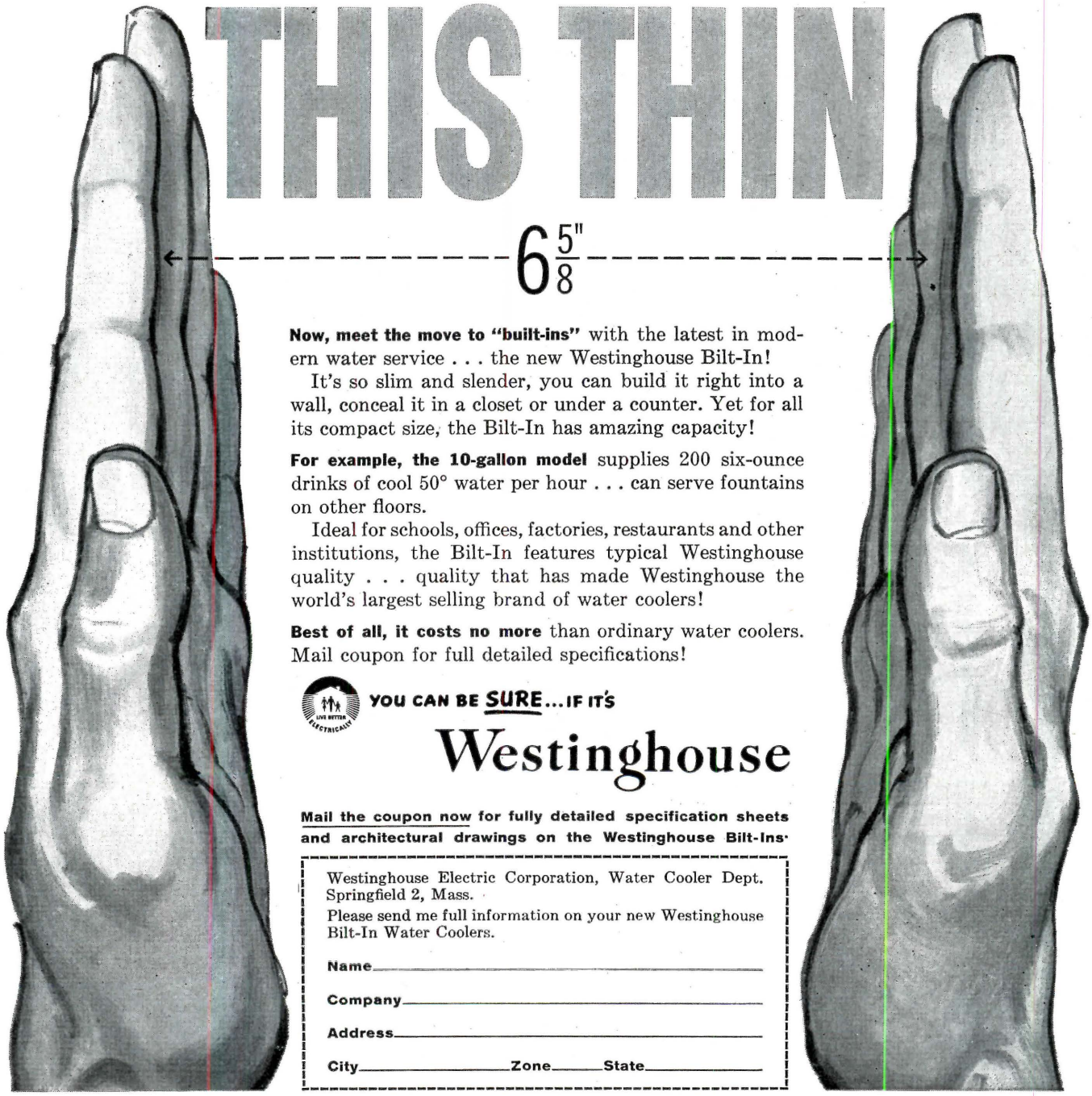
ON A JOIST

ON THE WALL

UNDER A COUNTER

HOUSE "BILT-IN" FITS IN A SPACE

THIS THIN



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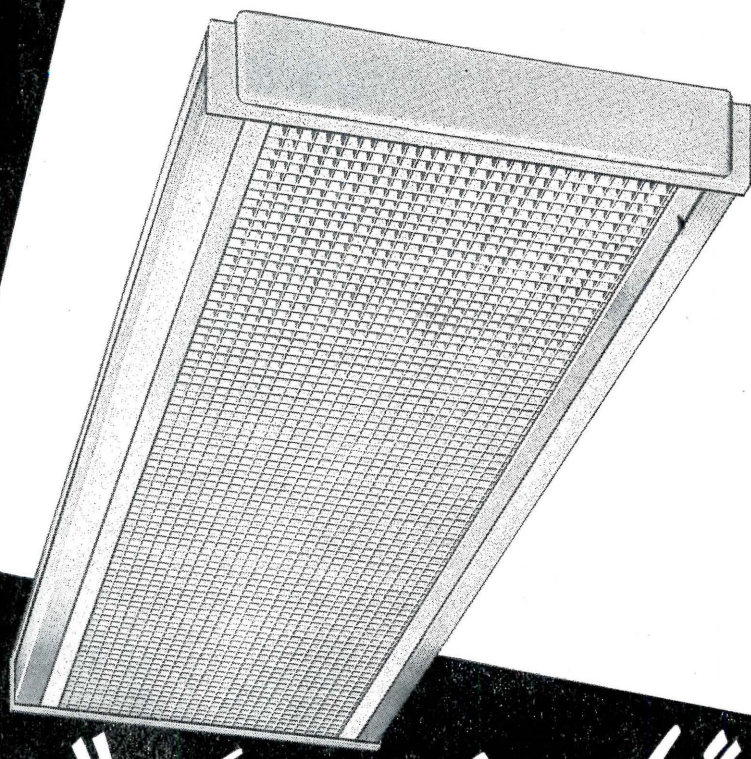
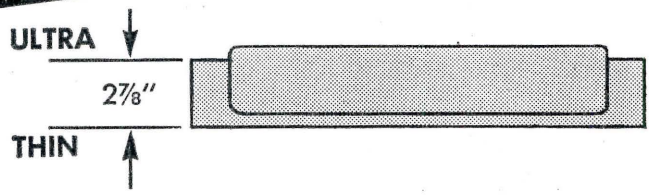


"Skylark"



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The Mitchell SKYLARK luminaire has a modern Thin-line appearance combined with unusual high efficiency and low maintenance features. Pleasing, graceful styling, quick, easy, low cost installation features makes this attractive luminaire ideal for use in offices, commercial areas, shopping centers and schools. The SKYLARK is available in 2-lamp and 4-lamp matching units designed to provide abundant glarefree illumination.

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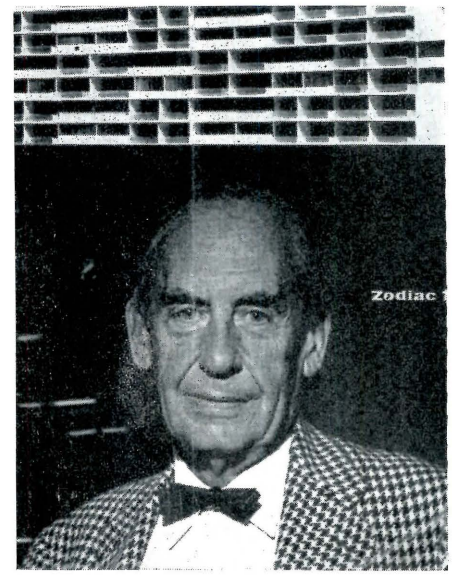
The Record Reports



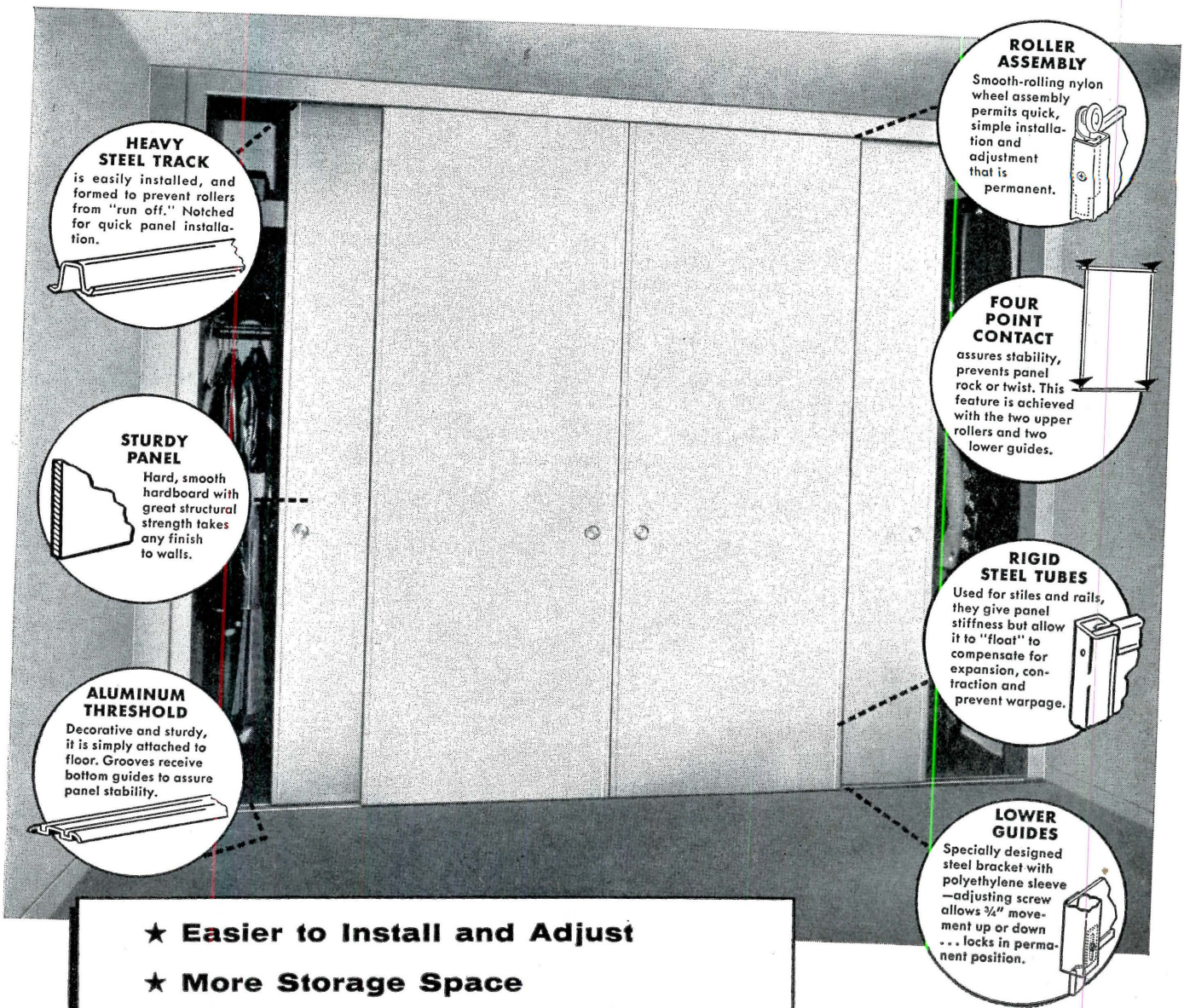
Zodiac: An Architectural Journal With an International Outlook

The newest member of the architectural press is called *Zodiac,* and is subtitled "an international magazine of contemporary architecture." The ideal of internationality is upheld in the team which sponsors the venture —the Belgian "Association pour la Diffusion Artistique et Culturelle" and the Italian Olivetti Company; backing them up is a staff of editors from Western Europe and the U. S. A policy statement from Adriano Olivetti describes a magazine with an editorial base broad enough to support a broad definition of architecture: "It is necessary to turn to the happy determinant necessity, that which sooner or later is destined to triumph over uncertainties, obstacles and immaturity: the necessity, the need for taking root, for finding again in the earth, in landscape, in traditions, architectonic forms, the love of men for their community, the whole and natural feeling for the place."

The lead article in this first issue is by Walter Gropius, whose face appears on the cover; it is followed by contributions from such international figures as Siegfried Giedion, Peter Blake, Ernesto Rogers, Arthur Drexler, Victor Gruen, Maxwell Fry. In an understandable effort to load this first issue with outstanding architecture, the editors have used examples familiar to most readers of foreign and domestic journals.

The magazine, which will appear semi-annually, is published in this country by George Wittenborn, Inc., 1018 Madison Avenue, New York 21; prices are $9 per copy, $17 for a year's subscription.

These GLIDE-ALL Features Offer YOU More* in Sliding Door Panels



HEAVY STEEL TRACK is easily installed, and formed to prevent rollers from "run off." Notched for quick panel installation.

STURDY PANEL Hard, smooth hardboard with great structural strength takes any finish to walls.

ALUMINUM THRESHOLD Decorative and sturdy, it is simply attached to floor. Grooves receive bottom guides to assure panel stability.

ROLLER ASSEMBLY Smooth-rolling nylon wheel assembly permits quick, simple installation and adjustment that is permanent.

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GLIDE-ALL DOORS are packaged, ready to install, with built-in adjustment features . . . in 8′ and 6′8″ heights, flush or recessed types . . . and in special sizes for custom jobs. See "Sweets" or write for complete details.

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BUILDINGS FOR RESEARCH

by the editors of Architectural Record

Here is a timely new book which brings you the latest information about the design of new buildings needed to house the nation's expanding scientific research program. Prepared by experts in architecture, engineering, and scientific research, this book is guaranteed to bring you up to date with the latest, tested developments in this important field. The book accomplishes this aim in two ways:

1. In several illuminating studies, it presents in detail the hundreds of common requirements of good laboratory design — vents, drains, services and utilities, safety measures, modular units, etc. Three of these studies cover the all-important field of nuclear research. These give you a clear picture of atomic processes and equipment, as they affect the design of the building that houses them.
2. Shows you how special problems have been solved, using actual examples. Presents 44 separate new laboratory projects, in all areas of scientific research. These buildings are in all areas of the country, and are owned by corporations, universities, and government agencies. Each is thoroughly described in text, photographs, plans and drawings.

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To examine this important material, all you need do is fill out and return the coupon below. You will receive your personal examination copy of BUILDINGS FOR RESEARCH for 10 days free use.

232 pages, large 8¾ x 11⅝" size
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Shows 44 separate research buildings
Latest laboratory design information
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BRIEF SUMMARY OF CONTENTS

1. PLANNING THE LABORATORY
An 18-page outline of fundamentals by Charles Haines of Voorhees, Walker, Smith and Smith. A study of laboratory equipment as it affects design. Analyses of five plot plans of research centers, including RCA laboratories at Princeton, N. J., and Armstrong Cork Co. in Lancaster, Penna. All 5 shown in numerous plans and drawings.

2. NUCLEAR LABORATORIES
Defines CC (concentrate and confine) and DDD (dilute, disperse, decontaminate) theories. Studies architectural requirements of cyclotrons, bevatrons, and other types of reactors and accelerators. Emphasis on shielding and personnel safety. Many AEC and university buildings shown in photographs and drawings. Much of this information only recently declassified by government.

3. INDUSTRIAL LABORATORIES
The largest section in the book. A total of 20 biological, engineering, chemical, and electronic laboratories. Includes a GE laboratory that won congratulations from its residential neighbors, Union Oil's 14-building complex, with all buildings connected by service tunnels, Corn Products' huge research center with complete pilot plant, and many more. All buildings described thoroughly in text, photographs, and drawings and plans.

4. INSTITUTIONAL LABORATORIES
Owned by government agencies and universities, with the emphasis on pure research. An entire new postgraduate school of research for the Navy at Monterey, Calif. is shown—maximum sharing of facilities by diverse departments and built on a very tight budget. Also a chemical engineering building at the University of Minnesota built on the modular plan, an engineering building at U.C.L.A. with a floor live-load of 600 lb per sq ft, and a dairy laboratory at the University of Wisconsin where a germ-free atmosphere and ease of cleaning were pressing problems.

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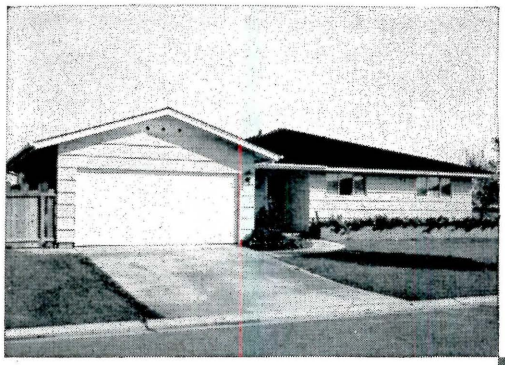
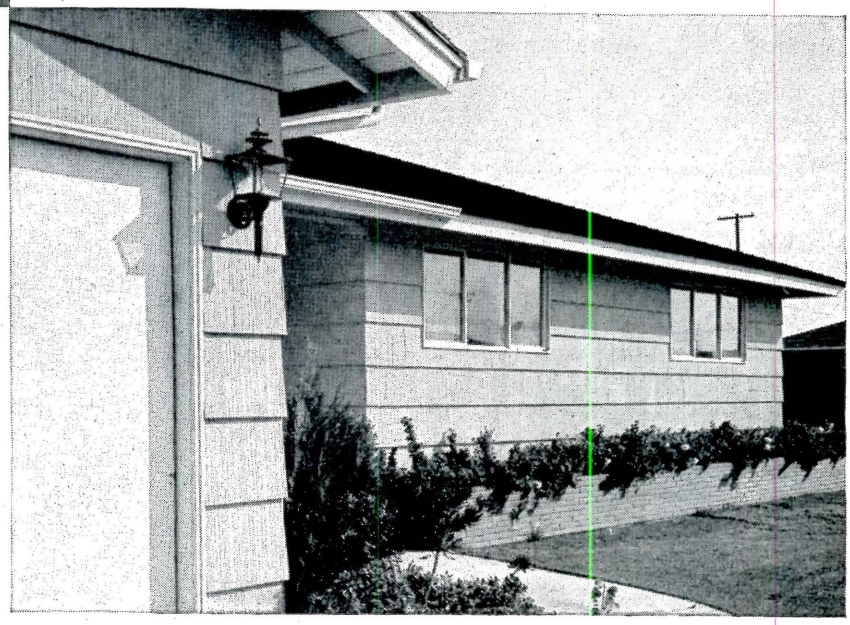
CEDAR SHAKE WALLS



an ageless integrity...



...in the clean, crisp idiom of today

The modern cedar shake is a shingle that has been squared and striated to fulfill the need for *line and texture* in exterior home design. Cedar shake walls, with their clean-cut striations and dramatic shadow accents, enhance any area where a natural material is desirable. That is why *genuine red cedar shakes* have become the dominant wall material in so many of the better communities.

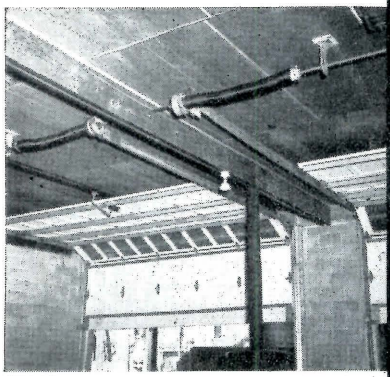
RED CEDAR
SHINGLE BUREAU

5510 White Building, Seattle 1, Washington
550 Burrard Street, Vancouver 1, B. C.

Problem: installing an overhead garage door on a flat-roofed building where false ceiling prevented normal installation

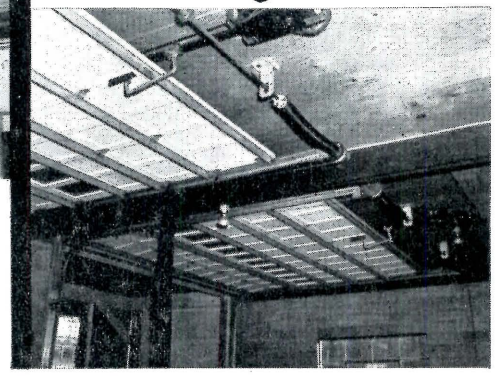
THE MARK OF QUALITY

RAYNOR
Overhead Type
DOORS
solve your most difficult Installation Problems



Only the top section's rollers travel this track on a low headroom installation.

Another view of the low headroom design — notice the minimum distance from track to ceiling.



RAYNOR Low Headroom DESIGN REDUCES HEADROOM TO 6½ INCHES

The machinery repair shop housed in this flat-roofed building added a ceiling to create insulation space. This reduced the headroom to less than a foot. A Raynor Low Headroom installation was made, using only 6½ inches for headroom! This modification not only eliminated costly alterations, but also retained the original door opening. If your job presents an installation problem, contact Raynor's Engineering Department for the most economical solution... shop drawings furnished free on request.

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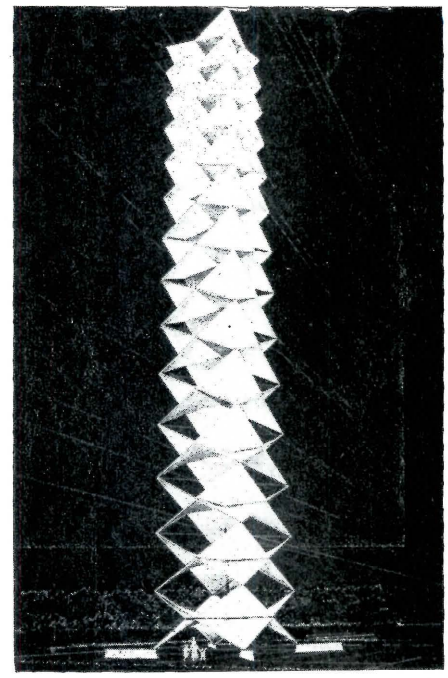
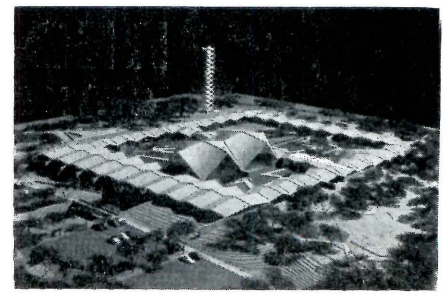
The Record Reports

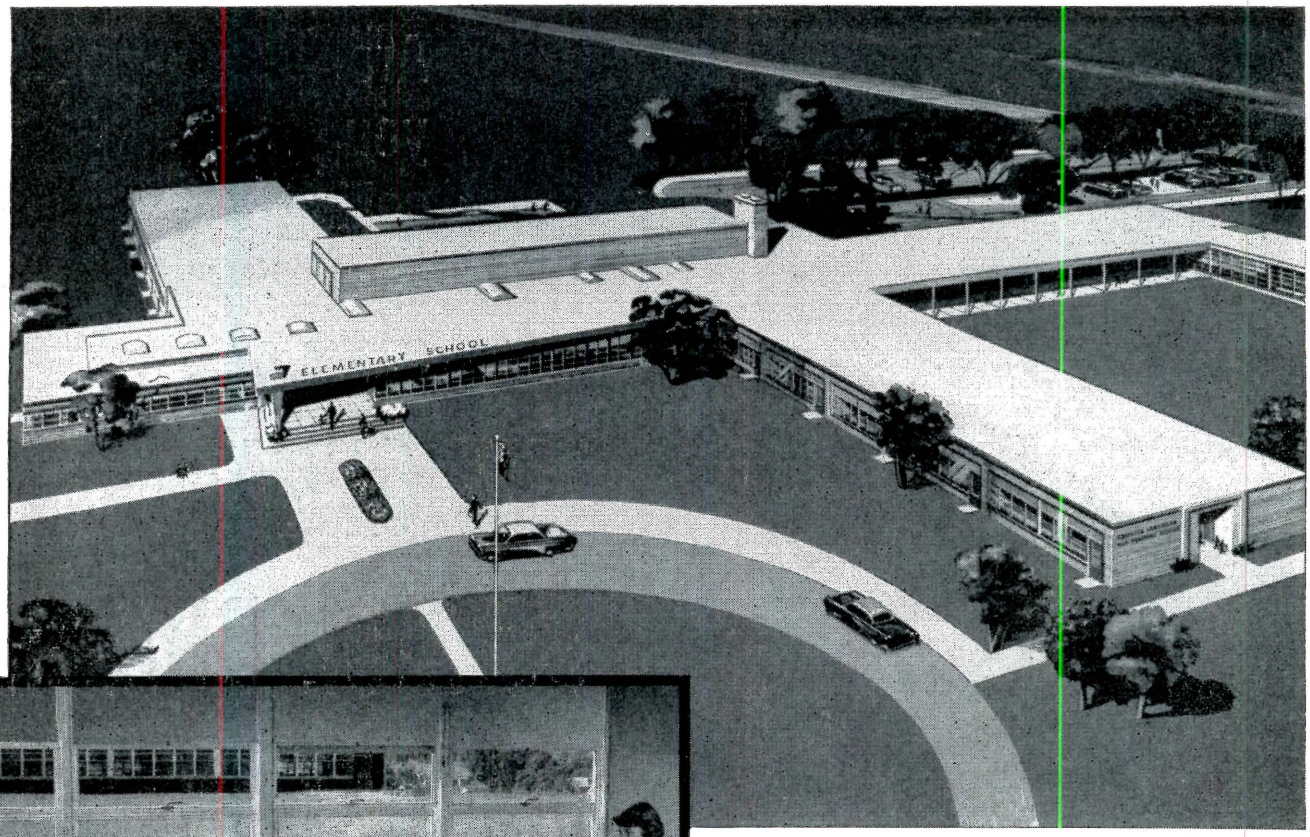


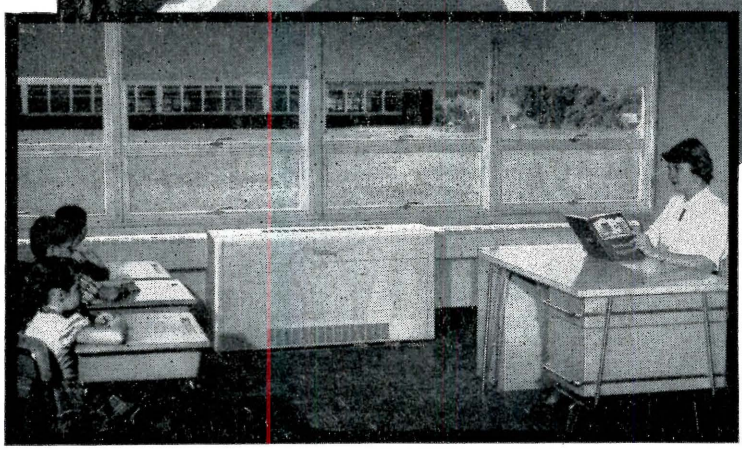
Musical Tower Will Be Added To Cowboy Hall of Fame

At the request of the clients, who felt that it would add "significance and dignity" to the project, the design for the National Cowboy Hall of Fame and Museum has been augmented by a 200-ft free-standing tower. Architects Harold Jack Begrow and Jack W. Brown, winners of the competition described in the RECORD, December 1957 (pp. 10-11), report that the tower will be composed of a stack of hyperbolic paraboloids, the form used for the roof structure of the museum. The precast sections will be held by diagonal tension wires. Electronic sound devices will be hung, in individual chambers, from the supporting cables. When played from a remote keyboard, the device will "emit strumming sounds similar to a guitar or banjo, both reminiscent of Western trail music."

The museum, which will be built on a bluff near Oklahoma City, is sponsored by a non-profit organization dedicated to commemorating the cowboy and cattleman. View of the projected museum appears below.







Section of Springville Elementary School, Springville, N. Y.

Architects
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General Contractors
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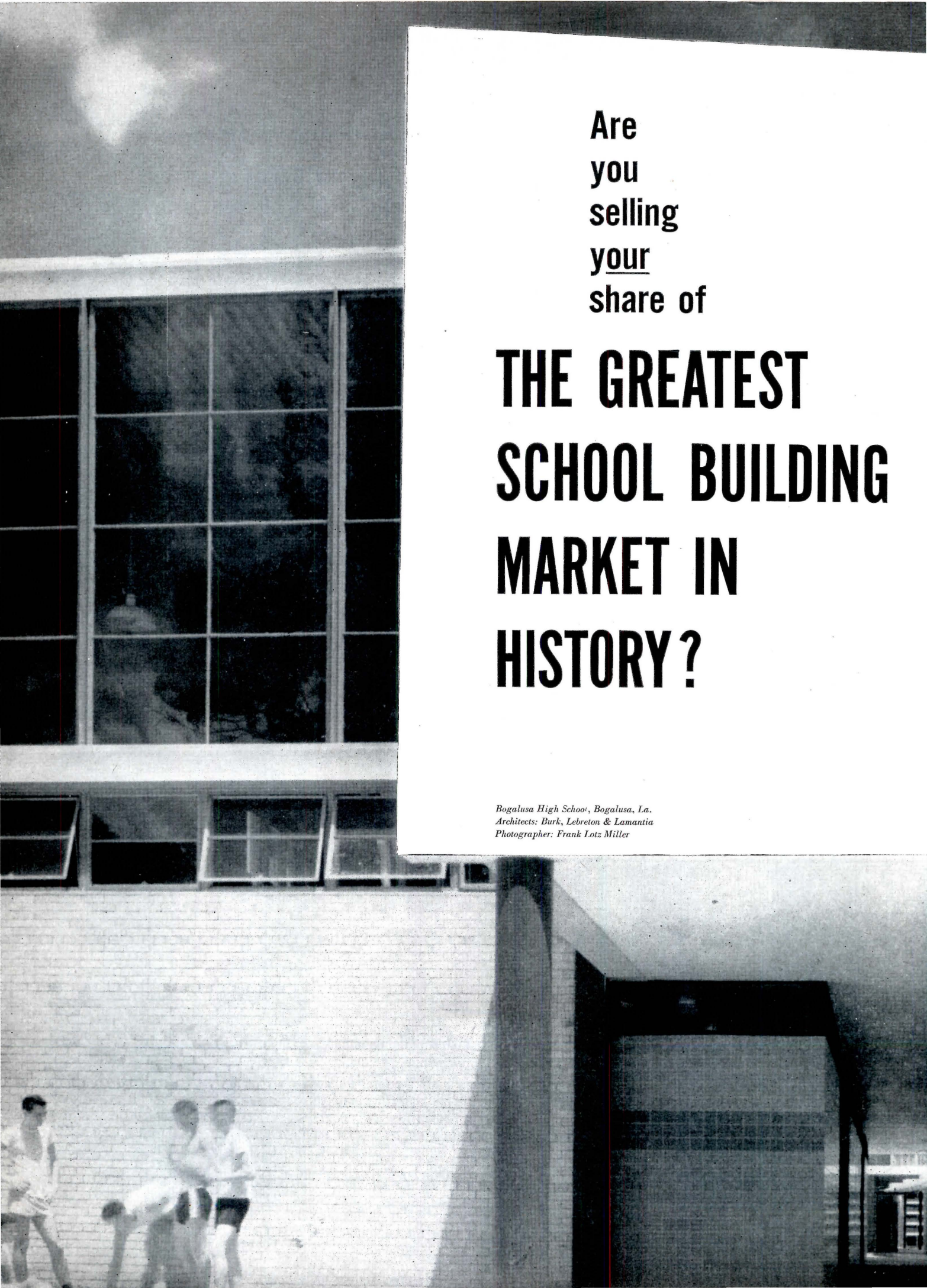

Are
you
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your
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THE GREATEST SCHOOL BUILDING MARKET IN HISTORY?

Bogalusa High School, Bogalusa, La.
Architects: Burk, Lebreton & Lamantia
Photographer: Frank Lotz Miller

For ten straight years school construction has scored a new all-time high. This notable uptrend is expected to continue in 1958. There has never been a better time to sell architects and engineers who plan over 99% of the nation's schools. And never before has a magazine been so well prepared to help you as *Architectural Record.*

Contracts for school construction in May totaled $286,000,000.

This brought 1958's five-month school volume to $1,225,000,000—within one per cent of last year's record-setting pace.

Clearly, there is no recession in school construction, and F. W. Dodge Corporation has estimated further gains in 1958.

The same pressures that have boosted school construction throughout the postwar period—to an all-time high of $2.94 billion in 1957—are still operating strongly:

- Accumulated classroom shortages are variously estimated at from two to four years' construction at the current rate.
- Soaring enrollments in elementary and secondary schools require a 20% plant expansion by 1965.
- College facilities, already under pressure, must be almost doubled by 1970 to accommodate a steadily increasing flow of applicants.
- Existing schools are being rendered obsolete in large numbers by changing educational programs and methods, better designed buildings and new building products.

Here are six good reasons why Architectural Record is in a unique position to help you take full advantage of your sales opportunities in 1958's great architect and engineer planned school building market:

1. Editorial leadership. In the past five years Architectural Record has published 40% more pages on school design than any other magazine. (By a margin of better than 2 to 1 architects and engineers have named Architectural Record the magazine supplying them with "the most helpful information on school design".*)

2. Preferred readership. Architects and engineers have voted Architectural Record their preferred magazine in 113 out of 124 studies SPONSORED BY BUILDING PRODUCT MANUFACTURERS AND ADVERTISING AGENCIES.

3. Largest architect—and engineer—circulation.

4. Top market coverage. 88% of the total dollar volume of all architect-planned building—including *94% of all school construction* is *verifiably* in the hands of Architectural Record's own architect and engineer subscribers.

5. Lowest cost per page per 1,000 architects and engineers.

6. Advertising leadership—by a margin of 72% more advertising pages than the second architectural magazine (6 months 1958).

Ask for full information on Architectural Record and all the markets it serves.

**Advertising agency study available on request.*

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ARCHITECTURAL RECORD

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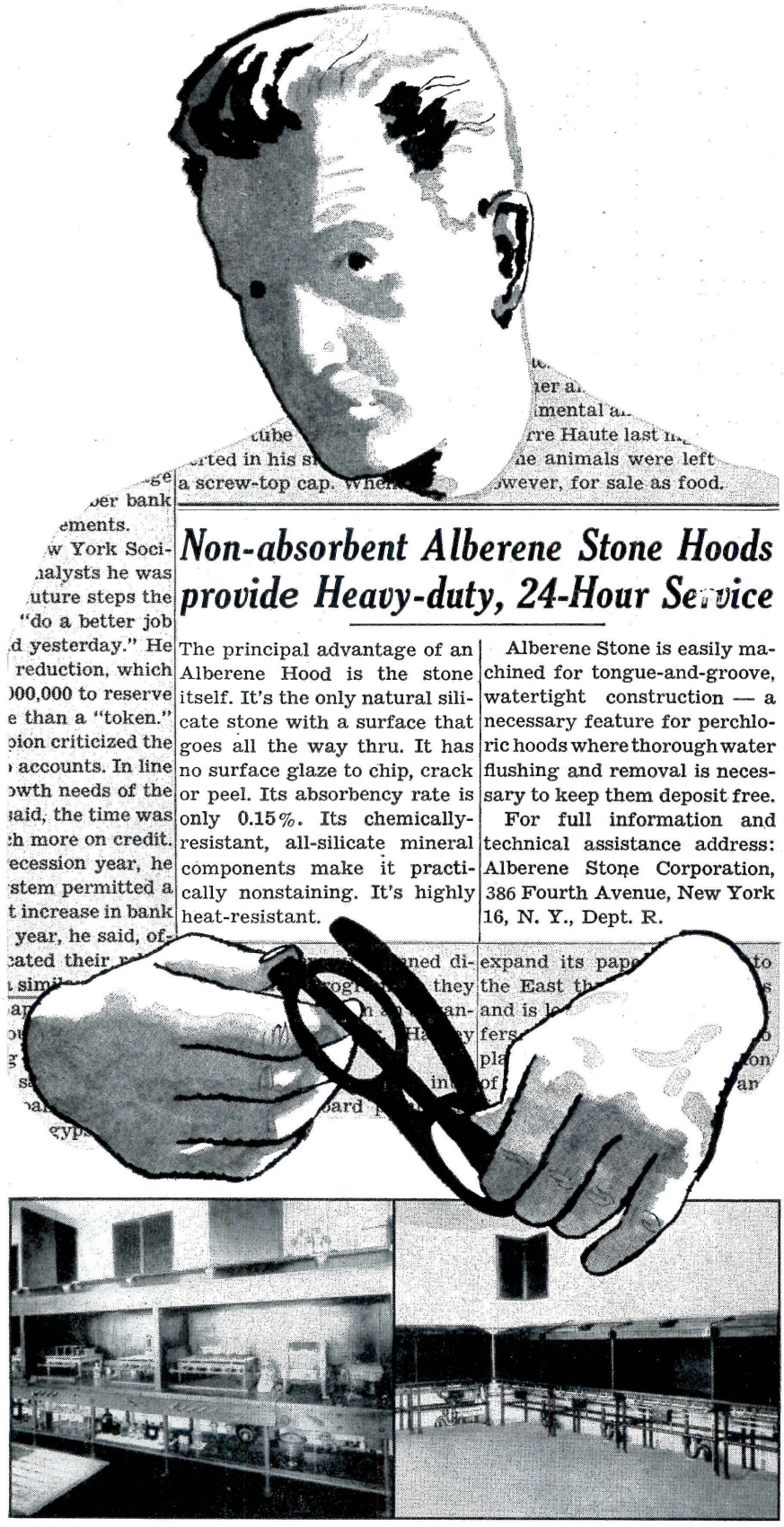
Oxford 5-3000

NOTE: A well-rounded sales program for most products in the new school market must include the *school administrator*, focal point for the formulation of educational programs and school building needs.
Architects and engineers *specify;* school administrators *approve and buy.*
A combination of *Architectural Record* and *The Nation's Schools* will give you top coverage of architects, engineers and school administrators at the lowest cost. Ask for details.



Washington Topics

continued from page 56

All construction must be in accordance with a comprehensive approved state plan.

Enacted first in 1946, the law was amended in 1949 to increase the original grant authorization of $75 million annually to $150 million. At the same time, this first major amendment provided for variable project matching ratios on the basis of comparative financial need. Federal grants have consisted of one third to two thirds of construction cost.

In 1954 Congress added to the general construction grant section a new authorization bringing four added categories into the program. These were chronic disease hospitals, medically supervised nursing homes, diagnostic or treatment centers and rehabilitation centers.

Another measure passed recently by the House would enable religious organizations with objections to accepting Federal grants to secure Federal loans for building hospitals and other health facilities. Such loans would be made for periods up to 40 years. Interest charges would be the current average yield on all outstanding marketable U. S. obligations plus one quarter of one per cent.

Continued Uptrend in Apartments Seen in N.A.R.E.B. Survey

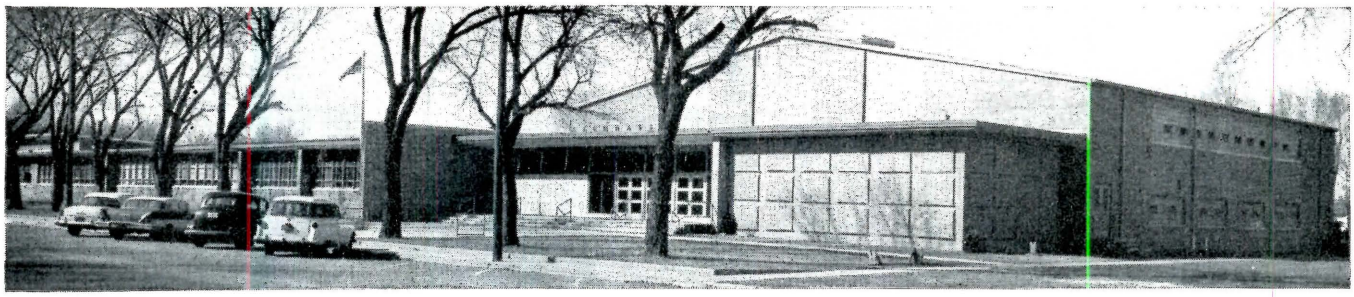
The trend toward increased apartment house construction will remain on the increase, according to reports assembled from 211 real estate boards throughout the country. The survey was another in a long series conducted by the National Association of Real Estate Boards.

Realtors in most of the large cities of the nation said they expected the volume of apartment building, increasing for the past several months, to continue to increase, perhaps reaching new high levels in the remaining months of 1958. The improved output still is considered relatively low, however, the national association reported.

Seventy-three per cent of those reporting from metropolitan areas foresee a continuation of the current increased level of production or higher rates of apartment construction in the months ahead.

Senate Group Releases New Batch Of Views on the Economy

Public works spending continues to be a feasible method of combatting recession in the opinions of several



Stafford Intermediate School, Stafford, Kansas
Architects: Hibbs, Robinson and Petit, Wichita, Kansas

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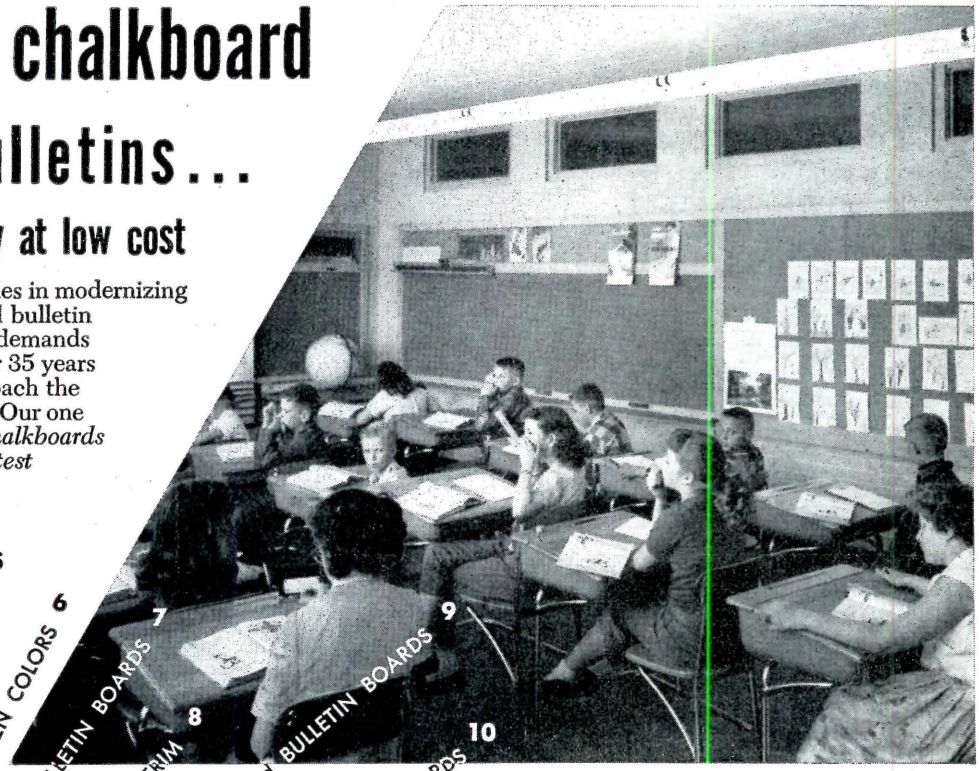

1 DURACITE CHALKBOARDS in SEVEN COLORS
2 GRAPHOLITE CHALKBOARDS
3 ASBESTOCITE CHALKBOARDS
4 HORIZONTAL SLIDING CHALKBOARDS
5 VITRACITE PORCELAIN ENAMEL CHALKBOARDS
6 DURASTEEL CHALKBOARDS in SEVEN COLORS
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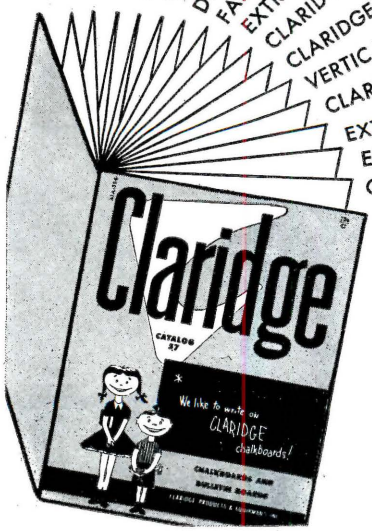

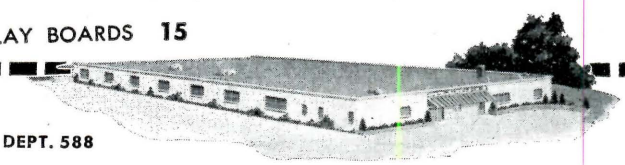

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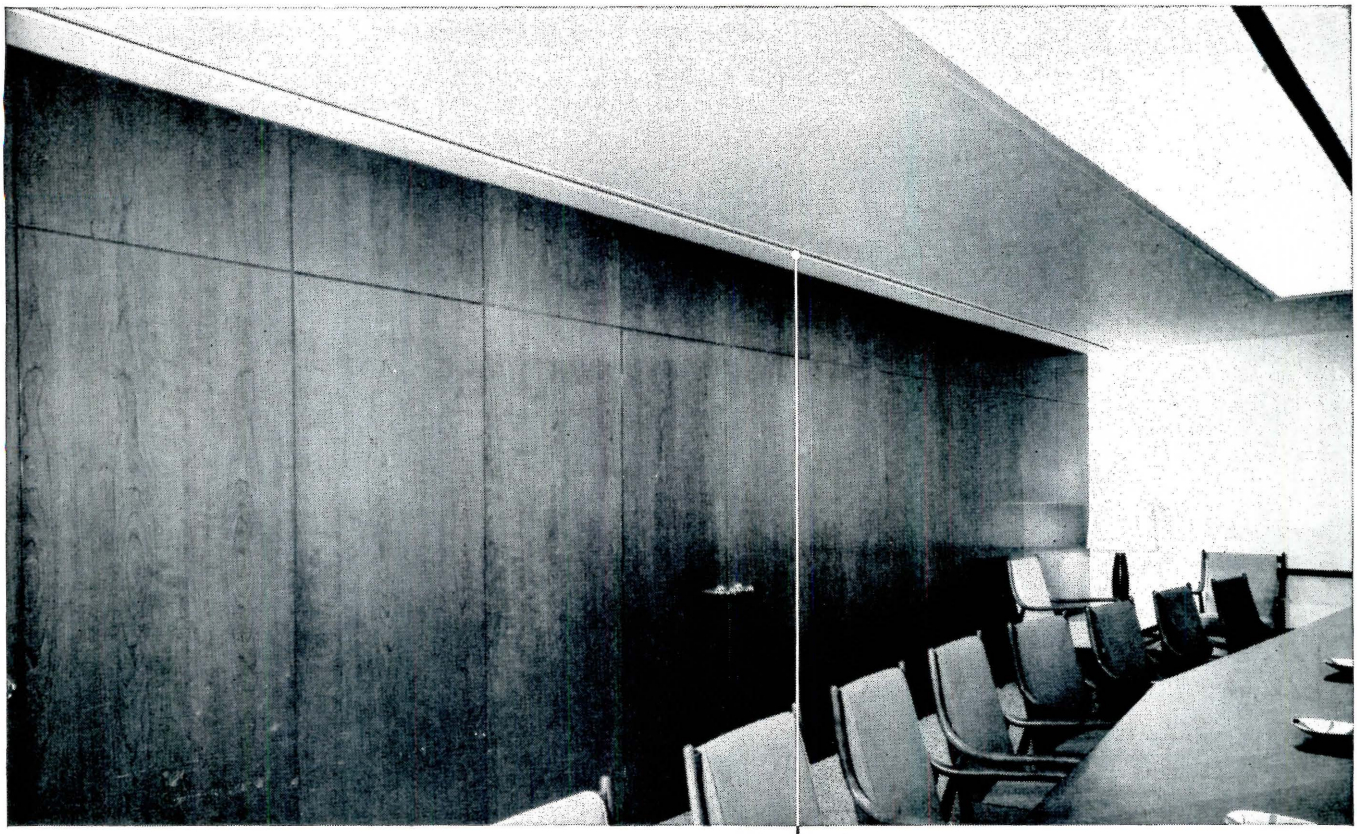

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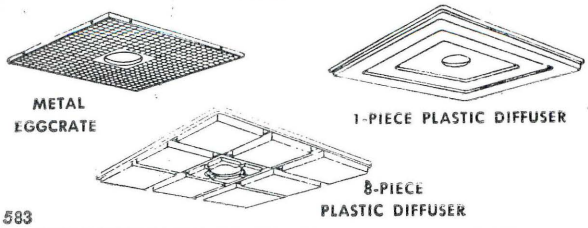
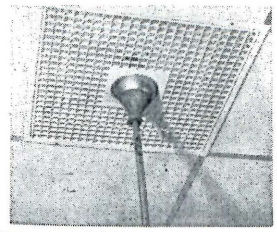


RELAMPS FROM FLOOR



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Washington Topics

economists. The Senate Finance Committee released communications from a number of the nation's leading economists, professors and businessmen giving assorted views on what is wrong with the national economy and how the trouble might be corrected. A majority agreed that a public works program would have some usefulness in stemming and reversing a recession trend.

James W. Angell, professor of economics at Columbia University, for example, urged greatly increased Federal aid to state and local government groups for the construction of schools, hospitals, slum clearance programs, highways and other projects of "high social value." He called for aid in the form of total Federal participation and purchase of state and local government bonds where debt limitation statutes permit. He called attention to relatively large increments of employment locally that such spending would generate.

Arthur Burns, National Bureau of Economic Research, Inc., New York, proposed enlarging the Federal government's planned public works program so that going projects might be "stretched out" during inflationary periods.

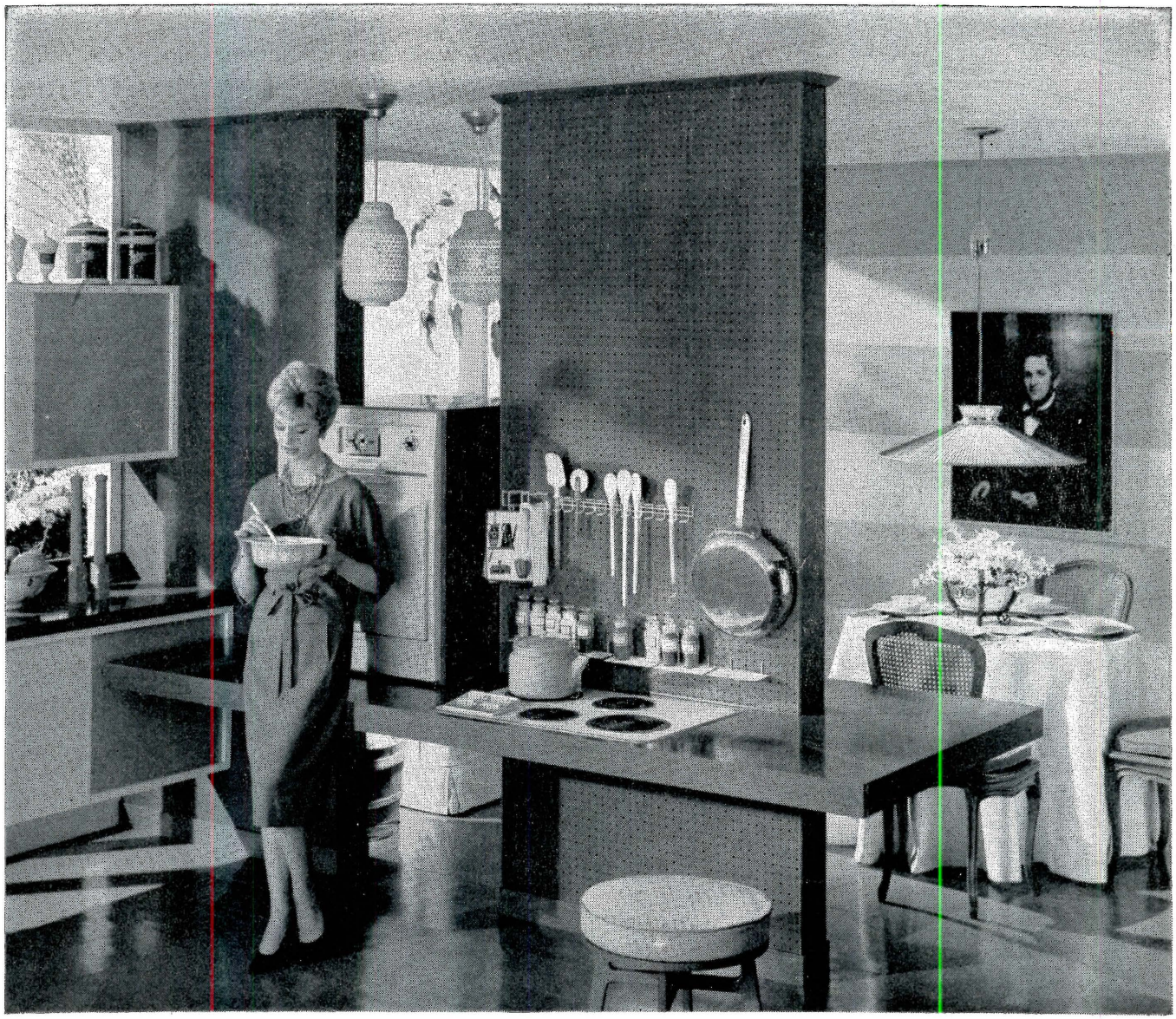
Public works spending also was favored by Gerhard Colm, National Planning Association economist, in times of economic recession. He recognized that a substantial lag is involved timewise, however.

And Howard S. Ellis, department of economics, University of California, told the committee in his reply that he felt public works spending should be considerably increased when unemployment exceeds six or seven million persons.

On the other hand, public works spending is too slow to be of much value in a recession period, and is inflationary, in the opinion of Edmond H. Leavey of the International Telephone and Telegraph Corporation.

Senate Battle on Housing Bill Starts in Committee Reports

The omnibus housing measure of 1958, with its important slum clearance and public housing provisions, was headed for a stormy session in the Senate as minority members of the Senate Banking and Currency Committee filed their own opposition report to the committee's bill. The fight centered principally on the public housing issue. Senator Homer Capehart (R-Ind.) led those who insisted that the committee's liberalized treatment of this program wan-



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dered far afield from the original Congressional intent.

Objection was focused on the committee bill's liberal treatment of low-rent public housing. Protesters claimed that in committee form the legislation would offer public housing occupancy to middle-income families against the original purpose of the law. They also fought an effort to give local public housing authorities greater flexibility in the handling of profit funds from their projects.

Senator Capehart had promised to try to cut back the committee's slum clearance authorization of $2.1 billion for slum clearance and urban renewal grants to the $1.3 billion sought by the Administration. Objections also appeared to a proposed $250 million in direct loans for use by colleges and universities in constructing classrooms. This, said the opponents, would infringe on jurisdiction of the Senate's Education Committee which rightfully handles such matters.

A total of 10 objecting amendments were promised at the time the bill cleared committee.

The amendments would not interfere with proposed construction of 105,000 public housing units during the four fiscal years following enactment of the measure as provided by the committee bill.

Other amendments were offered to eliminate an increase in FNMA (Federal National Mortgage Association) purchase authority for cooperative housing mortgages, to knock out the $150 million for direct home loans to veterans, to substitute a Title III under urban renewal where planning grants could be substituted for advances now made by Housing and Home Finance Agency, thus eliminating loss of these funds when advances are not repaid, and to remove from the committee version "excessive" increases proposed for FHA mortgage insurance ceilings. The last named item would apply to rental housing programs.

New Ruling on Discrimination Covers FHA and VA Housing

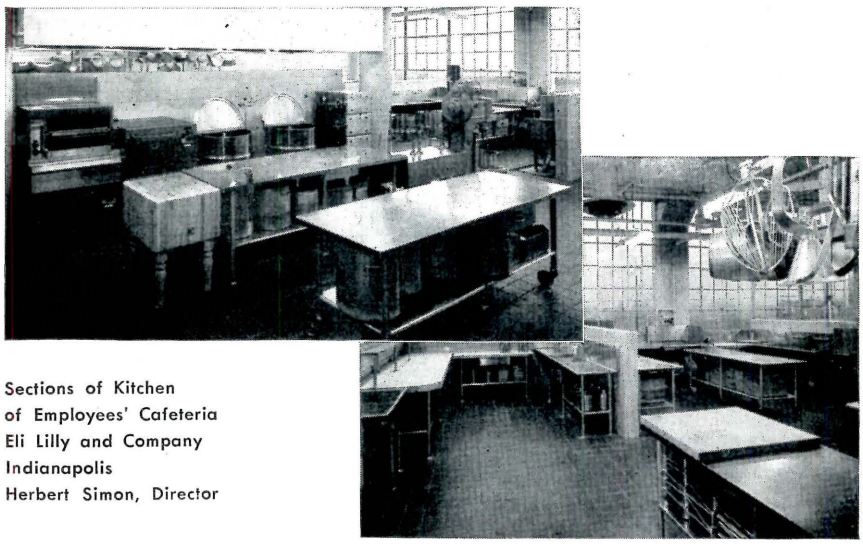
Conditions of sale in regard to minority groups are posing increasingly intense problems for home builders throughout the country.

A state court ruling in California has held that there can be no racial discrimination in the sales of housing units financed with the assistance of Federal Housing Administration or Veterans Administration. This has brought the matter to a head on the West Coast.

In the East attention was focusing on the third city to be constructed by William Levitt, large-scale New York home builder, in New Jersey between Camden and Trenton. He had said in Washington in June that he planned to follow the same conditions prevailing in his other two communities—Levittown, Long Island, and Levittown, Pennsylvania. Those are both all-white developments.

The National Association of Home Builders, confronted with the California situation, said it would stand for the time being on its statement made to Congress in 1955 by its then president, Earl "Flat Top" Smith of El Cerrito, Cal. This expression, delivered to the Senate Banking Committee, placed the association in the position of urging tolerance by everyone—both in and out of government—in regard to the builders' problem. The problem was stated thus:

"Home builders must operate in the marketplace under conditions which are completely beyond their control. The conditions in the home



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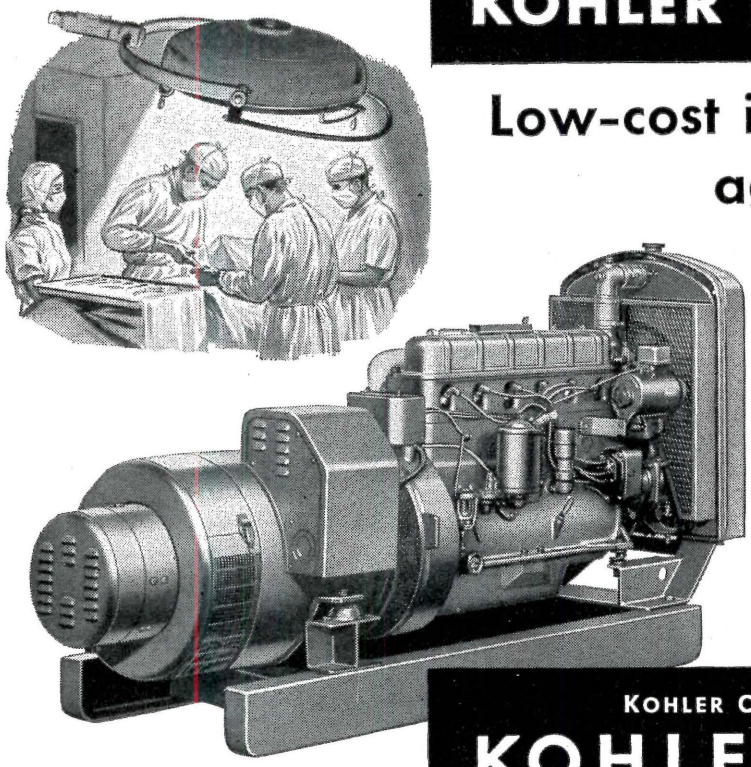

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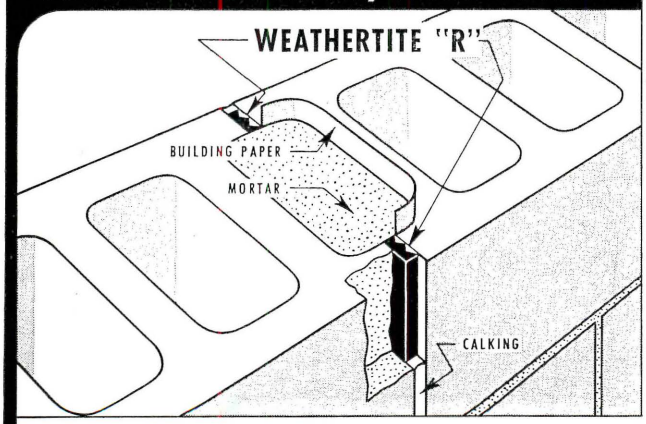

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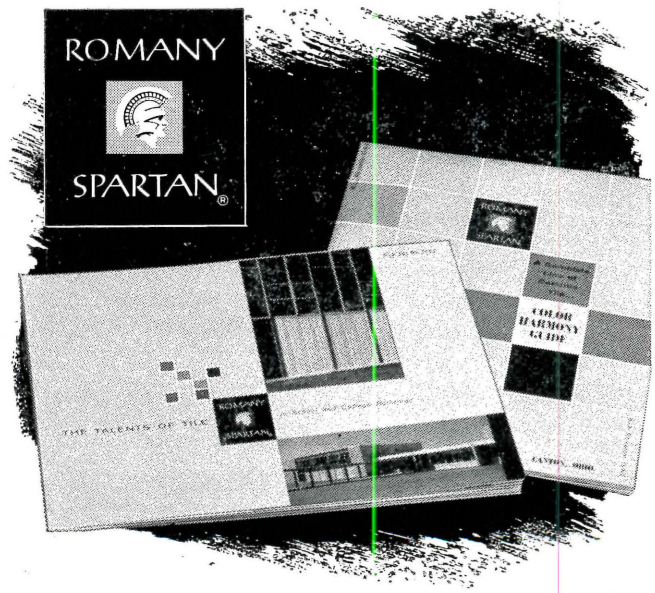

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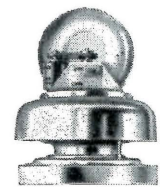

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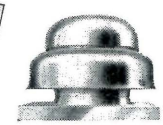

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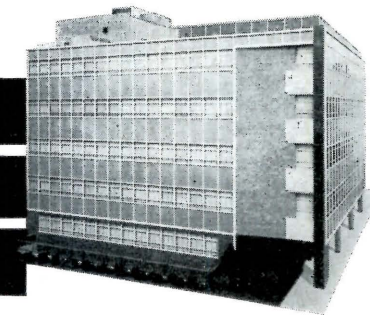

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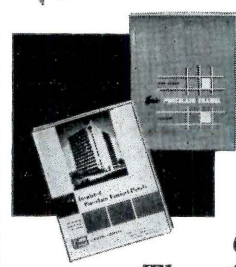

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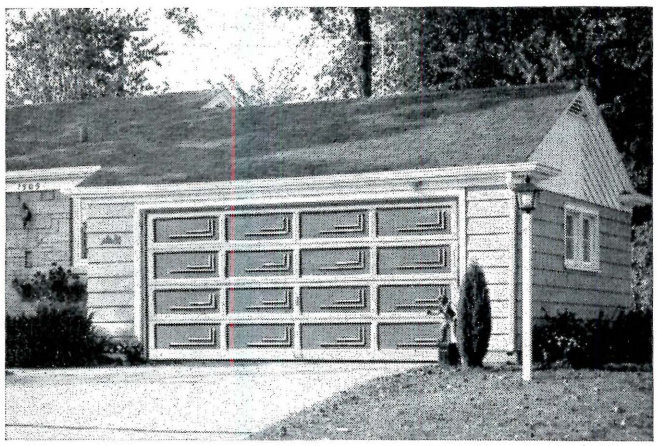

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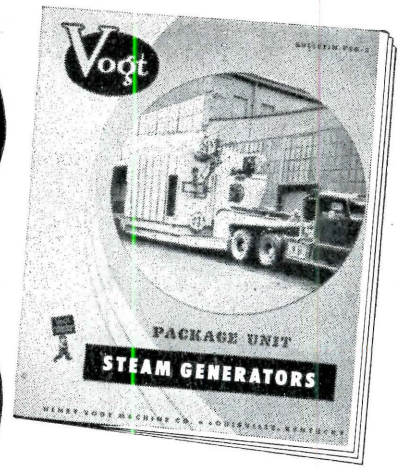

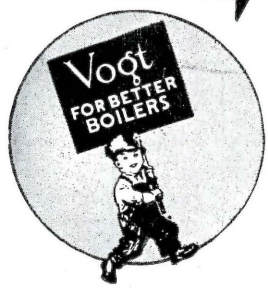

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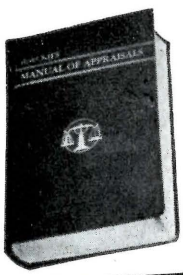

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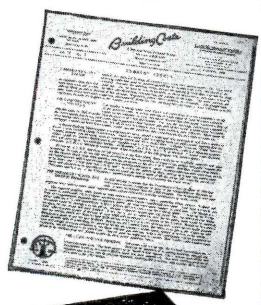

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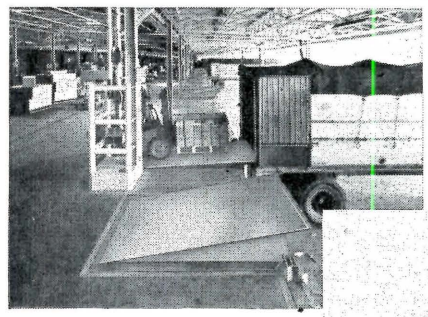

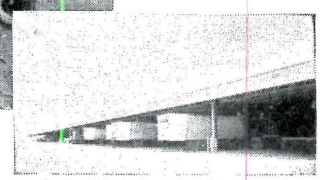

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building marketplace across this country as they relate to housing for minority families arise from a deep-seated emotional conviction in the minds of people who make up this home buying market. This emotional conviction, held by so many of the American people, cannot be changed overnight by legislative process, administrative directive, or any industry. We hope that one day this attitude will have disappeared through education, understanding and tolerance.

"Those who insist that housing for minority families must immediately be on a non-segregated basis completely ignore this basic fact; that is, the condition in the marketplace—a marketplace made up of people.

"We as home builders recognize the large potential which lies in the field of minority housing. We ask, however, that all people both in and out of government, recognize that there is no 'pat answer' to the serious problems involved.

"We as home builders are dedicated to the task of doing everything possible to build good, sound housing for all people within this country, but such housing must be fitted into the conditions of the housing market—conditions which arise from the attitudes and feelings of people and which are completely beyond the control of our industry."

Weather Delays Completion of Asphalt Test Strip

Completion of the asphalt test strip at Columbus, Miss., was delayed by bad weather this spring; it could not be finished until the end of July. This stretch is an official project of the Army Corps of Engineers, built to test design criteria of flexible pavement in relation to heavy bomber plane use.

One school of thought holds that the heavy "channelized" traffic of the B-52 landing gears makes rigid pavements necessary on taxiways and warm-up pads. Others are just as convinced that flexible pavements, properly installed, will withstand the weight of the bombers.

This argument has been the subject of a Congressional hearing and the present test strip at Columbus is a result of that session. The verbal struggle became particularly intense when the asphalt industry complained to Congress that the Air Force was discriminating against its product. At the conclusion of the hearings before Representative Hebert's House Armed Services sub-

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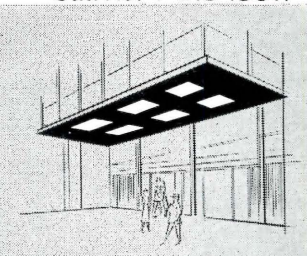

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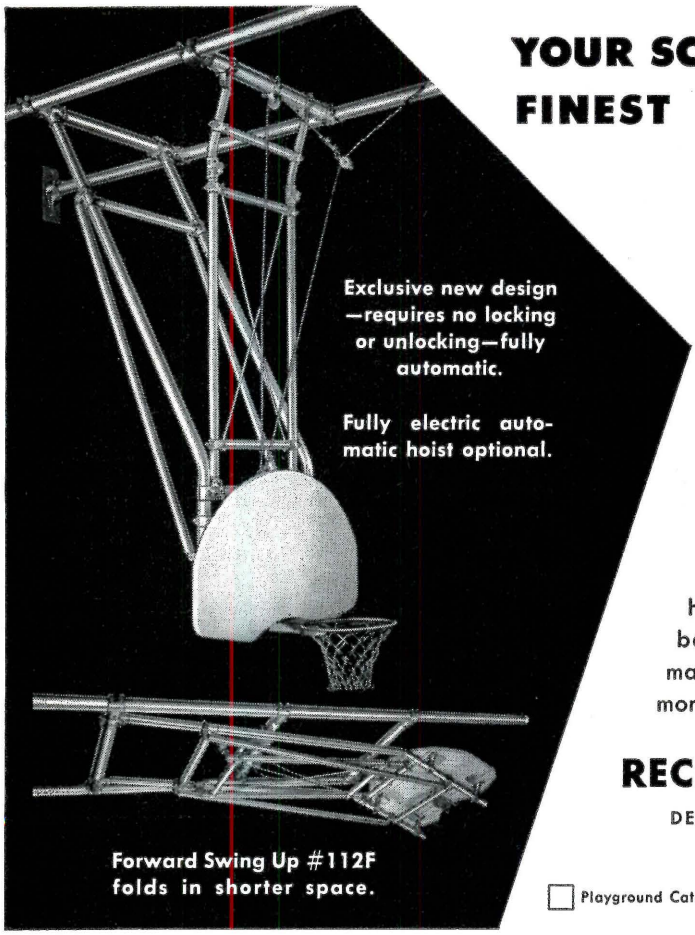

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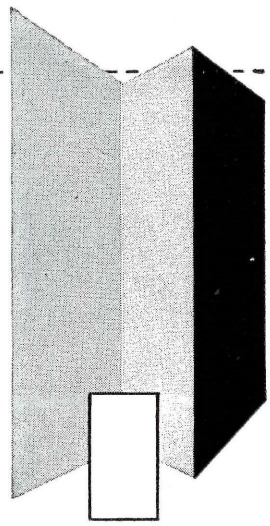

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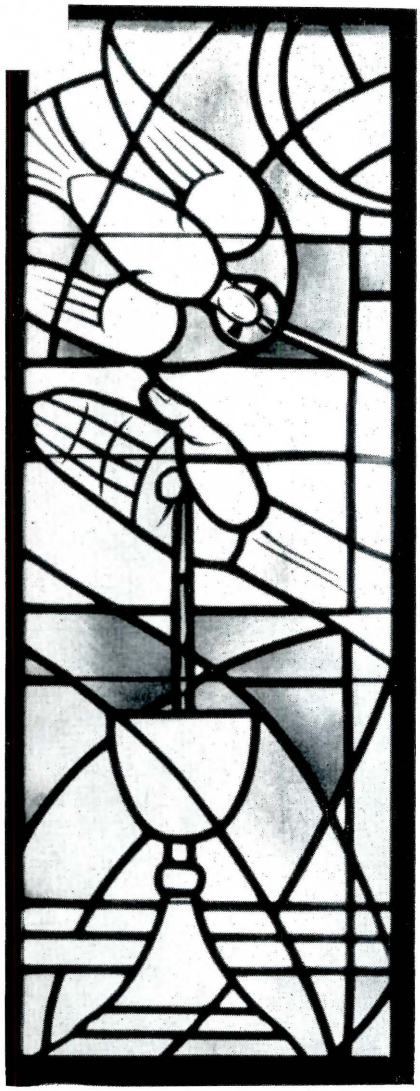

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Washington Topics

committee, the Air Force was directed to begin the test of the design criteria in cooperation with the Army Corps of Engineers.

The traffic test lane is about 14½ ft wide and 200 ft long. A cart, equipped with one of the four-wheeled plane's landing gear and weighing 212,000 lb in total, will make 5000 trips on the strip. It is estimated that the weight is about 80 per cent of a B-52, accounting for factors of speed and lift at landing or take-off.

Survey Reports Cheapest House Ranges from $8990 to $15,000

Real estate and business editors of 29 daily newspapers report through a survey conducted by the National Housing Conference that the median price for the cheapest new three-bedroom home available in the U. S. is $10,990.

Less than 30 per cent of the nation's families can afford to buy and maintain a new house at today's prices, the Conference survey indicated. It appears in the *Housing Yearbook* of the Conference for 1958.

Range in minimum prices for new homes was from $8990 in a New York City suburb to $15,000 in Rochester, N. Y. Median for northern cities was $12,000 and for southern cities, $10,075.

Purchasing power in the conclusion was based on the assumption that a family should not spend more than one-fifth of its income for housing, including utilities, taxes, insurance and maintenance.

FCDA Issues New Bulletins on Fallout and Blast Shelters

A new technical bulletin providing guidance to architects, engineers and contractors in the planning and construction of family shelters for protection against the effects of radioactive fallout beyond the blast range of nuclear explosions has just been published by the Federal Civil Defense Administration.

This guide presents basic standards for fallout shelters and recognizes the new emphasis placed on fallout protection by Federal officials. Covered in brief detail are shielding, ventilation, equipment and supplies and sanitation for three types—outside underground, basement and aboveground.

The bulletin, entitled "Family Shelters for Protection Against Radioactive Fallout," carries a guide to contracts and specifications.

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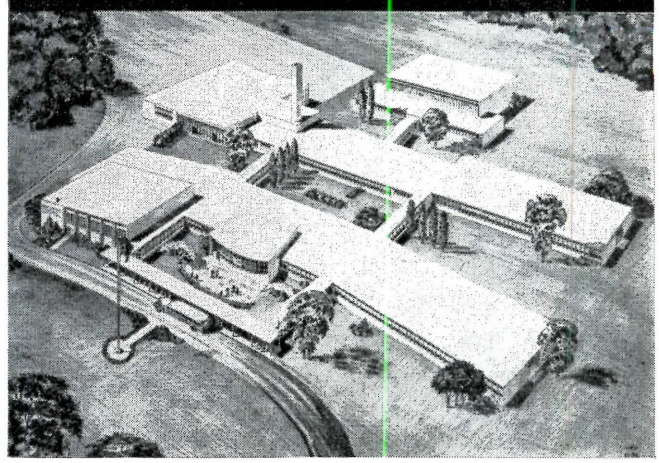

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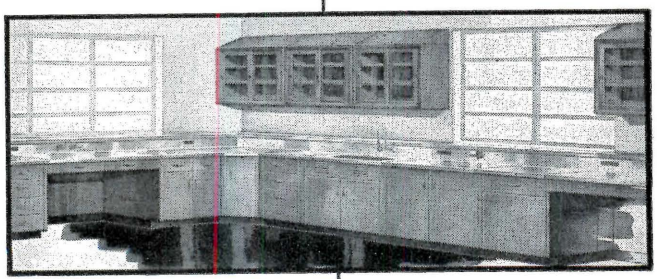

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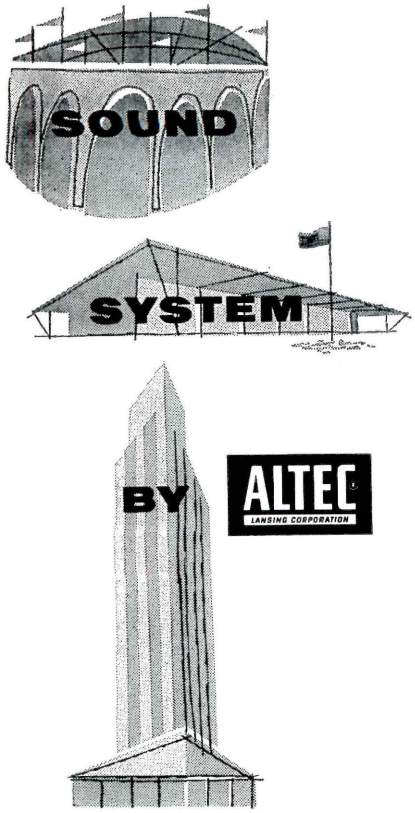

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Required Reading

continued from page 64

omitted, although the properties of Thiokol are listed among the synthetic rubbers. This amazing material has rendered obsolete the formerly correct principle that no calking compound can be relied on by itself for complete waterproofing of joints.

In any book of this kind each reader will find some topics he feels could be better treated, but on the whole this *Building Construction Handbook* is the best and most up to date I have seen. Many sections of it could be used as texts in architectural and engineering schools. It will be a valuable addition to the library of anyone connected with the building industry.

An Abbey And Its Architect
Adventure in Architecture: Building the New Saint John's. *Text and Pictures by Whitney S. Stoddard. Plans by Marcel Breuer. Longmans, Green and Co. (New York), distributed in cooperation with F. W. Dodge Corp., 1958. 127 pp., illus. $8.50.*

This is a story of architect-client relationship and sympathy to warm the heart—the tale of how architect Marcel Breuer and the Benedictine community of Saint John's worked together in planning and starting to build a new monastic community near Collegeville, Minn.

It begins with the selection of an architect—a task handled, in this case, with intelligence and understanding. Next, the development of a program and design for a long-range plan embracing 19 buildings, to be constructed in six stages over a period of 100 years.

The monastic wing was the first actual structure to be built; it was completed in the fall of 1955 after 15 months of construction. Twenty percent of the labor was furnished by the monks, who achieved fine quality in their work. The next stage, the building of the Abbey Church, is now under way.

The scope and imaginative design of Breuer's master plan, as well as the cooperative spirit that has grown up between him and the monks, are lessons in creativity and human understanding. Architects can profit from reading this volume, which can serve also to enlighten and guide building committees about to embark on a project, of whatever nature.

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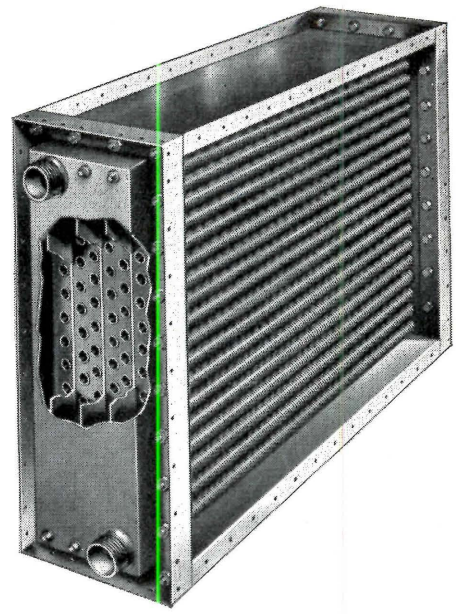

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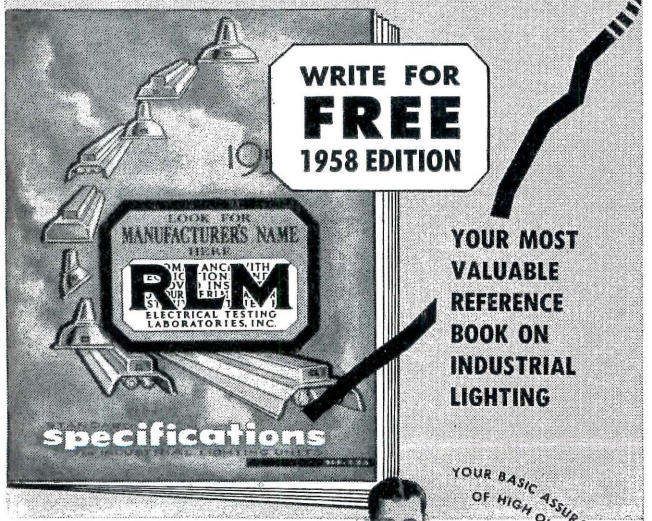

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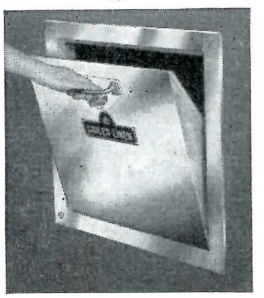

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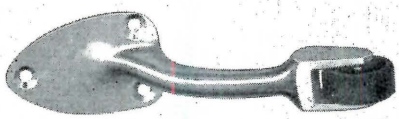
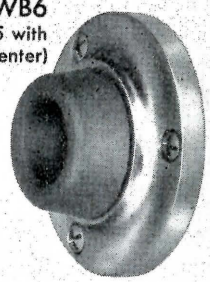
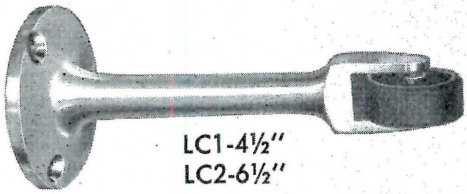

LBC

WB6
(WB5 with solid center)




LC1-4½"
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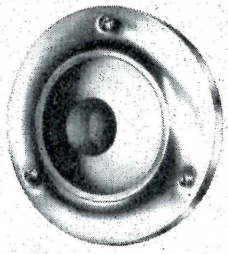
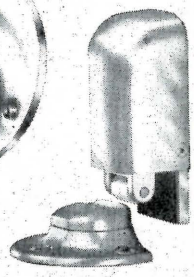

3507
(solid center 3508)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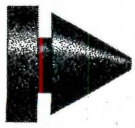
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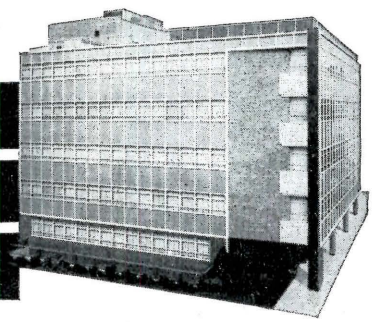

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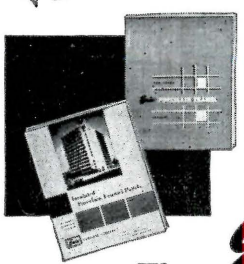

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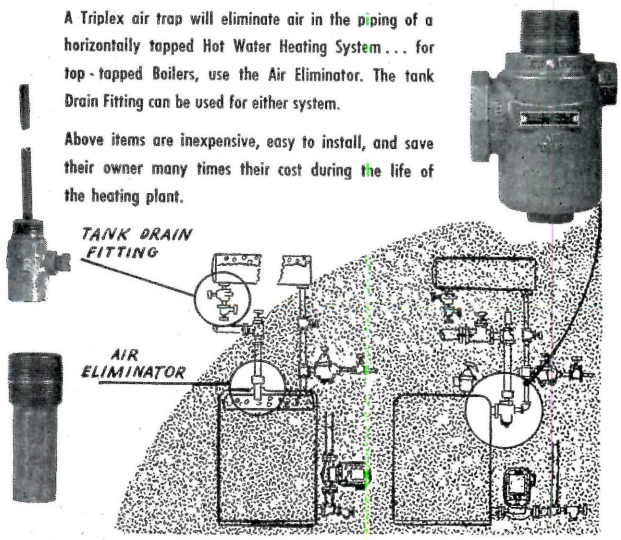

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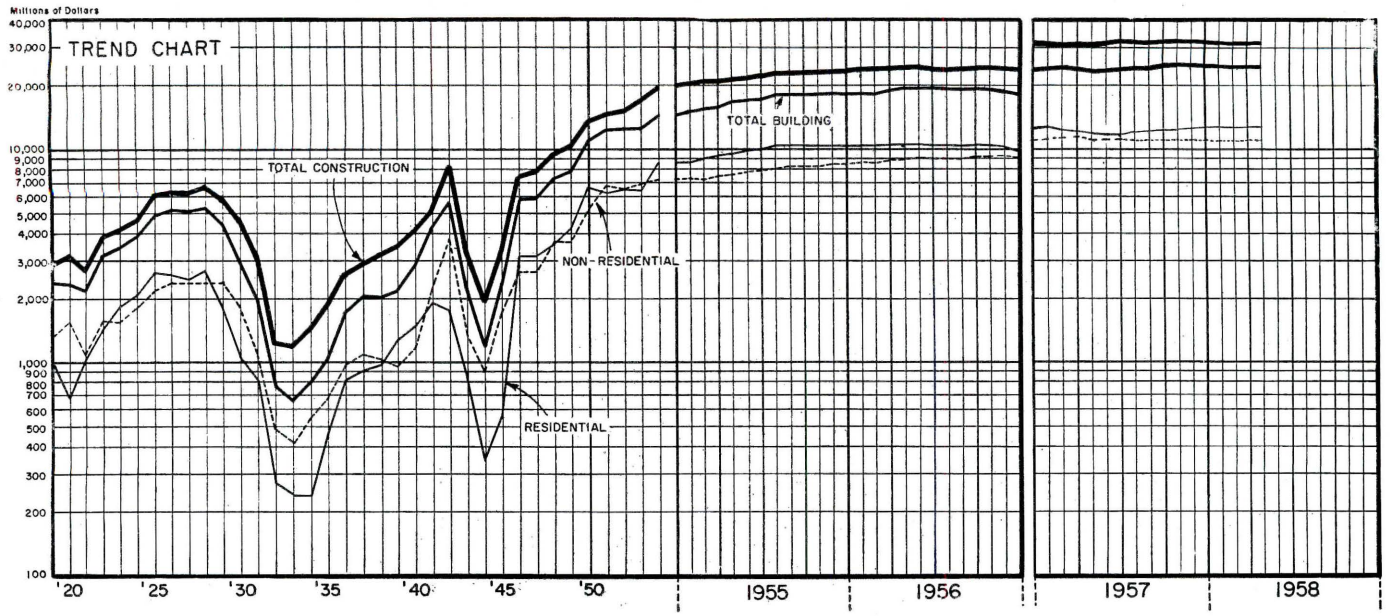
Current Trends in Construction

As Reflected in Contracts for Future Construction in the U.S. Reported and Tabulated by F. W. Dodge Corporation



JUNE TALLIES ANOTHER ALL-TIME RECORD

For the second consecutive month, the latest construction contract totals reported by F. W. Dodge Corporation set a new high for any single month. The June figures, released on July 30, showed a total for the month of $3.8 billion; this was 12 per cent above the previous high record set only the month before and 18 per cent higher than June of 1957. The six-months cumulative total for the year was $16.7 billion, down one per cent from the comparable 1957 period. Large increases in residential, public works and public utility contracts boosted the June total; but Dr. George Cline Smith, Dodge vice president and economist, noted that the gains were general through all types of construction, with only a few exceptions.

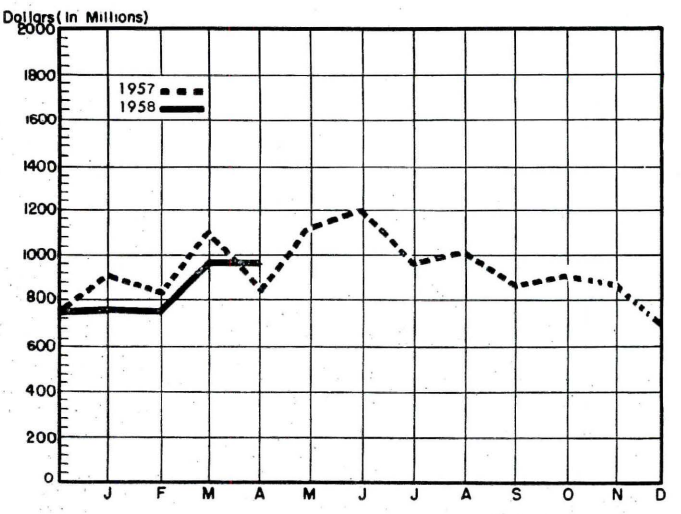
"When signs of an upturn in construction contracts first appeared in April," Dr. Smith said, "we reported that the recovery seemed to have a broad, solid base. This fact has been more than confirmed in May and June, with the dollar figures exceeding all expectations.

"A number of very large utility contracts, particularly in connection with the St. Lawrence Seaway project, helped boost the June total, but the most encouraging feature was perhaps the big increase in housing activity across the nation.

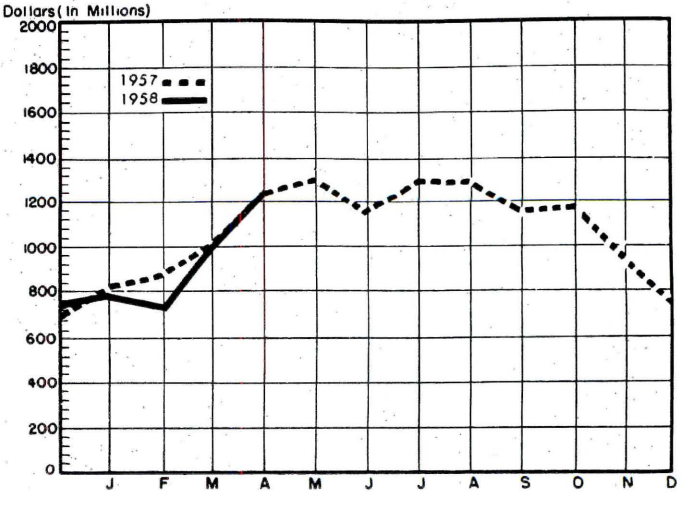
"The effect of government programs was particularly noticeable in June, since public ownership contracts were 30 per cent over the same month of last year. Nevertheless privately owned projects also rose by a substantial 11 per cent. Regardless of ownership, the net effect of this upsurge in the nation's largest industry is bound to be a big boost to the rest of the economy, which will be felt for many months to come as work proceeds on projects now under contract."

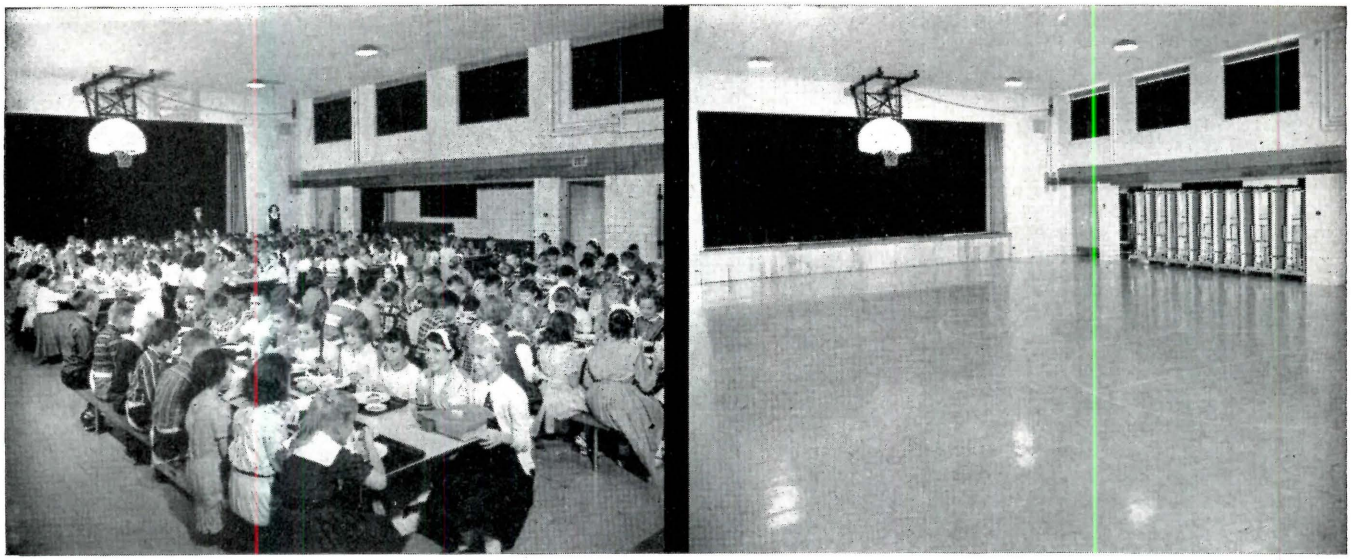
Within the nonresidential category, which showed an 18 per cent decline from June 1957, several types actually gained over the 1957 month—public buildings, religious buildings, hospitals and recreational buildings. Sharp declines were registered by manufacturing buildings (down 67 per cent) and commercial buildings (down 27 per cent); educational buildings dropped three per cent. The 20 per cent increase in the residential category included a 69 per cent increase for large residential buildings and a 17 per cent rise for one- and two-family houses.

NONRESIDENTIAL BUILDING



RESIDENTIAL BUILDING





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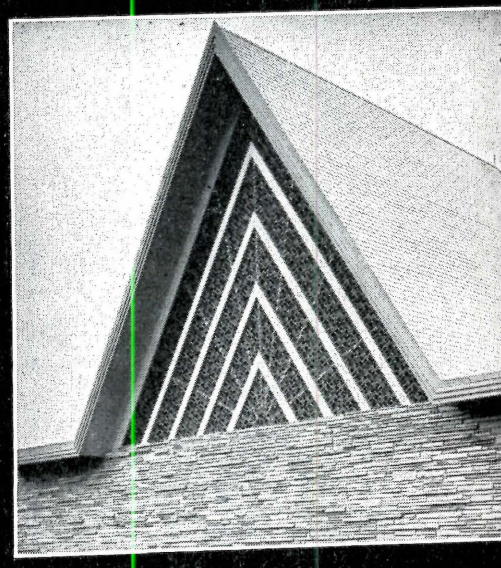

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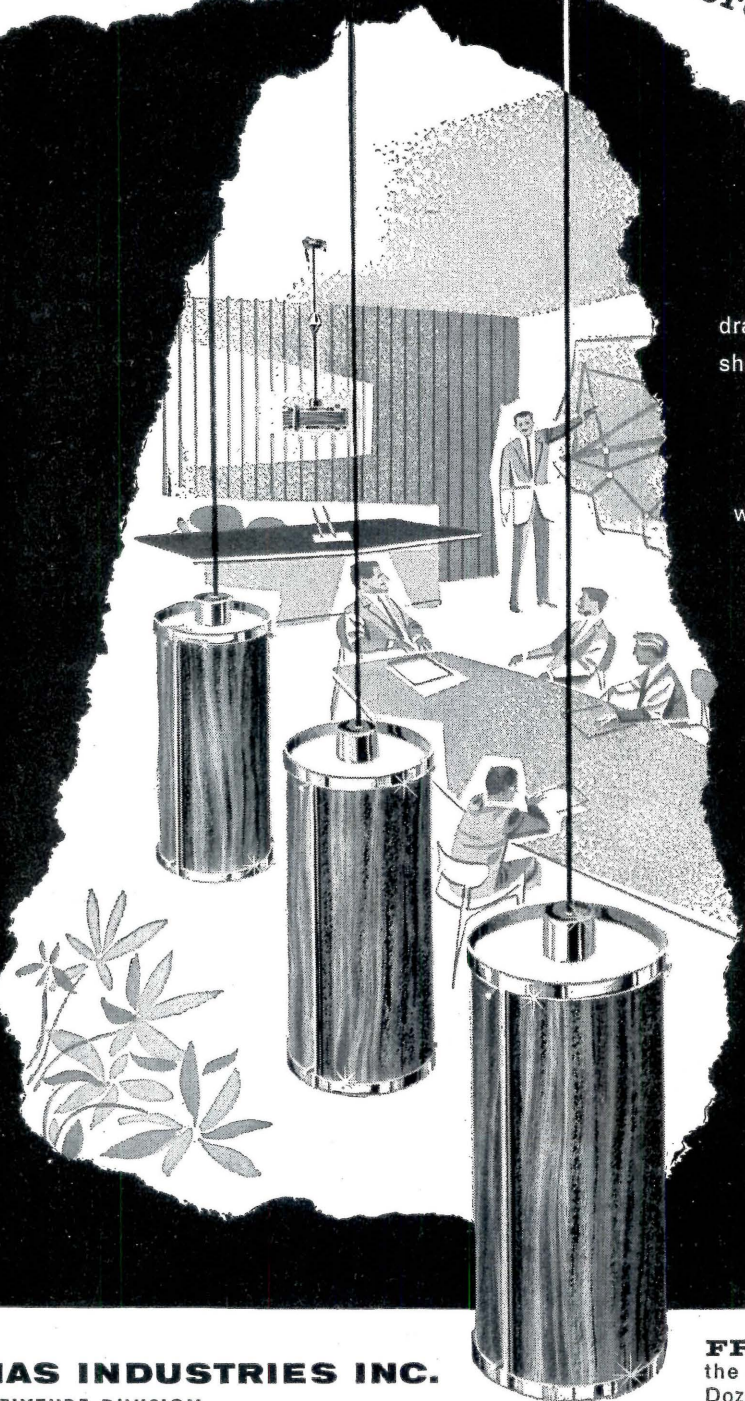

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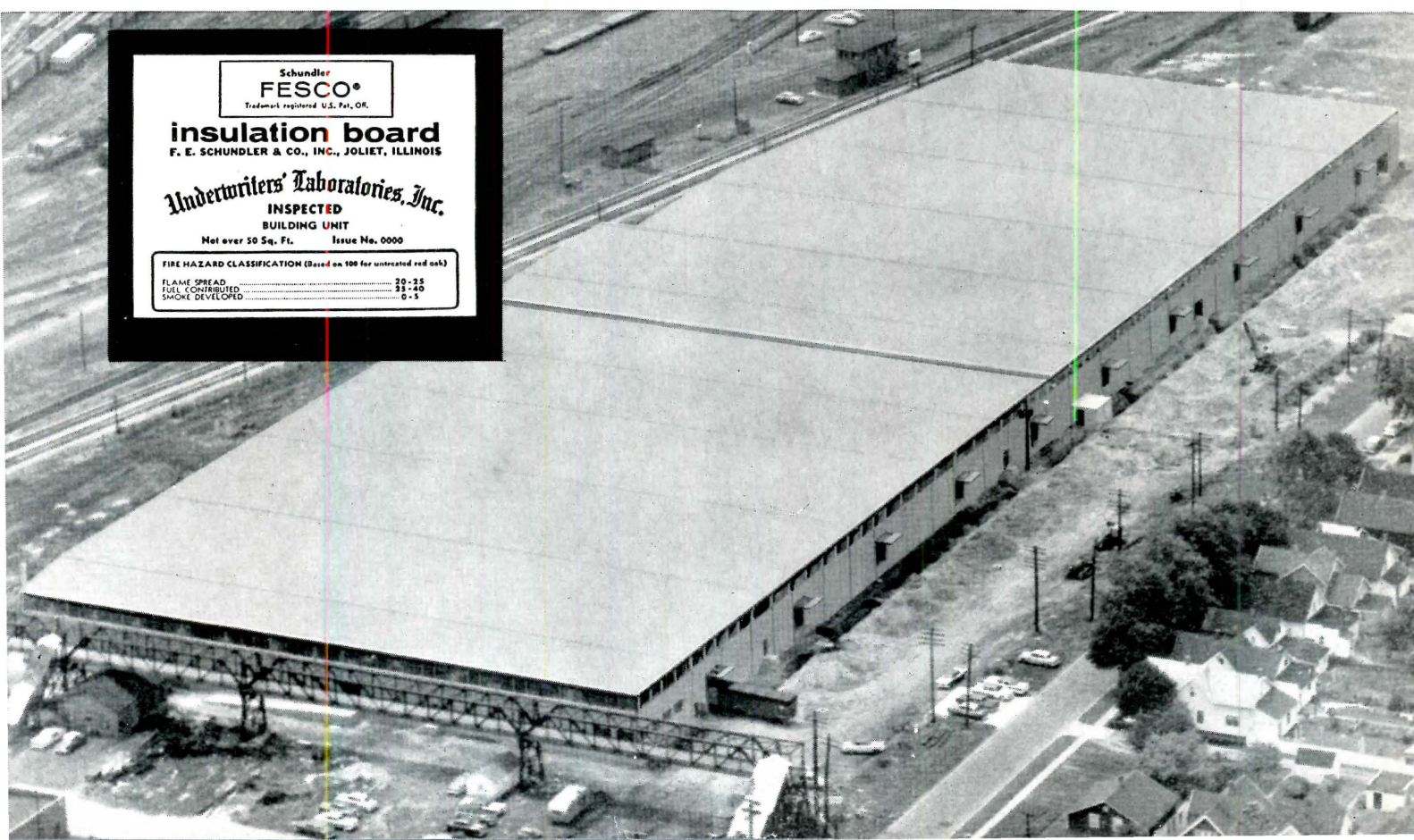

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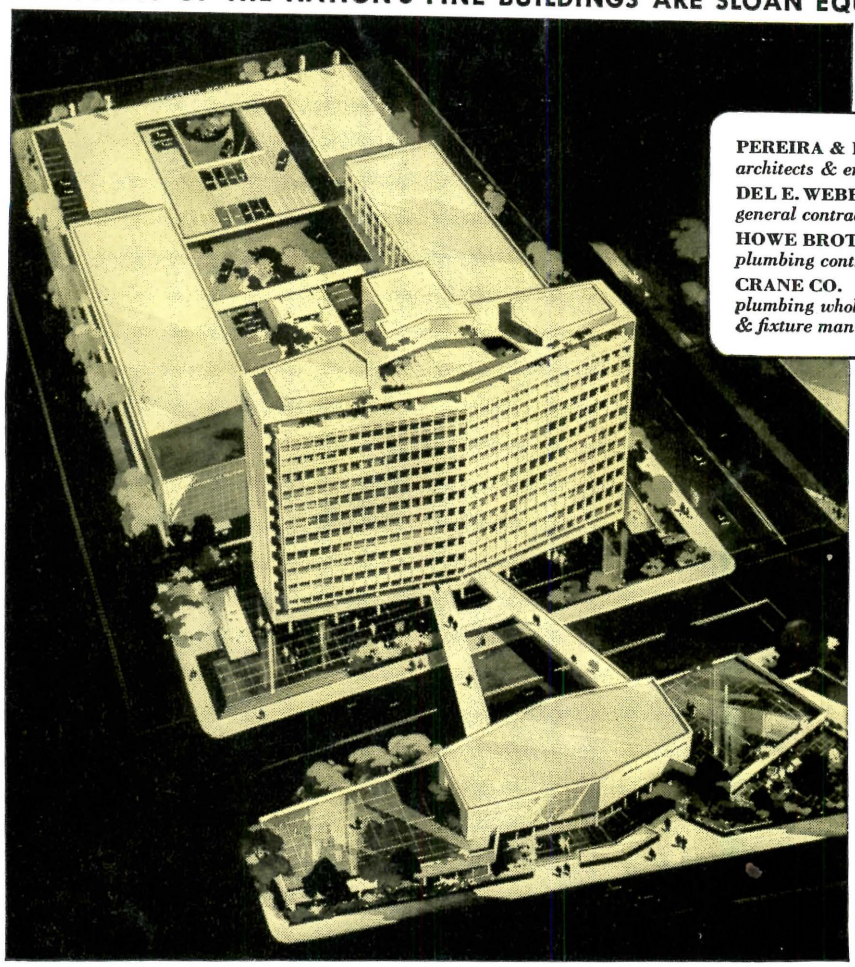

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