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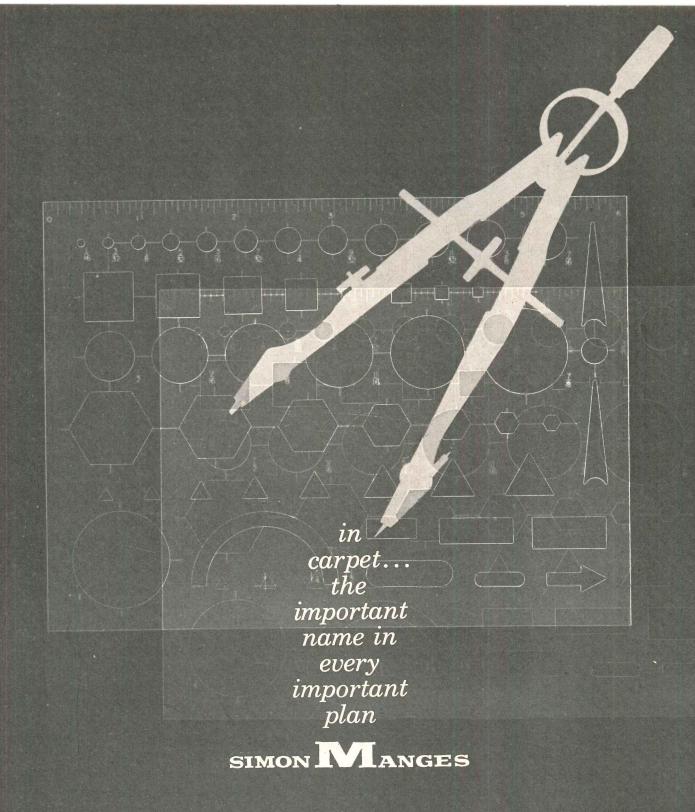
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Unity Church, Oak Park, Illinois, 1904-1908. Frank Lloyd Wright, Architect; John Szarkowski, Photographer

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Coming in the Record

CAMPUS PLANNING AND BUILDING DESIGN

As U.S. colleges and universities face ever greater need for ever more intensive use of their overflowing campuses, more and more architects are concerned with designing the campus as well as its buildings; and some considerable innovations in college building design already are emerging. Next month's study of college buildings reviews some of the significant current results, and leads off with a major analysis of the principles and problems of campus planning by Eero Saarinen.

AIR CONDITIONING AS ESTHETICS

Paul Rudolph's headquarters building for Blue Cross-Blue Shield in Boston is not only Rudolph's largest commission to date, and a major milestone in contemporary architectural experimentation with precast concrete forms, but a serious effort at architectural expression of the air conditioning system. It is a building that will be admired and chided—and very much discussed.

WHEN ARCHITECTS ARE CLIENTS

The six houses in next month's special 16-page house feature were all designed by architects for themselves; as every architect knows, the architect's most stirring challenge. This group offers some nice evidence of happy collaboration between architect and client.

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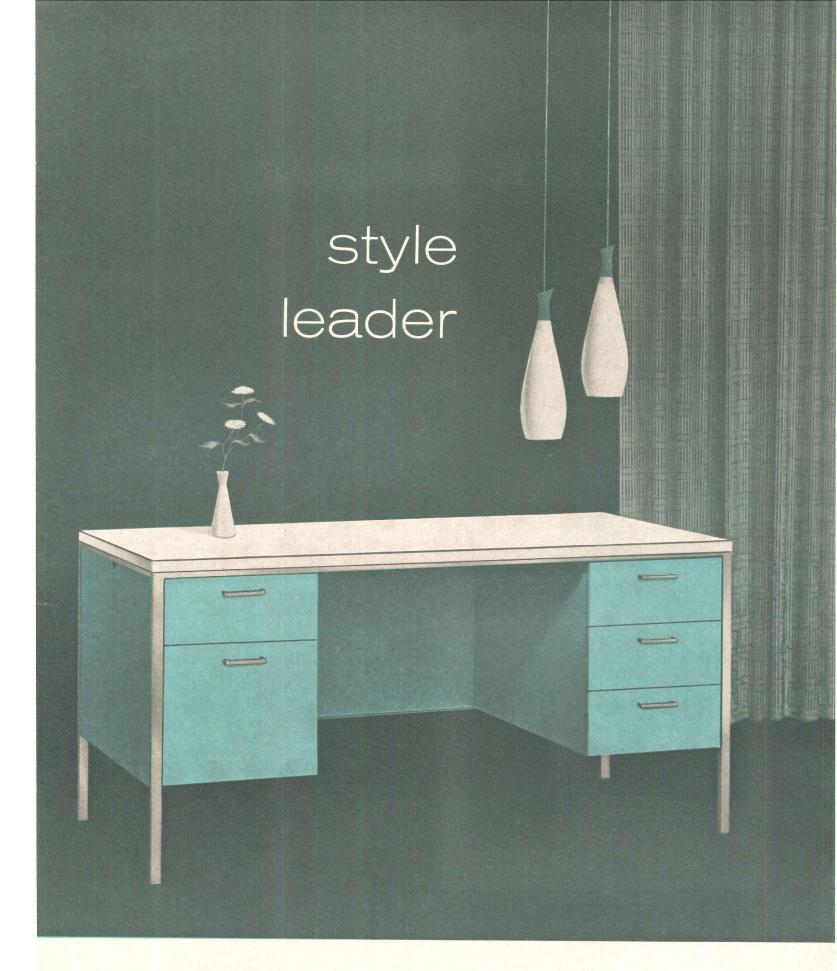
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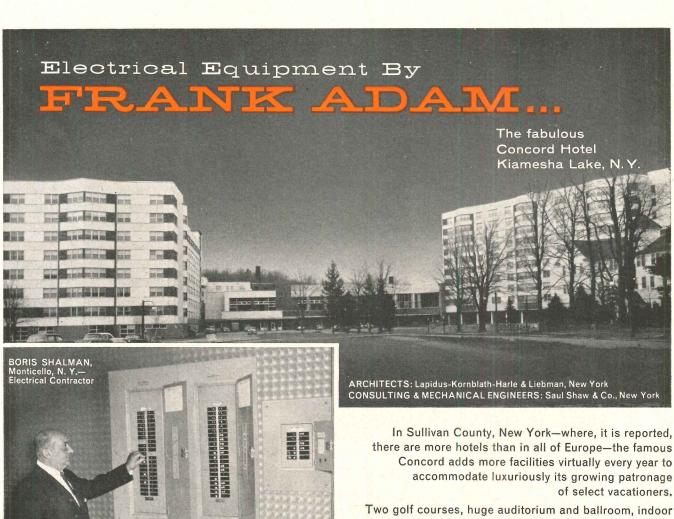
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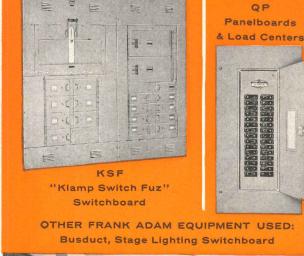


there are more hotels than in all of Europe-the famous Concord adds more facilities virtually every year to accommodate luxuriously its growing patronage of select vacationers.

and outdoor pools, indoor skating rink literally big enough for a football game, are but a few of the attractions that make the Concord one of the finest all-year resorts in America.

> It is significant that, for this year's new buildings, Frank Adam equipment was again chosen because of its previously proved reliability in other Concord structures.

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Behind the Record

The Complete Man Theme

Speaking of architects as doers (last month), a recent visit from Sir Arthur Stephenson was a reminder that architects are having to assume an increasingly creative role in international doings. The vast havenot areas of the world covet our architectural and construction achievements at least as avidly as our autos and our ball-point pens. They covet our hospitals (Sir Arthur) and our universities (Gropius), and when they are able to command the services of such men they cast them in the role of complete planners.

Now the "our hospitals" above is stretching it a bit, for Sir Arthur is of course the peripatetic Australian, holder of the R.I.B.A. gold medal and bearer of his title in recognition of his hospital architecture throughout the British Empire. But I venture to say that Arthur knows intimately more American hospitals (and their architects) than almost anybody in this country. You kid him about his love for travel-he gets around more than Dulles used to and he knows more American golf courses than Eisenhower-but his famous notebook has accumulated an almost complete record of what is done in the world's hospitals, why, and what it means in building design.

Small wonder that the Iraqi government wanted him to plan the facilities for its ambitious health program. The point of this piece, though, is that it wanted him in effect to plan its health program. One of the many have-not nations in this respect, it had no wish to dictate a program to a planner of his stature. So Arthur is building a great health center in Baghdad—at one time had some 70 men in a vast charette turning out drawings. Financial intricacies (his own and others') got a bit involved, so the architect by now

has instituted a broad program of financing for the whole enterprise, so that Iraq can buy materials and hire builders. So Arthur is now builder.

Walter Gropius, A.I.A. gold medalist (now don't tell me he isn't an American, even if Germany did give him a medal too) is similarly the master planner of a great university in Baghdad (ARCHITECTURAL RECORD, April 1959). Just as Iraq wanted a health program they wanted an educational program, and in the same manner they chose this architect to design the program as well as the facilities. And The Architects' Collaborative has now become TACI, the "I" for International, with a large office in Rome.

Two spectacular examples, now much in the news. It is not exactly news that American architects and engineers (and French and Italian and Greek and so on) operate virtually around the globe. Capital cities, mining establishments, military bases, hotels, housing. And embassies, especially embassies when it comes to exhibiting American cultural achievements abroad.

If American technological progress is putting strains on our architects, the wide world wants them as architects. Architects in the age-old meaning of the word. They want our technology and they want our engineers, but they seem to show a special fondness for our architects. They will expect, no doubt, that the architect will command the indicated technological necessities, but his architectural orientation is the membership card.

Maybe architectural students, while they try to get a sideline acquaintance with engineering, might also take an elective course in Arabic languages.

-EMERSON GOBLE

SALES VS. SERVICE (ARCH.)

Regarding your item in "Perspectives" in the August issue, you may be pleased to learn that I have been the Second Vice President of the Long Island Chapter of the Home Improvement Council for the past two years.

Home Improvers will require much education before any great number learn to use the services of an architect. My success in convincing even a handful is a milestone and even these few must be catered to with the patience devoted to beginning school children. Actually much of the difficulty lies in the relation of the Home Improvement Contractor with the home-owner. The former is not interested in entangling his sale with the professional approach of an architect who may point out fallacies in the "design" he has sold. Also, like many residential builders, they do not want the home-owner to be in a position of getting comparative bids. The larger firms who are represented on the Board of Directors are only interested in sales and do not care if their product goes into a poorly or well-designed improvement.

> Leon Rosenthal, Architect Babylon, N. Y.

SHALL WE TAPE FOR DRIVERS?

I have found that since I spend a great deal more time traveling by automobile than by public conveyance, since coming to Reading, I would like to use this time more profitably than listening to "What's with the Pittsburgh Pirates", etc., on the radio. Also, as with all architects, my time is limited—and too often the many excellent technical articles which I should keep up with, I can only skim through and pile on the shelf with other journals I "must read when I find time."

Many of these articles I feel could be taped and the tapes rented out to architects. This, together with a suitable tape recorder—which could operate in a car (many of which I'm sure are available)—could form the basis of a great deal of professional enlightenment for today's architect.

In fact, articles other than those appearing in the current issues could be done accordingly—possibly some arrangement for taping outstanding articles appearing in other journals could be made and a central library set up through which these could be loaned out. I believe this would be valuable to the profession and it does seem logical that this sort of thing should naturally evolve from a need which I believe exists.

I hope you may find this suggestion practical.

Ann M. Willis, Architect Wayne M. High and Sons Reading, Pa.

ARCHITECTURE VS. MONOTONY

A piece in the Chicago-American which expressed the fear that "the erector-set school of building" might turn all of downtown Chicago into "a featureless agglomeration of massive square buildings" inspired the following letter to the columnist, Ernest Tucker.—Ed.

I read with great interest your recent article titled "New Buildings Too Much Alike."

May I congratulate you on your "vague feeling of uneasiness" over the soulless piles of steel and tinted glass that you see rising or planned for Chicago.

May I add that contrary to your implication that these buildings are condoned by the profession, there are some architects who have been and continue to be appalled at the overwhelming boredom of our urbanscape.

Chicago has languished, unwittingly to a large degree, on the remarkable architectural heritage of the early skyscrapers—the Monadnock, the Garrick, 30 North LaSalle, Carsson's—of an architecture that is virile—in which imagination, per-

sonality, strength of principle, are evident and appreciated. Does Chicago realize that people come from all over the world just to see these masterpieces?

It's a pity that the adventurous spirit in which these great buildings were produced is not evidenced to-day. I am certain that these buildings of the past stemmed from ideas created by a single mind—the solitary artist-architect employing to the maximum all his faculties; not the least of which was imagination.

I can't help but believe that the vapid results about which you so rightly complain are the product of architecture by committee—safe—mediocre—unimaginative—a massive compromise of togetherness from the foundation to the roof. I see no idea here, no theme, no thrilling sense of achievement and purpose. I see no architecture—only buildings old before they are finished.

Whenever the corporations and companies that build realize their great responsibility in the selection of an architect and seek an architect on the merits of his total ability (not merely as an able businessman, or how many draftsmen he employs) and place purpose ahead of expediency, and understand that bigness bears no relation to architecture. then there is a chance that the corporate image sought for in the first place may be possible and that Chicago will once again delight in and enjoy a virile architecture instead of the timid, arid monotony we are faced with.

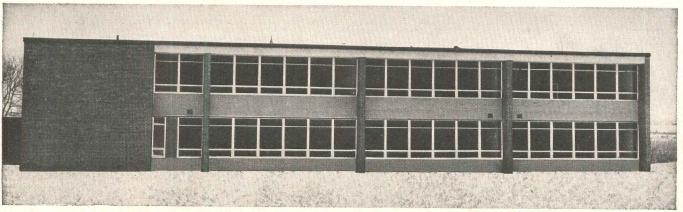
> Edward D. Dart, Architect Chicago

ANY COMMENTS?

This world does not have an unlimited amount of space for an unlimited amount of people. We do not even have an unlimited amount of fresh water. There are those who seem to think the answer lies in ignoring it.

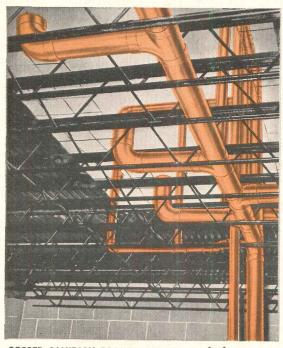
William R. Sullivan

Los Angeles

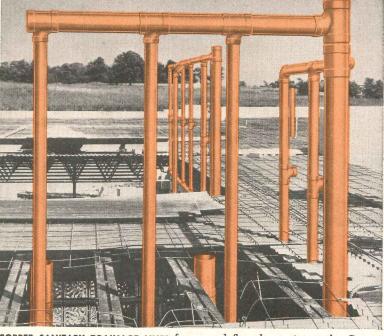


GOWER SCHOOL ADDITION, Hinsdale, Illinois. Architect: Wight & Schlaebitz, Downers Grove, Illinois. Plumbing and heating contractor: Jerry & Phil's Plumbing & Heating, Inc., Brookfield, Illinois.

SUPERIOR ALL-COPPER PLUMBING IN THIS SCHOOL AT LOWER COST TO TAXPAYERS



COPPER SANITARY DRAINAGE LINES roughed-in among structural members at Gower School. This space-saving installation would have been impracticable with heavy, bulky pipe requiring threaded or caulked joints.



COPPER SANITARY DRAINAGE LINES for second floor lavatories at the Gower School. Light weight of copper tube and ease of making solder joints save many dollars on multiple installations like this. Compact assemblies eliminate wide plumbing walls, give greater usable floor area.

Phil Bergeron and Jerry Wehrmeister, plumbing contractors near Chicago, have found that the installation economies with copper tube and solder-joint fittings enable them to offer all-copper plumbing—water supply and sanitary drainage—at a cost lower than competitive bids based on installing ferrous piping. Recent jobs awarded to them as low bidder include the Gower School, the LaGrange Township Junior High School, a church, health center, two restaurants and a store. Anaconda was used for all these jobs. Phil Bergeron says, "We specify Anaconda Copper Tube and Fittings

because their consistent fine quality and close tolerances makes our work easier and keeps the job costs within our estimates."

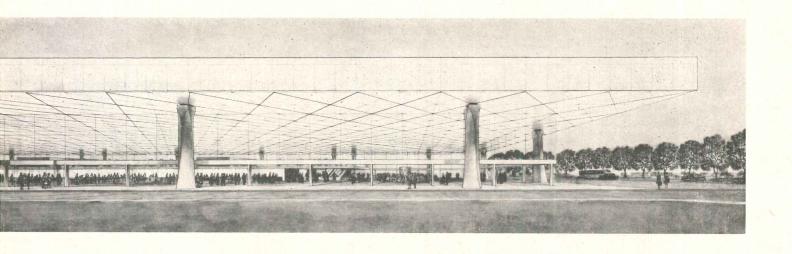
Contractors, builders, and architects the country over are finding that they can provide long-lasting, low-maintenance all-copper plumbing at a cost competitive with ferrous piping. For information on Anaconda Copper Tube and Fittings, write for a copy of Publication C-33. Address: Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

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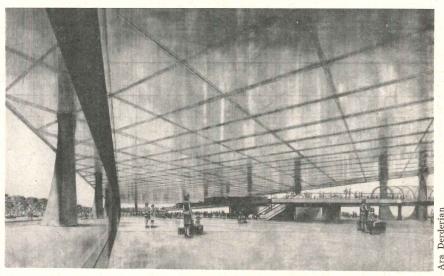
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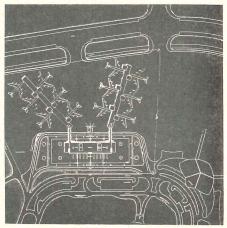




PEI WINS COMPETITION FOR DESIGN OF IDLEWILD TERMINAL



Pei's city-block-long rectangular structure is encased on four sides with glass walls. Two-story-high concourse runs full length of the building. Ticketing and baggage counters are on first floor; waiting areas and shops are on island-like mezzanine. Vehicular roadway gives access to both front and field side of building. Passenger arcades to aircraft are bridged over road on field side, which is separated from aircraft apron by fencing



I. M. Pei has been declared the winner in a limited competition held by the Port of New York Authority to determine the architect for a new multi-airline terminal at New York International Airport. This structure, the tenth terminal building in the Idlewild complex, will accommodate all airlines not housed in buildings of their own or in the already-completed International Terminal. B. Sumner Gruzen, Philip Johnson, Morris Ketchum Jr., and Arvin Shaw III, were the other architects invited to compete.

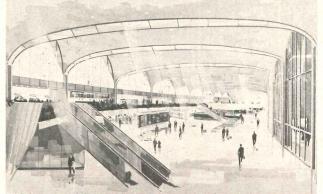
Wallace K. Harrison, Pietro Belluschi and L. Bancel LaFarge served as the Jury of Award for the competition, which was held under the A.I.A. rules. Robert W. McLaughlin, director of the School of Architecture at Princeton, was professional adviser. The Jury stated in its report that "the winning design provides good flexibility and has great clarity. The Jury believes that it is the best solution in its relation to its neighbors and the over-all scheme of New York International Airport."

In the winning design a space frame of steel tetrahedrons supported by massive concrete pylons forms a vast column-free interior 600 ft long and 30 ft high, within which the various facilities are symmetrically organized. Commenting on the simplicity and order of this scheme, Pei expressed the hope that it would "add a kind of peace to an area that is already overly agitated."

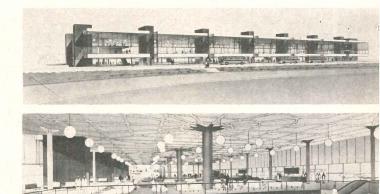
Ammann and Whitney were the structural engineers for the space frame, and Henry N. Cobb, Leonard Jacobson and Kellogg Wong assisted Mr. Pei in the preparation of the design.

Buildings in the News

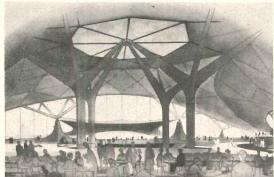


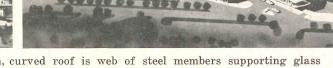


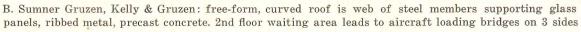
Arvin Shaw III, Carson & Lundin: 2-story concourse is daylighted by large glass areas in front and rear walls and skylights between barrel vaulted roof sections



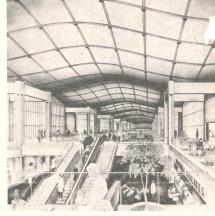
Morris Ketchum, Jr., Ketchum and Sharp: stairwells divide building into 7 glass-walled sections. Columns support concrete roof with radiating roof structure



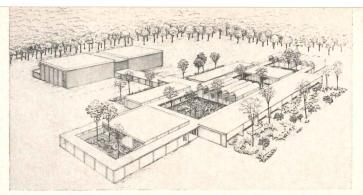








Philip Johnson, Philip Johnson Associates: undulating roof is made of grid of steel pipes which support precast concrete roof planks. Structure front has lower stone facing, upper decorative grille



Clemson School, John M. Preston. "A simple solution to a complex program . . . good integration of related elements"



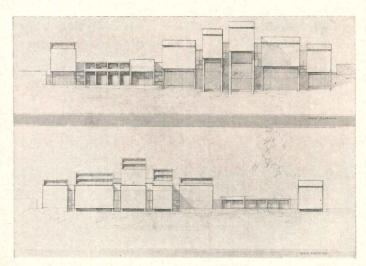
Syracuse Hospital, Michael H. Specter. "An attractive, modest building appropriate to a small community"



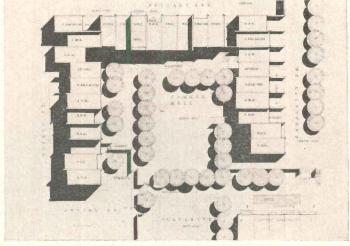
Ohio State Office Building, Phillip T. Markwood. "Sits comfortably on site . . . 3-pronged plan takes advantage of views"



Houston Municipal Building, W. C. Widdowson: "A dignified solution to problem . . . looks like public building"



Yale Museum, J. T. Robertson. "Highly imaginative . . . compatible with hilly terrain . . . intriguing . . . inviting"



Washington Housing, Richard Claybow. "Consistent site plan . . . works well as a whole . . . pleasant interior spaces"

SIX STUDENTS GET KOPPERS AWARDS

Continuing an expanding student scholarship program begun in 1957 with five schools, the Tar Products Division of Koppers Company, Inc. has awarded \$1000 scholarships to six fourth year students in architectural schools throughout the country.

The competition is integrated into the educational programs of the schools through the department of architecture in each school selecting the design problem and the students competing only with their classmates, rendering their creative interpretation of the project. The only restriction Koppers imposes is its insistence on primarily flatroof design.

Schools participating are selected periodically on a geographical rotation basis to give regional representation to the Association of Collegiate Schools of Architecture.

The local jury in each school is composed of the head of the department of architecture, the professor of the group involved, and a visiting critic. This year designs by six finalists from each school, 36 in all, were submitted to the national panel of judges, which included Paul Schweik-

her of Carnegie Tech, Paul Rudolph of Yale, and Joseph Hazen of Architectural Forum Magazine.

The schools and their individual projects were: Yale, a museum; Washington University (St. Louis), housing; Ohio State, office building; Clemson University, a school; and Syracuse University, a hospital.

The six award-winning designs, the names of their student designers and comments of the jury are shown on this page.

Plans are to increase the number of scholarships to eight in 1961.

CULTURE, RELIGION AND ARCHITECTURE IN INDIANA

One of the most improbable commissions of modern times in one of the most improbable locations has produced a highly provocative and certainly strongly personal statement by the post-Mies Philip Johnson. For the little town of New Harmony, Indiana, and in memory of its 18th and 19th century religious and social reformers, Mr. Johnson has designed a "shrine" which seems likely to take a permanent place among the more ironic examples of current architectural swashbuckling.

According to Mr. Johnson, the shrine is supposed to convey the feeling of a "concentration of the spirit of religion . . . When you enter its great doors, peace should come over you."

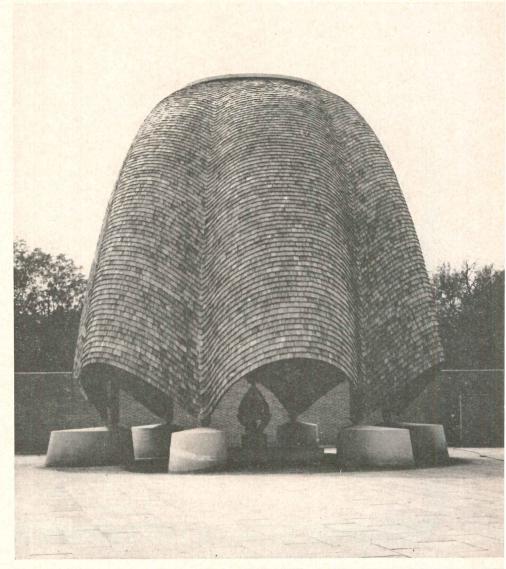
The shrine consists of a dome which shelters a bronze statue of the Virgin by Jacques Lipschitz, lighted through a four-ft wide opening at the peak; a 12-ft high brick wall enclosing the shrine area; sculptured bronze gates before a stone path leading to the dome; and a terrace. Brick, limestone and wood are used almost exclusively for construction.

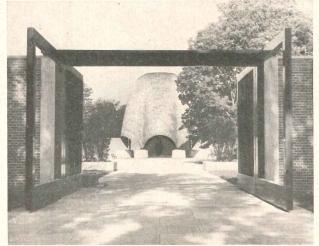
From six oval stone blocks arranged in a 50-ft circle, curving laminated fir supports rise to join with a brass ring, 6 ft in diameter at the top, 47 ft from the ground. Joined to the upright supports are curving ribs of laminated fir, which are covered with plywood and cedar shakes.

A shrine to the Rappites who founded a communal religious community in New Harmony, it also honors the Owenites who purchased the town in 1824. To be the nucleus of a "cultural and religious renaissance" planned by the state of Indiana, the shrine is open to the public and is also used for religious meetings.

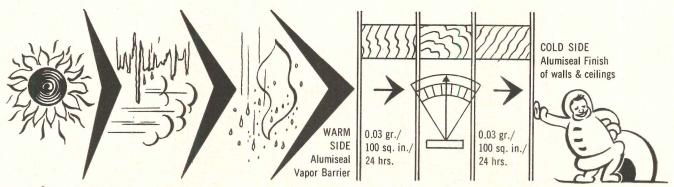
Funds for the shrine came from a trust set up by Robert Blaffer, administered by his daughter, Mrs.

General Contractors were Traylor Brothers Construction Company of Evansville, Ind.









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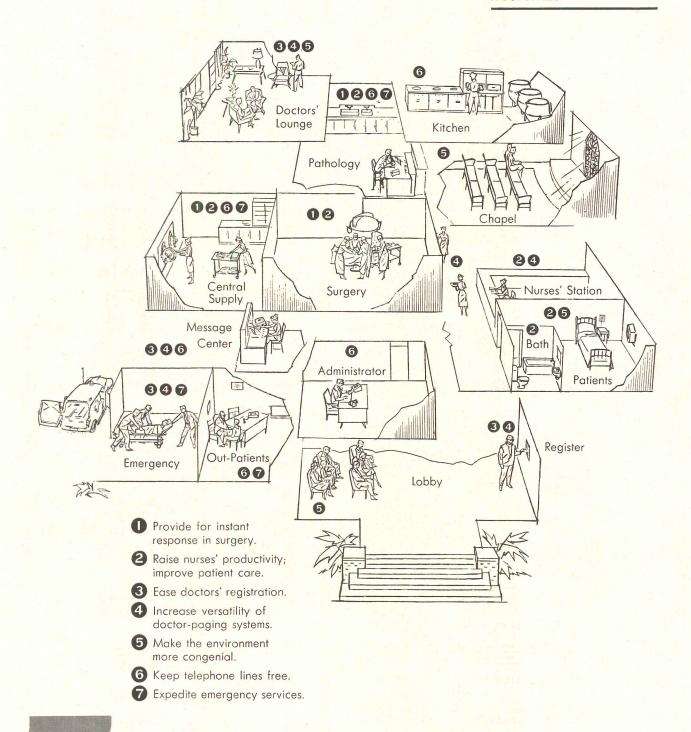


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ways to use functional sound and communications... to improve patient care and hospital efficiency

How to get the most out of communications and sound in HOSPITALS

Well-planned Executone sound-communication systems can perform heroic labors in the hospital. More than 30 different applications have been designed. Seven broad areas are detailed here. They are capable of lifting many burdens that high costs and personnel shortages impose on patients, administrators and staff.

2. Raise nurses' productivity; improve bed-patient care ...in new and existing hospitals

1. Provide for instant command-response in surgery



Lives can be saved by immediate response to doctors' commands in the Surgical Suite. It is vital that a surgeon obtain assistance from remote departments with as much dispatch as he receives an instrument from his Operating Nurse. He may, for instance, have to suspend an operation until a report on a specimen can be obtained from Pathology . . . until Blood Bank or Sterile Surgical Supply can fill an unforeseen need.

Executone's intercom systems put these services at the surgeon's immediate disposal. They fulfill special requirements of the Operating Room—explosion-proofing...foot-operation...extremely well-modulated voice reproduction. They can, in addition, be used to transmit 2-way voice communication between the surgeon and students.

In other than surgical areas where urgent situations arise, action can almost always be expedited by properly-specified Executone communications. Recovery Rooms, Obstetrical Suites, Emergency Department, Central Supply, mechanical service areas—all require the high degree of dependable contact for which Executone equipment is designed.



Time and motion studies have proved repeatedly that nurses' foot travel can be reduced by as much as 65%. At the same time, more bed-care duties can be assumed by orderlies, aides and Practical Nurses. The source of these skilled-labor-savings is the Executone audio-visual nurse call system. It can make a reduced nursing staff more responsive to the patients' needs.

In most cases, it can be installed using existing nurse call wiring . . . avoiding the inconvenience and loss of income that would result from closing a nursing floor. An effective audio-visual system will incorporate the following factors:

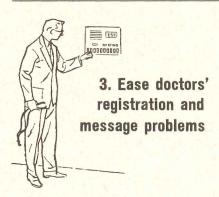
- a. ability of patients, including those unable to move or speak normally, to use the system effortlessly.
- b. operation of the system with all its



advantages regardless of the location of nurses at any given moment, or the number of calls registered.

- c. provisions to eliminate the possibility of a patient's being without means of signalling.
- d. psychological reassurances—of the proper registration of a patient's call, and the maintenance of his privacy.
- e. foolproof, urgent-priority call registration from bathroom stations.
- f. use of the system to monitor sounds in post-operative cases, polio or seclusion wards, nurseries, etc.

A demonstration of Executone's advanced nurse call equipment will show you how all these functions and safeguards can be implemented, and an optimum system designed for new or existing construction.



In-out registration and message collection duties are so burdensome to doc-

tors that many frequently neglect these essentials. Confusion and delays result. Executone, however, makes available a variety of systems designed to relieve this condition. One notable advance—especially in medium-sized and large hospitals—is Executone's simplified, one-stop register-and-message facility.

This facility is made available to the doctor at all habitually used entrances. Each register is tied in to a central compact "memory" unit at the hospital mesage center. The doctor need only punch

his own 3-number code into the nearest register and indicate whether he is entering or leaving. This information is stored in the "memory" unit and is instantly available at any register—merely by punching the same code number. If there are messages for a doctor when he uses a register, a blinking light alerts him, and he may speak to the message center by 2-way intercom right at the spot. System is designed for simultaneous registration to save doctors' time. The use of a central "memory" unit makes possible significant economies in wiring.

4. Increase the versatility of doctor-paging systems



The paging facilities in today's hospital can offer a far greater range of service—thanks to Executone's multi-purpose systems. Not only does this equipment make possible a variety of interchangeable paging methods, but it will accommodate background music and alarm functions as well.

In addition to the conventional all-hospital page, the Executone-equipped paging center may use:

zoned paging. A doctor's activities are generally confined to specific floors and departments. A sequence of zoned pages will usually locate him without disturbing the entire hospital. A typical sequence might be: obstetrical suite . . . maternity ward . . . doctors' lounges and dining rooms.

localized paging. This system operates as above—with this exception: On floors or wards served by nurses' stations, paging is restricted to the duty area. The duty nurse, who knows if a certain doctor is on the floor, completes the page by selective use of the nurse call system. This method offers maximum quiet in patient areas.

Executone implements either or both of these functions with advanced circuit-selection, amplification and reproduction components. Voice quality is unusually true and well-modulated.

5. Make the hospital environment more congenial

Sound can be genuinely therapeutic. Leading administrators attach great importance to its use for diversion and entertainment. They favor the availability of music—in wards and labor rooms, for example, as well as waiting rooms and visitors' facilities. Chapel services can be transmitted to the rooms of patients who so desire. Radio broadcasts can be made available at each bed.

Executone's versatile paging and nurse call systems readily handle these additional functions. For example, each patient can be supplied with an Executone Pillow Speaker and controls. This



remarkably compact instrument is a high quality sound reproducer . . . radio station and TV channel selector . . . volume control . . . and nurse-call cord set—all in one. No radios are needed in the rooms. Programs—and transmissions of records or tapes—originate at a central control rack. This facility helps keep rooms uncluttered.

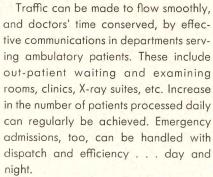
6. Speed internal action; keep telephone lines free



Reliance on the telephone for internal communication in the hospital often results in delay and switchboard congestion. Efficiency requires a channel of communication independent of the telephone . . . in order that administrators may have direct contact with heads of departments . . . that medically related departments be in instant touch with one another . . . that there be adequate intercom facilities within departments, parts of which may be physically separated.

Executone's advanced intercom systems have proved their worth in hundreds of hospital applications—in terms of vastly increased staff productivity, time savings, and freeing switchboards for rapid response to emergency calls.

7. Expedite out-patient, clinic and emergency service



Executone intercommunication — between nurses' duty stations and the medical facilities they serve—is the key to improved operation in these areas. An



ambulance entrance which is not regularly staffed at night can be made functional around the clock—by the use of an outdoor Executone ambulance intercom station to summon proper personnel upon arrival of an emergency case.

On the next page . . . an offer of unusual benefit to you and your client



How to get the most out of communications and sound

Executone offers you six stages of service...

WITH SINGLE-SOURCE RESPONSIBILITY



STAGE 1 DESIGN STANDARDS

Executone's service-tested design standards—mechanical, electronic and acoustical are your assurance of trouble-free system performance. Design ingenuity—resulting in simplification, miniaturization and increased capability—keeps the cost of an Executone installation competitive . . . reduces maintenance costs.

STAGE 2 CONSULTATION OR SURVEY

To help you plan an optimum system, your local Executone Systems Engineer will assist in a comprehensive study of your client's needs . . . recommend the equipment designed to meet them within his budget . . . suggest ways of implementing a system through modular purchases where funds are severely limited . . . provide you with full information on a professional level. You will find him thoroughly conversant with specialized practices in your client's field.

STAGE 3 INSTALLATION AND SUPERVISION

Your Executone distributor will assume full responsibility for the final and satisfactory operation of the system—whether installed by a contractor or by a factory-trained Executone crew. An Executone Field Engineer will co-ordinate and supervise all phases of the installation, and check it out thoroughly on completion.



STAGE 4 PERSONNEL INSTRUCTION

Executone representatives will train and—when necessary—re-train your client's personnel in the proper operation of the system. This planned program assures maximum benefits through full utilization and correct care of the equipment.

STAGE 5 MAINTENANCE ON THE PREMISES

To assure uninterrupted performance from any Executone system, prompt and reliable maintenance service and complete stocks of factory replacement parts are always available locally. Each distributor is staffed with skilled technicians trained on a continuous basis at Executone's Factory Technical School . . . to provide your client with expert service on his own premises . . . for the life of the building.

STAGE 6 FULL YEAR FACTORY GUARANTEE

Every Executone system and component is guaranteed by the Executone factory for a full year.

EXECUTONE offers single-source responsibility

One organization responsible for all sound and communication systems . . .

- planning coordinated
- purchasing simplified
- installation expedited
- systems easily integrated

One phone call for service . . .

 local personnel immediately available who know all systems in the hospital.

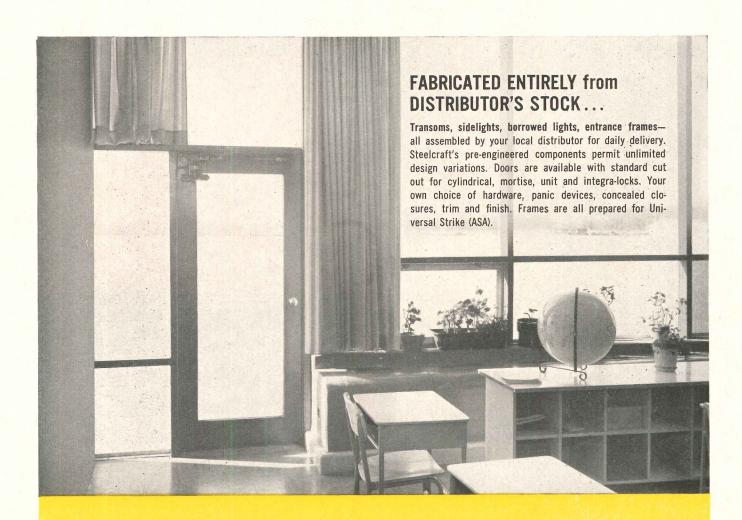
---- THIS COUPON WILL BRING YOU UP-TO-THE-MINUTE INFORMATION OR ASSISTANCE . . . WITHOUT OBLIGATION -----Executone, Inc., Dept. T-3, 415 Lexington Avenue, New York 17, N. Y. I would like my local Executone Systems Engineer to call. I would like detailed literature on intercom and sound systems for the following building types: new hospitals offices Churches ☐ transportation terminals ī existing hospitals plants retail stores other_ □ schools COMMUNICATION and SOUND SYSTEMS Name. Address_

City_

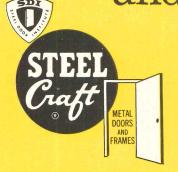
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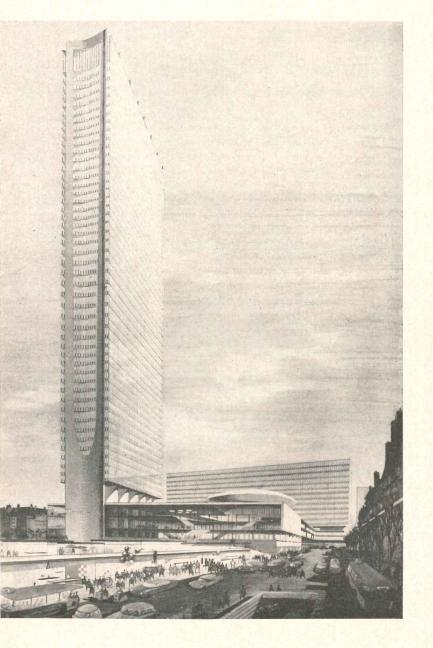
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News of Architecture Abroad





Railroad station is on lower floors of tower. Long station structure will continue at same height to form wings for other buildings, none less than 18 stories high. Tracks will be roofed over. Underneath buildings and triangular esplanade, planted with trees and shrubs will be railroad installations and parking area

SKYSCRAPERS FOR PARIS,

NEW LIFE FOR MONTPARNASSE

In an ambitious replanning of 20 acres on the famous Left Bank in Montparnasse, freed by the demolition of the century-old Gare Montparnasse and its maze of tracks, a new railroad depot will be built as the lower floors of a series of tall blocks.

Project Architects are: Beaudoin, Cassan, Lopez, de Narien and Saubot.

The central feature of the new area will be a 50-story structure, 600 ft high, described by the architects as "an opportunity for the present generation to inscribe the architec-

ture of today on a district where there is not a single stone which deserves preservation." The lower floors of the tower will form a platform 984 ft long and 328 ft wide to comprise the new terminal.

First stage in the redevelopment is the erection of six office buildings parallel to the tracks into the station.

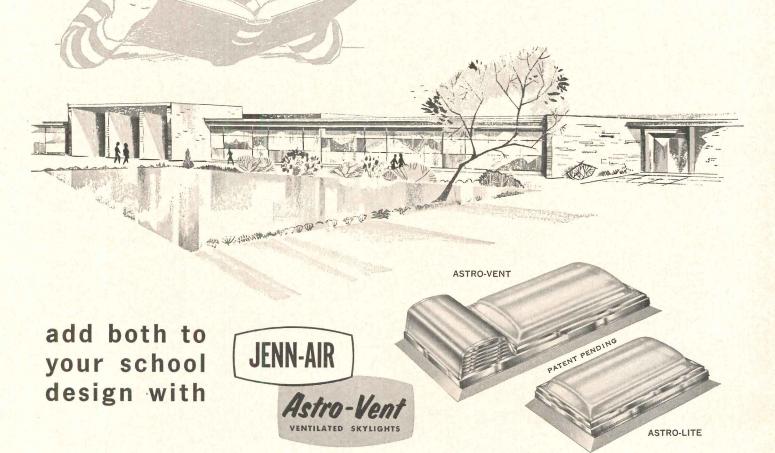
The redevelopment complex will include parking space for 6000 cars, a 1000-room hotel, offices, airways terminal, apartment buildings, congress halls and artists' studios.

Public and private funds will fi-

nance the project. Planning the legal and financial details of the scheme and controlling the project's design and construction is the Societe d'Economie Mixte Main-Montparnasse, a company formed with the active support of the City of Paris, National Organization for State Markets and Groupement Foncier Francais.

One of the main aims of the new development is to restore to Montparnasse, now moribund as the Paris population moves west, some of its old commercial and artistic vitality.

Natural light and ventilation for eager young minds



In the words of John Ruskin, a building "should do its practical duty well, and be graceful and pleasing in doing it." To help you achieve this ideal in school design, Jenn-Air has developed ASTRO-VENT, combining acrylic resin skylight and centrifugal fan into one handsome "low silhouette" unit.

With air moving capacities from 180 to 4400 cfm, ASTRO-VENT is the first dual-purpose unit to satisfy heavy-duty institutional require-

ments. It can be used in any corridor or room, even where noise control is a critical factor.

Jenn-Air offers ASTRO-VENT in a wide range of sizes and in combinations of single vent with one or two lights and double vent with one light. Use these in conjunction with Jenn-Air ASTRO-LITE Skylights, and you have an unlimited array of geometric patterns at your command. You circumvent the problems of glare, distraction and heat loss cre-

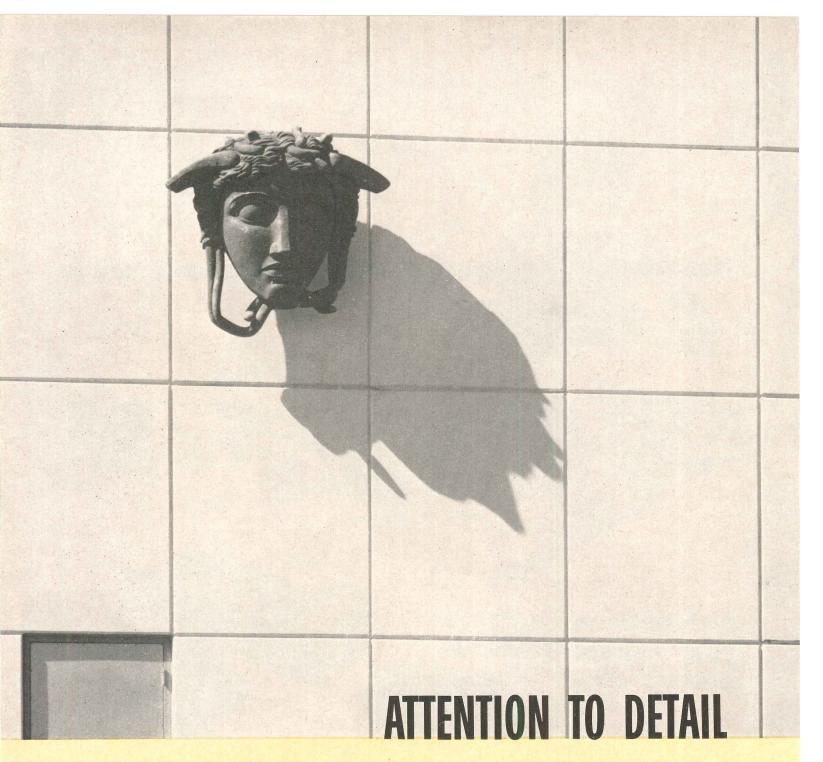
ated by window walls and the need for expensive indirect ventilation as well. What better way to assure fresh air and perfect light diffusion throughout every room?

ASTRO-VENT and ASTRO-LITE are fully described in Jenn-Air Bulletin 60-LV. Let us send you a copy.



Leader in Functional Imagineering . . .

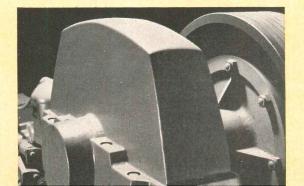
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chines are beautifully designed, combining compactness, accessibility of parts, symmetry of lines and physical proportions that provide adequate strength and durability. Their appearance is indicative of the optimum performance delivered. Dover Elevators are now available throughout the United States and Canada in both geared and high-speed gearless types to satisfy the most exacting vertical transportation requirements of all your multi-story projects. A letter will bring you more information promptly.

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Meetings and Miscellany



Drawn for the Record by Alan Dunn

"Let's get right down to business!"

FIRST STAGE WINNERS ANNOUNCED IN FRANKLIN DELANO ROOSEVELT COMPETITION

The six winners of the first stage of the Franklin Delano Roosevelt Memorial Competition have been announced by Edmund N. Bacon, Professional Adviser; their designs will be withheld from publication, in accordance with the rules of the program, until the winner of the second stage is announced on January 3. The successful competitors among the 574 from all parts of the country who submitted designs were: Abraham W. Geller, architect of New York City associated with Douglas Gordon, Diana Kirsch, and Claude Samton; Tasso Katselas, architect of Pittsburgh; Rolf Myller, architect of New York City; William F. Pederson and Bradford S. Tilney, architects of Boston associated with Joseph Wasserman, David Beer, and Norman Hoberman, sculptor; J. Edward Luders, architect, Hideo Sasaki, Don Olson and Robert J. Reilly associated as Sasaki-Walkers-Luders Associates of Watertown, Mass.; and Joseph J. Wehrer, architect of the University of Michigan associated with Harold J. Borkin.

The competition's professional jury was headed by Pietro Belluschi, Dean of the School of Architecture and Planning, M.I.T. On the jury were: Thomas D. Church, Landscape Architect of San Francisco; Bartlett

Hayes Jr., Director of the Addison Gallery of American Art, Phillips Academy, Andover, Mass.; Joseph Hudnut, Professor of Architecture Emeritus, Harvard; and Paul Marvin Rudolph, Chairman of the Department of Architecture, Yale.

The jury was impressed by the number of ideas submitted and by the seriousness of the entrants. The report noted "the wide variety of solutions ranging from pure sculpture to abstract architectural forms, from civic plazas, including wide participation of the public, to quiet and simple garden schemes" . . . "the six contestants chosen to prepare the final drawings represent widely differing solutions; some leaving the park-like character of the site untouched, others remodeling the topography to suit their particular ideas." The jury felt the designs would result in a group from which a fine Roosevelt memorial may be developed.

The six winners of the first stage of the competition will be awarded \$10,000 each and will prepare detailed drawings and models for submission in the final stage. The second stage winner will be awarded \$50,000. Following the final judging on December 29-30, an exhibition will be held of winning and honorable mention designs.

Charles and Ray Eames Win First \$20,000 Kaufmann Award

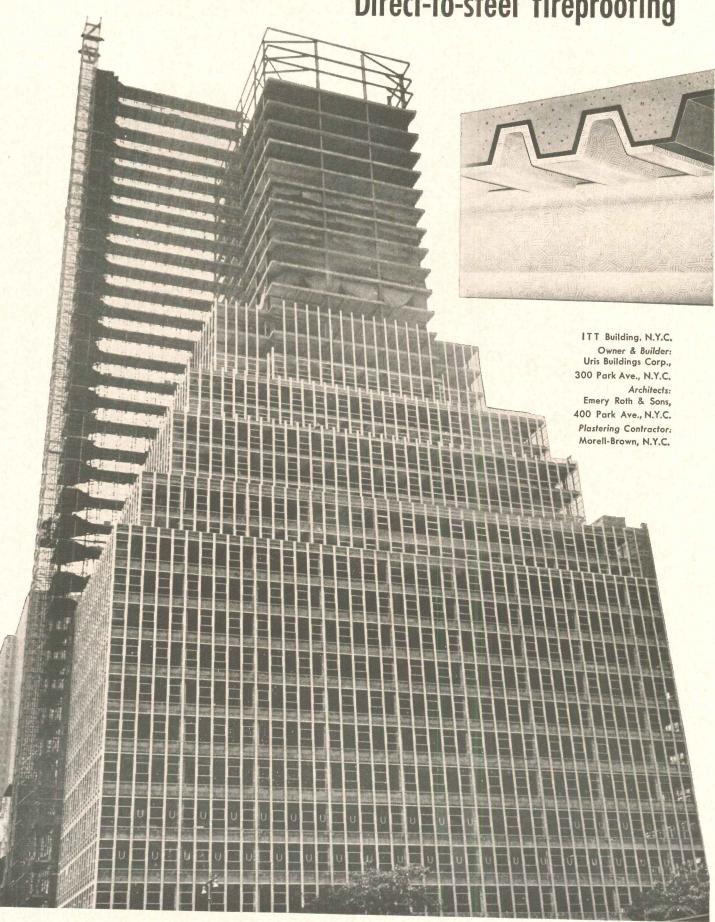
The first \$20,000 Kaufmann International Design Award has been won by Charles and Ray Eames, designers in all facets of industrial design, including architecture, furniture and films.

With design defined as "the forming of useful, meaningful and expressive products, delightful beyond the satisfaction of needs or entertainment," the Kaufmann Design Award aimed at a significant contribution to the character of present-day design.

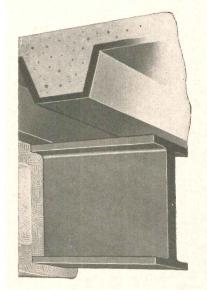
This largest comprehensive award ever offered in the design field was made in Lugano, Switzerland in mid-September, from a panel of distinguished candidates submitted by consultants from all parts of the world. The jury was composed of: Arthur N. BecVar, Manager of Industrial Design for the General Electric Company; Erik Herlow, professor of Design at the Danish Royal Academy; George Nelson, American industrial designer; Sir Herbert Read, British educator and architectural critic; and Dino Olivetti, President of the Olivetti Corporation of America. Non-voting chairman was Mateo Lettunich, Director of the Arts Division of the Institute of International Education.

more news on page 28

Direct-to-steel fireproofing



in new ITT Building gives dramatic proof...



ZONOLITE new ZONO-KOTE MONO-KOTE

sprays on, stays on...cuts fireproofing costs!

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Mr. Melville Praeger, president of Morell-Brown, plastering contractors, reports that "the use of Mono-Kote in the ITT Building provided enormous savings in labor and materials. It adheres perfectly to metal, without fall-outs. It withstands humidity and temperature changes. There are no ingredients irritating to workers. Job performance quality is easily maintained. And I should add that the technical assistance given by Zonolite is invaluable, particularly in the present period when new changes are taking place in construction."

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and the underside of steel floors, it saves up to 7 inches per story in height—permitting drastic savings in other construction materials. It sprays on in one fast, trouble-free operation, sets hard and fissure-free with bond strengths of 400 to 500 psf.

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Architect To Be Chosen For Hawaii State Capitol

The State of Hawaii is in the process of selecting an architect for a new state capitol building. Island and mainland architects interested in serving were invited to submit statements of their qualifications and experience with evidence of their work by approximately mid-September.

The 1960 State Legislature having appropriated the sum of \$100,000 for the preliminary plans and architectural design, Governor William F. Quinn in August appointed a 14-member committee to select the architect for the proposed \$7 million building.

Architecture Stressed in Two Sessions of AHS Convention

The architects who attended the 62nd annual convention of the American Hospital Association August 29-September 1 in San Francisco found that among the 58 different subjects covered in the program—ranging from "Infections in Hospitals" to "The Hospital's Role in the Care of the Aged"—were two sessions of particular interest to them. Of the two the livelier was the panel on "International Viewpoints on American Hospital Design," which included the pithy observations of a young Australian architect, Peter Scrymgeour, holder of this year's Harkness Fellowship, who had visited many U.S. hospitals in his travels; the more gentle commentary of Australia's dean of hospital architects, Sir Arthur Stephenson; and the practical viewpoint of the hospital administrator, given by John Kinnaird, a Scot from Edinburgh.

Both Sir Arthur and his fellow countryman took U.S. hospitals to task for not making greater use of the multi-bed room; and where the former urged that "bringing the nurse into closer association with the patient" continue to be the hospital's primary concern, the latter begged the American architect to consider the nurse as much as he does the patient in planning the nursing unit. Both agreed on the environmental characteristics desirable in a hospital: Sir Arthur asked for "human scale," Scrymgeour for "buildings that are fun to

walk around in, pleasant to look at, and meet all the requirements too." Scrymgeour offered his "KISS" rule: "Keep it simple and safe" as a good guiding principle.

The other session of architectural interest was a Conference on Hospital Planning dealing with "Community Planning for Care of the Chronically Ill and Aged;" "A Hospital Designed Against Radiation Fallout," described by Julian Smariga, structural engineer, division of Hospital and Medical Facilities, Public Health Service; and "Planning the Patient's Room," a two-part presentation with Anthony J. J. Rourke, M.D., New York City hospital consultant giving the main paper, and William R. O'Connell, A.I.A., of Austin, Tex., acting as architect-discuss-

Smariga's hospital proved a controversial proposal, suggesting that the fallout-proof section of the hospital be a separate building, three stories high, connected to the main hospital, but there was little discussion of it during the session. Efficiency and economy were the two points most frequently mentioned in conversation. Dr. Rourke's paper presented an exhaustive array of solutions to the patient nursing unit—a veritable primer for the hospital planning neophyte.

-Elisabeth Kendall Thompson



1961 A.I.A. Convention planners before Independence Hall plot April activities for Philadelphia meeting. They are Charles E. Peterson, Beryl Price, Herbert H. Swinburne, and Harry W. Peschel

A.S.L.A. Endorses Competition For Mobile Home Park Design

The American Society of Landscape Architects is endorsing a mobile home park design contest sponsored by the Mobile Home Research Foundation and Rogers Industries. With cash prizes totaling \$9350, the competition aims to create an outstanding park, to explore new concepts of site planning, and to create a place for mobile homes in the community.

The competition for U.S. residents will be divided into two categories: one for students in landscape architecture, architecture and city planning; the other for registered landscape architects or associations of planners or architects.

On the jury will be Vernon De-Mars, Head, Department of Architecture, University of California; Stanley Hart White, professor emeritus, University of Illinois, Department of Landscape Architecture; Hideo Sasaki, professor and chairman of Department of Landscape Architecture, Harvard Graduate Design School; George F. Miles, founding member, Mobile Home Research Foundation; Eugene R. Martini, Southeastern Chapter President of A.S.L.A.

Student prizes are \$1000 first, \$500 second, \$250 third, three fourth prizes of \$100, and six honorable mentions of \$50; professional awards, \$4000 first, \$2000 second, and \$1000 third.

For programs, students should register by Oct. 15, professionals by Dec. 15. Forms and information can be had from John L. Bloom, Professional Adviser, Mobile Home Park Competition, 20 No. Wacker Drive, Room 656, Chicago 6, Illinois.

Brunner Scholarship Available

Active U. S. architects with advanced professional background may apply for a top architectural award, the \$3000 Arnold Brunner scholarship.

Offered annually by the New York Chapter of the A.I.A., the scholar-ship calls for study in a special field which will contribute effectively to the practice, teaching or knowledge of architecture. Candidates may choose their field.

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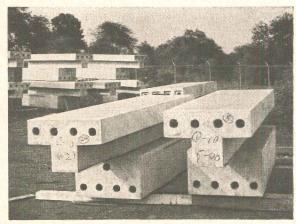


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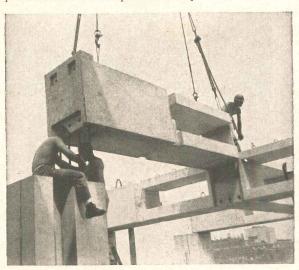
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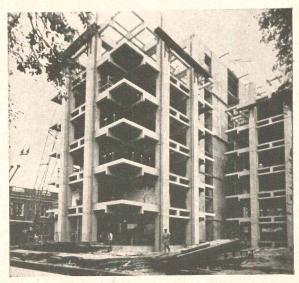
ALFRED NEWTON RICHARDS MEDICAL RESEARCH BUILDING, UNIVERSITY OF PENNSYLVANIA, Philadelphia, Pa. ARCHITECT: Louis I. Kahn. STRUCTURAL CONSULTANT: Dr. August E. Komendant. STRUCTURAL ENGINEERS: Keast & Hood. General Contractor: Joseph R. Farrell, Inc. PRECAST, PRESTRESSED UNITS: Atlantic Prestressed Concrete Company. READY-MIX CONCRETE: The Warner Co. FRAME ERECTION: Cornell & Co.



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Sweeping Changes Discussed In Engineering Education

What should be the aims and scope of civil engineering education? This question, relative to all categories of engineering on a professional level, was explored by department heads and deans of 138 engineering institutions, as well as more than 100 other educators, practicing engineers and industrialists from all parts of the country at the July Conference on Civil Engineering Education. The purpose of the conference was to evolve specific recommendations for the undergraduate curriculum in civil engineering designed to meet current and future needs.

As Frank W. Edwards, Manager, Chicago office, Stanley Engineering Company, said near the end of the conference, the program outlined has four unique features, distinct, in emphasis, from those generally

9/Up

adopted in the past. It provides for a longer time to develop a suitable foundation for professional education, a broader base of preparatory courses, a terminal point short of a degree in civil engineering, and emphasis on professional concepts in engineering.

From the conference came 11 resolutions which are currently being voted on by educators via the mail. What will come as a result will be an expression of opinion by educators as to how best to advance engineering education. From there on, it will be up to the individual engineering schools to benefit from the conference by making curriculum changes.

Held at the University of Michigan in Ann Arbor, the conference was the final in three this year planned with the support of the National Science Foundation and under the co-sponsorship of Cooper Union, the American Society for Engineering Education, and the American Society of Civil Engineers.

Focusing point for the conference was the first resolution of the 11 favoring a core of subject matter common to all engineers and occupying study effort equal to three academic years during the first four, with a stipulation that professional or graduate level engineering require a minimum of five years study to qualify for a CE degree.

The conference program included four sessions: Bases of Civil Engineering Education, Proposed Structure of Undergraduate Curriculum, Professional Development, and Aims and Objectives.

In the first session, Nathan M. Newmark, head, Department of Civil Engineering, University of Illinois, said, "A major change in civil engineering education is long overdue." In addition to a four year college course, he felt further professional training must come with additional education and with association with practicing engineers in a "learningby-doing" activity. Following the first undergraduate degree, Prof. Newmark sees two types of emphasis in the educational process: a graduate program with science and technology emphasized leading to a Masters Degree and Doctorate to prepare men for research and teaching; and a program involving training in "systems engineering con-

continued on page 42



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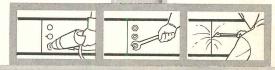
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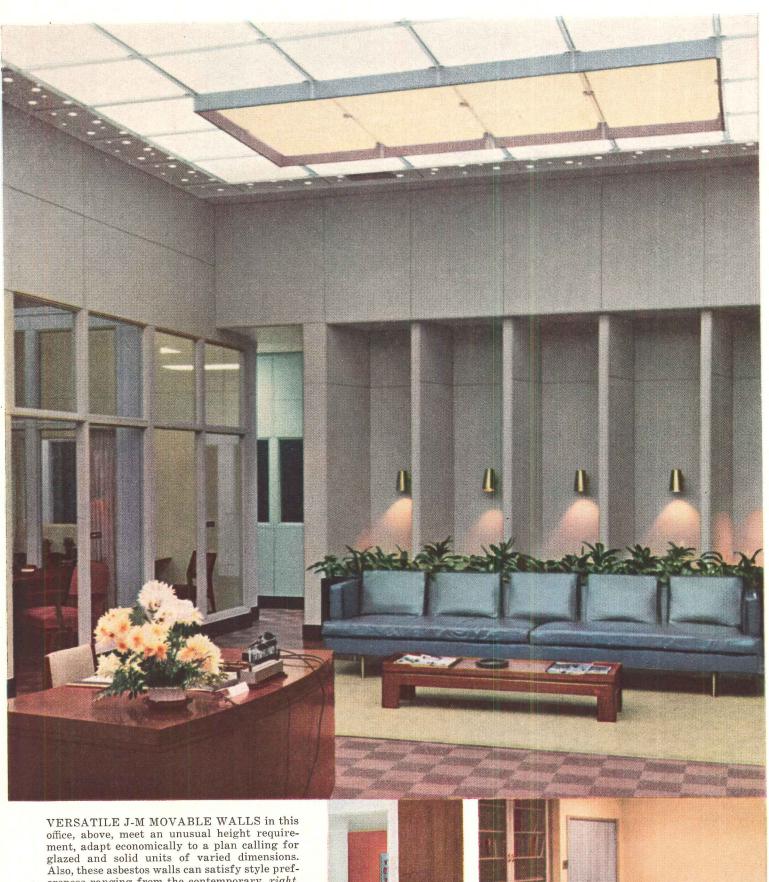
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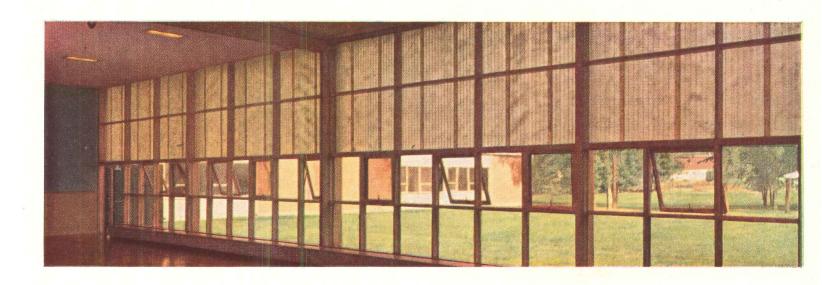
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The Record Reports

continued from page 32

cepts" or in "synthesis" providing technical training combined with a broad knowledge of public policy and social problems.

John B. Wilbur, head, Department of Civil Engineering, M.I.T., in defining civil engineering's purpose as "the fullfillment of human needs through the adaptation and control of the land-water-air environment," believed this indicated "both a broadening of the scientific base of

undergraduate curricula and the in-

clusion of the mathematical backup for the engineering systems as well as of components . . . it inevitably follows there will be a lesser emphasis on professional subjects during the first four years—that the more important emphasis on professional applications will become increasingly associated with graduate study or . . . with a fifth undergraduate year."

J. L. Waling, professor of Structural Engineering, Purdue Univer-

sity, stressed the engineer's potential for future development through individual study which a strong science background makes possible and urged encouragement of the "future professional development of graduates."

John S. McNown, dean, School of Engineering and Architecture, University of Kansas, declared, "We must bend our efforts toward giving students the opportunity to receive scientific knowledge imaginatively and with understanding . . . I am much more concerned about the stultifying effects of pedantry and the lack of creativity in our program than I can ever be about the need for a fifth year."

John W. Graham, Jr., dean, College of Engineering, University of Rochester, and Thomas E. Stelson, associate professor and head of Civil Engineering, Carnegie Institute of Technology, cited the significant influence of the high school science teacher in a student's choice of engineering as a life vocation.

A broadened "interchangeable core" came under discussion in Session Two, with Hamilton Gray, professor and chairman, Department of Civil Engineering, Ohio State University, declaring its result would be an engineer's "increased competence and adaptability . . . that implementation of the interchangeable core will come about more or less concurrently with the acceptance of two propositions: that the engineering profession deserves professional education and that professional education should be broader and stronger in the basic sciences and humanities than most current curricula in Civil Engineering."

In the third session, Ralph Fadum, head, Department of Civil Engineering, North Carolina State College, advocated fulfilling the need of the "practitioner-oriented student," by proposing a graduate program to parallel the MS and PHD degree programs designed for students oriented for research and teaching. The curriculum would consist of a year's professional course work in which a student could pursue a specialty field in depth, leading to the professional degree of Civil Engineering and a three-year professional program leading to a Doctor of Engineering degree.

V. L. Streeter, professor for Hycontinued on page 46



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The Burgess-Manning Radiant Acoustical Ceiling provides heating and cooling with a minimum input of energy or fuel consumption. With fewer mechanized parts, maintenance of the ceiling is greatly reduced.

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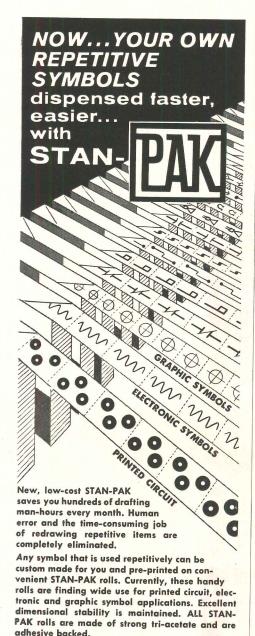
Three problems with one answer...CERAMIC TILE

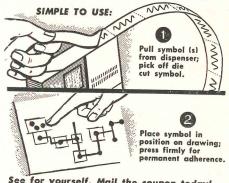
The problems: (1) how to add interest to a large expanse of windowless facade...(2) give individuality, add color and pattern interest at street level without adding maintenance expense...(3) shield display windows and entrance areas from sun and weather—attractively and permanently. The answer: American Olean ceramic tile—with its versatile decorative qualities, its permanence, its matchless economy of upkeep.

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The Record Reports

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draulics, University of Michigan, did not favor a split between teaching and research and practice in working toward an advanced engineering degree, but felt there should be a single graduate program.

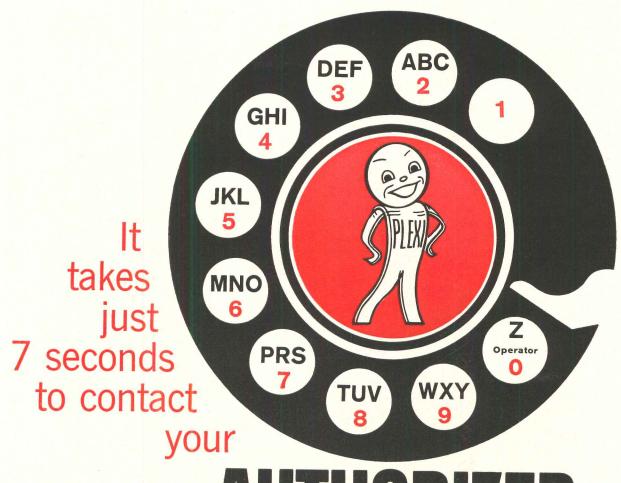
J. W. Hubler, vice president of Macomber, Inc., Canton, Ohio, declared, "Programs ranging from onthe-job training in techniques to university study . . . to leaves of absence for studies of technical or professional subjects are feasible particularly when combined with personal guidance by the job supervisor who should be a strong member of his professional society."

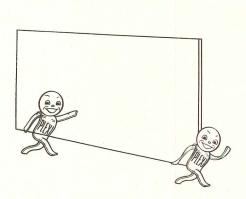
Frank M. Edwards, engineer with Stanley Engineering Co., Chicago, deplored the limited participation in engineering education and lack of communication between engineering educators and practicing engineers. He remarked, "whether pre-engineering under a system of professional schools would be two, three or four years in length, and the professional program four, three, or two years is unimportant. The important factor is that the proposals discussed here provide a logical transition for such future evolution."

In the fourth session, Jack E. Mc-Kee, professor of Sanitary Engineer ing, California Institute of Technology, said, "The future of engineering education lies in the development of professional schools superimposed on the undergraduate pre-engineering curriculum. . . . Administered by engineers on a par with the graduate schools of other professions, such engineering schools might award degrees of Master of Engineering and Doctor of Engineering for the engineer who intends to practice in the profession, along with the MS and PhD for men who plan to teach or do research. Graduates of these programs will constitute the truly professional engineering fraternities of the future, with support from sub-professional personnel holding baccalaureates, or with training as technicians." Referring to the engineering societies which have professional as well as technical interests, Prof. McKee said it is "only through their united and concerned efforts that professional schools of engineering will ever be established."

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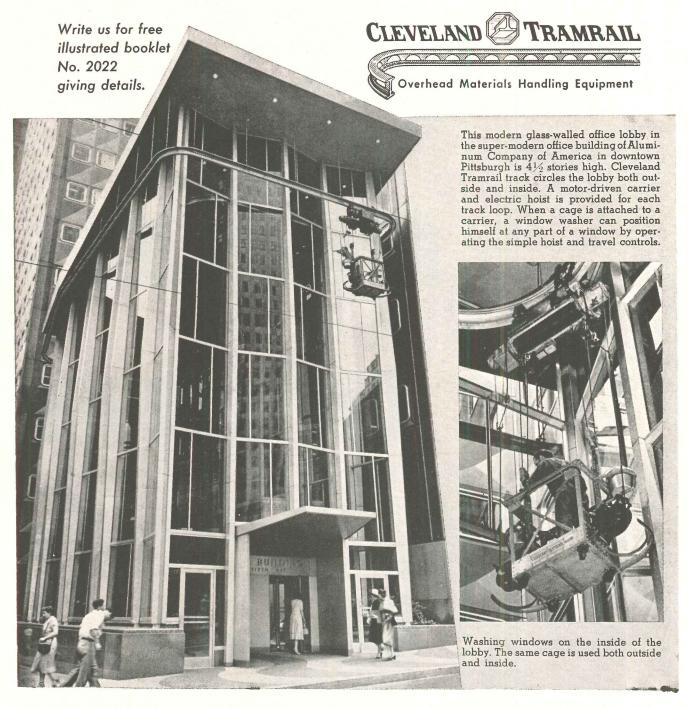
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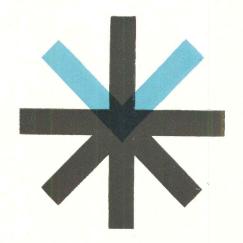
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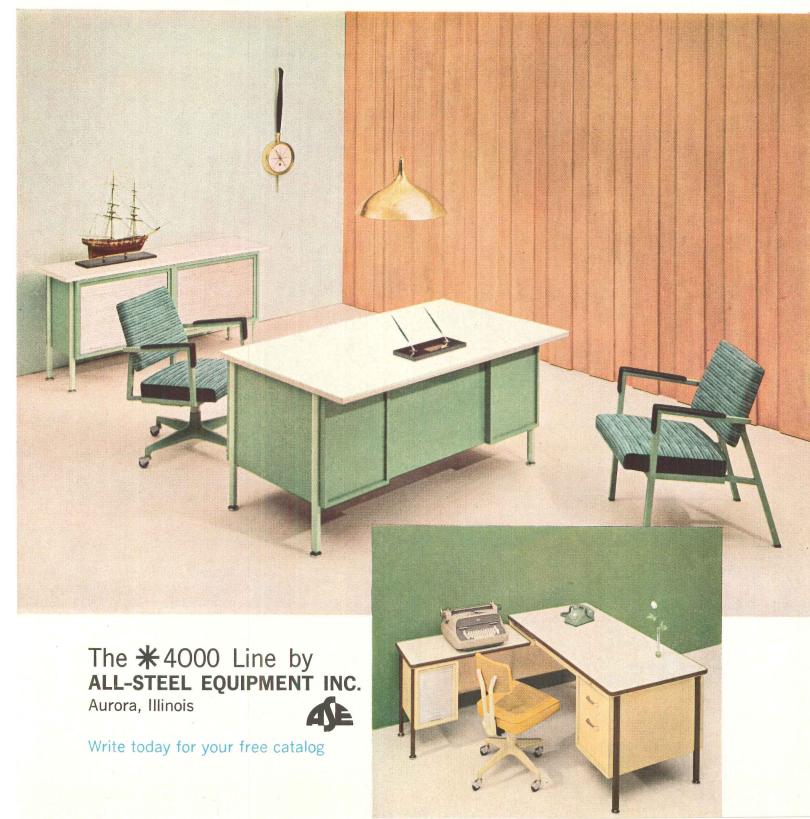
Even where provision is made for reaching the outside of a window from the inside, this usually is not desirable when a building is airconditioned. Open windows quickly unbalance an air-conditioning system, in warm weather and, of course, are undesirable in cold weather.

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CONGRESSIONAL ACCENT ON POLITICS LEAVES MAJOR CONSTRUCTION BILLS DANGLING

With respect to construction industry matters, the final session of the 86th Congress was largely negative. Except for the inevitable appropriations laws and a stopgap housing measure far removed from the omnibus legislation under consideration earlier in the year, Congressional accomplishments of interest to architects and engineers were absent.

Much of the material watched closely through 1960 because of its importance to the field of construction remained bottled up in the Rules Committee of the House as the final gavel sounded to end the 86th. This included the Federal aid to education bill which was held from a conference committee by 7 to 5 vote of the powerful committee group. Although a bill providing funds for assisting states and school districts with their classroom con-

struction programs had passed both Senate and House for the first time in history, the tie vote in Rules prevailed until the end of the short session.

Other matters stalled in Rules included the special assistance purchases authorized for the Federal National Mortgage Association in the amount of \$1 billion, an expanded urban renewal program, housing for the elderly and the broad revisions voted by the Senate for the Federal Housing Administration. This could have added \$4 billion to the mortgage insurance ceiling, lowered down payments and created the central mortgage bank proposed by home building and financing interests

One of the bills of greater interest to architects that failed to pass the 86th Congress was that estab-

lishing a voluntary pension plan for self-employed persons. This legislation, considered during the better part of the year in the Senate, would have enabled the self-employed to set aside certain moneys to take care of themselves in later years and to do so with certain tax advantages.

The House passed the bill and the Senate Finance Committee reported out an amended version but there progress halted.

The volume disappointments, however, came in developments on the school construction and housing legislation. Together these measures have carried around \$2 billion worth of construction.

The short stop-gap measure to continue three lagging housing programs was put through at the last minute by the expedient of tacking it onto a non-controversial resolution.

This continued the FHA Title I home improvement loan program for one year beyond its October 1 expiration and lifted the authorization ceiling. It provided \$500 million more additional for college housing loans and \$50 million more for community facilities loans by expanding the authority of the respective revolving funds.

These were the three programs of the Housing and Home Finance Agency felt to be in greatest need, and there was no argument about providing for them before the adjournment. The action rescued the loan activity from extinction or total inactivity. In the case of the Title I loans, the program was faced with expiration; the college housing and public facility programs were limping for lack of funds and applications were piling up.

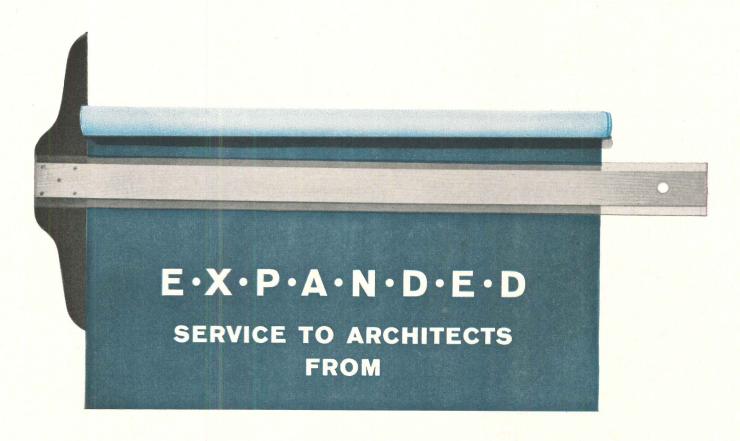
The college housing loan effort was virtually shut down, with revolving funds exhausted and \$250 million worth of applications on hand, it was reported. The additional \$500 million enabled the agency to pick up pending applications and make future allocations. Something of the same situation prevailed with regard to the public facility effort.

SCOREBOARD O	NC	CONSTRUCTION	FUNDS
(Appropriations	in	Millions-Figures Ro	unded)

Fiscal 1960	Fiscal 1961
\$ 63.0	\$ 63.0
3.4 6.0 107.5 132.0	4.0 6.0 150.0 140.0 20.0
31.7	75.0
25.0 60.0	165.4 21.0 58.0
186.2 61.1 45.0 30.0 4.8	186.2 63.4 45.0 30.0 9.7
661.3 10.5	706.5 12.0
132.4 4.6 48.1	166.4 4.9 52.5
306.8 213.1 797.3 23.2 16.5	148.4 162.5 609.5 17.5 13.8
262.5	212.7
17.4	10.7
\$3249.40	\$3154.10
	1960 \$ 63.0 3.4 6.0 107.5 132.0 31.7 25.0 60.0 186.2 61.1 45.0 30.0 4.8 661.3 10.5 132.4 4.6 48.1 306.8 213.1 797.3 23.2 16.5 262.5

¹ Of this total, \$150 million is for regular H-B construction, and \$35 million for rehabilitation facilities (Part G of Act) as follows: \$7.5 million for diagnostic or treatment centers, \$7.5 million for hospitals for the chronically ill and impaired, \$10 million for rehabilitation facilities.

² OFB item includes operation and maintenance.



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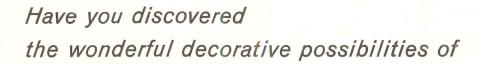
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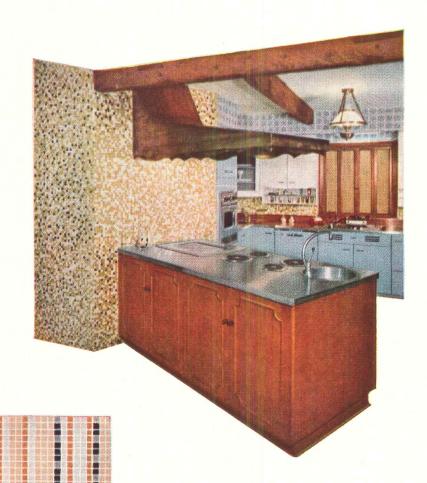
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HORIZON







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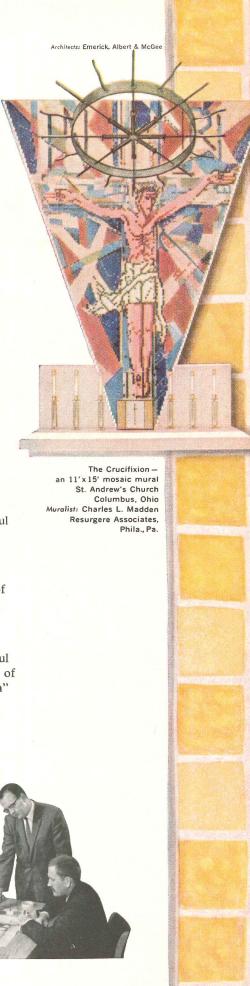
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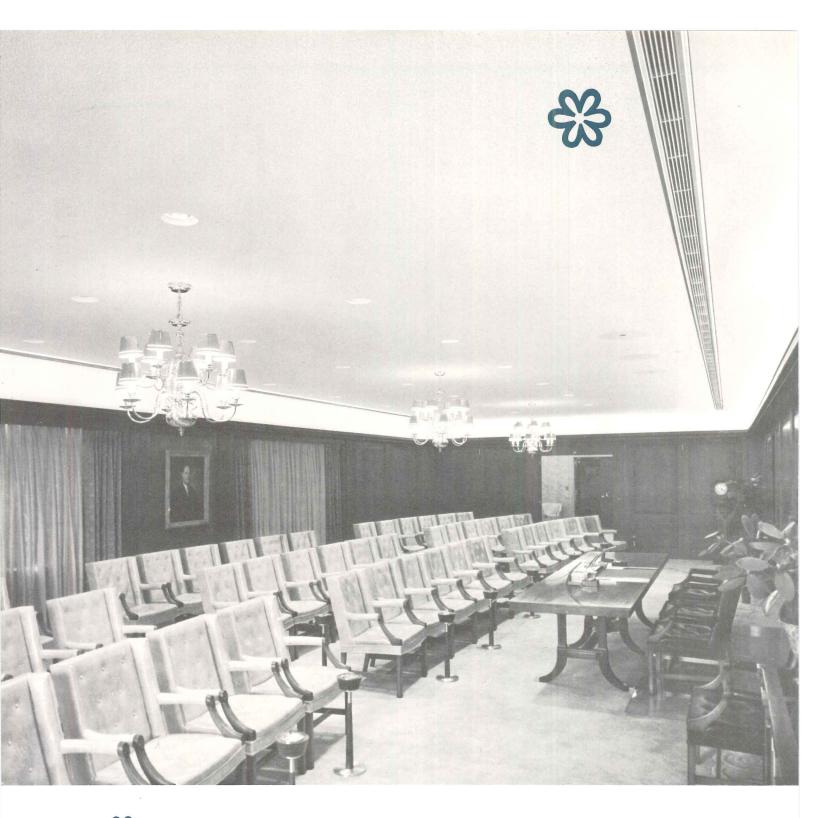
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ARCHITECTURALLY



(Photo by Julius Shulman)

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 $An \ intimate \ link \ with \ nature... for \ the \ Pasadena \cdot Community \ Church... through$



GLASS BY AMERICAN-SAINT GOBAIN

The Pasadena Church in St. Petersburg, Florida, has long been noted for its outdoor sanctuaries. In the new edifice shown above, the church members and their architects have achieved a noble, expressive building perfectly wedded to its site. This sanctuary, which accommodates over 2000 worshippers, takes abundant advantage of the beauties of new and existing gardens. • The architects, using great expanses of glass, have attained not only striking vistas but also well-modulated daylighting and freedom from glare and distraction. The chief means for this admirable balance: GLASS BY AMERICAN-SAINT GOBAIN.



WIRED AKLO* in A-SG's Blue Ridge Finetex® pattern crowns the sanctuary foyer. This glass is heat-absorbing, light-diffusing, fire-retarding. At the same time, it presents a handsome, modern appearance.

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*Reg. T.M., Lic. by Corning Glass Works

Striking visual effects were achieved with these functional A-SG glasses by the architects

The installation and samples pictured here suggest the variety of ways in which American-Saint Gobain glasses can contribute to your plans. Every important type of flat glass—in the widest range of characteristics, sizes and designs—is available to you from this one source.

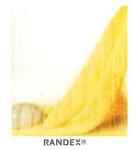
For detailed information, see the following Sweet's files: Architectural: 7a/Am...16d/Am...3e/Am. Industrial Construction: 6a/Am...3b/Am. Light Construction: 2e/Am. Plant Engineering: 5b/Am.

For other information, call the American-Saint Gobain district office nearest you...or write:

AMERICAN-SAINT GOBAIN CORPORATION Dept. AR-40, 625 Madison Avenue New York 22, New York



Wm. B. Harvard, AIA—Architect B. E. Jolly, AIA—Associate Glass distributor and pre-glazier: St. Petersburg Glass & Mfg. Co.









TEXTURED FLUTEX®

These patterned glasses are a small sampling of A-SG's Blue Ridge line.

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AMERICAN-SAINT GOBAIN CORPORATION

Washington Topics by Ernest Mickel

HHFA Sets Up New Division of Housing for the Elderly

Late in August the Housing and Home Finance Agency announced plans for putting \$20 million worth of housing for the elderly under construction "in the shortest practical time."

The program is being handled by the newly created Division of Housing for the Elderly in the Office of the Administrator. It supplements the larger FHA-insured loan program and the PHA low-rent public housing program for the elderly. The \$20 million appropriation to activate the new plan was signed into law by the President in July.

Said Housing Administrator Norman P. Mason: "Within the first month since funds became available, we have sent information on the requirements to groups in every part of the country. We intend to get housing under this program into ac-

tual production as soon as possible, and we will be ready, when the sponsors are ready, to give prompt review to their project proposals."

In the first month of its existence, the Division of Housing for the Elderly reported this progress:

The basic operating organization to handle requests and applications has been established by Daniel G. Minto, director. He named Edward George, a California business executive, as his deputy to assist in directing the program. In addition, agency personnel have been assigned to the Division.

A 12-page booklet outlining the policies and requirements of the program has been published and sent to several hundred civic, fraternal, church and other non-profit organizations and groups in virtually every state who have written to inquire about the program.

Application blanks have been sent to prospective sponsors who have indicated further interest.

Work was completed on the drafting of minimum property standards for housing constructed under the program.

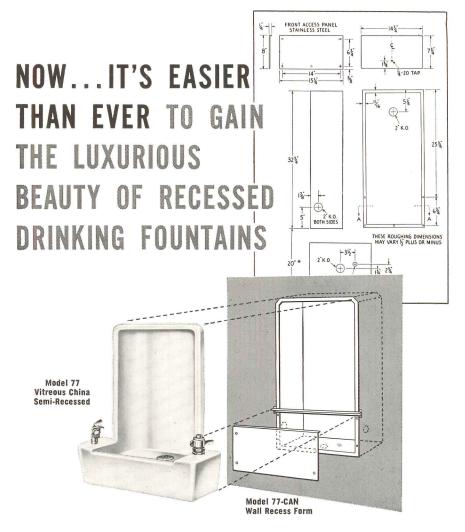
Three HHFA architects were moved into the Division to aid in the drafting of the MPS on housing for the elderly. They are Harry Lindsay, formerly of the Atlanta HHFA office; Trudpert A. Kunz, from Community Facilities Administration; and George C. Sponsler, Jr., from Urban Renewal Administration.

Senator Asks Coordination of Highway-Urban Programs

It's too early to tell what might come of it, but Senator Clifford P. Case, New Jersey Republican, last month was planning to meet with Housing Administrator Norman P. Mason to discuss his newly expressed concern over the effect of highway location and construction on urban development.

What disturbs Senator Case, he says, is the apparent movement of the urban development and highway construction programs in opposite directions without due regard for each other.

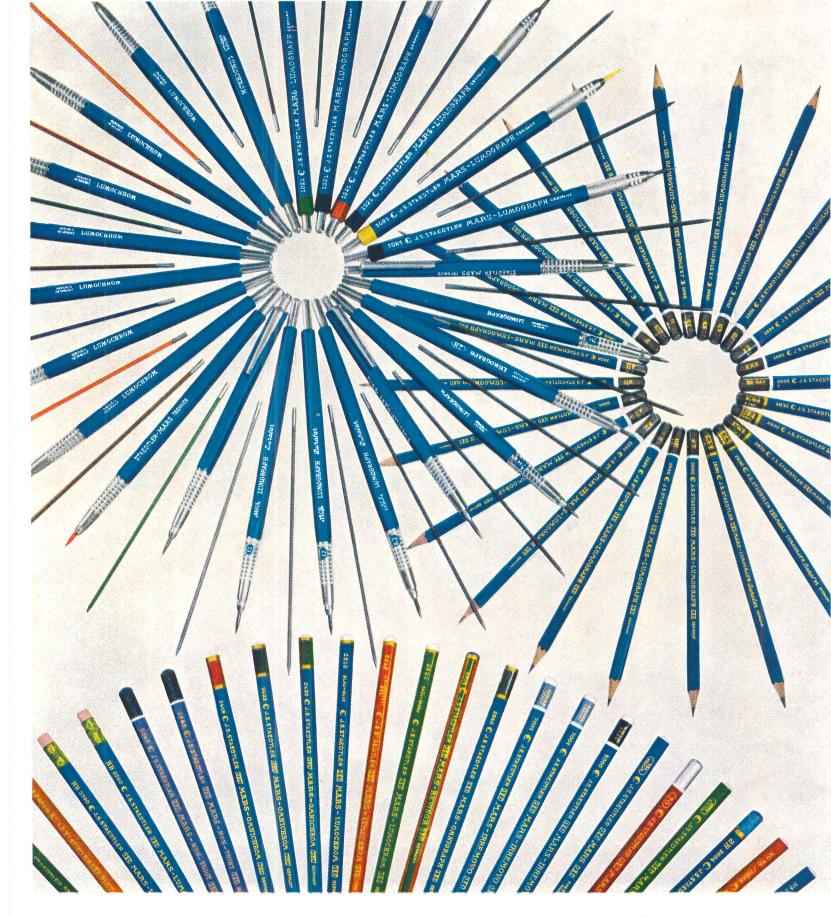
In writing to Administrator Mason to outline his views, the Senator said in part, "The competing claims of urban planners and highway encontinued on page 288



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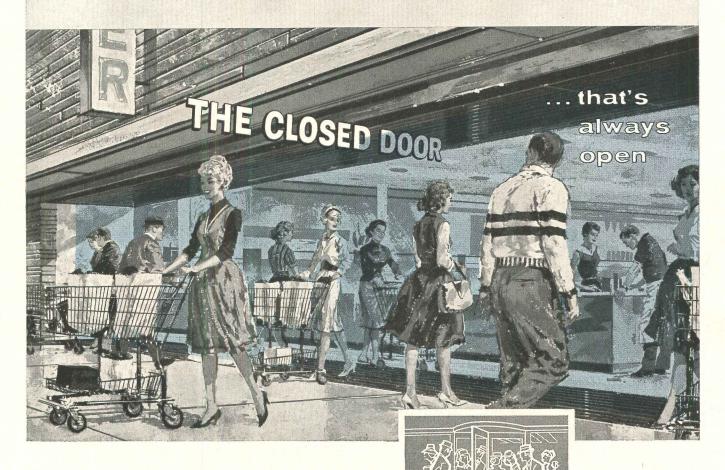
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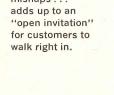


... an entrance that's sealed against wind and weather, heat and cold, odors and insects-against everything but people! It's that imaginative innovation in architectural engineering, the American Air Curtain.

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Plate No. 1094

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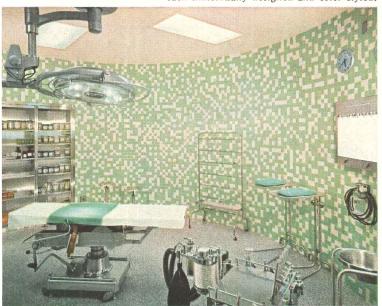
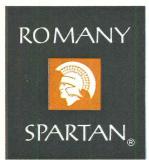


Plate No. 1093

FRANK CUNEO MEMORIAL HOSPITAL, Chicago, Ill. Architects: BELLI & BELLI CO. INC., Chicago, Ill. Tile Contractor: McWAYNE COMPANY, Chicago, Ill.

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mounting for speedy installation. Want design help, information or a quotation? Call your nearby Romany. Spartan sales representative, or write United States Ceramic Tile Company, Department AR-17, Canton 2, Ohio.

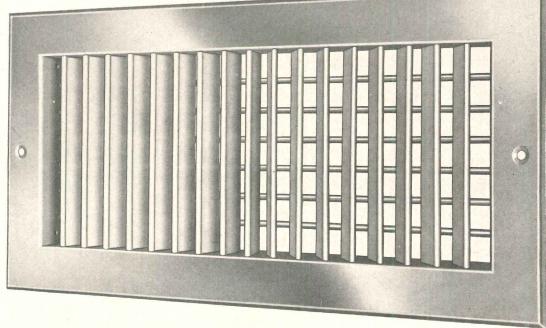






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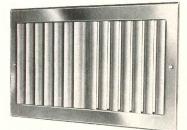
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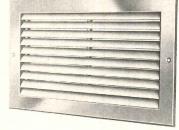
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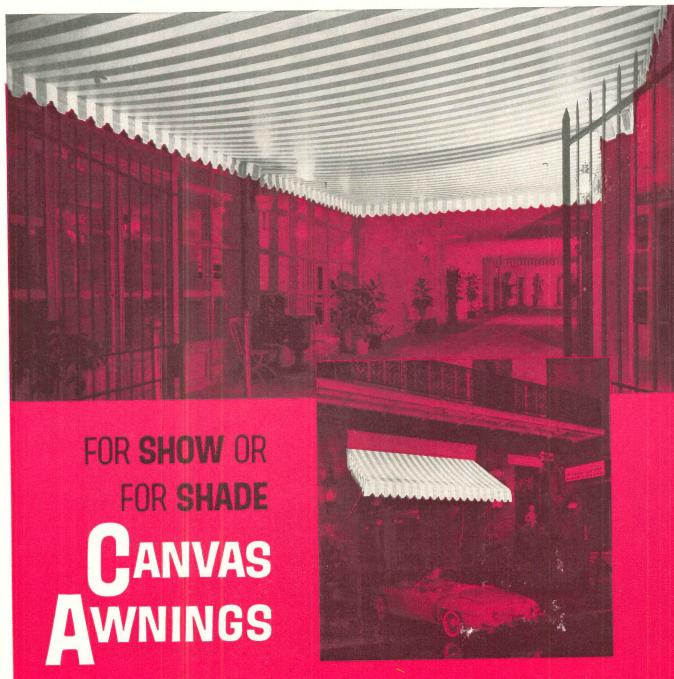




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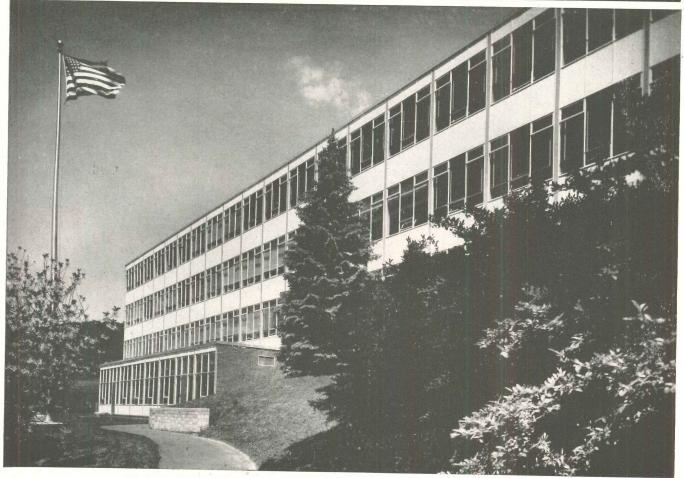


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Presented by Chyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc., Inc.

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

NEW YORK

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			Brick	Brick	Brick	RESIDENTIAL		OFFICE BLDGS.	FACTORY	
			and	and	and			Brick	Brick	Brick
PERIOD	Brick	Frame	Concrete	Concrete	Steel	Brick	Frame	Concrete	Concrete	and Stee
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.
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.
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.
1953	281.3	277.2	281.0	286.0	282.0	223.0	224.6	221.3	221.8	223.0
1954	285.0	278.2	293.0	300.6	295.4	219.6	219.1	233.5	225.2	225.4
1955	293.1	286.0	300.0	308.3	302.4	225.3	225.1	229.0	231.5	231.8
1956	310.8	302.2	320.1	328.6	324.5	237.2	235.7	241.7	244.4	246.4
1957	318.5	308.3	333.1	345.2	339.8	241.2	239.0	248.7	252.1	254.7
1958	328.0	315.1	348.6	365.4	357.3	243.9	239.8	255.7	261.9	262.0
1959	342.7	329.0	367.7	386.8	374.1	252.2	247.7	266.1	272.7	273.1
May 1960	348.8	335.1	374.0	391.1	379.7	258.1	252.8	273.1	279.9	279.
June 1960	353.8	338.9	380.4	399.7	382.8	258.1	252.3	272.1	279.6	277.6
July 1960	353.8	338.9	380.0	399.4	381.3	261.1	254.8	275.9	284.9	278.
		9	6 increase over 19	39				increase over 1939	204.7	2/0.5
July 1960	186.5	176.9	190.7	199.4	193.1	202.5	206.6	190.1	192.5	194.1
	ST. LOUI	S				SAN FRA	NCISCO			
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	100.4
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3			99.7
1948	227.9	231.2	207.7	210.0	208.1	218.9	216.6	117.4	121.9	116.5
1949	221.4	220.7	212.8	215.7	213.6	213.0	207.1	208.3	214.7	211.1
1950	232.8	230.7	221.9	225.3	222.8	227.0	223.1	214.0	219.8	216.1
1951	252.0	248.3	238.5	240.9	239.0	245.2		222.4	224.5	222.6
1952	259.1	253.2	249.7	255.0	249.6	250.2	240.4	239.6	243.1	243.1
1953	263.4	256.4	259.0	267.0	259.2		245.0	245.6	248.7	249.6
1954	266.6	260.2	263.7	273.3	266.2	255.2	257.2	256.6	261.0	259.7
1955	273.3	266.5	272.2	281.3		257.4	249.2	264.1	272.5	267.2
1956	288.7	280.3	287.9		276.5	268.0	259.0	275.0	284.4	279.6
1957	292.0	283.4	295.2	299.2	293.3	279.0	270.0	288.9	298.6	295.8
1958	297.0	278.9		307.1	302.9	286.3	274.4	302.9	315.2	310.7
1959	305.4		304.9	318.4	313.8	289.8	274.9	311.5	326.7	320.8
May 1960	312.5	296.4	315.0	329.8	323.9	299.2	284.4	322.7	338.1	330.1
June 1960	311.8	302.3	323.5	338.6	333.0	308.1	291.2	335.9	353.6	344.3
July 1960	312.0	301.4	322.8	337.9	330.1	309.1	293.4	337.8	354.0	345.1
2017 1700	312.0	301.6	322.5	337.4	327.1	307.5	291.4	337.2	353.6	344.5
July 1960	183.1	181.9	increase over 193				-	ncrease over 1939		
,		101.7	171.7	181.6	174.9	191.2	193.4	187.2	190.1	195.7

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.

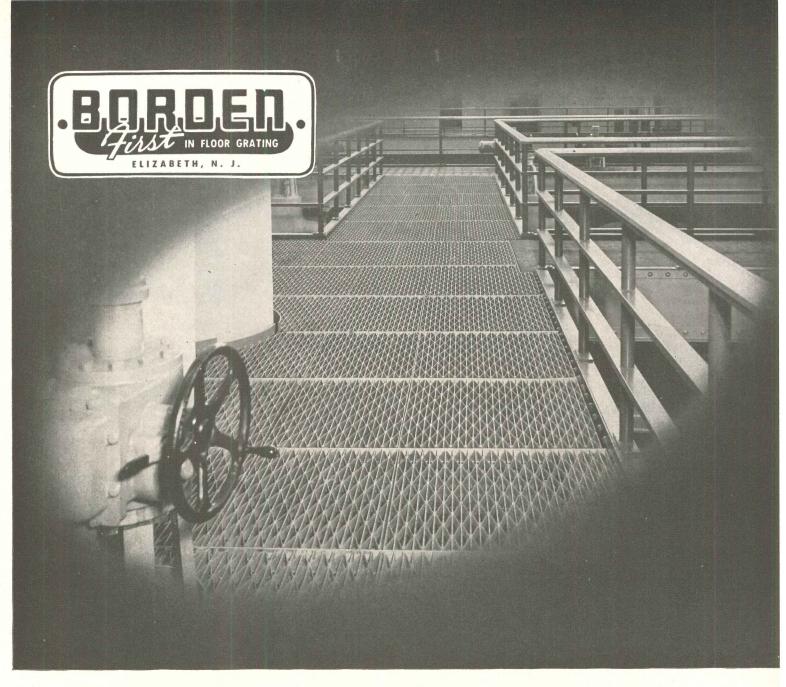
$$\frac{110 - 95}{95} = 0.158$$

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.



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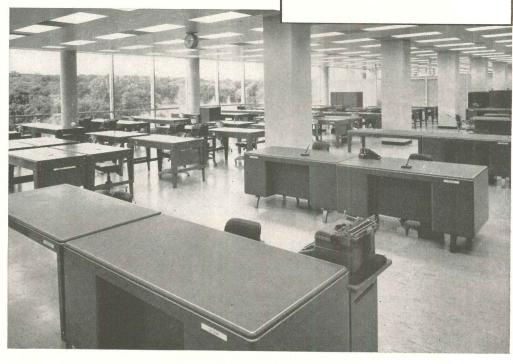
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Mechanical Engineers: Scott & Kinney

General Contractor: S. Patti Construction Co.

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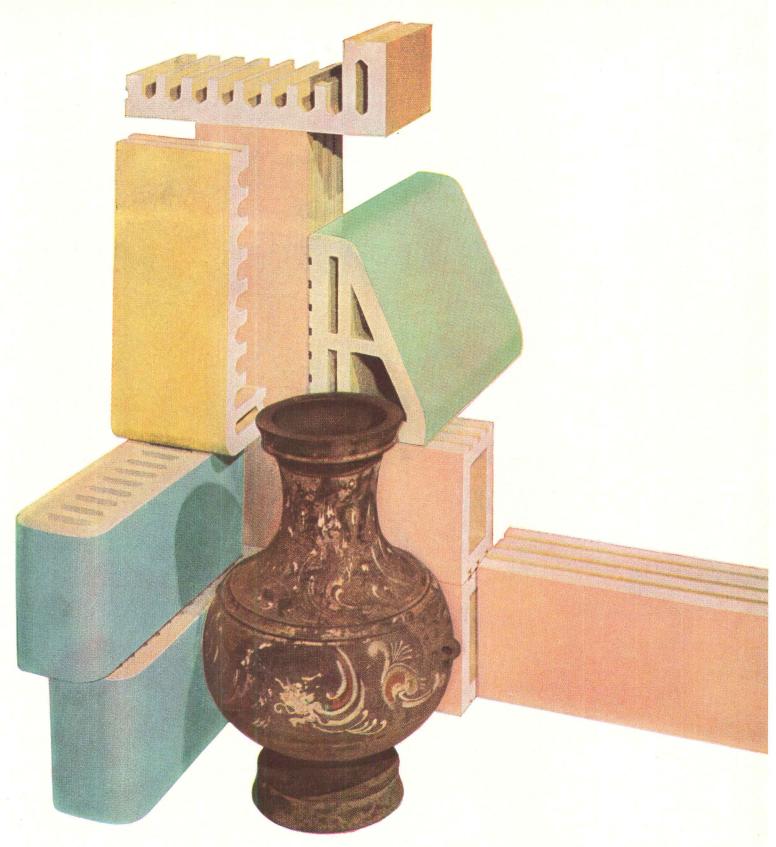
Take a good look at the photo directly above and you can barely see the installed Perfair diffusers because they blend in so unobstrusively with the ceiling decor.

And these perforated air diffusers are designed to provide more than beauty to any interior. Perfair diffusers are engineered to assure proper air distribution without any noise or drafts whether the application calls for a 1-2-3 or 4 way blow. Also available in matching return units.

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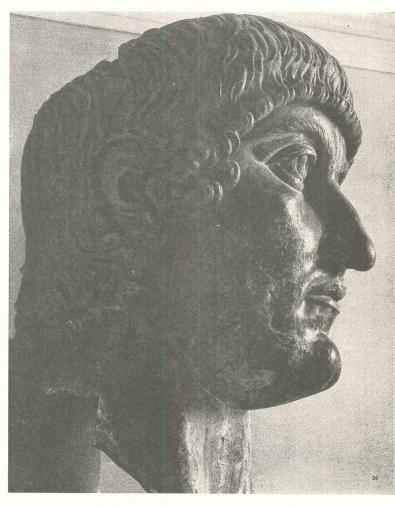
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Required Reading



Constantius, in Capitoline Museum
—from Rome for Ourselves

Planning for Industry

INDUSTRIAL ARCHITECTURE—An Analysis of International Building Practice. By James F. Munce. F. W. Dodge Corporation, 119 W. 40th St., New York 18. 232 pp., illus. \$14.75.

There was a time, not too long ago, when few if any industrial buildings were designed by architects. Obviously, this is no longer true. Not only are the majority of industrial buildings architect-designed, but in many of them the architect plays a much larger role than has been usual in the past.

It is rapidly becoming the rule, rather than the exception, for architects and their consultants to become increasingly involved in such highly specialized aspects of industrial building planning and design as site feasibility, relationships of the building and its site with the surrounding area, to the labor available, to sources of supply and markets. The planning groups led by architects often include production or industrial engineers, who work closely with the

client in order to insure efficiency in manufacturing operations and lay-

According to its author, this book is intended to "capture the essence of the modern factory" and relate it to the architect's expanding role in its design. In order to accomplish this, the book contains a short history, followed by analyses, in some depth, of the design, planning, and engineering of postwar British, American, and German industrial buildings. Important individual topics, such as factory services, fire protection, automation, and heating and ventilation are discussed. Specific types, including buildings for light and heavy industry, process industries, and utilities are examined in considerable detail.

For architects, engineers, and other members of the planning group, who are now, or in the future will be, involved in the design of industrial buildings, this book should prove to be a valuable text and reference. It should also be of at least equal value to their industrial clients.

—Dudley Hunt, Jr.

The Once and Future City

ROME FOR OURSELVES. By Aubrey Menen. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 26. 244 pp., illus. \$15.

The talents of an Indo-Irish author, an American publisher, Dutch, French and English printers and engravers have all converged to produce this splendid book on the eternal Italian city. It is no fault of the text that what is likely to tempt the prospective buyer are the plates (151 of them): velvety half-tones and sparkling four-color work in a large format, displaying only Rome's best from the Etruscan period on.

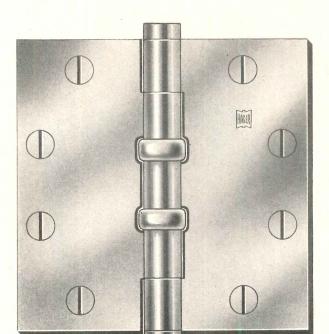
Mr. Menen is, as usual, highly readable, though he seems at times over-zealous in resisting the intemperate prose of some 19th century art historians. One doubts that the cause of history is really served by replacing the prejudices of the sentimental pedant with those of the determined debunker, however well-read and amusing. Whatever the ex-

continued on page 78

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

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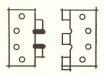
Hager's advanced, two-knuckle-bored construction puts steel against case hardened steel in this failure zone. The result is flawless ball bearing performance—life-time performance.

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!

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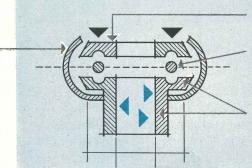
not one-knuckle-bored with wear-away brass to anchor the bearings. (Bearings finally fall out when pin is removed)



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

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

Brass outer shell permanently fixed. Protects raceways and balls from dirt. Contains lubricant in bearing.



Case hardened steel top raceway. Knuckle rides on this.

Case hardened carbon steel balls.

Case hardened steel bottom raceway permanently fixed. Puts steel in the zone of lateral thrust against pin. Carries vertical thrust transmitted from top raceway through balls.

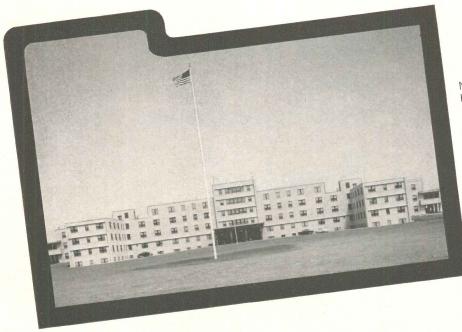


(Both stainless steel raceways and balls are available on stainless steel ball-bearing hinges.)



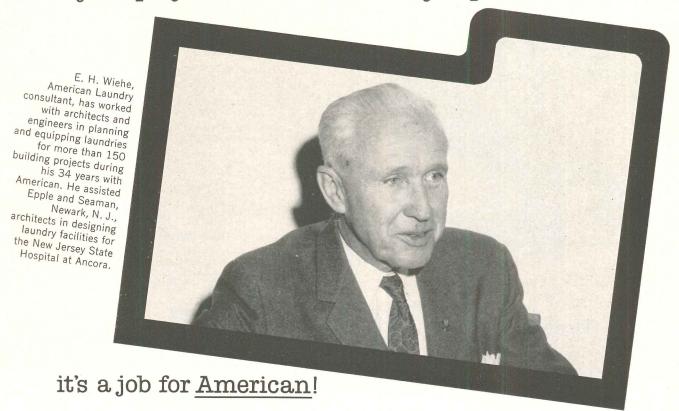
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Robin Lake dining pavilion, Ida Cason Callaway Gardens, Pine Mountain, Georgia. Architects: Aeck Associates, Atlanta, Georgia. Structural Consultants: Drake, Funsten & Harrison, Atlanta, Georgia

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Conical bowls atop slender concrete stems create a roof that's unusual and dramatic. For a pavilion where informal meals are meant to be fun, these parasols give just the right atmosphere.

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New Bulletin 29-H answers all your questions about modern shower equipment.



Required Reading

continued from page 74

The Once ...

cesses of earlier writers, the fact remains that the Italian peninsula supported two great Western civilizations, at least one more than any other region can claim, and to "explain" away Italian contributions by dubbing the first civilization Greek and the second Arabic is to avoid the question. No matter how lofty the Greek way, Rome, not Athens, was the capital of the Empire; and no matter how intellectual the Arabs, Florence and Rome, not Baghdad or Cordova or even Naples, were the capitals of the Renaissance.

Nonetheless, even at his most outrageous Mr. Menen is rarely less than stimulating and never less than witty. And his concluding chapter recognizes a Rome that the guidebooks generally overlook: a modern and exceedingly vital city.

And then, there are still those photographs.

More Italian Cities

VENICE, VICENZA & VERONA. By George Campbell Dixon. Essential Books, a division of Oxford University Press, 517 Fifth Ave., New York 16. 160 pp., illus. \$12.50.

As so often happens in picture books, the illustrations—72 color plates of the buildings and gardens of Veneto—upstage the text, which is frankly the sort of "votive offering" made by 17th, 18th, 19th and 20th century Englishmen after touring Italy, and which draws heavily and with some charm from these earlier writings.

Technical Books

FUNDAMENTALS OF ENGINEERING GRAPHICS. By Myron G. Mochel. Prentice-Hall, Inc., Englewood Cliffs, N. J. 379 pp., illus. \$8.50.

A text book containing sections on theory and methods of solving threedimensional space problems on twodimensional surfaces; on methods of communicating spatial solutions by continued on page 376 other

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Monumental stock and custom types. All sash operate and bypass for window cleaning from interior. Strength of section allows heights to 6'6". The leader in the field for weather-tight performance and beauty of sight lines.

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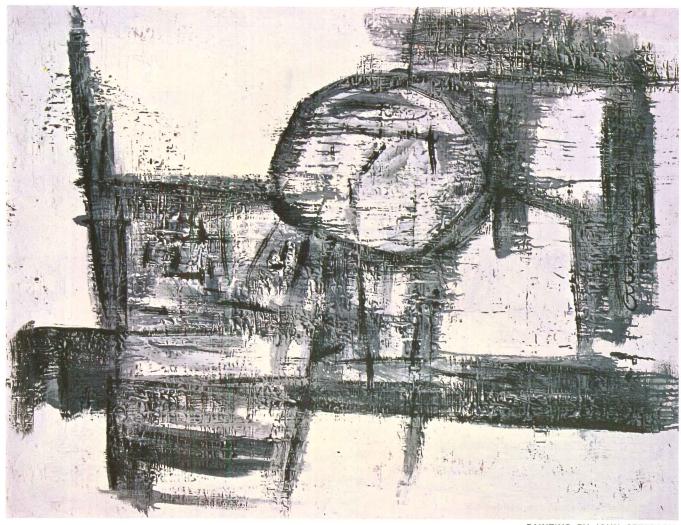
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DIRECTION

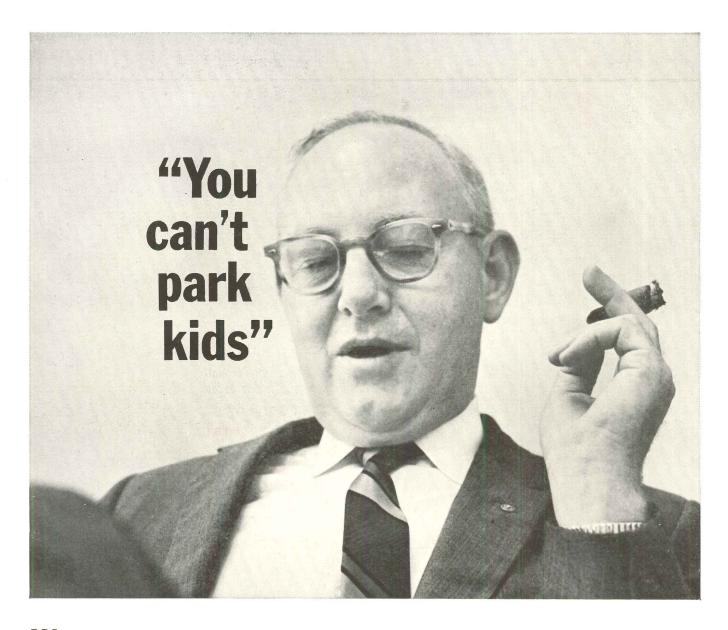
PAINTING BY JOHN OTTERSON

The abstract nature of architecture allows architects the greatest freedom for innovation. GRIDWALL paves the way for uninhibited architectural creation by making available curtain walls in keeping with the design principles of architects who are trail-blazers.

Proven water-tight and mechanically dependable, GRIDWALL ASSURES THE ARCHITECT MORE TIME FOR DESIGN CONCENTRATION...eliminating all doubts and time-consuming research regarding his use of curtain wall.

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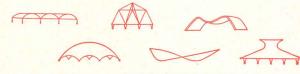
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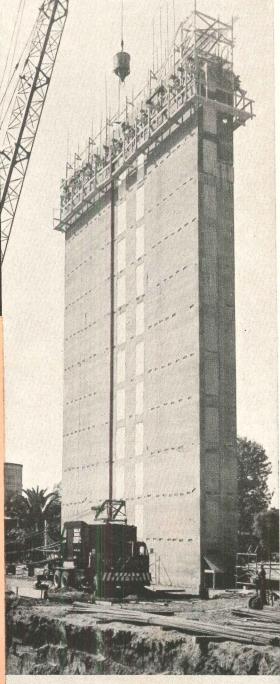
NEWS FROM PALO ALTO, CALIFORNIA

MUELLER BRASS CO. Streamline COPPER TUBE IN THE NEW TYPE "CENTRAL CORE" 15 STORY LUXURY



The first application of "slip-form" central core construction in the United States has been employed in the erection of the new 101 unit Palo Alto apartment building. With this method, the form in which the concrete is poured rides on high strength steel rods equipped with hydraulic jacks. The slip form is progressively lifted to each elevation after the concrete has been poured and allowed to set. By using this system, the 15 story core of the building was completed in 5 working days at an estimated saving of 8% on labor costs. Pre-stressed slabs, poured in place, serve as both floors and ceilings in the core. This Swedish-originated method has been used extensively in this country for bridge piers and storage silos, but is completely new in the construction of buildings.

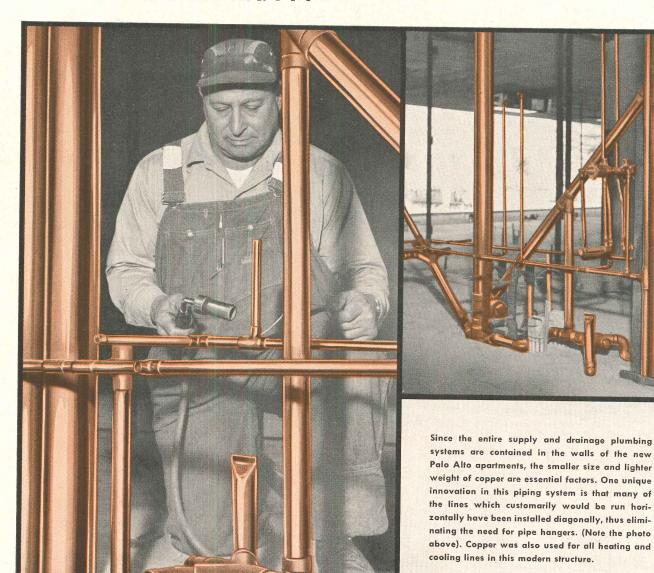
Architect for the new Palo Alto apartments is William F. Hempel, AIA. The North State Builders Ltd. own and are constructing the 15 story building; engineering was by R. B. Welty of Modesto with H. B. Brewster, Fresno, consulting. The plumbing is being installed by the Herman Lawson Company of San Francisco. According to Mr. Hempel, the location of the utilities in the central core of a building sometimes creates problems in relation to local codes. But, in the case of the Palo Alto apartments, the city of Palo Alto changed code requirements so all plumbing in the building could be copper.





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Even complex plumbing assemblies can be quickly put together with a minimum number of joints when Streamline DWV copper tube and solder-type fittings are used. The work is faster and the completed job assures a life-time of clog-free, rust-proof, leak-proof plumbing service . . . and copper costs no more than rustable piping materials. More and more architects and engineers, builders, and owners are specifying Streamline copper tube and solder-type fittings . . . the modern plumbing material for supply and drainage systems.

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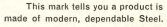
PORT HURON 8, MICHIGAN





Meet an expert in strong, light construction Grass, fibers, weed stalks and horsehair don't sound much like building materials, but an oriole can do wonders with them. She weaves them into a sac-shaped nest that's light enough to suspend from thin twigs. Yet the nest is so strong that hurricane winds can't tear it from the branches. ☐ For exceptional strength and lightness in a man-made structure, we suggest USS AmBridge Steel Joists, both standard and long-span. They provide strong, lightweight and economical construction suitable for most any type of roof, ceiling or floor. AmBridge Joists have an underslung, open-web design for maximum headroom, and to accommodate pipe, ducts and conduit in all directions. AmBridge Steel Joists are easy to install. And once in place, they make a safe working platform. Want more information? Write to our Pittsburgh Office for your free copy of a 40-page catalog.

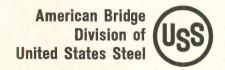
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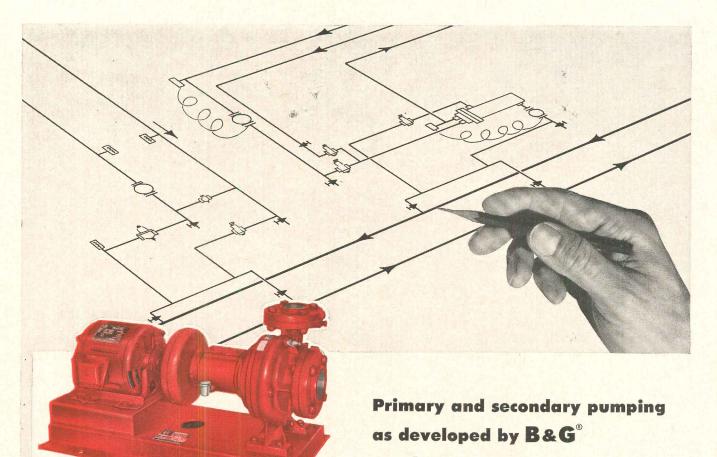




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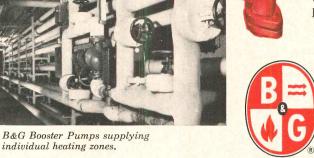


Where multiple buildings or multiple zones within a building are to be heated with circulated water, *Primary*

building are to be heated with circulated water, *Primary* and Secondary Pumping, as conceived and developed by Bell & Gossett engineers, both reduces pump horsepower and saves fuel by improving heat control.

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Now...Benjamin introduces the ultimate in dramatic fluorescent lighting—the slim trim Coronado. It's excitingly different, with the smart, slender look of distinction. Available in either a clear or "Prisopal" lens, the Coronado hugs the ceiling in perfect harmony of design, with a visible depth of only $2\frac{1}{2}$ ". Its distinctive styling sets this unit apart from all other plastic enclosed units.

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Available in 2 or 4 lamp-40 W. Rapid Start.

EXCLUSIVE NEW FEATURES

NEW...finger-touch latch hinges from either side, allows basket to swing down or be removed—no tools needed.

NEW...snap-in wire way cover provides easy access to wiring and control equipment.

NEW...end plate design permits easiest tandem installation, coupling units in perfect alignment.

NEW...decorative plastic end caps available for use on individual units or at ends of row.

NEW . . . one-piece ''wrap-around'' extruded plastic construction—only $2\frac{1}{2}$ " visible depth.

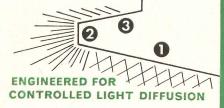


CORONADO - CLEAR LENS (Top)

This new 3-in-1 diffuser boasts a crystal-clear L-120 low-brightness prismatic bottom, complemented by linear refracting lenses on sides and top to redirect light out of glare zone. Here is the ultimate in clear, color-stabilized polystyrene.

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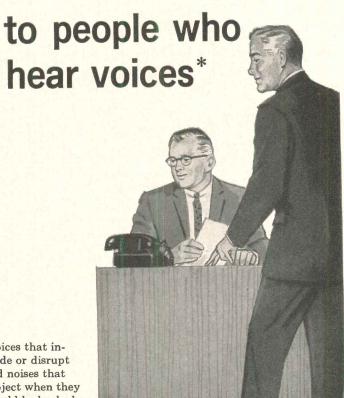
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W-2	3½"	42"	48"
W-3	5"	30"	48"
W-4	5"	42"	48"
W-5	7"	30"	48"
W-6	7"	42"	48"



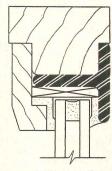
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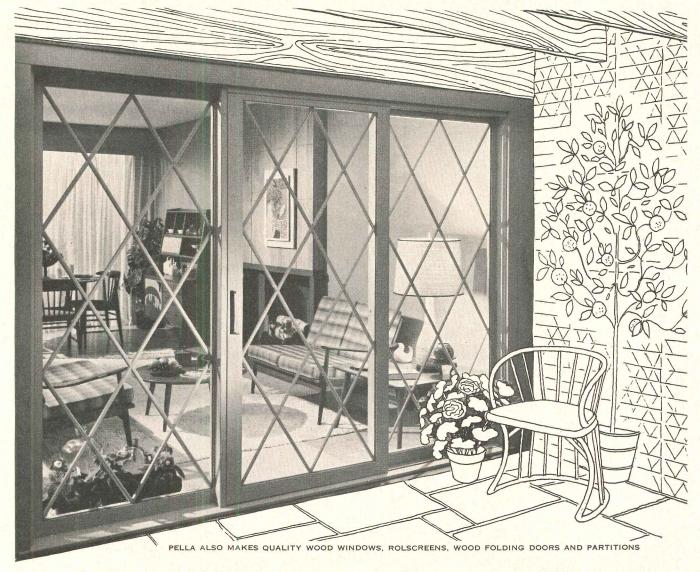
that can be painted or finished naturally

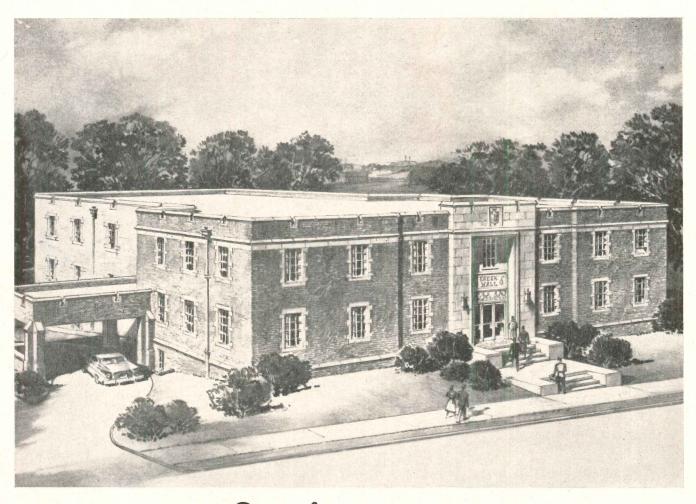
Pella now offers sliding glass doors of wood that can be painted or finished to match any color scheme inside and out. The superior insulating qualities of wood plus a combination of stainless steel and wool pile weather-stripping make this sliding door weathertight — prevent condensation. And you can achieve warm, traditional

effects with Pella removable muntins in regular or diamond patterns. Types 0, 0x, x0, 0x0 and 0xx0 doors available in 33" and 45" glass widths x 763/4" glass height. Call the Pella distributor listed in your classified telephone directory for specifications and literature. Rolscreen company, Pella, 10WA.



The welded steel T-section on all four sides of the 1¾" Ponderosa Pine door panels gives the PELLA SLIDING GLASS DOOR its rugged strength and slim lines.





MARLO Quietly LEADS THE CLASS IN ENGINEERS' AIR CONDITIONING TEST

Selected over nine other makes to comfort condition new music conservatory

There was no guesswork in the selection of air conditioning for the new Cadek Hall, conservatory of music at the University of Chattanooga, designed by architects Shepherd and Smith.

The consulting engineers, Campbell & Jones, conducted comparison tests on 10 leading makes of equipment. Judgment was on the basis of noise level, overall construction, and individual features such as access panels, grilles, etc.

Results of the tests pointed conclusively to Marlo Seazonaire remote room units as the best choice. Low noise level in particular was an outstanding characteristic of the Marlo equipment, which operated as quietly at high speeds as other units at low speeds.

For **your** air conditioning needs, you'll find this same high quality typical of the entire Marlo line. The Marlo representative in your area can give you complete information.



Marlo Seazonaire Unit, Model FWC-C, selected for Cadek Hall, University of Chattanooga.

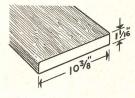
MARLO coil co.

ST. LOUIS 11, MISSOURI

Quality Air Conditioning and Heat Transfer Equipment Since 1925

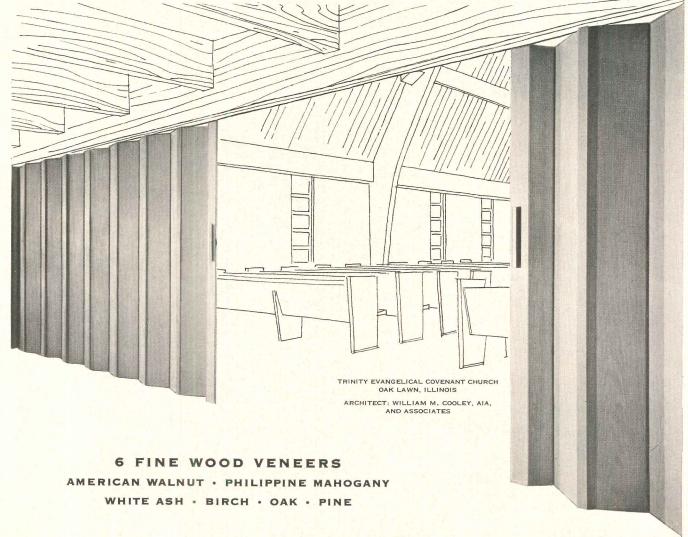


... massive panels of WOOD to divide large areas of space

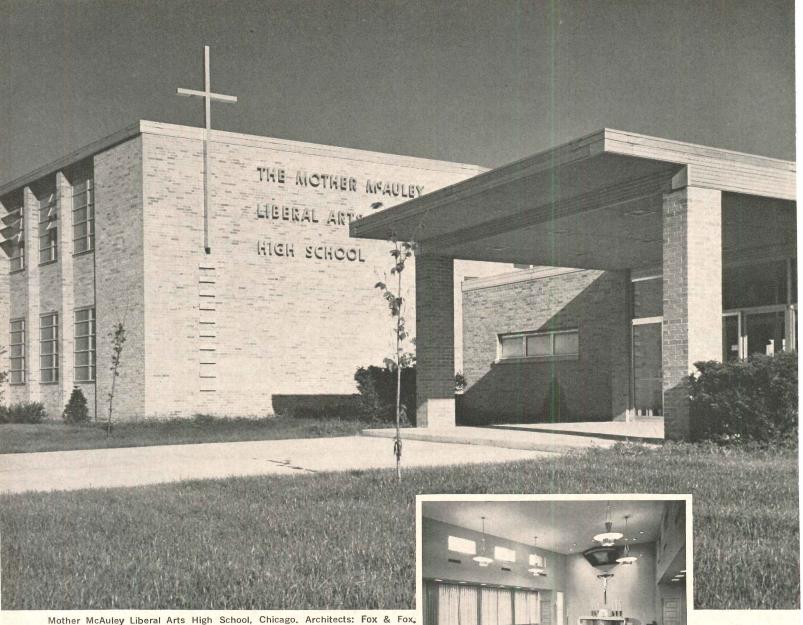


When plans call for a large space divider—one that's substantial yet decorative—try Pella wood folding partitions. This latest Pella product offers new panel dimensions of 10-3/8" x 1-1/16". Available for any width opening and heights up to 20'1". Embodying good basic design and rich natural wood textures, these partitions integrate with interior appointments of most churches, restaurants,

schools, clubs and offices. Specify factory-finished or for finishing on the job. Stable core construction assures non-warping panels. Patented "live-action" steel spring hinging system maintains panel alignment. Consult your classified telephone directory for nearest PELLA distributor in U.S. or Canada, or, send for literature. ROLSCREEN COMPANY, PELLA, IOWA.



OTHER PELLA QUALITY PRODUCTS INCLUDE PELLA WOOD WINDOWS, ROLSCREENS, WOOD FOLDING DOORS AND WOOD SLIDING GLASS DOORS



Painting Contractor: M. H. Roberts Company, 515 South Cicero Avenue, Chicago.

DECORATED WITH DEVOE PAINTS The modern beauty of Mother McAuley Liberal

NEW CHAPEL AND SCHOOL

Arts High School is a combination of many things. It's the architecture of Fox & Fox, the color scheme of Sister Augusta, and the paints applied by M. H. Roberts Company—Devoe paints, for both the interior and exterior.

On your own projects you'll find working with Devoe advantageous. Not only for the matchless beauty and quality of the paints themselves, but for the Devoe Color Consultant Service as well. It's free and without obligation.

If you wish, Devoe's Color Consultants and architectural representatives will thoroughly analyze your paint requirements . . . taking into consideration such important factors as cost, climate, use, maintenance, and durability as well as color and appearance. Or they'll assist your specification writer or color specialist. They'll save you time, costs, and details. Make you color presentations to show your clients. Build you a color reference library. All without obligation.

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206 years of paint leadership

DEVOE & RAYNOLDS CO., Inc. A Subsidiary of Merritt-Chapman & Scott Corp. Atlanta • Boston • Charlotte • Chicago • Cincinnati · Dallas · Denver · Los Angeles · Louisville · New York · Philadelphia and in other principal cities

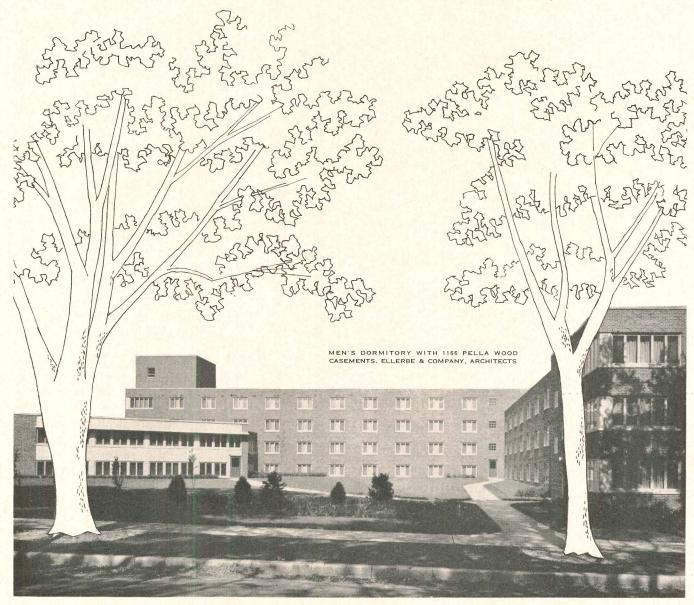


wood casements

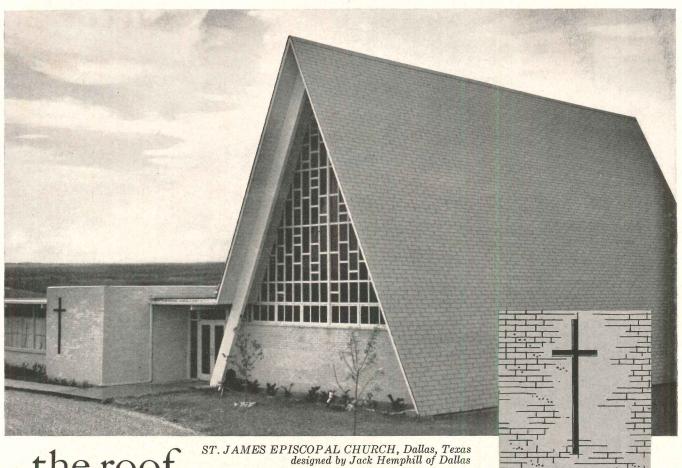
save on storage space and maintenance

STORAGE SPACE: Inside storm panels and ROLSCREENS® on PELLA WOOD CASEMENTS are *self-storing* the year 'round. You don't have to provide space to store screens and storm sash.

MAINTENANCE: Occupants pull down ROL-SCREENS at sign of the first fly . . . raise them in the fall. This *exclusive* PELLA feature is a real laborsaver twice a year. Pella wood casements adapt to your design requirements. Only pella offers 18 ventilating casement units up to 68" x 24" glass size and 60 fixed units. Full specifications in sweet's or consult the classified section of your telephone directory for the name of the nearest U. S. or Canadian distributor of pella products. ROLSCREEN COMPANY, PELLA, IOWA.



MAKERS OF FAMOUS PELLA WOOD WINDOWS, WOOD SLIDING GLASS DOORS, ROLSCREENS, PELLA WOOD FOLDING DOORS AND PARTITIONS



the roof

dominates,

the shingle glorifies

The traditional beauty of the Bird Architect Shingle dignifies a roof with sweeping modern lines

The roof of this Dallas church, by far the outstanding feature to the eye, is emphasized with special impact. It is another perfect example of the importance of these unique qualities of the great Bird King-tab Architect Shingle:

Conformity with Design achieved by the Architect's 18" King-tabs — 50% less vertical lines accentuate the horizontal.

Uniformity of Surfacing in even distribution of jumbo color granules (here, Polar White) controlled in manufacture — no unsightly application on site.

Greater Safety, Triple Protection: 300 lbs. per square, thick as standard slate; 3 full layers at every point, with 5" exposure. Flatter roofs, pitched as low as 2" in 12", use it with complete safety.

See Specifications in Sweets File Bi



or write BIRD & SON, INC., Box AR-100, East Walpole, Mass. Charleston, S. C. • Shreveport, La. • Chicago, Ill.

MOISTURE AND TERMITES A PROBLEM? Write for details on Bird Termite Prevention System and Vapor Barrier.

Children's convalescent

hospital makes efficient

use of

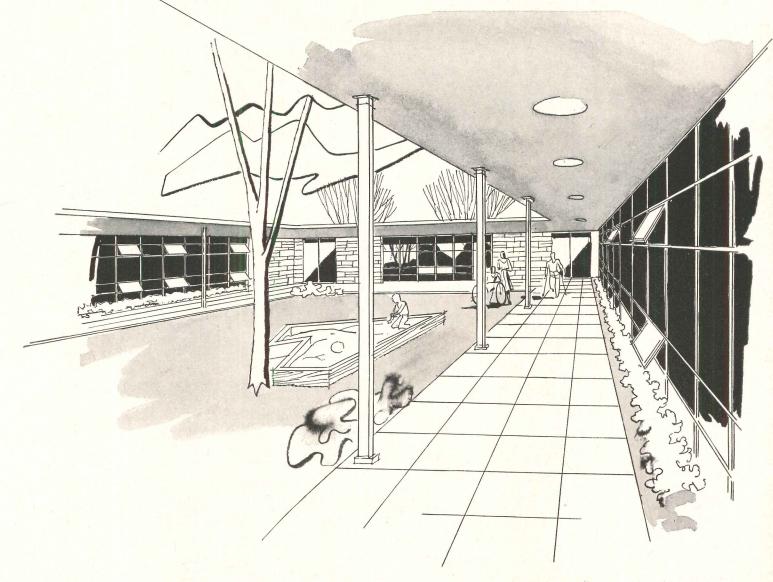


windows

For simplicity of design and erection, make large modular units with PELLA WOOD MULTI-PURPOSE WINDOWS. For example, here is one 11' wide by 10'8" high. It utilizes 9 standard PELLA M-P WINDOWS. Available in a wide range of stationary and ventilating sizes, PELLA MULTI-PURPOSE WINDOWS feature the exclusive GLIDE-LOCK® underscreen operator for opening sash to 10 positions without removing screens. Roto-Oper-

ator also available. Inside screens and Dual Glazing Panels are *self-storing*. Insulating glass can be specified. Multipane effects can be created with removable muntins. Pella M-P Windows are constructed on a 4" module and combine nicely into large units that are economical to erect. Consult sweet's or see classified telephone directory for name of nearest U. S. or Canadian Pella distributor. Rolscreen company, Pella, Iowa.

4420	4420	4420
VENT	FIXED	VENT
4448	4448	4448
FIXED	FIXED	FIXED
4420	4420	4420
VENT	FIXED	VENT



Fairbanks-Morse Announces!

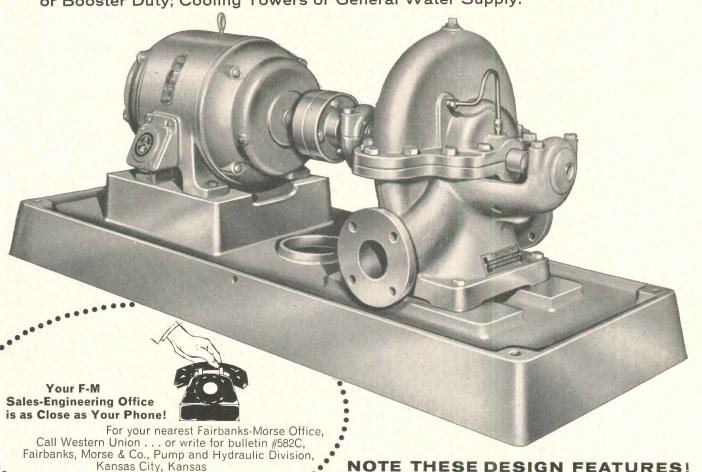
A NEW SPLIT-CASE PUMP

FOR THE AIR CONDITIONING INDUSTRY

specifically designed for

MODERATE COST INSTALLATIONS

Single Stage, Horizontal Split-Case Centrifugal Pump for Chilled Water, Circulating or Booster Duty; Cooling Towers or General Water Supply.



NOTE THESE DESIGN FEATURES!

- Replaceable casing wearing rings . . . for increased pump service life
- Mechanical shaft seals (or packing box)
- Sealed prelubricated bearings requiring no lubricating service
- · Heavy cast-iron base, drip-lip design

Fairbanks, Morse

A MAJOR INDUSTRIAL COMPONENT OF FAIRBANKS WHITNEY CORPORATION

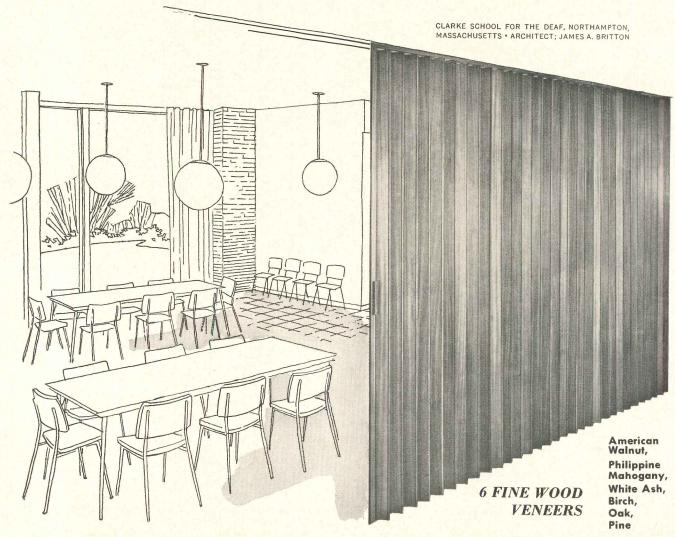


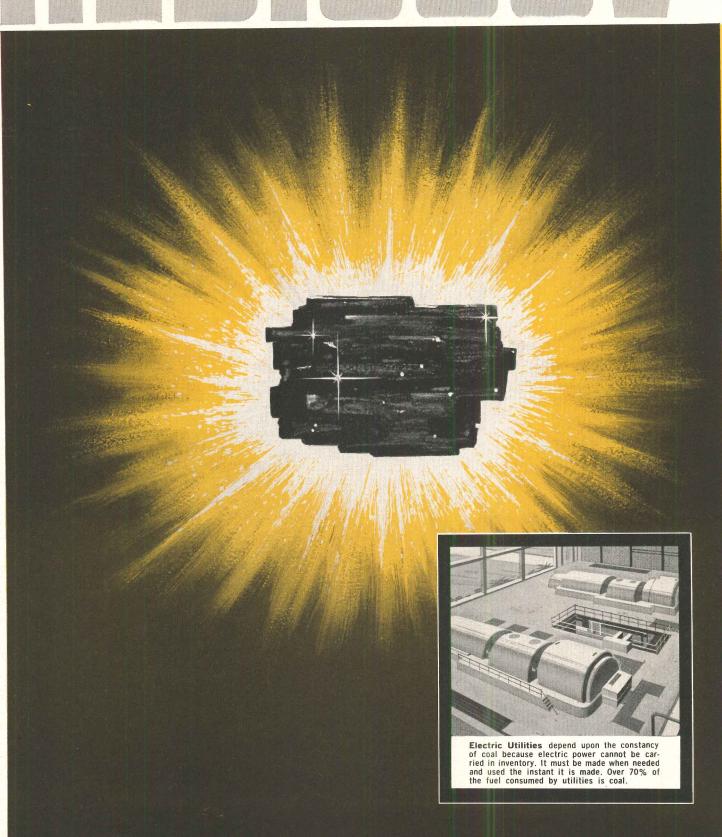
folding doors

provide warm texture of natural wood

After you've decided to use folding doors, consider the ones that carry the name PELLA. The rich-grained beauty of their genuine wood veneers complements brick, tile, glass and plaster surfaces. Available factory-finished or unfinished, PELLA WOOD FOLDING DOORS provide lasting beauty with their quality materials and fine craftsmanship. Patented "live action" steel spring hinging assures dependable, effortless operation for even the largest units. Solid wood "Lamicor" panel construction prevents

warping. Available for any width and in heights up to 12'1", Pella wood folding doors arrive factory assembled, complete with all hardware for quick installation. Because satisfaction depends on appearance as well as function, try working with wood folding doors by pella on your next problem of space control. Full specifications in Sweet's. Consult the classified telephone directory for your nearest U. S. or Canadian distributor. ROLSCREEN COMPANY, PELLA, IOWA.





COAL IS ENERGY... producing low-cost kilowatt-hours for modern electrical living

As more and more Americans turn yesterday's household luxuries into today's necessities, electricity continues to be the greatest single force lifting our standard of living. In the last ten years our population has increased 20%. But the residential demand for electrical power during that time has risen 251%! For commercial and industrial use there has been a 150% increase. To satisfy this growing and boundless demand for dynamic energy, the electric utility industry has just about doubled its capacity every decade, all the while improving its fine record of giving more and more power for the consumer dollar.

Power companies are the biggest single user of coal. Nearly 70% of fuel-produced electric energy is generated by coal. Our country's five most efficient power plants, based on the 1958 report of the Federal Power Commission, operate 100% on coal.

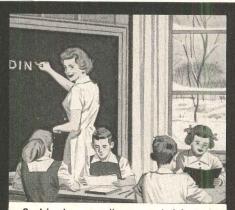
In this booming energy market—and in other industries including steel making, process steam and heating as well—coal is the favored fuel. It offers the highest efficiency at lowest cost. It can match the stride of future consumption... is dependably, economically transported as needed by Chesapeake and Ohio's giant coal car fleet—and its abundant reserves can be counted upon for centuries.

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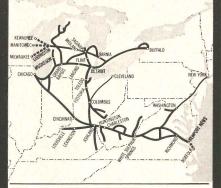




Coal is clean as well as economical for modern institutional heating. Advancements in handling and combustion equipment, electrostatic precipitators and other devices to prevent air pollution make coal the ideal fuel.



C&O Fuel Service Engineers offer free consultation in C&O's market areas on any problem of combustion, application, equipment or plant arrangement. Write to: R. C. Riedinger, General Coal Traffic Manager, at the address above.



The 5100-mile Chessie Route directly serves over 300 mines in America's richest bituminous coal reservoir with the finest fleet of 68,000 coal cars. Specify C&O routing for dependable, efficient delivery.

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There's a Sisalkraft Product That Does the Job ... Saves You Money





SISALKRAFT, tough, reinforced waterproof papers for protecting floors, curing concrete, covering unfinished work on the job. In fact, any application requiring protection against the weather.

MOISTOP — a reinforced paper-polyethylene laminated vapor barrier. Provides complete, permanent protection against moisture infiltration through floors, whether slab on ground, below grade or in crawl spaces.

VAPORSTOP — a low cost vapor barrier for under slabs. Tough and strong for application without rips or tears. Fungicide treated to resist rot and decay.

COPPER ARMORED SISALKRAFT, a sheet of pure copper laminated to reinforced kraft. Permits the use of pure, permanent, waterproof copper at lowest cost. For all concealed flashing and waterproofing.

SISALATION — a reinforced reflective insulation and vapor barrier for sidewalls, ceilings and floors. Low in cost — protects against condensation — saves heat in winter — provides summer comfort.

A selection of flexible and semi-rigid, clear plastic films are also available in a variety of widths. A new line of vapor barriers is now being manufactured — called Pyro-Kure, these products are flame resistant and carry the UL label.



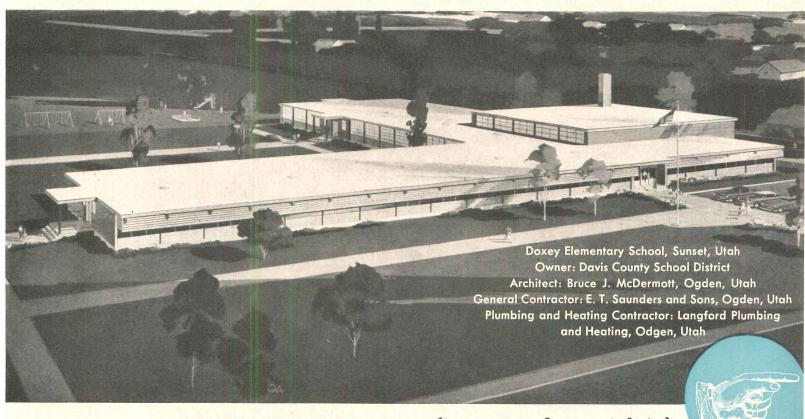


reinforced paper, foil and plastics for construction, industrial packaging and agriculture

561st SCHOOL

selects herman nelson "now or later" air conditioning

DOXEY ELEMENTARY SCHOOL



(turn page for cost data)

New architecturally styled hernel-Goo III offers:

OPTIONAL COLOR, OPTIONAL FUNCTION, OPTIONAL AIR CONDITIONING

and Nelson flexibility brings the cost within any school budget

Herman Nelson first made air conditioning economically practical for schools by providing it on an optional, "now or later" basis. Now Herman Nelson offers brand new unit ventilator styling, optional color and optional function.

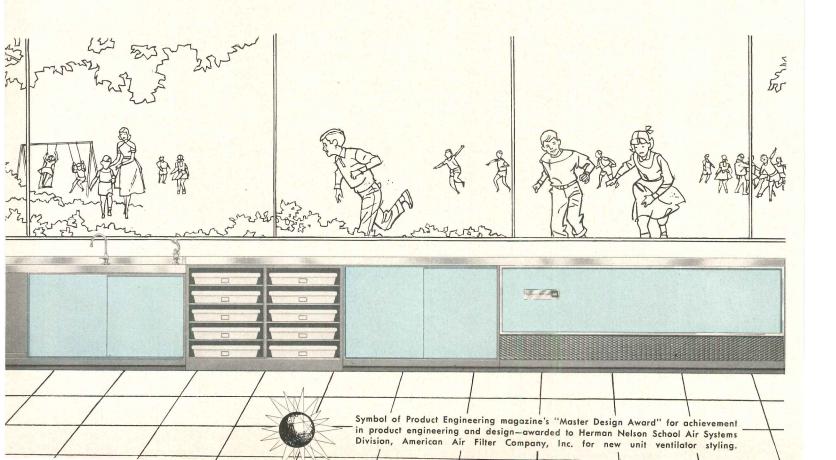
OPTIONAL COLOR! Six new accent colors: Flame Red, Kentucky Green, Topaz Blue, Brushed Orange, Sunset Yellow and Neutral Gray.

OPTIONAL FUNCTION! Your unit ventilator companion equipment can include (1) sink and bubbler unit, (2) sliding door cabinets, (3) open shelf cabinets, (4) magazine racks, (5) cubicle

cabinets and (6) 10- or 20-tray tote tray cabinets. All units, except sink and bubbler and magazine racks, are available in either stationary or mobile models.

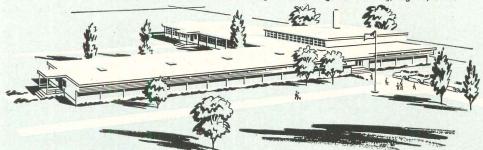
And Herman Nelson offers low cost optional component equipment and optional air conditioning, making it easy to tailor your system to fit your school budget.

This new-color, new-function architectural styling is available with *all* Nelson unit ventilators—whether they provide for air conditioning or for heating, ventilating and natural cooling only.



COST DATA: DOXEY ELEMENTARY SCHOOL

Doxey Elementary School, Sunset, Utah; Owner: Davis County School District; Architect: Bruce J. McDermott, Salt Lake City, Utah; General Contractor: E. T. Saunders and Sons, Ogden, Utah; Plumbing and Heating Contractor: Langford Plumbing and Heating, Ogden, Utah.



at this price, can you afford not to provide for air conditioning?

Beautiful, rambling Doxey Elementary School is nestled within some of America's most rugged and picturesque mountain terrain—an area where temperature extremes range all the way from the heat of a scorching summer sun to the bitter cold of Rocky Mountain winters. As in schools in every state, Davis County officials selected a flexible HerNel-Cool unit ventilator "now or later" air conditioning system to accommodate the thermal needs of their school.

HerNel-Cool Unit Ventilators serve now as standard unit ventilators—heating, ventilating and cooling (with outdoor air) according to the needs of each classroom. But, this unique system can be converted to year-round air conditioning at any time in the future without interrupting educational activity or requiring building alterations.

The cost for this system? Doxey Elementary School -26,660 sq. ft. with boiler and piping sized to accommodate 12 additional classrooms—cost only \$10.57 per square foot. This is in the same range as most other schools in this area that have not provided for future air conditioning.

By the time you read this report, far more than 561 schools will have selected "now or later" air conditioning by Herman Nelson. You can install HerNel-Cool unit ventilators at little or no extra cost — air condition at any time in the future by merely installing a Herman Nelson packaged liquid chiller in the boiler room. At this price, can you afford not to provide for air conditioning?

Mail coupon for FREE herman nelson FACT KIT on school air conditioning

Includes information on (1) how air conditioning affects the learning environment, (2) the cost of school air conditioning (including rule-of-thumb estimates you can use in your own planning), and, (3) the equipment for school air conditioning.





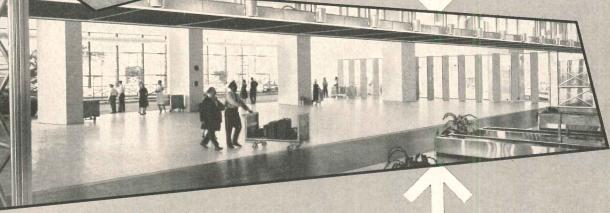
THE STATE OF THE S	May round

3	chool Air Systems Division, Dept. 259
1	American Air Filter Co., Inc.
2	215 Central Avenue, Louisville, Kentucky
	FACT KIT on school air conditioning. Booklet: The case for air conditioned schools.
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The Modern Entranceway... Operates All Year 'Round!



A Typical Installation... Even Though It's The Largest Air Curtain In The World...dor-less-dor... Providing A Unique And Outstanding Entrance Combining Both Function And Unmatched Customer Appeal!

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A DOOR MADE OF AIR MEANS MORE SERVICE AND MORE BUSINESS TO YOUR CUSTOMERS!

- Unobstructed Entrance and Exit
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- . An "Open" Invitation Is Extended To All
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- Tremendous Attention And Prestige Builder • Full Use Of Floor Area . . . No Drafts Near
- Entrance
 Insurance Premiums Reduced ... No More Door Accidents
- Lower Maintenance Cost . . . No Dust, Dirt Or Weather Problems
- . Heat Or Cooling Loss Reduced

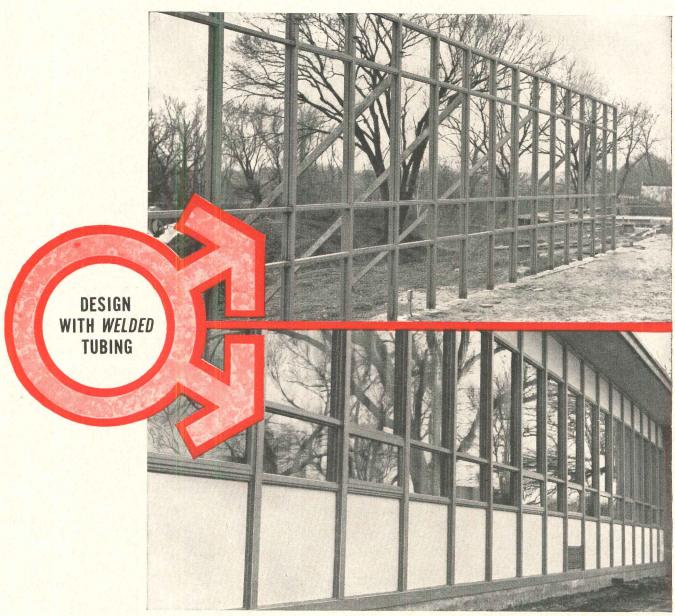
Write For Free Consultation And Further Information!

Since 1841, A Famous Name In Engineering,
Heating And Air Conditioning

Architects: Tippetts-Abbett-McCarthy-Stratton, New York General Contractor: Turner Construction Co., New York

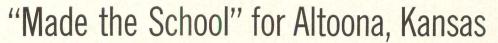


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LC-605

How WELDED STEEL TUBING





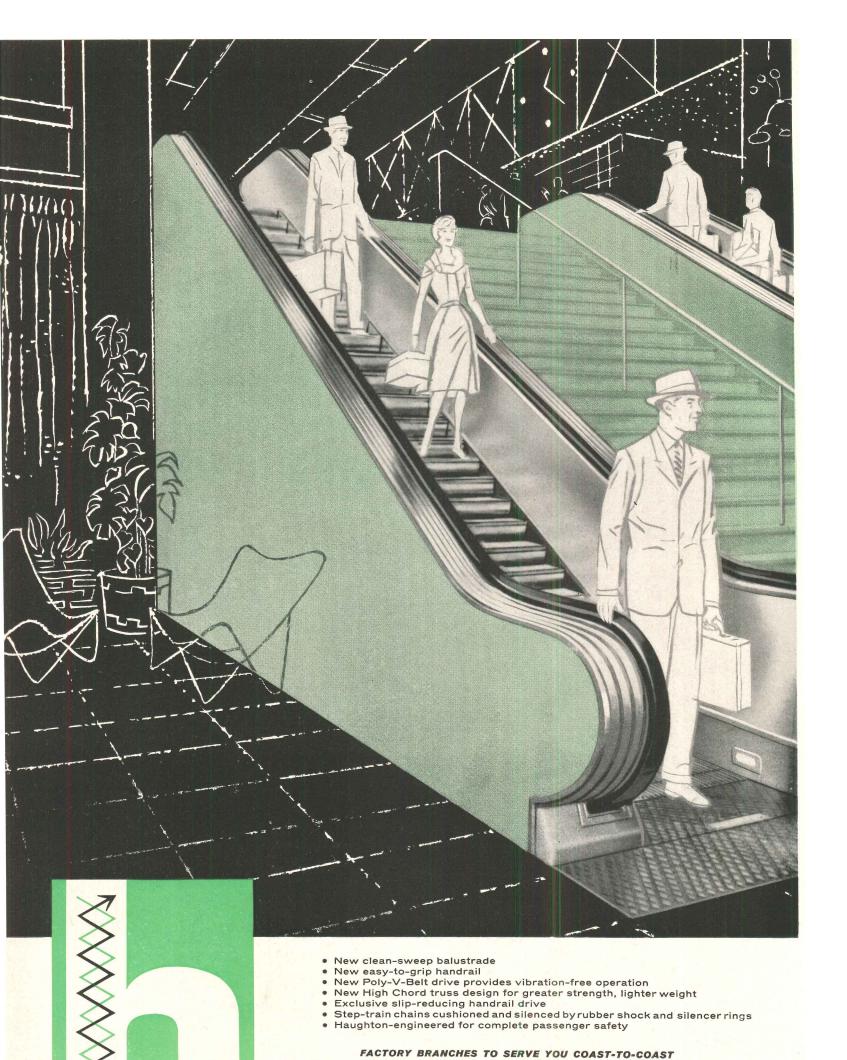
How to slash costs without reducing quality—for the schools we must have today? Like many another school district across the country, Altoona, Kansas found the answer in welded steel tubing for new high school wall construction. • With square and rectangular tubing, the same amount of space was achieved as with conventional framing. Walls went up faster, thanks to shop-built sections up to 28 ft long by 11 ft high. Besides framing the window-wall, the tubular members support structurally the wall and roof system. • Costs? 80¢ per square foot of building for entire installed wall, insulated, paneled, glazed and caulked! Write today for data-filled Bulletin 8591, free on request.



Welded Steel Tube Institute, Inc.

1605J HANNA BUILDING, CLEVELAND 15, OHIO

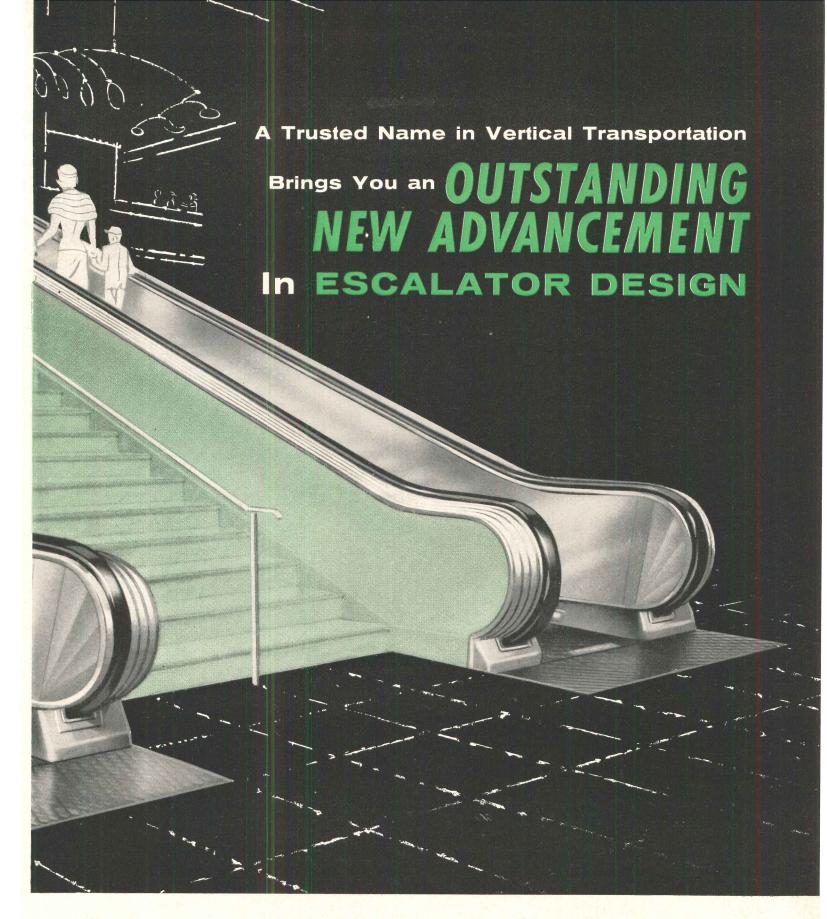
• Armco Steel Corp. • The Babcock & Wilcox Co., Tubular Products Div. • The Carpenter Steel Co., Alloy Tube Div. • Clayton Mark & Co. • Damascus Tube Co. • Jones & Laughlin Steel Corp., Electricweld Tube Div. • National Tube Div., United States Steel Corp. • Ohio Seamless Tube Div. of Copperweld Steel Co. • Republic Steel Corp., Steel and Tubes Div. • Revere Copper and Brass Inc., Rome Manufacturing Company Div. • Sawhill Tubular Products, Inc. • Owheastern Metals Co. • The Standard Tube Co. • Superior Tube Co. • Trent Tube Co., Subs. Crucible Steel Co. of America • Union Steel Corp. • Van Huffel Tube Corp. • Wall Tube & Metal Products Co.



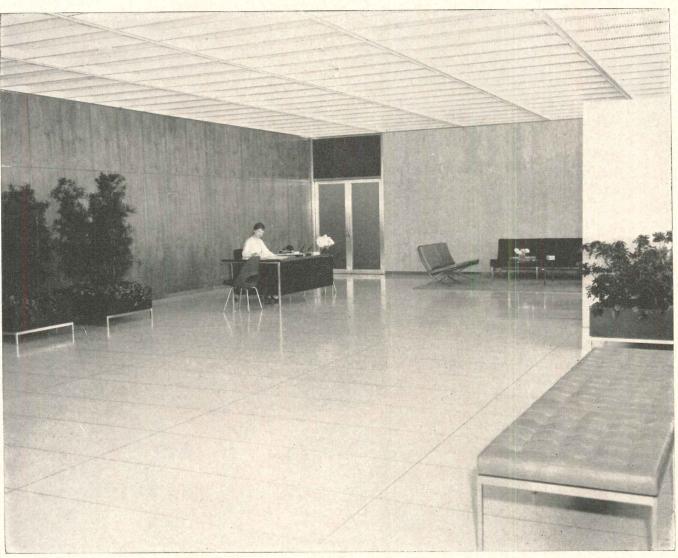
HAUGHTON ELEVATOR COMPANY

Executive Offices and Plant, TOLEDO 9, OHIO

DIVISION OF TOLEDO SCALE CORPORATION



Haughton Type H escalators are designed to move from 3000 to 8000 people per hour—efficiently, safely, quietly. Equally important, they're styled to enhance the beauty of their surroundings... provide exceptional flexibility of arrangement to meet varying space requirements. In appearance as well as performance, they represent the greatest advancement in vertical transportation in years. Let us show you how new Haughton Type H escalators and the men who design, build, and maintain them can help you provide better traffic movement in the buildings you design. Call your nearest Haughton Factory Branch or write for illustrated brochure.



MAIN LOBBY, CONNECTICUT GENERAL LIFE INSURANCE CO., HARTFORD, CONN. ARCHITECTS: SKIDMORE, OWINGS AND MERRILL. TERRAZZO INSTALLATION BY DE PAOLI MOSAIC CO.

Insurance Company Insures Floor Quality, installs Terrazzo

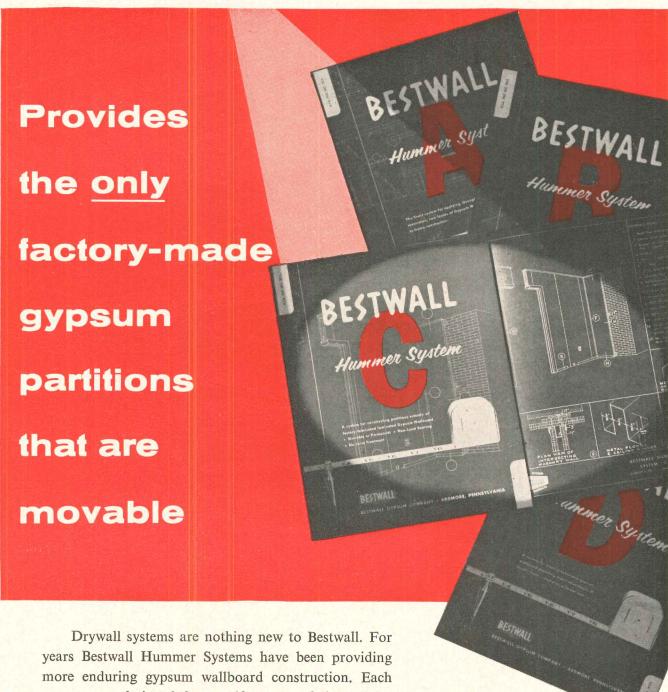
Terrazzo satisfies insurance company's taste for economy enhanced with aesthetics.

Terrazzo combines infinite design possibilities, durability and low total cost. Tested by centuries of use, Terrazzo is in harmony with contemporary creativity and modern budgets.

Sometimes lower initial cost is weighted disproportionately in total cost consideration. Projected maintenance cost for Terrazzo and comparable floor finishes represents the bulk of total cost. Terrazzo's maintenance cost is 20% less per year than its closest competitor's —enough to make its total cost less after only seven years.

Aesthetically and economically, Terrazzo is without parallel for walls, wainscots, stairs and floors. Write the Association for detailed information and comprehensive cost study. Catalogued in Sweet's.

Member Producers' Council



system was designed for specific types of drywall installations.

System "C", for example, makes possible superior partition construction. Use of factory-laminated panels, ready for installation, results in movable or permanent partitions with paneled appearance, which can be erected, trimmed and painted in one day. No joint treatment is needed. All accessory items are available.

Write for complete specifications and construction details.

A brief description of the other systems:

"A"-For applying, through lamination, two layers of gypsum wallboard to frame construction.

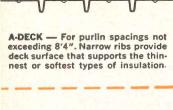
"B"—For constructing smooth, permanent partitions entirely of laminated gypsum wallboard.

"D"-For erecting laminated gypsum wallboard with many advantages of doublelayer installation at lower cost.



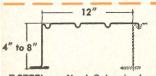
BESTWALL GYPSUM COMPANY

Ardmore, Pennsylvania Plants and offices throughout the United States

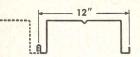


B-DECK—For spans to 10'0". Wide rib distributes metal for greater structural efficiency—gives higher section properties per pound of steel — well suited for use as side wall panels.

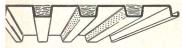
C-DECK—Carries normal roof loads over spans up to 20'0". Used extensively in canopies.



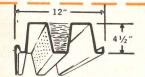
T-STEEL — New! Galvanized only. For clear spans to 32'0". Adaptable to acoustical and flush, luminous celling treatments. Provides superior diaphragm to transmit seismic and wind loads.



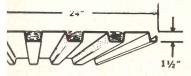
H-DECK — New! For simple spans from 10'0" to 20'0"— 3 and 4½" depths. Especially practical to cover walkways in shopping centers, schools, other installations.



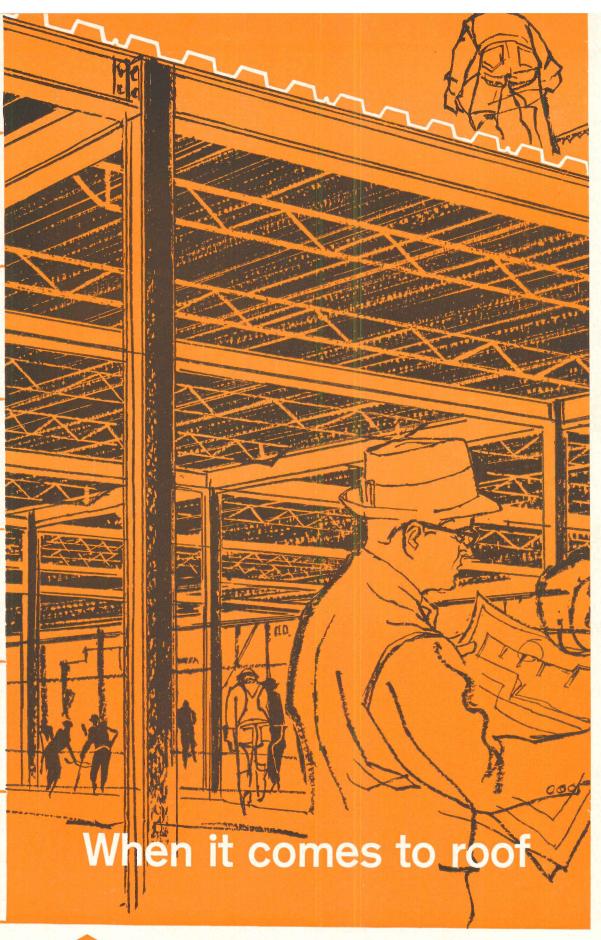
B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70 — used for spans to 10'0". 24" coverage by 1½" depth.



C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 20'0". 12" coverage by 4½" depth.



RIBFORM—High tensile steel form for concrete slabs over spans up to 8'0". Three types: Standard, Heavy-Duty. Super-Duty (shown). Galvanized.

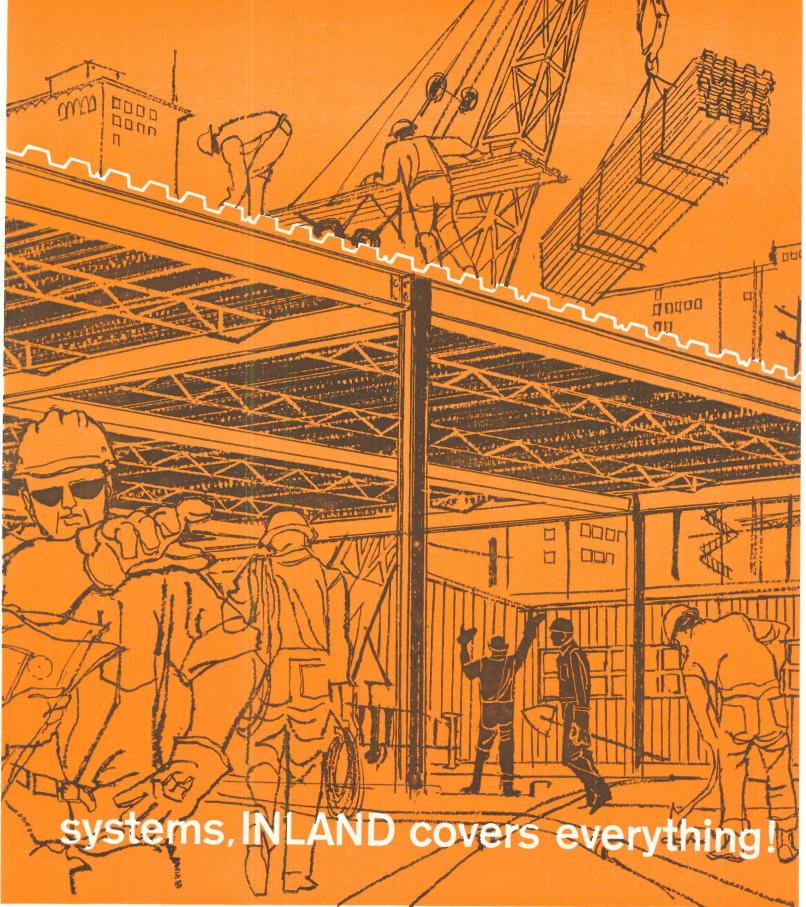


Whether your design calls for a dry insulation board roof or for wet-fill, there's an Inland roof system for the job — by the makers of Milcor steel building products, famous for years for highest quality.

Inland steel deck is lightweight — weighs less than half as much as poured-inplace or pre-cast construction. You can space joists wider than otherwise and use lighter framework, to save both time and money.

Panels are easy to handle and weld in place — in any weather that a man can work. They don't need warmth for setting, nor time for curing. They don't

ATLANTA, BALTIMORE, BUFFÀLO, CHICAGO, CINCINNATI, CLEVELAND,



absorb water, nor lose their strength when wet — the job stays on schedule.

Types A, B, C, and H decks have the additional advantage of a Bonderized, baked-enamel prime finish that resists on-the-job damage. One field coat of paint on these Inland decks usually does the job of two coats on ordinary decks.

Write for catalogs 240, 241, and 245 — or see Sweet's sections 2c/Inl, 11a/In, and 2a/In for full information on Inland steel roof deck and permanent centering. If you have an unusual problem, you can draw upon their diversified experience by consulting Inland's Engineers.

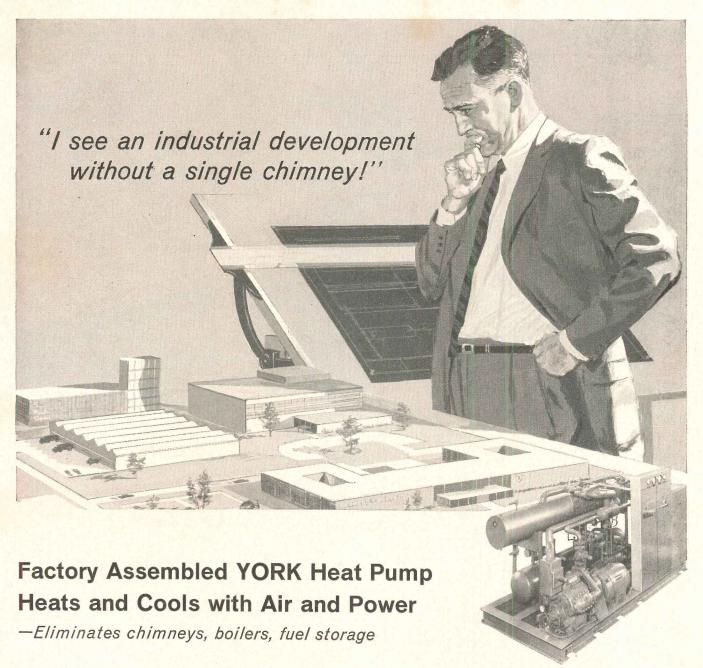


ENGINEERED PRODUCTS DIVISION

INLAND STEEL PRODUCTS COMPANY

Dept. J,4033 West Burnham Street
Milwaukee 1, Wisconsin

DALLAS, DENVER, DETROIT, KANSAS CITY, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, NEW ORLEANS, NEW YORK, ST. LOUIS



EXCLUSIVE COMPOUND COMPRESSION—Patented multi-stage compression wrings heat from even— 10° F. air making York Heat Pumps practical in coldest climates. Compound compression delivers up to 67% more heat than single-stage system from same power.

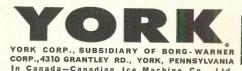
REDUCES COSTS, SAVES SPACE—No unsightly chimney to build and maintain, no boilers to tend, no space-wasting fuel storage, no smoke and soot. Compact system can be located anywhere from basement to roof, or even in separate building.

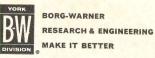
NO SUPPLEMENTARY HEATING—Compound compression eliminates need for electric strip heating, reduces operating costs. York Heat Pumps can heat and cool simultaneously, or automatically switch from one to the other according to load.

simplified selection and installation—Can be completely factory assembled to save design time and field labor. Units from 50 to 150 tons cooling and up to 1,200 MBH heating. Larger, field-assembled systems to meet your requirements.



Another YORK Trail Blazer Concept Proved in Action at Sylvania Laboratory, Amherst, N. Y.—A York Heat Pump provides all-weather air conditioning for this 85,000 sq. ft., 2½ story research and testing facility. System delivers 250 tons cooling and 2400 MBM heating to York perimeter fan-coil units.





Air Conditioning, Heating, Refrigeration and Ice-Making Equipment • Products for Home, Commercial and Industrial Applications



Blue Weldwood Glasweld for window inserts and railing panels, Holiday Inn Motel, Brunswick, Ga. Arch: Curt C. Scheel; Assoc. Arch: James D. Logan. Gen'l Cont: Price Co. Owners: Southeastern Motel Corp.

Glasweld – the versatile building panel guaranteed not to fade

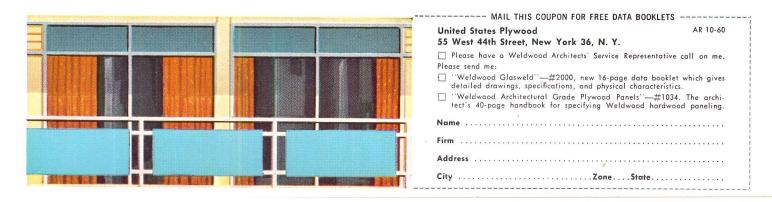
The Glasweld® color you specify is the color that remains on the building—year after year. For Glasweld, available in 20 standard colors, is guaranteed colorfast by Weldwood®.

Glasweld's permanent colors are fused to an incombustible asbestos reinforced panel that requires no maintenance other than an occasional washing The panel is weatherproof and dimensionally stable. It does not absorb moisture, will not swell, shrink, or work loose in its mountings. Its low coefficient of linear expansion makes Glasweld an ideal panel for curtain wall and window insert components. Its

high resistance to the effects of chemicals and abrasion and its freedom from rot, rust, and corrosion suit Glasweld for a wide range of interior and exterior applications.

Glasweld has an extremely high strength/weight ratio. It machines cleanly and can be cut on the site. You can order Glasweld in ½", ¾", ¼", and ¾" thicknesses in 4' x 8' panels, and in ½" and ¾" thicknesses in 4' x 10' panels. Learn more about Glasweld—mail the coupon today.

WELDWOOD GLASWELD





Weldwood® plain sliced 34" Architectural walnut, installed in a carefully mismatched plank style. Office of the president, Southland Life Insurance Company, Southland Center, Dallas. Arch: Welton Becket, FAIA, & Assoc., Los Angeles. Inst: Adleta Show Case & Fixture Mfg. Co., Dallas.

How many faces has walnut paneling?

THREE POPULAR TYPES OF VENEER CUTS

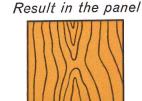
Type of cut



Plain slicing-The log is cut in half, then sliced with a razor sharp blade moving parallel to a line through the log's center.



Quarter slicing - The log is quartered and sliced so the blade strikes the log at right angles to the growth rings

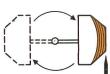


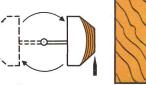
A unique and variegated figure as strikingly illustrated above.

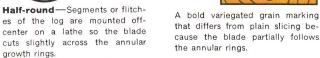


A series of stripes, straight in some woods, varied in others.









— it all depends on how you slice it . . .

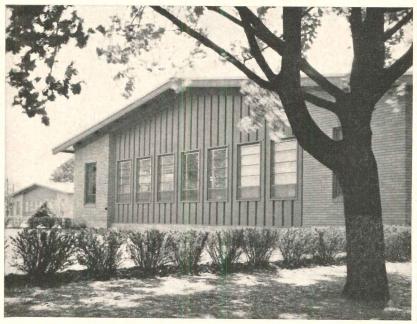
Walnut can be many woods when it is made into paneling by Weldwood. It can be quarter sliced, half-round, or plain sliced as in the office above. However it's cut, it is dignity, it is warmth, formal yet friendly, luxury without maintenance. And like Benge®, rosewood, teak, and Korina® - among others – walnut is just one of the many species available to you when you specify Weldwood Algoma-Made paneling.

A visit by a Weldwood Architects' Service Representative places at your command the incomparable production facilities and experience of United States Plywood. He will be happy to help you plan a Weldwood paneling installation in your next commercial or residential design. For details, plus a free copy of Weldwood's 40-page illustrated guide to veneer cuts, flitch matchings, and specifications, "Weldwood Architectural Grade Plywood Panels," mail the coupon on the reverse side of this page.

REAL WOOD PANELING

Product of UNITED STATES PLYWOOD • In Canada: Weldwood Plywood, Ltd.

Steel





and ARMCO STEEL BUILDINGS

Panel-wall construction gets new look with new Sculptured STEELOX Panels

When you design with Armco Steel Buildings—in either the rigid frame or truss type models—you now get a classic new Sculptured wall panel that imparts a handsome shadow effect and works well with other exterior materials. This new Sculptured Panel is a variation of the familiar and time-proved STEELOX® Panel. The same simplicity of erection, and the same weathertight interlocking joint, are still there. Now you get extra ruggedness and wall beauty. Send the coupon for details on this and other new Armco Building features. Armco Drainage & Metal Products, Inc., 7210 Curtis Street, Middletown, Ohio.

New steels are born at Armco

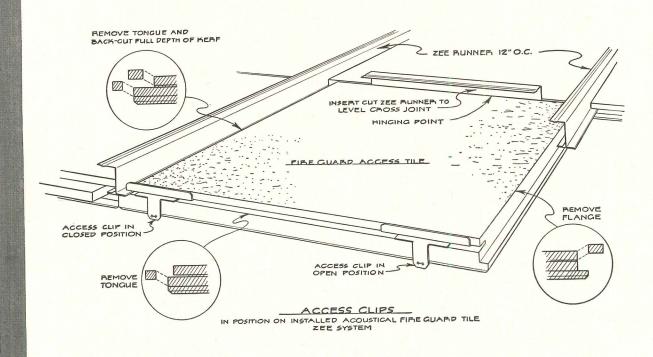
	E & METAL PRODUCTS, INC. et, Middletown, Ohio	
Send details abo	out ALL-NEW Armco Steel B	uildings
Name	FALSIN SURE	
Title	2012/16/8	100
Firm	Market 1979	
Street		*
City	ZoneS	tate

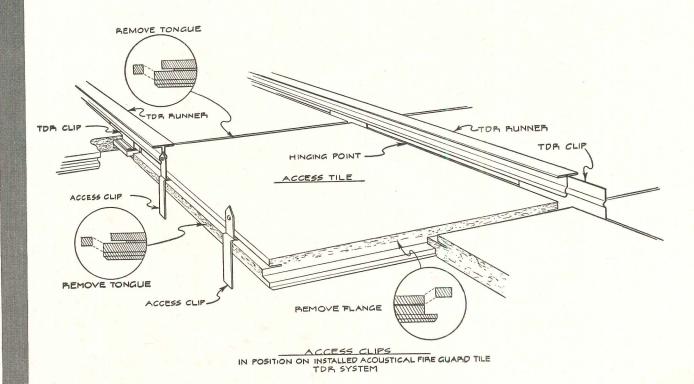
ARMCO DRAINAGE & METAL PRODUCTS



Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation





How Armstrong Acoustical Fire Guard can provide easy accessibility

Acoustical Fire Guard's new access-clip arrangement allows access to any part of the ceiling's plenum chamber

Because of the maze of pipes, ducts, and electrical equipment installed above the suspended ceilings of today's buildings, accessibility has become an important consideration in specifications. Emergency entry to the plenum chamber of the traditional fire protective ceiling has meant expensive damage or loss of time.

Armstrong Acoustical Fire Guard—the first time-design-rated acoustical ceiling tile—provides access to any part of the plenum chamber. The access-clip arrangement (see diagrams) permits tiles to be removed with ease and speed. The system works equally well for either 5%" or 34" Acoustical Fire Guard tiles in

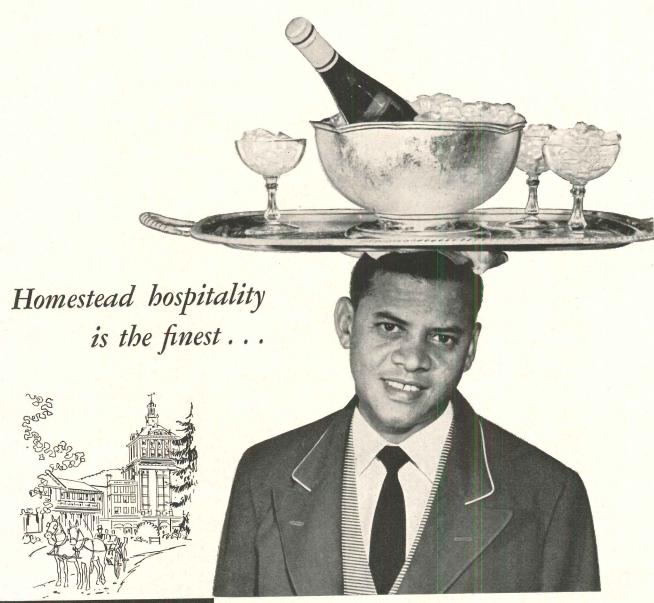
either the zee or TDR systems—both of which have official fire-retardant ratings from Underwriters' Laboratories, Inc.

This access-clip system is more economical to install than unsightly access doors in conventional ceilings. When in place, the clips are almost invisible.

To learn more about Acoustical Fire Guard and the many benefits it can offer, call your Armstrong acoustical contractor (he's in the Yellow Pages) or your nearest Armstrong District Office. For further technical information about Acoustical Fire Guard, write to Armstrong Cork Company, 4210 Rock St., Lancaster, Penna.



1860-1960 Beginning our second century of progress







Shell-Ice helps make it so

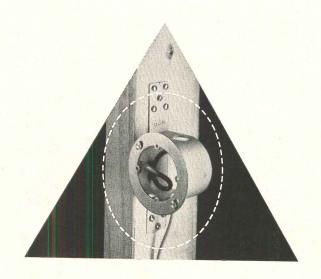
• The Homestead, world-famous resort hotel at Hot Springs, Virginia, noted for its fine facilities, has added a Frick Shell-Ice maker, further providing its guests with the finest of cooled beverages and foods.

Shell-Ice is superior for several reasons . . . it is curved, combining a large surface with great cooling power and durability. Shell-Ice is clear, hard and solid . . . has no snow, slush, thin flakes or waste.

Frozen on stainless-steel tubes by direct expansion of ammonia or other refrigerant, Shell-Ice is made with a controlled variable thickness of ½ inch to ½ inch, and is harvested automatically.

The Shell-Ice makers are built in a wide selection of sizes, with nominal capacities up to 40 tons of ice every 24 hours. A free Bulletin (No. 54) describing Shell-Ice makers may be had on request. Write to

FRICK COMPANY • Waynesboro, Pennsylvania

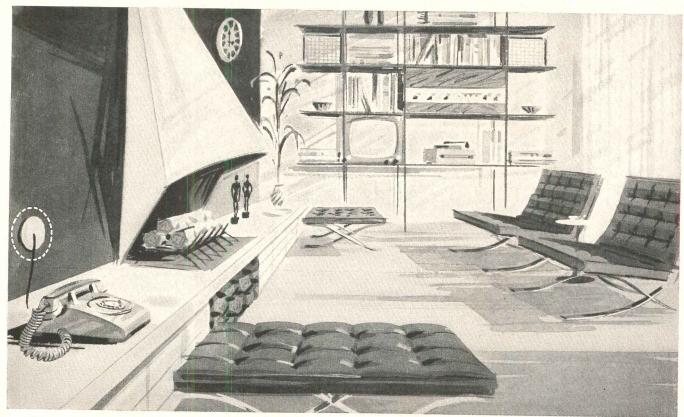


you design more livable. Built-in outlets, with wiring concealed, keep telephone service flexible and protect the beauty of your home interiors.

For details of home installations, see Sweet's Light Construction File, 11c/Be.

Bell Telephone System

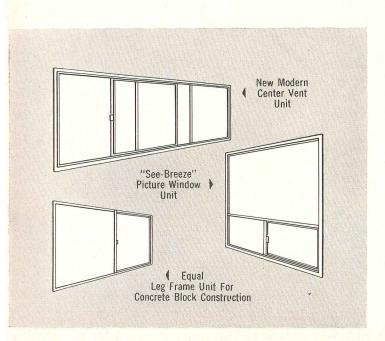






TRUSCON'S New Full Line of Aluminum HORIZONTAL SLIDING WINDOWS SERIES 700

... in types to meet every consumer demand



SINGLE SLIDE—one ventilator operates
FIXED PICTURE WINDOWS
SEE-BREEZE—slide ventilating picture windows
CENTER VENT PICTURE SLIDE WINDOW
SIDE VENT PICTURE SLIDE WINDOW
FOR CONCRETE BLOCK CONSTRUCTION
COMBINATION STORM SASH AND SCREENS AVAILABLE

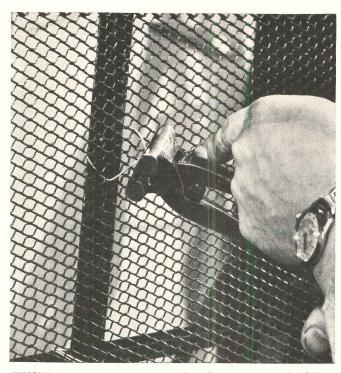
No other manufacturer supplies all these types to meet every consumer demand. Available in standard types and "Pacific Coast" types. Majority of types and sizes are stocked, completely glazed, for prompt shipment from warehouse.

Manufactured to meet FHA and VA requirements. Full perimeter weatherstripped. Stainless steel vent slide channel assures smooth, easy operation. Interlock at meeting rail assures weathertightness, easy operation.

Call your Truscon representative and get the facts direct. Or, send coupon.



YOUR REPUBLIC ROOF DRAINAGE PRODUCTS DISTRIBUTOR carries a complete line of everything you need—in galvanized steel, ENDURO® Stainless Steel, terne, or copper, with perfectly matched accessories to assure fast, low cost installations. They go up easy, go up fast, go up to stay—with more profit on every job. Ask for Republic Roof Drainage Products by name. Send coupon for more information.



TRUSCON TRU-DIAMOND METAL LATH trimmed square . . . no flare! It's a pleasure to work with this precision-made, distortion free metal lath. Sheets are perfectly square and true—selvage edges are neatly finished. These Truscon Tru-Diamond features insure a good fit on the toughest job. Full line of Truscon Tru-Mesh Metal Lath Accessories. Contact your Truscon Dealer and get the complete story, or send coupon below.



REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products



Standard Units of Republic Steel Kitchens are available in a wide range of sizes in base and wall cabinets, sinks, drop-ins, and accessories to meet every kitchen need and size. Easy to install.



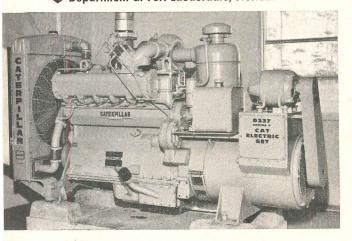
NEW TRADITIONAL FINISH—grain texture, vinyl on steel. *Traditional* is the homebuilder's answer to any kitchen preference. A vinyl of beautiful, natural grain inseparably bonded to Republic Steel Kitchen door and drawer fronts. In apartment or multiple home developments, you can vary the kitchen plan without altering the floor area. Every kitchen is a custom kitchen with a choice of *Traditional Finish*, or crisp, clean, popular colors. Republic Steel Kitchens are easy to install, dimensionally accurate. Call your Republic Steel Kitchens distributor, or send coupon for information and color sample.

1441 REPUBLIC BU	ILDING • CLEVELAND 1, OHIO
Please send more i	nformation on the following products:
Truscon Alumin	num Horizontal Sliding Windows, Series 700
Republic Roof I	Orainage Products and Accessories
Truscon Metal 1	Lath and Accessories
Republic Steel F	Kitchens Traditional Finish—Color Sample
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Firm	

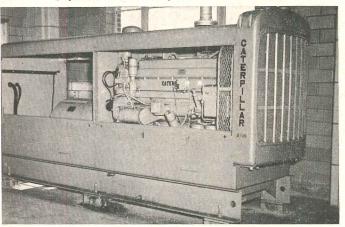
engine CATERPILLAR

Prime power-Emergency power...

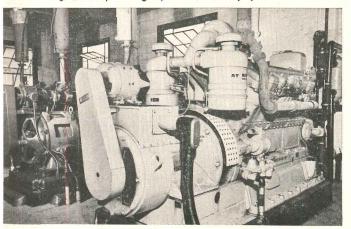
Cat D337 Electric Set in Plant D of Public Utilities Department at Fort Lauderdale, Florida.



Cat D326 Diesel Electric Set is used for standby power at Water Department in Warren, Ohio.



Cat 397 helps furnish power for the village of ■ L'Anse, Michigan, which has a population of 2400.



Whatever the job, Caterpillar engines will provide an economical, reliable investment

In water works, sewage plants, or electric utilities, Caterpillar Engines prove their worth. In the town of L'Anse, Michigan, Caterpillar Diesels furnish power for a population of 2400. "I've been running Caterpillar Engines in our power plant for 20 years," the superintendent says. "During that time we've had only the best from the engines themselves and our Caterpillar Dealer."

At Plant D of the Public Utilities Department in Fort Lauderdale, Florida, Plant Supervisor Vernon Sheesley says, "Although our plant is relatively new, we are well satisfied with our Caterpillar Diesel Electric Set and the excellent service given by our Caterpillar Dealer."

At the water purification plant of the City of Warren, Ohio, three Caterpillar Diesels give dependable powera D326 Electric Set is used for standby power in the purification plant, a D397 is on a standby pump to keep up water supply when electric pumps are down, and a D318 pumps water from reservoir to purification plant automatically on a low service pump at reservoir.

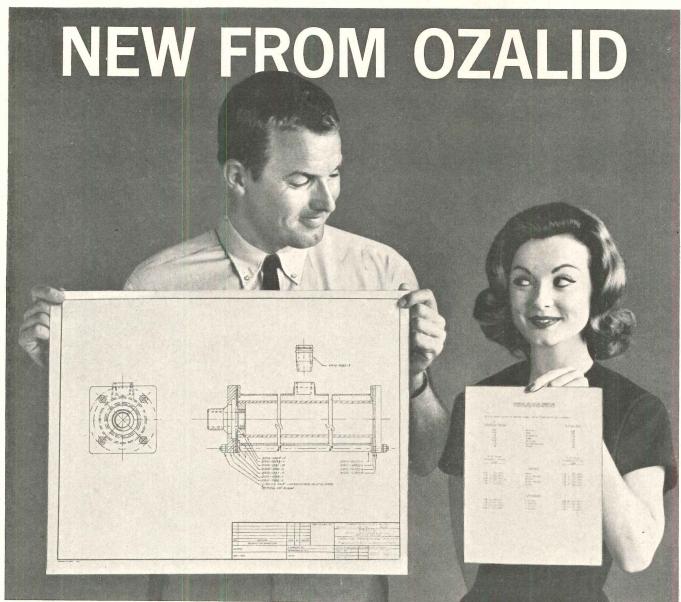
Superintendent J. Paul Price said that Caterpillar "had the product which was most suitable for this operation. Specifications were set up first and after the bids were in, it was found that Caterpillar equipment met the specifications best."

Lightweight, compact Caterpillar Engines are available up to 730 HP and in Electric Set ratings to 400 KW. The Caterpillar Natural Gas Engine is the lowest cost gas engine available. Call your Caterpillar Dealer. Whether it's for prime or standby power, he can show you why Caterpillar Engines help assure client satisfaction.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.



Greater contrast, greater clarity with Ozafax and Ozalid materials for drafting room or office

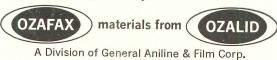
New Ozafax semi-dry papers and developers now bring Ozalid quality to every Diazo Copy Machine

From Ozalid—the nation's leader in dry diazo materials for more than a quarter of a century—comes Ozafax, the newest line of top quality semi-dry copy materials. Regardless of the make machine you own, you can now look to Ozalid as a new source of supply for all your diazo copying needs, and look to Ozafax for . . .

Better Contrast! A new, advanced diazo coating formulation fastens a sharp black image against a clean white background. On the shelf or after processing, the bright white appearance of Ozafax papers lasts.

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SEND TODAY FOR FURTHER INFORMATION Ozalid, Dept. B-10, Johnson City, N. Y. Check one: Please send information explaining the new Ozafax semi-dry diazo materials. Please have representative call. Name Firm Phone Address City Zone State



BUILDING PRODUCTS



MILLARD FILLMORE HOSPITAL, Buffalo, N. Y. Architects: Kidd and Kidd.

A. D. Pearson, vice president of Jewett Refrigerator Company, Inc., an Approved Insulation Contractor.



STYROFOAM®



Dow Approved Insulation Contractors offer design assistance to the architect and assure quality installation for low temperature applications

Economical, efficient cold storage rooms and other low temperature facilities have two important engineering requirements—efficient insulation and proper installation. That's why Dow established an Approved Insulation Contractor program for its outstanding low temperature insulation, Styrofoam†. Dow awards this approval only to carefully selected contractors capable of giving the architect technical design assistance, followed up by quality installation.

AIC installs over 3/4 million board-feet!

Typical of the more than 90 Dow Approved Insulation Contractors is Jewett Refrigerator Company, Inc., Buffalo, New York. An AIC for three years, Jewett has installed more than three-quarters of a million board-feet of Styrofoam. To serve the architect, Jewett offers a design staff of engineers to make specific recommendations and detail out plans.

Combined cooling and deep-freeze facilities were constructed, using Styrofoam, for the hospital research institute. Low temperature rooms for meat, dairy products, fruit, vegetables and other purposes were constructed.



A typical Jewett job is the recent major modernization program for the Millard Fillmore Hospital in Buffalo. Styrofoam was used to insulate a variety of low-temperature facilities. Jewett designed and constructed combined cooling and deep-freeze facilities for the storage of enzymes, proteins, blood specimens and other substances under study in the adjoining research institute. Also part of the project was the building of refrigerated storage rooms for food service, and for other cold storage requirements as well.

Says A. D. Pearson, Jewett vice president: "Styrofoam impresses us with its qualities of lighter weight, easier handling, simplicity of installation and non-absorbency of moisture. Once it's installed properly, Styrofoam affords permanent insulation efficiency, and we never have to worry about the job."

For the names of Approved Insulation Contractors near you ... for more information about Styrofoam for low-temperature applications or for comfort insulation uses, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1703N10.

†Dow's registered trademark for its expanded polystyrene.

Other Dow Building Products

 $\textbf{SCORBORD}^{\$} \ (\text{Pat. applied for}) \ -- \ \text{Rigid expanded polystyrene insulation} \\ \text{for foundation perimeters, slab floors. Exclusive pre-scored feature speeds} \\ \text{installation.}$

ROOFMATE*—Rigid, lightweight insulation for built-up roofs—serves as its own moisture barrier.

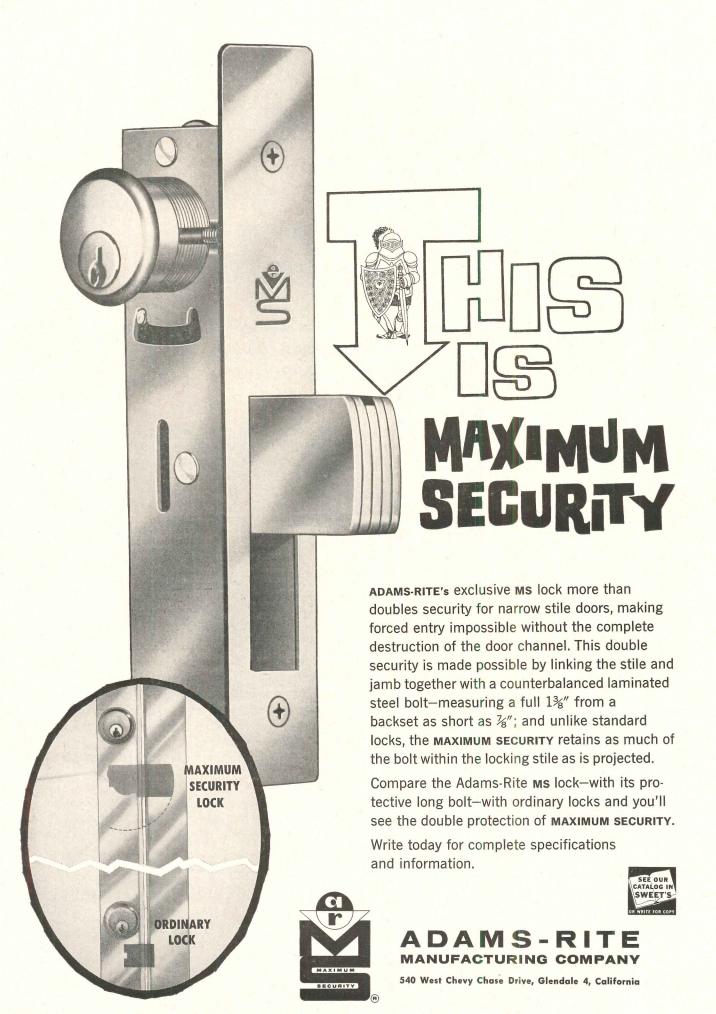
SARALOY⁸ **400**—Durable, elastic flashing material installs without prefabrication, can be conformed to irregular shapes.

POLYFILM®—High-quality polyethylene film for use as a moisture or vapor barrier and for temporary enclosures.

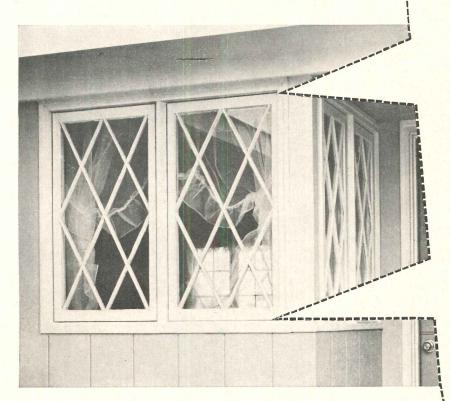


*TRADEMARK

THE DOW CHEMICAL COMPANY . MIDLAND, MICHIGAN



another first from Bilt-Well by Caradco





This concealed hinge is one of the many outstanding features of the BILT-WELL **Casement Window**

Permits unbroken exterior lines. Window can't sag or pull loose. It's tamper-proof, too!

The First Truly Modern **Wood Casement Window**

A casement that incorporates all the latest thinking in fenestration engineering

Insist on these BILT-WELL Features:

- 1. Double weatherstripped for lowest 5. Three glass widths: 16", 20" and 24" heating and cooling costs.
- 2. Unitized sill construction facilitates groupings.
- 3. Nylon bearings, stainless steel track, cadmium-plated steel hinge arm.
- 4. Angle and radial bays from stock parts.
- and five glass heights: 24", 32", 36", 48" and 60".
- 6. Gold-tone finished operators, locking handles, storm panels and
- 7. Single or double insulating glass.
- 8. Dove-tailed frame joints.

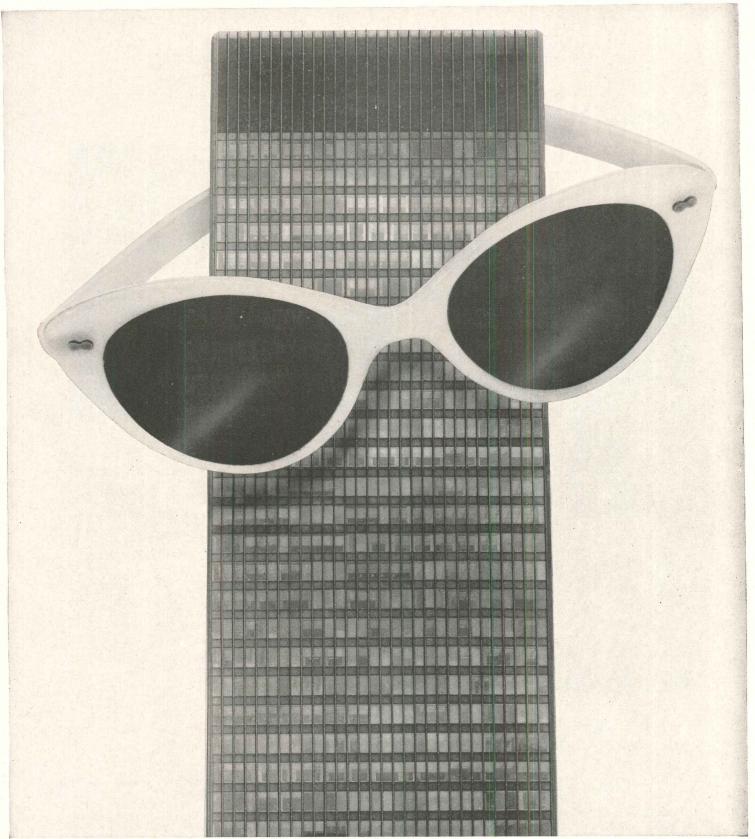
The BILT-WELL Line of Building Woodwork-WINDOW UNITS, Double-hung, Awning, Casement, Basement. CABINETS, Kitchen, Multiple-use, Wardrobe, Storage, Vanity-Lavatory. DOORS, Exterior, Interior, Screen and Combination.

manufactured by

CARADCO, Inc.

Dubuque, Iowa

For ultimate design flexibility specify



Famous Park Avenue beauty enjoys Flexalum light control

Regard the Seagram Building. What glamour it adds to Park Avenue! How shapely! How well-groomed! For its 3,676 windows, the architects naturally chose Flexalum Twi-Nighter venetians. What's more, Hunter Douglas engineered two custom features so that haphazard slattilts and blind heights wouldn't interrupt the symmetry of the building's facade. A special 3-stop action keeps the blinds fully raised, fully lowered, or set at one happy medium, while the unique tilt mechanism

fixes slats at a 45-degree angle. No other window covering is so ideal for buildings with curtain-wall construction.

Naturally, Hunter Douglas is concerned with the people *in*side, as well as sight-seers *out*side. Flexalum venetians give real light control, let in soft, diffused light, or make rooms dark and strictly private. As for maintenance problems, there aren't any. Only Flexalum venetians are designed as an integrated whole, so they don't suffer from malfunctions that often afflict blinds

whose parts have been garnered from several sources. Flexalum venetians won't rust, chip, crack or peel. And they're guaranteed for 5 years. See our latest specs in Sweet's Architectural File 19d/Br or write to: Dept. AR-10, Bridgeport Brass Co., Hunter Douglas Division, Bridgeport, Conn.

Hexalum &

New Dry-set Mortar

makes ceramic tile cost breakthrough!

What It Means in Savings

The new mortar, consisting of ordinary portland cement modified by polymeric additives, is making possible tremendous savings in time, materials and labor. Invented by the scientists of the Tile Council of America Research Staff, the new dry-set mortar is proving itself fast in both interior and exterior applications, on walls and floors, in schools and commercial installations.

How It Performs Better

Use of the new mortar permits tile to be applied directly on dry brick or cement masonry, cement plaster, poured concrete walls and floors and other approved surfaces. In many cases it completely eliminates lath and scratch coats. In contrast to the conventional ¾" mortar bed, the new mortar permits much thinner beds—1/16" to ¾" in depth on the average. Bonding strength is much greater than the regular cement bed. Mixing is simpler because of the small amount of mortar used. Tile does not have to be soaked, back up walls do not have to be sprayed—the whole job goes faster.

Why It Works Better

When the dry-set mortar is mixed with water on the job, the resulting mix is water retentive and trowels more smoothly with no sagging. Uneven surfaces can be leveled by adding screened sand to the mortar.

Manufactured by L & M Tile Products, Dallas, Texas; Permalastic Corporation, Detroit, Michigan; Technical Adhesives, Inc., Evanston, Illinois; The Upco Co., Cleveland, Ohio, the new mortar is available nationally. Look for the seal of approval. For more information ask your tile contractor or write to any Tile Council of America office listed below.

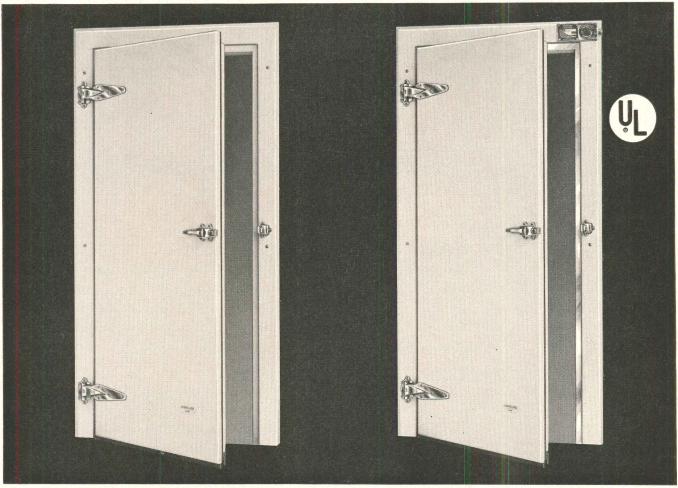
The Modern Style is

tile

TILE COUNCIL OF AMERICA, INC. 800 Second Ave., N. Y. 17, N. Y.; Room 933, 727 West Seventh St., Los Angeles 14, Calif.; Room 207, 5738 North Central Expressway, Dallas, Texas • American Encaustic Tiling Co., Inc. • Atlantic Tile Mfg. Co. • Aztec Ceramics, Inc. • Cambridge Tile Mfg. Co. • Carlyle Tile Co. • Continental Ceramics Corporation • General Tile Co. • Gladding, McBean & Co. • Hood Ceramic Corporation • Jackson Tile Mfg. Co. • Jordan Tile Mfg. Co. • Lone Star Ceramics Co. • Monarch Tile Mfg. Inc. • Mosaic Tile Co. • Murray Tile Co., Inc. • National Tile & Mfg. Co. • Olean Tile Co. • Oxford Tile Company Pacific Tile and Porcelain Co. • Pomona Tile Mfg. Co. • Redondo Tile Company • Ridgeway Tile Co. • Robertson Mfg. Co. Stylon Corp. • Stylon Southern Corp. • Summitville Tiles, Inc. • Texeramics, Inc. • Wenczel Tile Co. • Winburn Tile Mfg. Co.

NEW FOR COOLER AND FREEZER ROOMS:

Lightweight, Colorful JAMOLITE® Plastic Doors



JAMOLITE Cooler Door

Lightweight: Weight is 1/5 of metal clad cold storage doors.

4" Thickness: Cooler and Freezer doors are both 4" thick.

Impervious to moisture and vapor - easy to keep clean.

JAMOLITE Freezer Door

with Jamison Frostop®

Colorful JAMO-LITE doors come in gleaming white and four colors.

Frostop prevents ice formation at area of gasket contact.

• THE JAMOLITE DOOR is a completely new development in cold storage doors for the Food Service Industry. In hotels, restaurants and institutions JAMOLITE Doors are transforming interiors with new brightness and color.

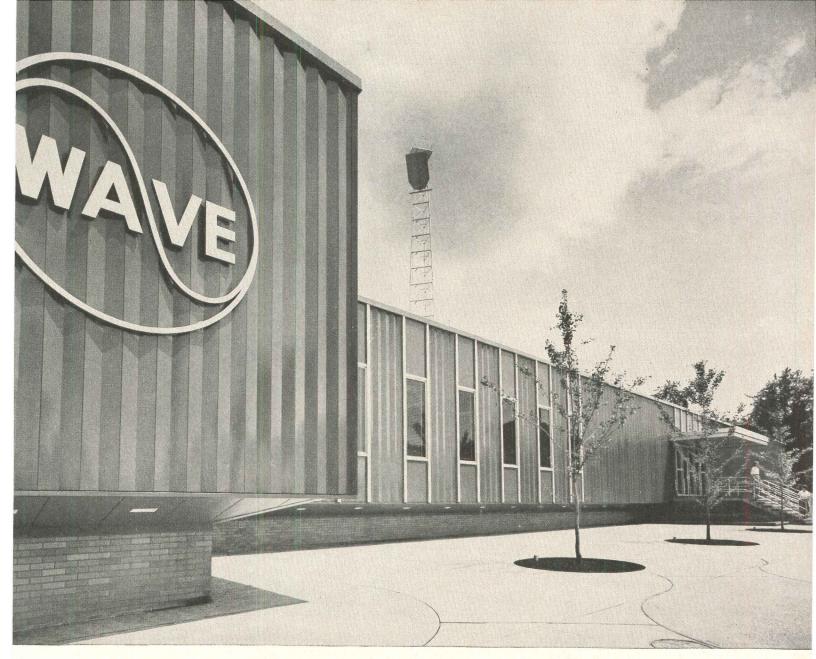
Both cooler and freezer doors are flush-fitting and only 4" thick with new lightweight framing. Foamed-in-place

polyurethane plastic provides highly efficient insulation, is permanently bonded to rigid fiber glass shell. Installation details for each door are practically identical.

Complete data on new, lower-cost JAMOLITE is available in Sweet's; or write today for Catalog FS to Jamison Cold Storage Door Co., Hagerstown, Md.

*Jamison Trademark



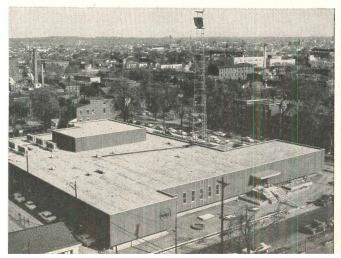


Kentucky's first TV station Powers-Up to put new radio-TV center on the air New Television Center of Channel 3, Louisville, is a ground floor structure supplying 75,000 square feet of production, storage, studio and office space.

Bright, attractive conference room (below) at WAVE utilizes modern decor and paintings to symbolize its aggressive growth in the bustling TV industry.

J-94148-1

YOU CAN BE SURE ... IF IT'S Westinghouse







Smaller of two TV studios demonstrates the electrical capacity available for flooding light on television sets. Smaller, permanent sets are located here. Main studio, 65' x 45' and 23' high, contains a complete electrical kitchen and adequate space for automotive and aquatic displays.

New "WAVE" broadcasting station criteria demands reliable electrical system

Prime among the design criteria for the new WAVE TV studios in Louisville, Kentucky, was an absolutely reliable electrical distribution system to keep the 100,000-watt station on the air without interruption. Station executives also insisted on plenty of reserve electrical capacity to facilitate easy expansion.

In designing the new building, Architect A. Read Henry developed a very successful combination of beauty and function. With the TV and radio studios as the core of the building, all production facilities, storage offices and control stations are arranged in a square for convenient access to these main centers of station activity.

This impressively modern new studio and office building of WAVE, Inc., is accented by an interesting pink and gray sidewalk pattern that undulates in inviting fashion along Floyd and Jacob Streets in Louisville. It's the third new home for the station since it first went on the air in 1933.

Heart of the electrical distribution system is a Westinghouse building-type switchboard that feeds and protects all circuits in the building. Circuit breakers were specified for all feeder circuits in the switchboard and panelboards to provide maximum protection and absolute reliability for continuous TV programing.

Owners, architect, engineers and contractors alike are all well pleased with the cooperation Westing-

(contd.)

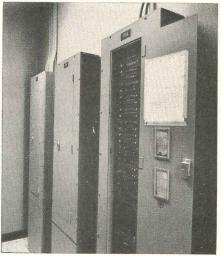
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J-94148-3



K. A. Lentz, Jr., Westinghouse Sales Engineer, looks on as L. A. Bulleit, E. R. Ronald & Associates, points out some of the many important electrical features of the new Television Center to L. A. Worland, E. R. Ronald & Associates; G. W. Norton, Jr., President of WAVE, Inc.; and Architect A. Read Henry of Hartstern, Louis & Henry.



Westinghouse Type NA1B panelboards are used for distribution of the many lighting circuits in the studio. These circuit breaker panels protect circuits against overloads and short circuits.



A. J. Eversmann, Maintenance Superintendent of WAVE, inspects the modern and compact Westinghouse building-type switchboard with R. A. Schlaug and M. D. Bornstein, both of Bornstein Electric Company. Westinghouse AB De-ion® circuit breakers distribute and protect all power circuits in the studio. Provision is made to install additional breakers when required in the future.



Station finds reliable electrical system essential (contd.)

house demonstrated on the project. A Westinghouse construction specialist can be of service in your planning. Call the Westinghouse sales office near you, or write Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania.

J-94148-4

OWNER: Station WAVE, Inc., Louisville, Ky.
ARCHITECT: Hartstern, Louis & Henry, Louisville, Ky.
CONSULTING ENGINEER: E. R. Ronald & Associates,
Louisville, Ky.

GENERAL CONTRACTOR: F. W. Owens Company, Inc., Louisville, Ky.

ELECTRICAL CONTRACTOR: Bornstein Electric Company, Louisville, Ky.

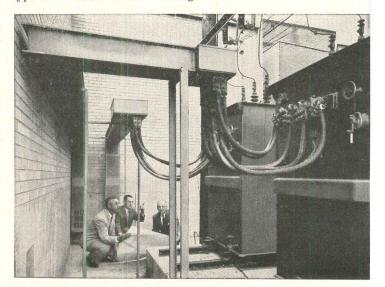
MECHANICAL CONTRACTOR: Stevens Engineering Company, Inc., Louisville, Ky.

WESTINGHOUSE DISTRIBUTOR: Tafel Electric & Supply Company, Louisville, Ky.

Westinghouse

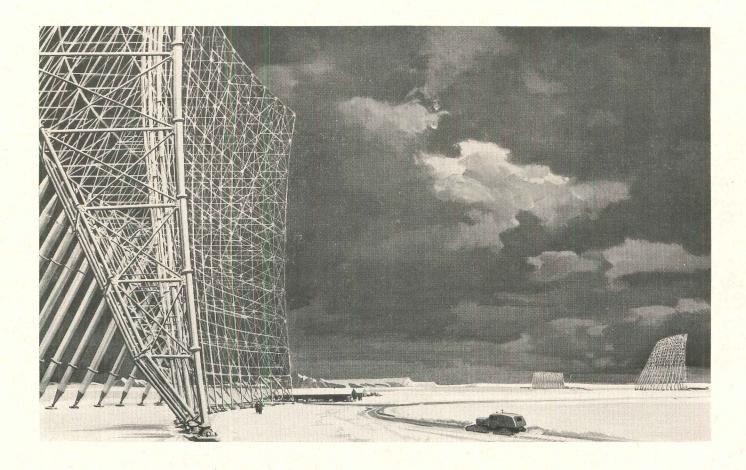
K. F. Haynes, F. W. Owens Company, General Contractors, discusses Westinghouse Class 11-700 part winding reduced voltage starter with Paul Tafel, Jr., Tafel Electric and Supply Company; and M. T. Shaw, Mechanical Engineer, Stevens Engineering Company, Inc. This starter controls the 30-hp Life-Line® "A" air conditioning motor shown in foreground. Also shown are Westinghouse safety switches, line-starters and pushbuttons.

R. J. Barker, Tafel Electric and Supply Company; R. A. Schlaug and M. D. Bornstein inspect substation where two 300-kva transformers furnish 120/208 volts for building power. Two runs of 1600-ampere, weatherproof, low-impedance bus duct carry the low-voltage power to building-type switchboard within building.



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They're part of a Ballistic Missile Early Warning System (BMEWS). Officially, you'd call them surveillance radar antennas. Yet, they look like over-sized baseball mitts. That web-like framework can detect (or spot) a far-off missile darting through the shivering Arctic sky, and rifle its speed and direction to any of our military bases in seconds.

Up here, weather is a constant battle. Arctic storms slam into the 163-foot high antennas, and rake icy fingers back and forth over the mesh-faced structures. But they'll stand for years. The D. S. Kennedy Company, builders, made certain of that by weaving foot after foot of USS National Steel Pipe and Tubing into every antenna.

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USS National Steel Tubular Products have been used in buildings and commercial structures for more than 90 years. If you'd like some additional facts, write for a copy of our Bulletin No. 2—Pipe For Mechanical and Structural Purposes. National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. But, for fast delivery of USS National Steel Tubular Products, see your National Tube Distributor.

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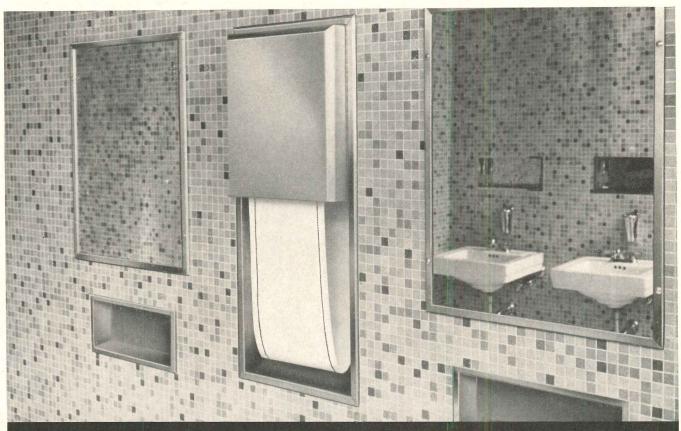


A-1411



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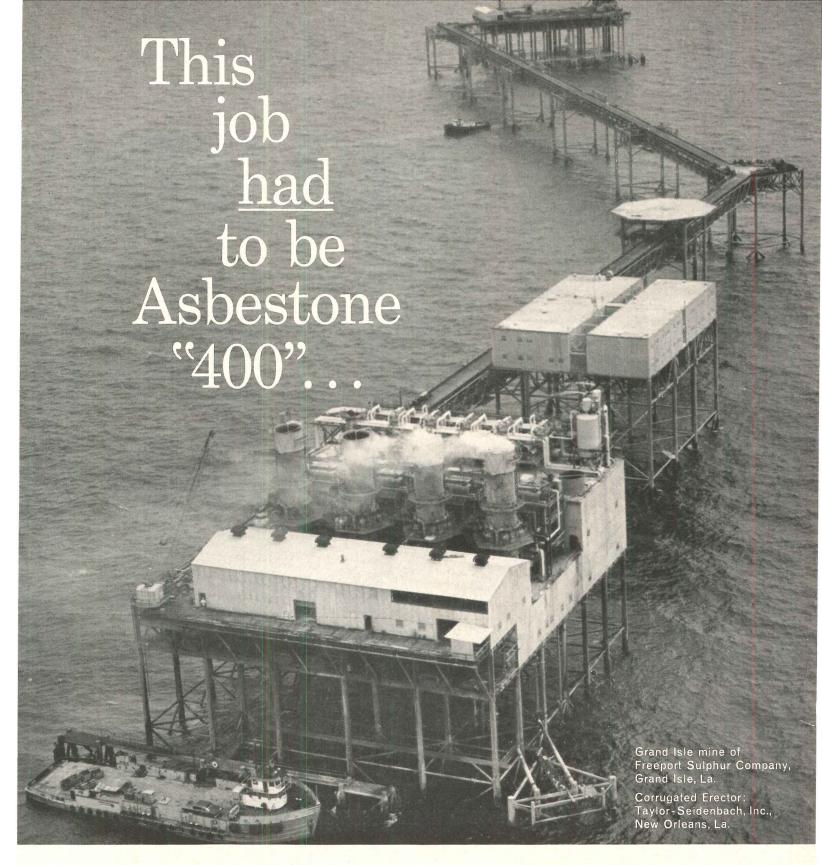
When YOU specify continuous cotton towel cabinets for washrooms, you automatically provide your clients with a number of plus values: Lowered janitorial costs ... fewer plumbing repairs ... less litter ... less fire hazard. So plan for continuous towel cabinets. Your local Linen Supplier will install the units and keep them supplied with fresh, real cotton toweling. Yes, specify continuous towel cabinets for the job on your board right now ... your clients will appreciate it.

For complete information, write to Linen Supply Association on your letterhead. You'll receive this free, fully illustrated Planning-for-Cloth Kit which includes specifications for recessed and other continuous cloth towel cabinets.



This beautiful recessed unit is but one of the many designs available. It is solidly constructed of 22 gauge, satin-finished stainless steel and carries 50 yards of cloth toweling.

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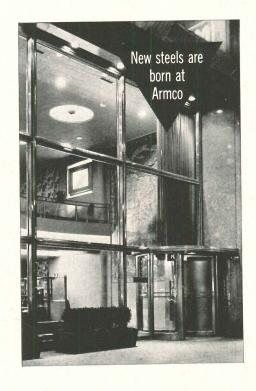
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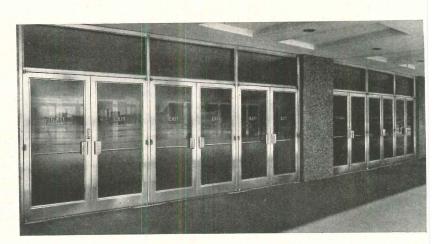
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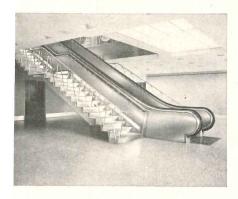


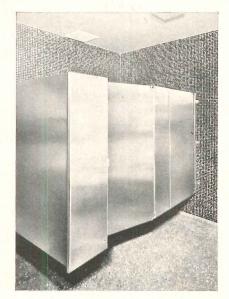






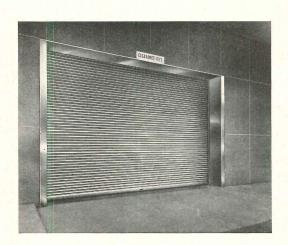
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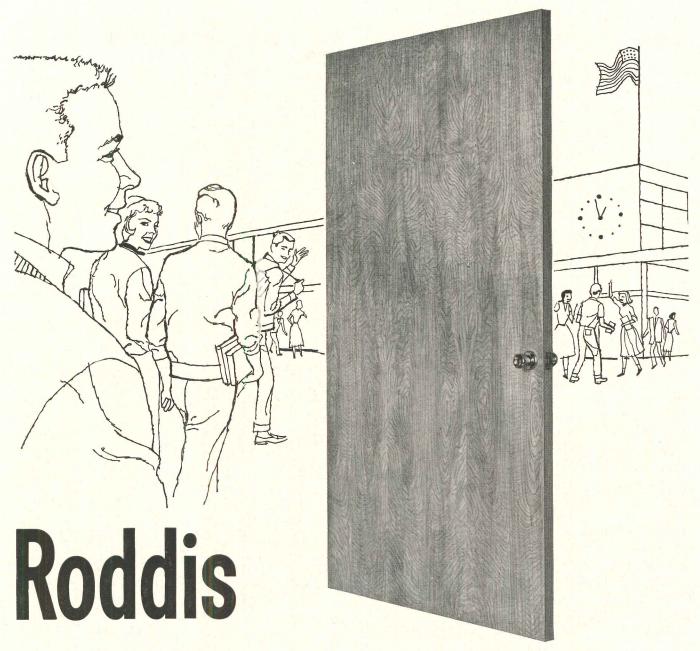
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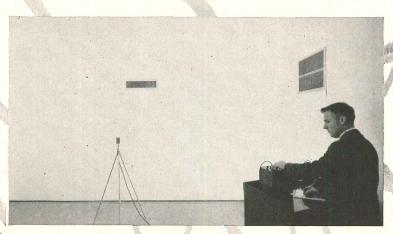
What about the performance data assures Make q and behave... you of the best possible auditory environ-Ask to hear it: new Barber-Colman Noise criteria curves demonment. strate permissible sound levels. slide film, "Making Sound Behave."

auditory environment?

Facts about air distribution sound levels of importance to engineers and architects

An architect skillfully uses both color and light to create the proper environment. A good analogy exists between an architect working with frequencies of light (color) and an engineer creating ideal air distribution specifications with sound.

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enough to assure comfortable environment, for sound must be measured and specified not only in terms of over-all magnitude, but also in magnitude at different frequency levels.

To help you create the proper auditory environment, Barber-Colman has built modern sound laboratories where engineers break down into eight octave bands the sound of air passing through Uni-Flo diffusers. The decibel value of each band then is charted for a complete range of capacities.

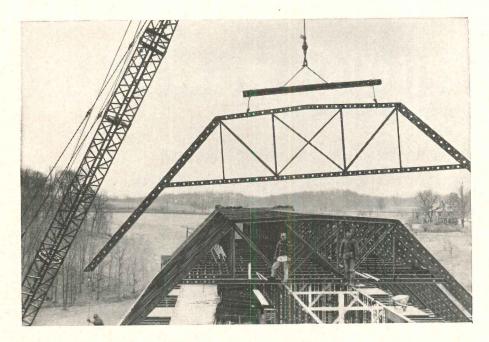
The results are twofold: data is available for comparison with noise criteria curves which are used for specifying permissible sound levels in different frequency bands; scientifically proved performance data is provided for correct selection of air distribution equipment.

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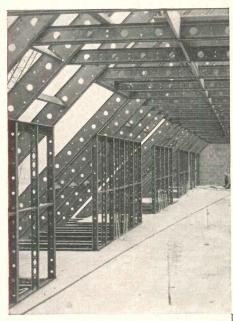
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After fabrication, roof trusses were raised into position by a mobile crane and securely welded in place in a matter of minutes. Smaller panels were light enough to be carried and erected without handling equipment.

Architect tells why he selected Penmetal structural framing for Methodist Country House



METHODIST COUNTRY HOUSE Wilmington, Delaware

ARCHITECTS: Dollar, Bonner, Blake and Manning STRUCTURAL ENGINEER: L. H. Doane Associates, Inc. GENERAL CONTRACTOR: Haddock Construction Co. STEEL ERECTION: Delaware Steel Service, Inc.



According to the architectural firm of Dollar, Bonner, Blake and Manning, "The reasons for our choice were numerous, but the most important were that the light steel would provide a lightweight incombustible frame and that the nailable feature of the members would provide a simple means of attaching other materials.

"We were also convinced that light-steel framing was no more expensive than other types of construction, and that proper panelization would result in a rapid rate of progress in erection. The latter two points were subsequently proven to be correct by the results achieved in this project."

The structure of Methodist Country House combines a minimum of heavy steel with extensive use of Penmetal framing. Interior walls are plaster over Penmetal rib lath, which was nailed to double studs. Roof trusses were fabricated from 10", 15-gage and 6", 16-gage joists.

Write for details of this versatile framing system. Ask for a copy of catalog SS-33.

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Structural Framing Sales Office: P.O. Box 1460, Parkersburg, W. Va.

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PM-251

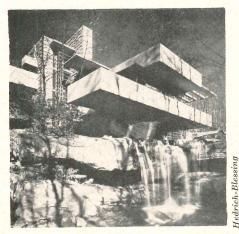
THE WRIGHT LEGACY EVALUATED

Since Frank Lloyd Wright died last year, millions of words have been written about him, familiar anthologies of his writings have reappeared in paperback, industrious editors continue to rearrange his writings into new anthologies, and along with the millions of words are thousands of pictures, photographs and plans culled from all the books and monographs that have gone before. This is as it should be. Wright was a great inventive genius and he brought an awareness of architecture to many who would never have known it existed. To evaluate Wright's seven decades of creative life is to commemorate him, but how to begin? Try to catch him. He still eludes us in spite of the tons of print and pictures. Perhaps the books show us too few pictures of too many buildings. In the thirty-three pages which follow Frederick Gutheim's introduction to this Wright portfolio, ten major works of Wright are shown, not briefly but in detail. They were selected by Gutheim because each represents a major period of Wright's singular, original and creative development.

ARCHITECTURAL RECORD OCTOBER 1960

THE WRIGHT LEGACY EVALUATED

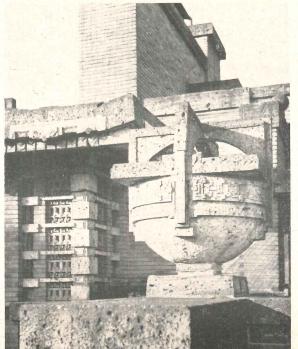
Introduction by Frederick Gutheim



Kaufmann House, Bear Run, Pa. 1936



S. C. Johnson and Son, Inc., Admin. Building, Racine, Wis. 1936-1939



The mystery of the creative process in architecture, as in all art, having always defied critical explanation, it is hardly to be wondered that there are a large number of ways to misunderstand the architecture of Frank Lloyd Wright. Not a few of these have been offered by the architect himself. In his writings and preachments, however, he has been concerned mainly to tell us what he wanted his architecture to do, not how he went about doing it.

What marks a successful artist, however, is his ability to get it on paper, canvas or stone, or, in the case of architecture, to get it built. Without that we have no way of knowing the true artist from the dreamer. That is why architectural theory, while interesting, cannot be conclusive.

So it is that, with all the speculation, in the end we turn to Wright as the man with the passion to build, the architect whose uniquely long career of seven decades is best thought of as the enunciation and development of a series of concepts of structure and the appropriate, correct and imaginative use of materials, created and elaborated to articulate a particular set of ideas.

My first contact with Wright, and the one that naturally left the deepest subjective impression, was in 1928 when his affairs were at their lowest ebb and the specific demands of active practice were negligible. It was at precisely this juncture that he was most inquisitively active in the sources of design. I imagine it must have been so during earlier periods of professional inactivity. His studio was filled with large-format German photographic albums of plant forms, many of them microscopic; with photographs and books on the buildings of prehistoric America, Tibet and other exotic architectures; and, as always, with his own earlier buildings and especially projects that appeared to have particular relevance.

There was never a question in my mind what he was doing with all this food for the imagination. He was ruminating on it, searching for concepts of structure in nature, in earlier architectures, in his own work, that would fit his ideas. It was that exercise many architects call "research", thereby to baffle their more proper academic colleagues.

Two aspects of this process should be mentioned. Wright always began with an idea of what purpose he wanted the structure to serve, and it was nearly always a quite subjective and architectural purpose. He wanted a house to seem sheltering, or a concrete structure to appear light and spacious. These are poetic reasons. Beyond purpose, Wright was interested in exploring the properties of new building materials and qualifying them, so to speak, as the materials of architecture.

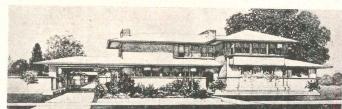
His approach to structure, therefore, was one of making it do his bidding, and to do that he had to plumb its secrets. The process was one of discovery rather than invention, as I saw it. His engineering was "sound"-if you want to think of it in those terms—but it was essentially intuitive and imaginative. And as so often turns out to be the case, such engineering may start by being beyond conventional calculations, but test high on any pragmatic basis. All the famous Wright stories illustrate this: the Imperial Hotel's ability to survive the earthquake, the "dendriform" columns of the Johnson Wax Administration Building, or the cantilever of "Falling Waters" from which the architect and client themselves had to remove the scaffolding when the workmen "knew" it would collapse.

While much of Wright's early architecture shows an understandable interest in mastering the contemporary idiom, or a desire to conform to the standards of the Adler and Sullivan office, the first break-away showed the unmistakable structural principle at work. This illustration was the windmill and watertower erected in 1896 in Wisconsin. The engineering was organic. As Russell Hitchcock writes, "The bracing floors every ten feet within the lozenge were like the braced articulation of a hollow plant stem, so that the tower was in a real sense like a product of nature."

The wooden houses of the prairie style are Wright's first major exercise in the development of structural form. From their beginning in the two "idea houses" drawn for the Ladies Home Journal in 1900 and 1901, particularly the latter, and their initial realization in the Ward W. Willitts house in 1902, the prairie house theme was carried to its ultimate fulfillment in the celebrated and familiar Robie House of 1908. In that long series of residences we see Wright struggling to make the structure convey the idea of the house. As soon as the building type had received its definitive expression in plan, that is, when he had resolved the issue of the kind of life to be lived in the house, Wright's major concern was not with the details but to squeeze everything he could from the basic form itself. Therefore, in these woodand-plaster or masonry houses, the base became a more significant element, an anchor to the site. The silhouette was brought lower and the hip roof flattened. The central masonry core of the house was strengthened and emphasized with hearth and chimney, banks of windows alternate with continuous walls. But literally above everything else, it was the hovering contilevered roofs, and the deep shadows thrown by their bold projections, that gave the prairie houses their special character.

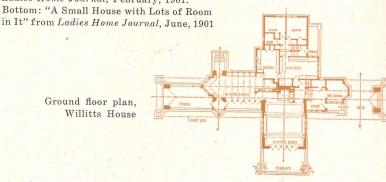


Misses Lloyd Jones windmill, Hillside, Spring Green, Wis. 1896





Two projects for Curtis Publishing Co. 1900. Top: "A Home in a Prairie Town" from Ladies Home Journal, February, 1901. Bottom: "A Small House with Lots of Room

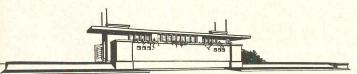


Ward W. Willitts House, Highland Park, Ill. 1902

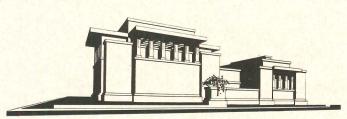


Chicago Architectural Photo Co.





Project: Yahara Boat Club, Madison, Wis. 1902



Unity Church, Oak Park, Ill. 1906

Avery Coonley Playhouse, Riverside, Ill. 1912



Chicago Architectural Photo Co.



Poured concrete detail. Midway Gardens, Chicago 1914.

Wright's long awareness of concrete as a building material (dating from his student days at the University of Wisconsin engineering school) and such projects as the Yahara Boat Club and (presumably) the exhibition pavilion for Universal Portland Cement in the Buffalo exposition of 1901, were distant anticipations of his first mature statement of these potentialities of concrete construction in the Oak Park Unity Church of 1906. The handling of the material itself represented little difficulty. One sees from the beginning that Wright was proceeding along different lines from Auguste Perret. His endeavor was to resolve the massive qualities of the material, and to develop a lighter, more spacious, and complex series of volumes. With all their great simplicity and regularity in plan, such buildings as Unity Church or the Avery Coonley Playhouse (1912) became exercises in abstract design. The enrichment of these forms by the development of the concrete itself was the next obvious step. Again, heralded in some earlier buildings, this creative direction led to the Midway Gardens (1914) and the Imperial Hotel (1916).

The poured concrete architecture of Unity Church, an achievement described by Wright in one of the most memorable passages of "An Autobiography," is truly a monument. It presents a monolithic façade, the concrete brought to life and given texture by exposing the pebble aggregate. The exterior of the building offers a large-scale abstract composition in light and shadow, enlivened as in all the architect's buildings by carefully designed planting. High up, under the overhanging roof slabs, the concrete piers are decorated. The interior is splendidly illuminated and enriched with abstract decoration whose forms clearly derive from the structure itself.

Poured concrete so fully enunciated as structure in Unity Church appears in different roles in Midway Gardens and the Imperial Hotel. Midway Gardens is essentially a concrete building, in which the material receives decorative modelling and actually flowers into abstract decoration and sculpture, its plastic character made still more positive by the contrasting panels of brick. The use of patterned concrete block foreshadows not only the sculptured volcanic stone of the Imperial Hotel but more particularly the California textile block houses of the next decade.

Wright's enthusiasm for concrete as a material for fine architecture came to its logical climax in the series of California houses that began with the Barnsdall house of 1920, and are best expressed in the much smaller Millard House, built three years later in Pasadena. As distinguished from the poured

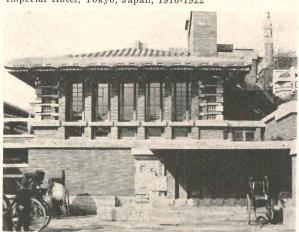
concrete buildings that preceded them, the Millard house brought to its full expression what Wright called "textile block construction"—a system in which the structure of concrete block and the integrated system of decoration were fused. There hangs in the principal exhibition room of Taliesin North a holograph "conception drawing" of the Millard House that exhibits Frank Lloyd Wright's matchless architectural gift at its clearest and best. See page 030. It is the gift of total conception. In a single drawing, the work of several hours, Wright conveys everything needed to build this new and revolutionary kind of house. Again, it is the structure which fascinates, and which, having been resolved, gives the key to the detailing and decoration. The exterior of the house conveys with a force equal to Unity Church the thickness and solidity of its concrete walls. But the interior shows the concrete, perforated, as a screen, through which light reaches the darkened interior in a mysterious pattern.

The reinforced concrete structure of the Imperial Hotel is almost wholly covered by brick and lava stone, or in the form of concrete "pins" lies buried in the famous earthquake-resistant foundations which support walls and piers, yet from a structural point of view this is in actuality a poured concrete building. Like all of Wright's major works, it echoed much in earlier buildings, but still more heralded suggestions for future development.

Beginning with the Press building in San Francisco in 1912, Wright commenced an endless flirtation with that most American form, the urban skyscraper. Reaching its first climax in 1924, when he enunciated the glass-and-metal curtain wall in the projected National Life Insurance Company building in Chicago, the structural system was finally perfected in the drawings of a housing development, St. Marks-in-the-Bouwerie (1929) and ultimately realized in the Price Tower (1956), Bartlesville, Oklahoma. A paradox for the architect and ruralist who frequently predicted "the disappearing city", his skyscraper projects tested the credulity of his admirers with the "mile-high" Chicago skyscraper of 1956. But this was simply an extension of the basic structural principle of the mast, the cantilevered floors, and especially the curtain wall, used by Wright in all of his tall buildings, and today, of course, like so many of his innovations, a commonplace of our architecture, although seldom expressed with the authority of its originator.

In the 1930's and 1940's Wright's major preoccupations included the founding of the Taliesin Fellowship, the development of Broadacre city and other unfulfilled projects, the design and construction

Imperial Hotel, Tokyo, Japan, 1916-1922



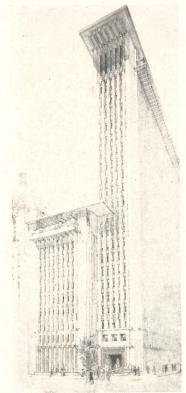


"Hollyhock House", Los Angeles, Cal. 1920

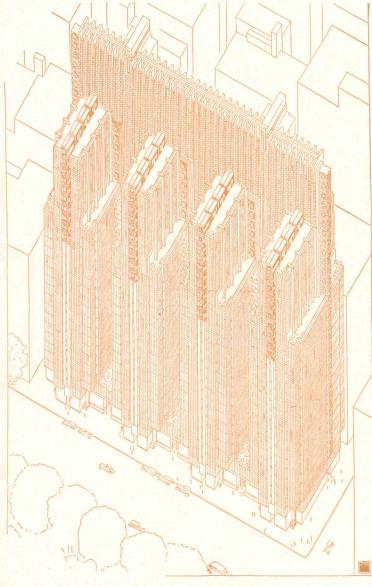


Millard House, Pasadena, Cal. 1923

ARCHITECTURAL RECORD October 1960



Project: Press Building, San Francisco, Cal. 1920



Project: National Life Insurance Co. Skyscraper, Chicago, Ill. 1924 ARCHITECTURAL RECORD October 1960

of Florida Southern University, and the Usonian houses. An examination of the work of this period in structural terms allows us to take a fresh look at the strangely scale-less Richard Lloyd Jones house of 1929, or the romantic and celebrated Falling Waters at Bear Run, Pa., built in 1936 and probably the most interesting of all Wright's houses.

The concluding period of the architect's work was given over to the exploration of curved forms, including those which were elliptical, parabolic or spiral. These begin with the projected Sugarloaf Mountain, Maryland, spiral "automobile objective" of 1925 and culminate, of course, in the ramped spiral Guggenheim Museum, designed at the end of the war and completed finally in the year of the architect's death, 1959. They include a number of houses, and an impressive array of projects, many of which are now being executed by the Taliesin Fellowship Associates, who are continuing Wright's practice.

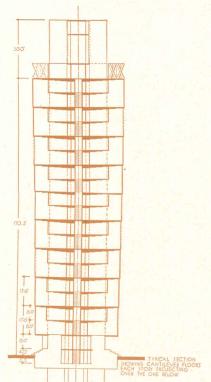
In each of these distinct phases we find the discovery, perfection and development of an independent structural concept. Each has its intuitive basis in organic life—the world of nature that was one of the prime sources of Wright's inspiration. There are recognizable linkages and continuities between the various individual structural forms. Each is erected into a complete system of design, with its inevitable impact and conditioning of the plan, in which detailing follows structure, and decoration finds its rationale and theme from its part in the basic design. Organic in this interdependent sense, as well as in its more literal inspiration from nature, it is in this that the larger harmonies of Wright's architecture are founded.

The reform toward which Frank Lloyd Wright worked in American life was part of a larger cultural movement toward the servantless house, the two generation family, and domestic informality. He was a powerful element in this movement, but neither its originator nor its exclusive figure. The strongly moral viewpoint which he projected, with its roots in his early religious and educational training, had many counterparts in the art movements generated by Ruskin and Morris, and a specific influence in Sullivan; so here again Wright must be regarded as unique only in that he maintained this posture in an age when only the force of his own personality kept it from seeming the anachronism it was. The exotic elements in his art—Japanese, Mayan and others and his response to the abstract designs of his Froebel kindergarten training, had many parallels in the art history of the period which saw the dawn of modern architecture. So did much of Wright's interest in nature.

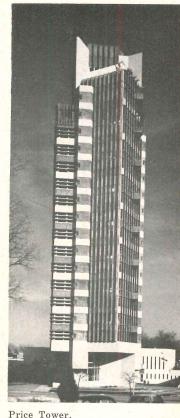
What is original in Wright's architecture is his ability to take this raw material of art, together with the resources of industrialized building, and erect them into a series of structural forms from which American architecture can draw continued inspiration.

For many years a familiar point of critical opinion was whether Wright's architecture could have continuity in the work of others, or only imitators. This doubt continued to be expressed in spite of the outstanding influence he had exerted. It was the major question raised when the Taliesin Fellowship was established as an avowed educational institution, rationalizing the apprenticeship system of the earlier Wright studio. Common sense would tell any architect that romantic individualism as it is commonly regarded is not a sufficient principle upon which to organize and direct an architectural office of fifty or more employees, to produce designs and working drawings for huge and complicated structures, or to operate an educational institution whose success has been tested by the work of its graduates. Anyone who has seen Wright work over the drawings of his assistants, correcting and developing them, and indicating their further development, or who has examined the drawings contained in his posthumous collection, will recognize that discipline and principle are at work, and see that structure is the organizational basis.

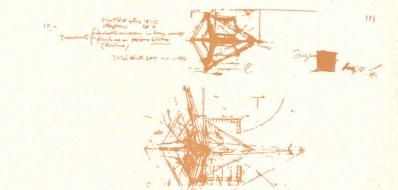
Now is the time to take a fresh look at Wright's contribution to our architecture, one that sets aside older views rooted in prejudice or personalities. When that more detailed examination has been made, it will reveal, I am sure, that Wright's decisive leadership lies in his development of structural form. Increasingly we can see that the architectural progress of Wright's period was in the assimilation of new materials and building technology, and the efforts of the architect both to direct and control these innovations and to organize them into a structural program which he could command. Wright never turned his back on progress, but when faced with the choice of using a manufactured product that fell short of his design standards, he never hesitated to reject it even when the alternative was the expensive and difficult one of designing and building a substitute himself. The innovations which resulted have received considerable recognition—and they range from the wall-hung water-closet to the abolition of the dining room—but the important result was the development of a kind of building in which the architect remained the responsible creator. For this his lesser contemporaries hated him; but for this a new generation of architects, whose very profession he saved, can honor him.



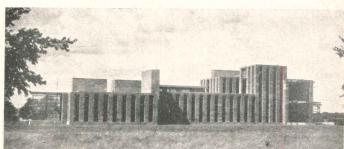
Project: St. Mark's Tower, New York City, 1929



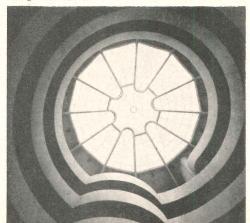
Price Tower, Bartlesville, Oklahoma, 1953



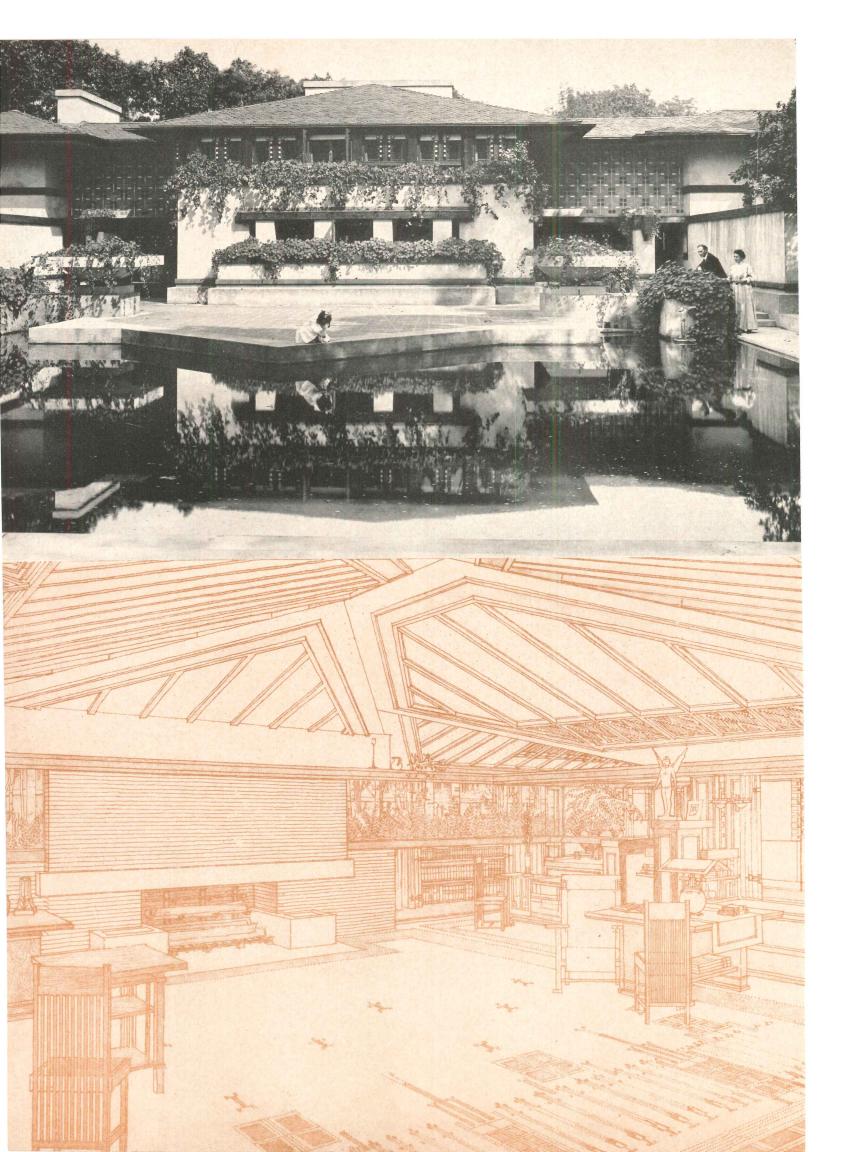
Project: The Mile-High Illinois, Skyscraper, Chicago, Ill. 1956. Plan



George Cserna

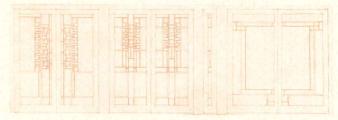


Richard Lloyd Jones House, Tulsa, Okla. 1929



WRIGHT'S FAVORITE PRAIRIE HOUSE

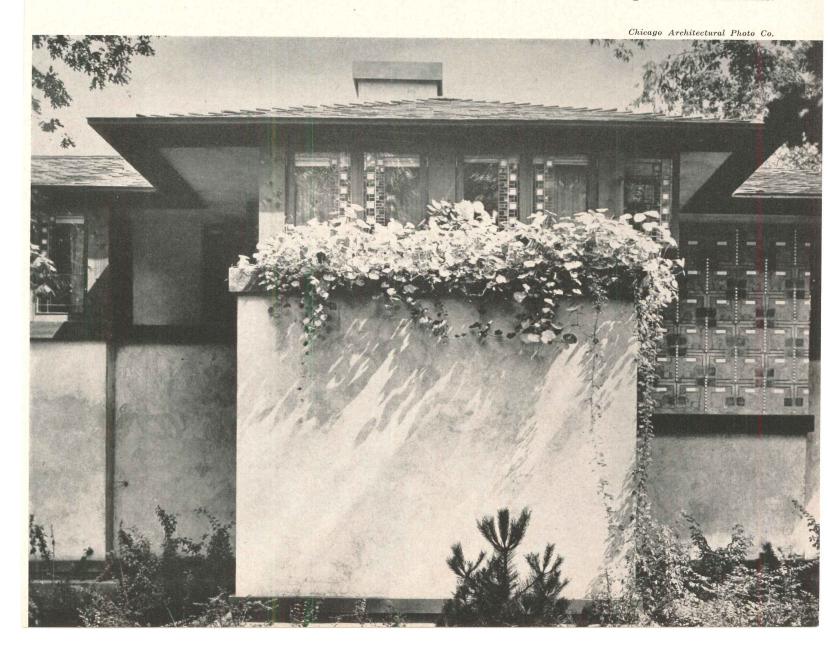
The Coonley House of 1908 is one of the best prairie houses by Wright which have helped shape American domestic architecture since their initial appearance sixty years ago.

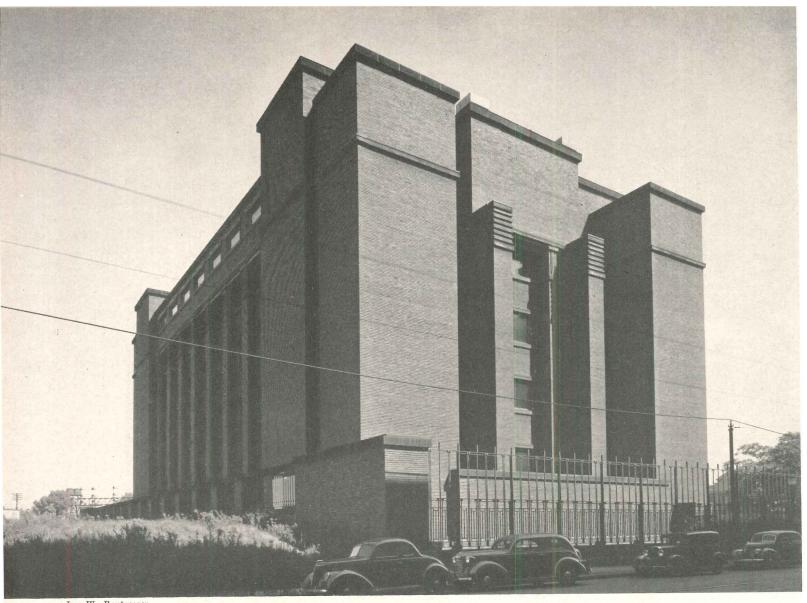


Leaded glass details for casement windows

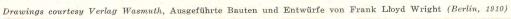
Drawings courtesy Verlag Wasmuth,
Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright (Berlin, 1910).
Most of Wasmuth drawings were the work of Marian Mahony,
Wright's leading assistant in the Oak Park years

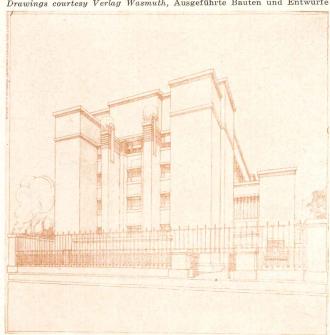
This two story wood and plaster house embodies the principal characteristics of Wright's influential prairie house style, and includes features in the best of our present day houses as well. Wright demolished the room as a self-contained box. Walls became screens. Attics vanished. In the Coonley house spatial elements flow into each other in a generously spread out cross axial system. A massive central chimney forms the core of the plan. The house is built without a basement on a concrete platform at ground level, its lines low and horizontal, its roof broad and sheltering. Wright opposed the double-hung or "guillotine" window as he called it as much for itself as for its random use, "like holes punched in a box", in the houses of his day. As in the Coonley House he favored casement windows grouped in horizontal strips under the eaves to preserve the continuity of the wall surface below. The living, dining and bedrooms are on the second floor, allowing the landscape to be viewed from a slight eminence. Decoration is derived from the same total geometric order Wright imposed on the house. He designed the patterned tile on the façade, the furniture, fixtures, fabrics, rugs and hangings as well as the ornamental glass in the casements.

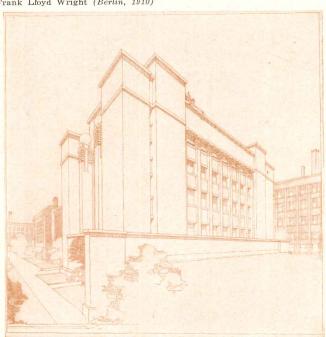




Jay W. Baxtresser





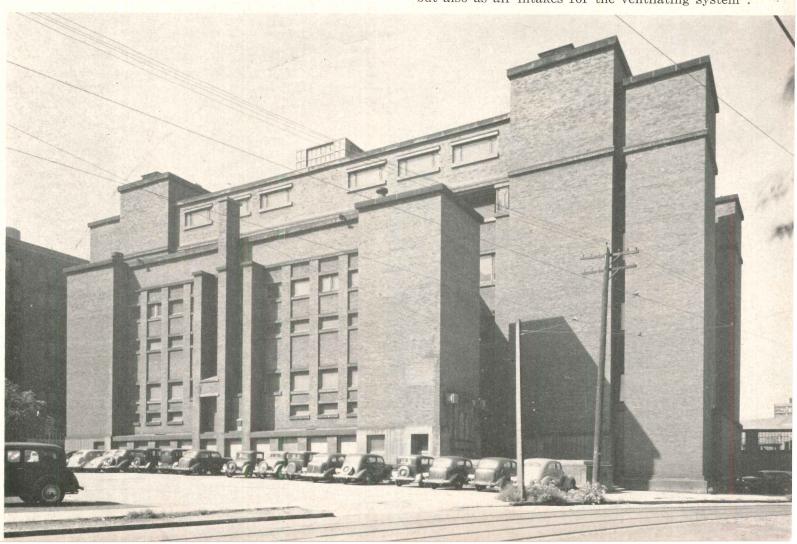


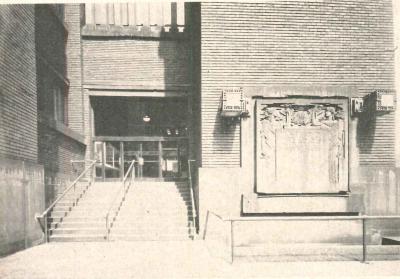
EARLY PROTEST AGAINST TRADITIONAL FORMS

The Larkin Building built in Buffalo in 1904 was the first commercial monument in the United States to dispense with historical style.

Pencil study by Wright of ornament later removed

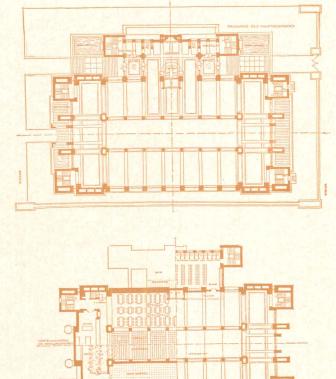
The critic Russell Sturgis appraising the Larkin Building in the April 1908 issue of ARCHITECTURAL RECORD and trying to be fair about a building the lines and masses of which he deemed "a monster of awkwardness", wrote as follows: "Admitting, then, that the chase of the Neo-Classic, of the Gothic, of the French Romanesque, has come to nothing, that we are as far as we were in 1850 from a living style of architecture, and even from anything which is worthy to be called architecture at all, when a large mass of the work of the period is taken together, we shall find that the building we are considering puts on a new aspect." Further on, Sturgis writes: "The designer . . . has determined that the square corner, the right angle, the straight edge, the sharp arris, the firm vertical and horizontal lines, unbroken, unmodified, uncompromising in their geometrical precision . . . that these and these only shall be the features of his building." Wright in his Autobiography called the building: ". . . a simple cliff of brick hermetically sealed (one of the first 'air conditioned' buildings in the country) to keep the interior space clear of the poisonous gases in the smoke from the New York Central trains . . . in terms of the straight line and flat plane . . . (it) was a genuine expression of power directly applied to purpose, in the same sense that the ocean liner, plane or car is so . . . the stair towers (were) free of the central block, not only as independent stair towers but also as air intakes for the ventilating system".





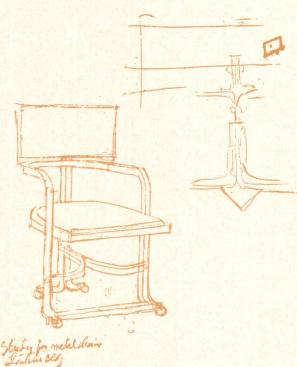




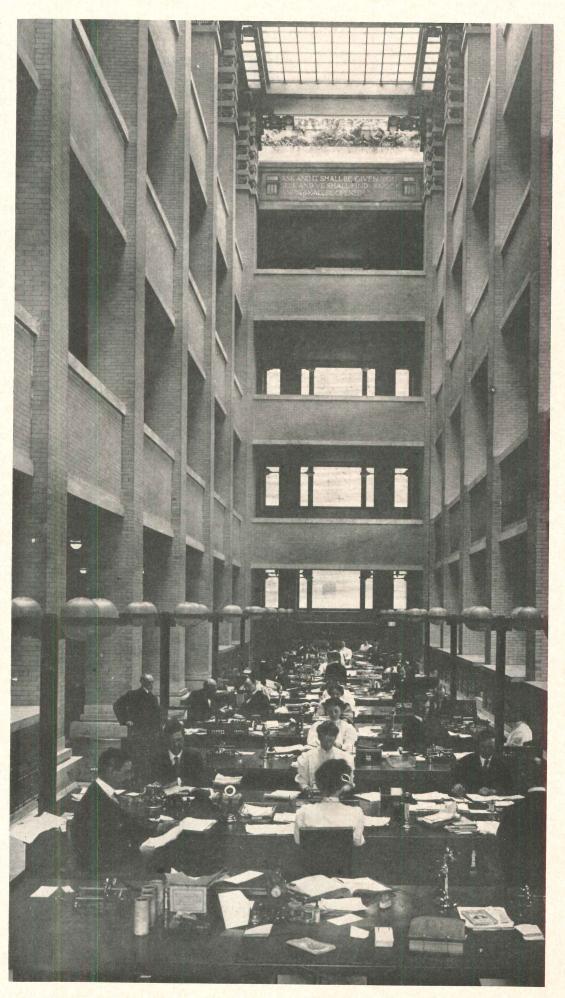


In photograph at top left, note early use of plate glass entrance doors set in flat metal frames. A sheet of water formerly fell into the pool in the foreground. Wright designed all furniture, files and fixtures of steel and magnesite either built in place or moveable. Said he in the Autobiography: "And I made many new inventions. The hanging water closet partition, the long automatic multiple chair desk, the wall-water-closet, were only several among them. All were intended to simplify cleaning and make operation easy. The dignified top-lighted interior created the effect of one great official family at work in day-lit, clean and airy quarters . . . The top story was a restaurant and conservatory, the ferns and flowers seen from the court below."



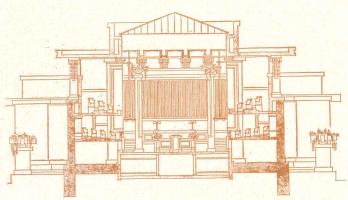


Plans courtesy Verlag Wasmuth, Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright (Berlin, 1910)



"THE FIRST CONCRETE MONOLITH IN THE WORLD"

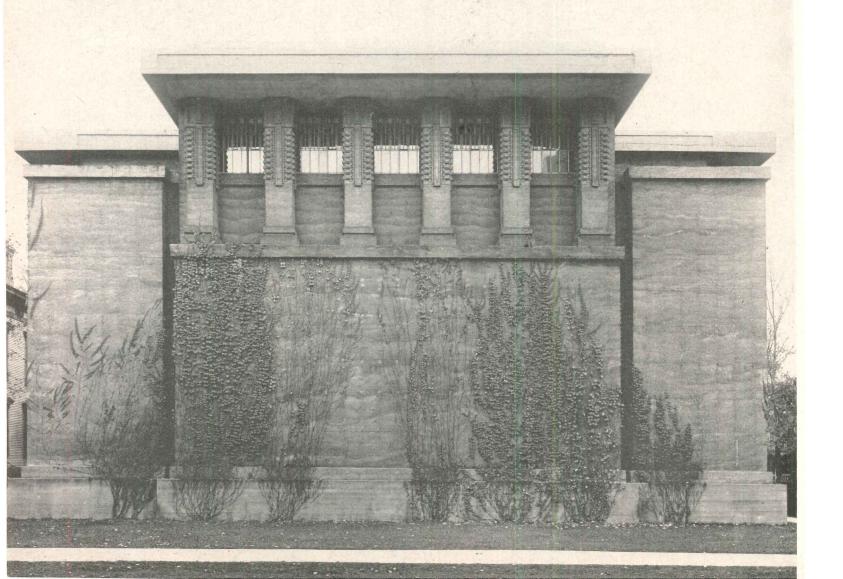
So Wright called his Unity Church of 1906.



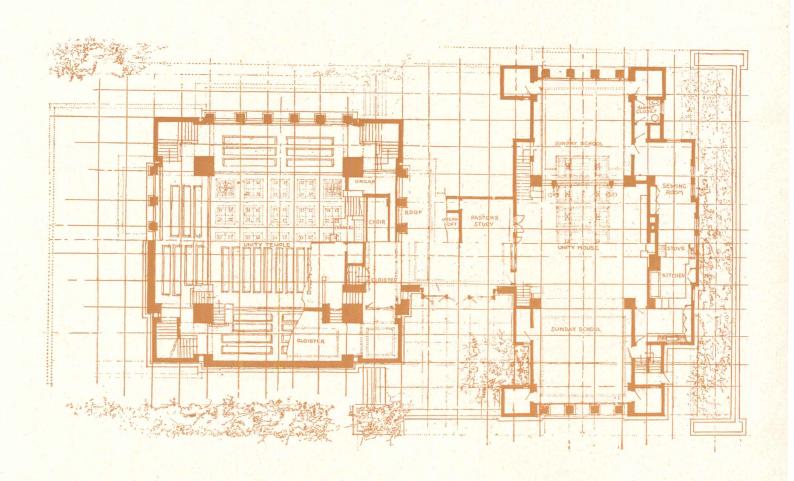
Drawing courtesy Verlag Wasmuth, Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright (Berlin, 1910)

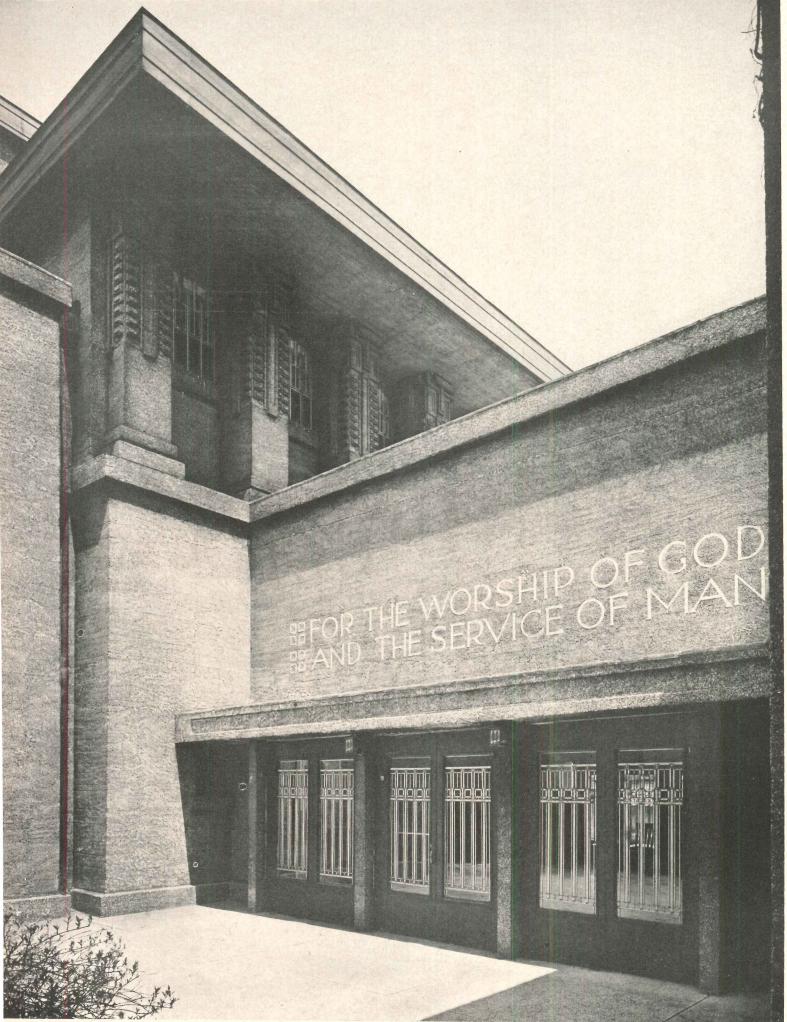
Concrete without steel reinforcement had been used since the 1870's and was called "poured stone". Not considered a proper finish material, reinforced concrete made its first significant appearance in heavy Beaux Arts disguise in the Ingalls Building at Cincinnati and was described in full technical detail in the ARCHITECTURAL RECORD of June 1904. Perhaps influenced by the Ingalls building, Wright used reinforced concrete in the "E-Z" Stove and Shoe Polish plant built in 1905 on Chicago's west side, but covered it with brick veneer. The sharply defined geometry of the Larkin building and the prairie houses indicate that Wright was already working in a stylistic manner which could easily have taken shape in concrete. His continuing interest in the realization of the intrinsic potential of materials naturally led him to a building whch was designed for the wooden forms into which concrete is poured and which expresses this mode of construction. Only Perret's famous concrete apartment house built in Paris in 1903, and Garnier's project for an industrial city of concrete exhibited in 1904, predate Unity Church, and not by very long.

Chicago Architectural Photo Co.

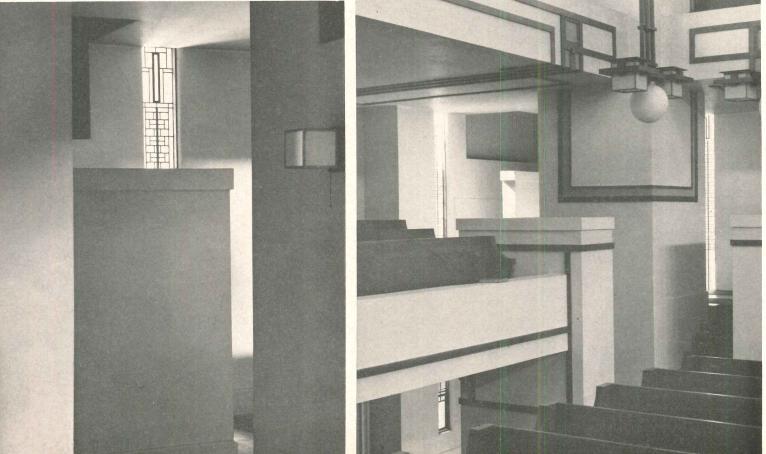




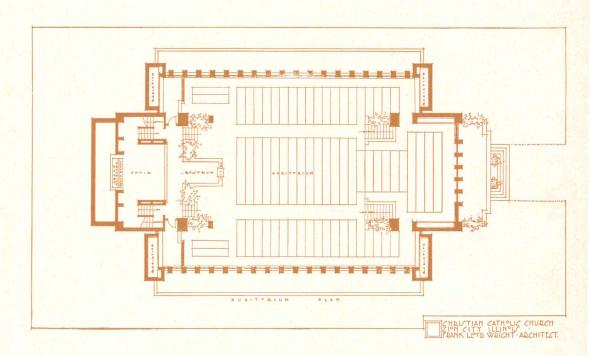


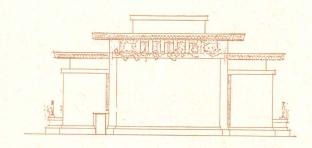


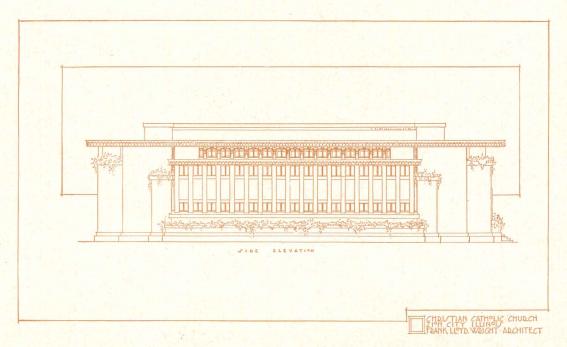




The lovely scheme below, a Christian Catholic Church designed for Zion City and never built, has no exact date but is believed to have been planned about 1915. These drawings are rarely seen. The project has been included here because of its conceptual relationship to Unity Church, and because of a similarity in façade to the central element of the Midway Gardens of 1914 shown on the following page



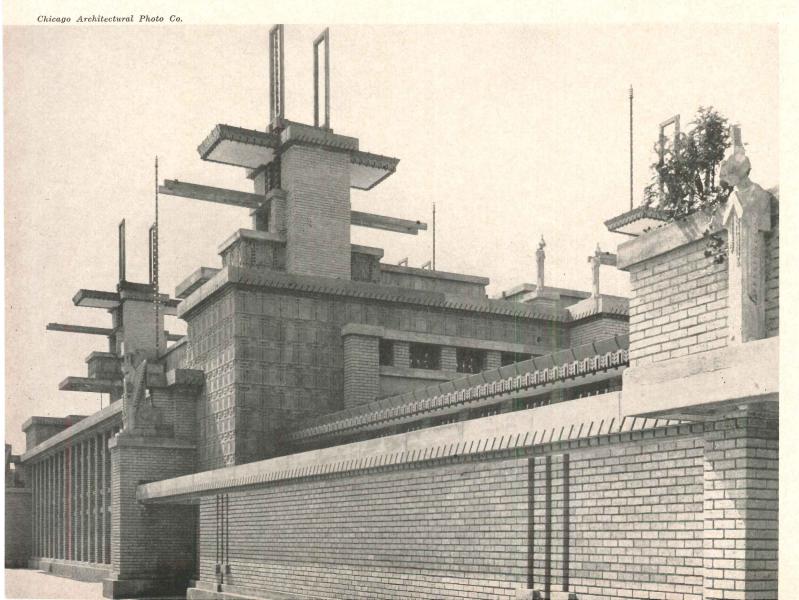


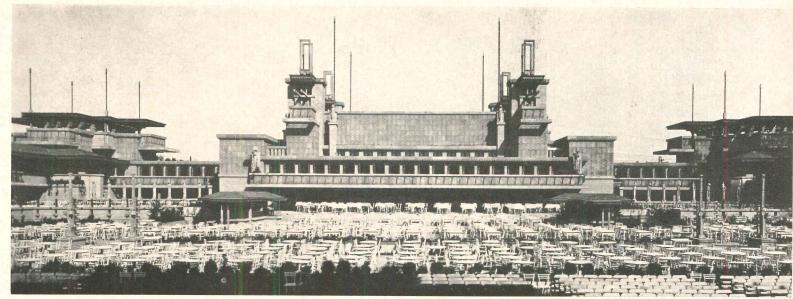


WRIGHT'S LESSON IN ORNAMENT

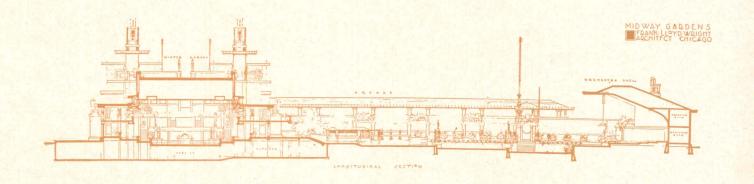
In Chicago's Midway Gardens of 1914,
Wright's ornament had a new richness and
exuberance suitable to a building for
outdoor concerts, dance recitals by
Pavlova, and dining and dancing both indoors
and out. Like it or not, Wright's
decoration shared the increasingly abstract
quality of his architecture
and was integral to it.

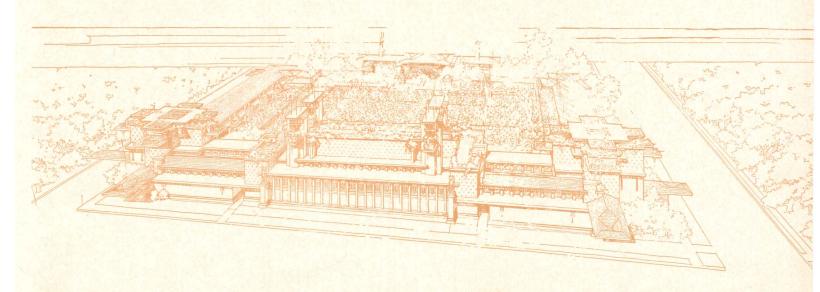
Said Wright in the Architects' Journal, August, 1936: ". . . in the Midway Gardens . . . I tried to complete the synthesis: planting, furnishings, music, painting, and sculpture, all to be one. But I found musicians, painters and sculptors were unable to rise at that time to any such synthesis. Only in a grudging and dim way did most of them even understand it as an idea. So I made the designs for all to harmonize with the architecture; crude as any sketch is crude, incomplete as to execution, but in effect sufficiently complete to show the immense importance of any such attempt on any architects part and show, indeed, that only so does architecture completely live. A new ideal of ornamentation had by now arrived that wiped out all ornament unless it too was an integral feature of the whole . . . This matter of integral ornament is the rock upon which a later generation of young architects splits and wisely decides to let it alone for the time being." And again in his Autobiography: ". . . integral ornament is the developed sense of the building as a whole, or the manifest abstract pattern of structure itself. Interpreted. Integral ornament is . . . structure-pattern made visibly articulate . . . as it is seen articulate in the structure of the trees or a lily of the fields."



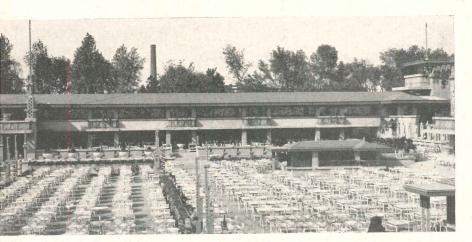


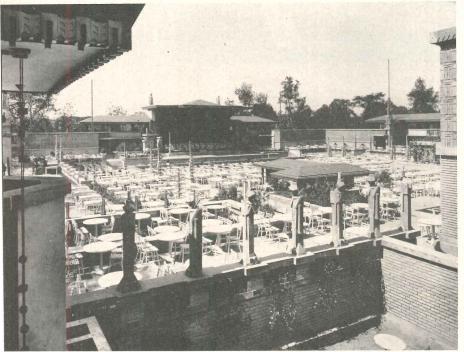
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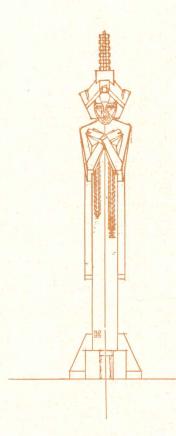


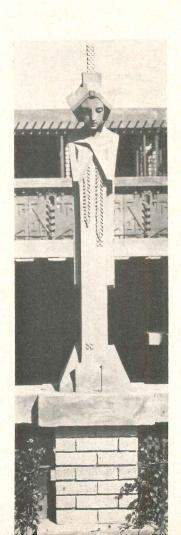
The Wright Legacy Evaluated: Midway Gardens

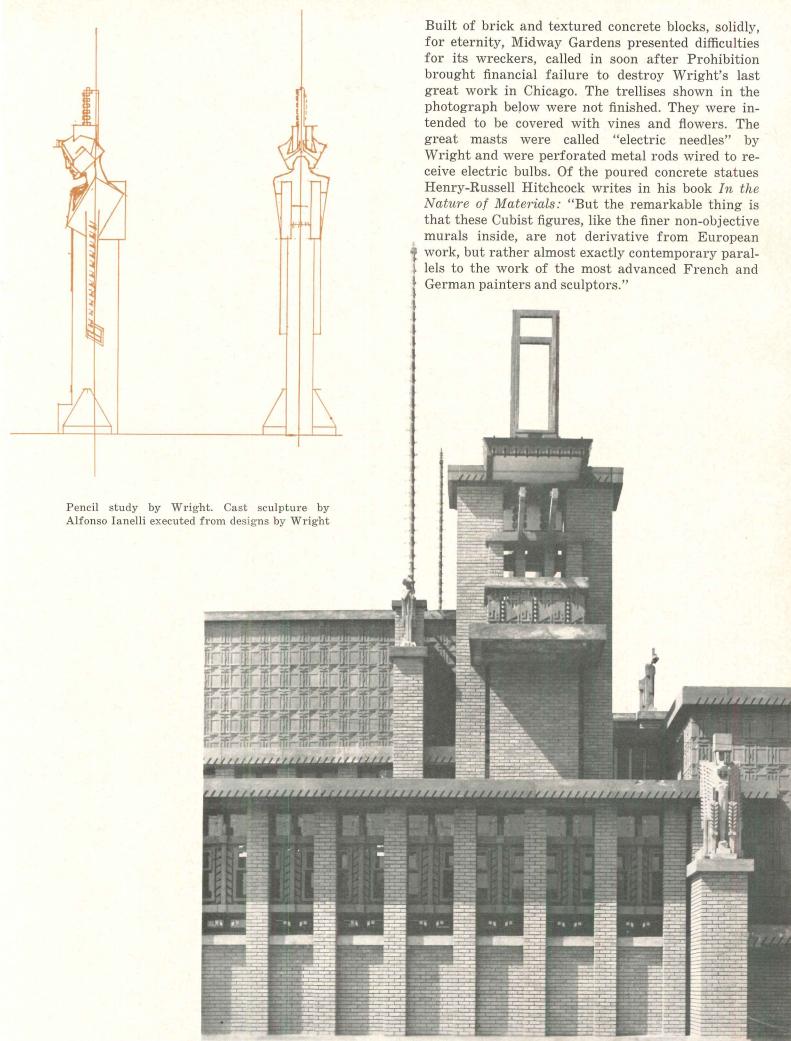






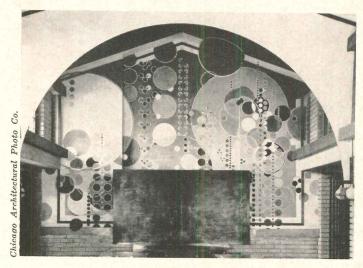






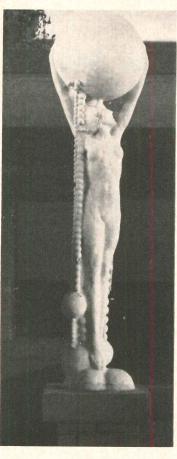
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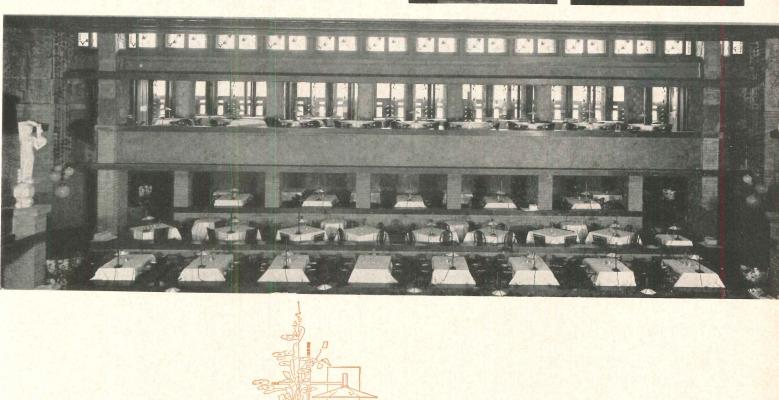


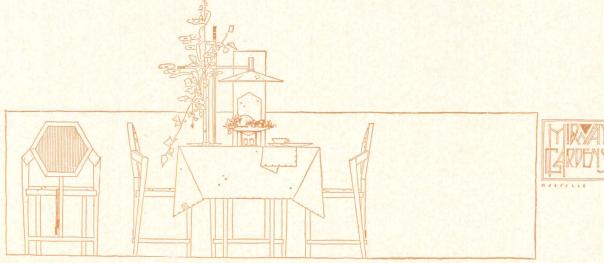


Interior of the Winter Garden, symmetrical along both axes (see drawings on page 167) and although much lower, similar to the Larkin Building in the majestic handling of interior volume. The human figures called "sprites" were designed by Wright and cast in plaster by Alfonso Ianelli. Of them Wright said in his Autobiography: "The lovely human figure might come in only to respect the architecture, dominated by a proper sense of the whole. The human figure should be there but humbly, to heighten the whole effect." Mural decorated cigar counter. Suspended chandeliers and other ornament derive from the Froebel "gifts," the geometric toys with which Wright played as a child. Chairs in drawing were not executed for Midway Gardens, but appear in the Imperial Hotel



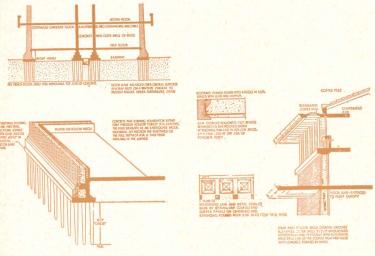






"BUILDING AGAINST DOOMSDAY" WRIGHT INVENTED EARTHQUAKE PROOF STRUCTURE BASED UPON A FLEXIBLE CANTILEVER SYSTEM

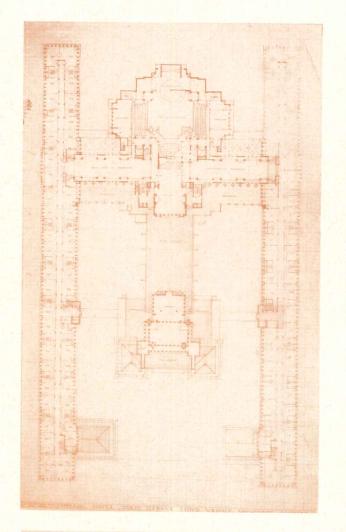
The Imperial Hotel, begun in 1915,
was in construction seven years.
Wright was proud of its integrated structure.
Its flexible cantilever construction
is here described by Louis Sullivan
in an excerpt from
the Architectural Record of April 1923.



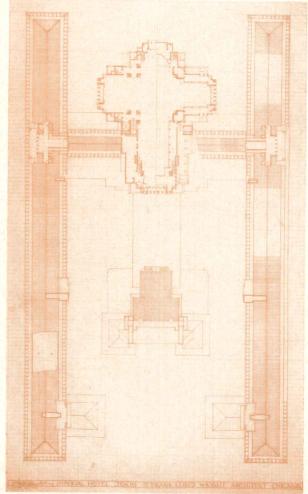
"Construction is based upon the reinforced concrete slab idea . . . a flexible resistance to earthquakes developing shocks, undulations, oscillations, and twists in action. The entire structure rests upon a layer of spongy soil, beneath which is found mud of undetermined depth. Short concrete piles are inserted in the upper layers where required, and as numerous as required, capped by reinforced concrete slabs which receive their direct loads at calculated points. The entire structure thus rests upon a flexible foundation which is free to yield to the mutation of earthquake disturbance and come back to place again. By a system of steel rods, the masonry superstructure is knitted together to render it yielding but resilient. The slabs are as tenaciously yet flexibly adjusted to the vertical supports and where occasion requires, the slab system merges from that of lintel into that of cantilever. There is here so general a use of this latter method, on account of its adaptability to projecting horizontal slabs otherwise unsupported, and the resulting ease of creating unobstructed areas, that it may perhaps be described as in essence a reinforced-cantilever-slab-system. In the construction of all outer walls, wooden forms were dispensed with; the outer layer of specially notched bricks, and the inside layer of hollow bricks serving as such. In the cavity between, concrete filler was poured over vertical and horizontal rods, the wall thus becoming a mass into which the floor slabs are so solidly tied as to take on the character of cantilevers, as conditions of disturbance might demand."

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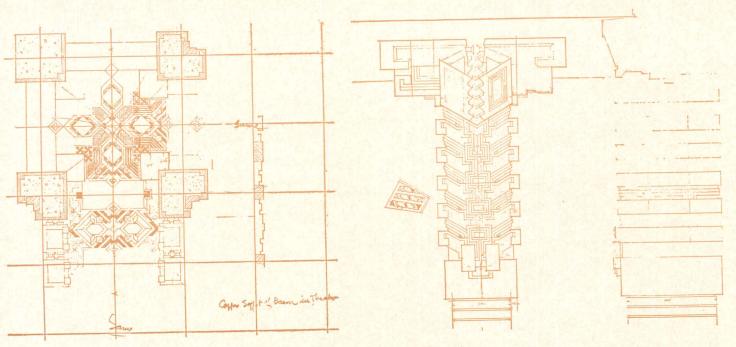






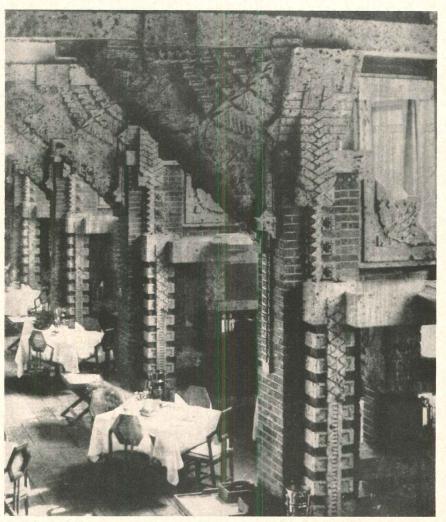


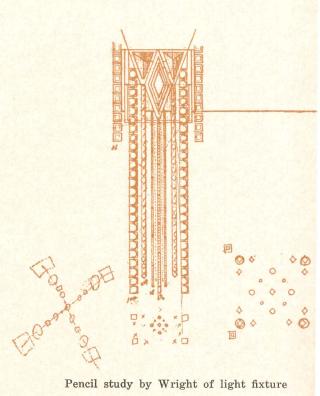
Plans show a monumental classic order imposed on a complex variety of spaces covering a ground area of 150,000 sq. ft. It has been said that Wright, if he chose, could have been the finest classic designer of his time. Terraces are everywhere, breaking down the appearance of size with the decorative interest their ornament and planting provides. Great pools were included for fire control as well as beauty and saved the building from the fire aftermath which followed the earthquake of 1923. The entire structure was designed for Japanese hand methods and local materials were skillfully used. The handmade bricks are buff colored, the carved lava yellow green with brown spots, the copper turquoise. All flat roofs were intended to be gardens



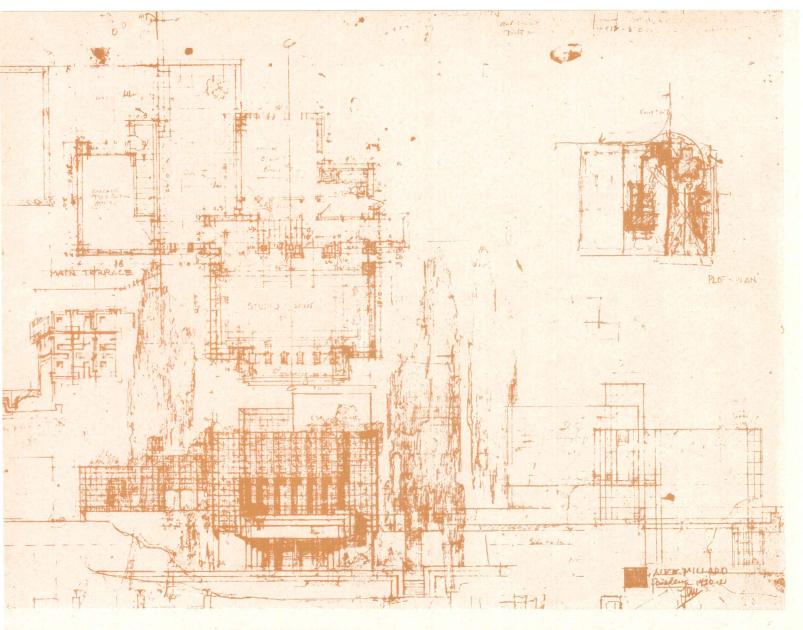
Pencil studies by Wright. At left, copper soffit of beam in theater, at right, a pier cap











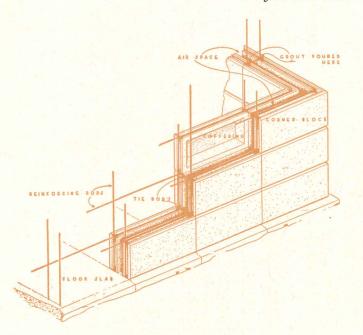


First conceptual drawing by Wright showing entire scheme as it grew from the concrete block as the unit of structure. House is located in a deep ravine. A rough plot plan appears in the upper right hand corner of the drawing

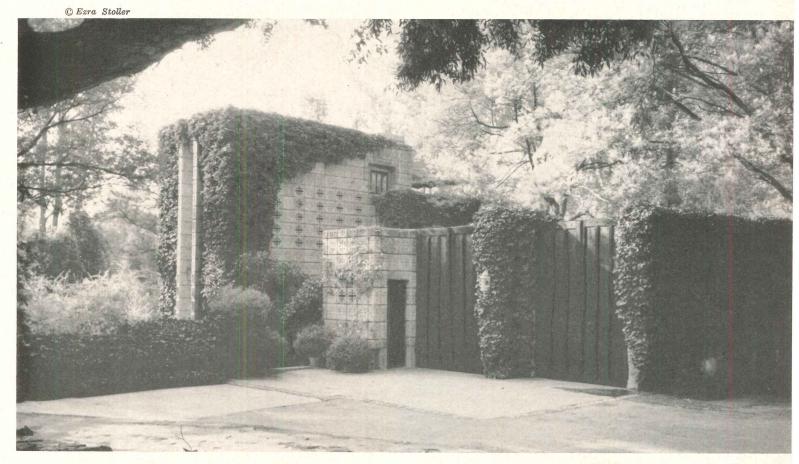
Photo at right shows rear entrance. The garden façade which is shown on sketch above appears on page 151

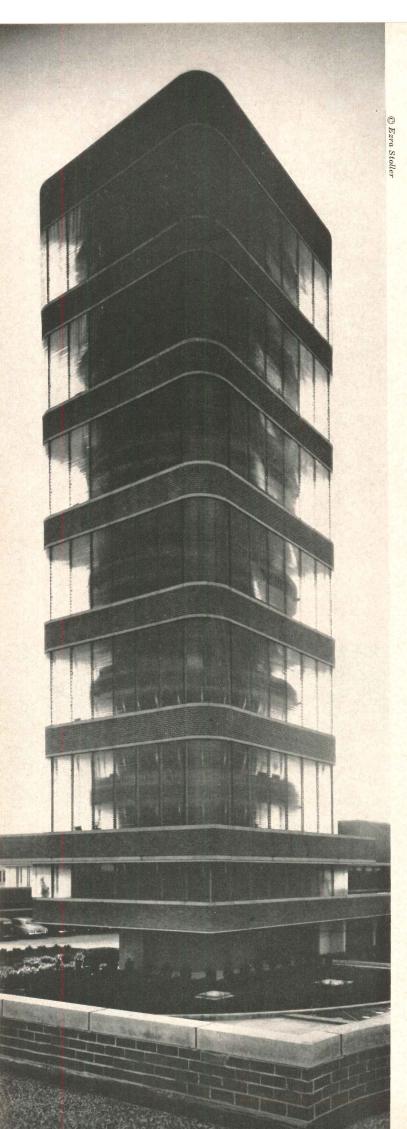
WRIGHT'S TEXTILE BLOCK SLAB

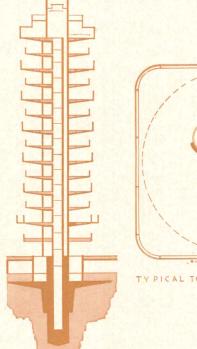
"La Miniatura" designed for Mrs. George Millard in Pasadena, Calif., in 1923, a great experiment with a promise not yet realized.

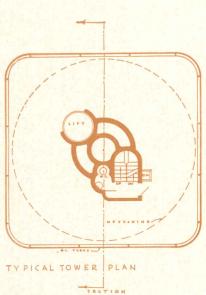


Although the textile block process shown in the drawing at left was carried out in a clumsy home made manner in the Millard House with the blocks cast on the site, it could have lent itself readily to mass production. This block system was used in most of Wright's buildings actually executed between 1923 and 1930. Tied together with steel rods with air space between, the system accepted both compression and tension and was used for both walls and beams. To enrich the pattern some of the blocks were pierced through, giving the effect of a pierced screen within. "La Miniatura" in its use of concrete. its contained plan, and its massing of elements, resembles such early Le Corbusier projects as the Citrohan House of 1922. Hitchcock in his book In the Nature of Materials points out an important difference: ". . . this house, because of its special construction, because of the textured surface of its cement blocks, above all perhaps because it has a definite solidity and is not dependent on linear abstractions and paper-like planes, but on material of a definite thickness and certain intrinsic visual qualities, is as beautiful a work of architecture as it ever was. Most of the early "international" houses, unfortunately are today shabby and cracked, and seem poverty stricken and barren unless one studies them in renderings in which their abstract qualities are clearest or in the best of contemporary photographs."







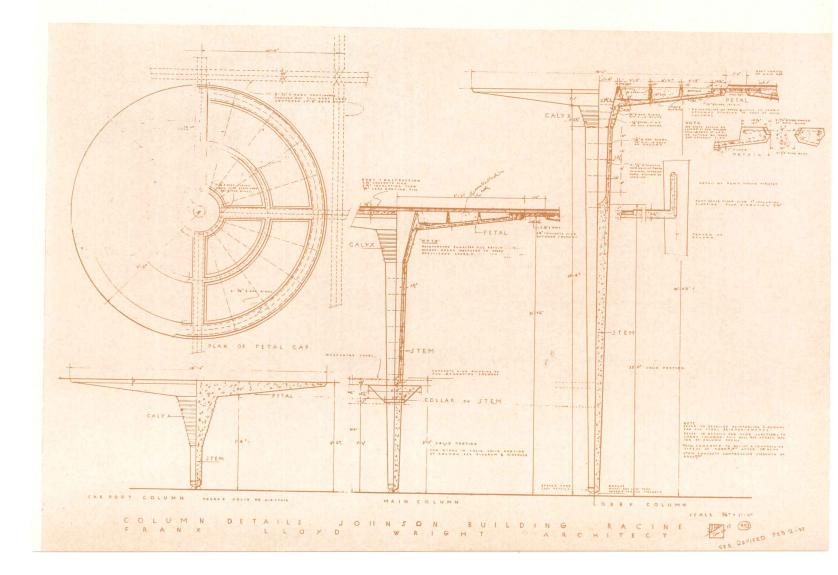


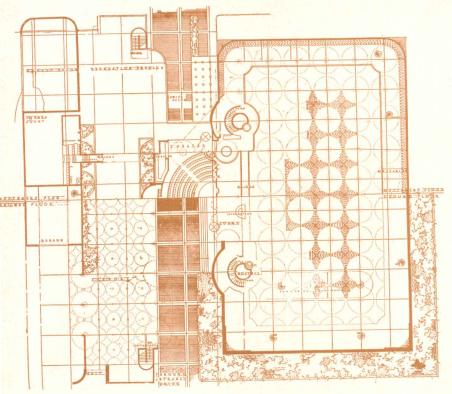
ONLY WRIGHT COULD MAKE A "TREE", OR A "TAP ROOT" OR A "LILY PAD"

His chance came in the Johnson Wax Administration Building of 1936–39, and the Johnson Tower of 1950.



The Johnson Wax Laboratory Tower with its "tap root" core from which the floors are cantilevered, is a natural descendant of Wright's first "tree," the St. Mark's Tower Project of 1929 with floors similarly cantilevered from a central mast. All laboratory space opens off this core which contains the elevator, stairs and the duct system. The wall is a glass shell made of glass tubes affixed to each alternate floor slab. The dendriform or "lily pad" columns shown in the photograph at left and the drawing below were first used in the Johnson Wax Administration Building. They support only themselves, their great spreading circular capitals form the solid parts of the roof. Small at the base, they rest in 9 in. bronze holders. In his Autobiography Wright describes his Johnson Wax "lily pads" thus: "The main feature of construction was the simple repetition of slender, hollow, dendriform shafts . . . By way of a natural use of steel in tension, weight in this building appears to lift and float in light and air; miraculous light dendriforms standing up against the sky take on integral character, plastic units of plastic building construction, emphasizing space instead of standing in the way . . . "

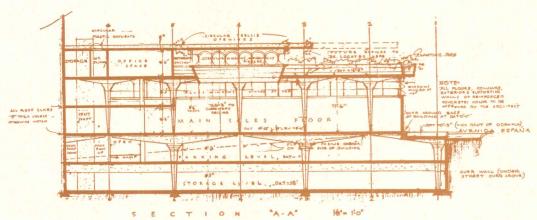




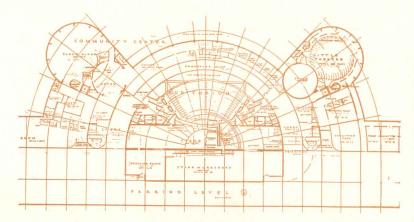


Top: Johnson Wax Administration Building Plan. Right: principal interior. Below: the dendriform column in a department store project for the Freund Company in El Salvador. Below right: another projected use of the dendriform in the Lenkurt Electric Company project of 1956

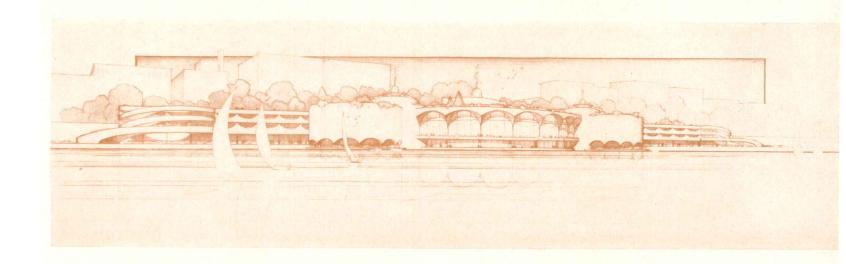
© Ezra Stoller







An emphasis on circular forms coupled with a Beaux Arts symmetry is the ordering principle in the Monona Terrace project, a civic center for the Lake Monona waterfront in Madison, Wisconsin designed by Wright in 1955, and being carried out by the Taliesin Architects Associated headed by architect Wesley Peters, formerly Wright's chief engineer. The project is now in working drawing stage and includes a theater auditorium, a community center, and a small theater as part of a three level terrace. Boathouses and moorings are on the lowest level, the top level is a great terrace with three large fountains representing the Sun, Moon and Earth. Intermediate level plan at left. Perspective below



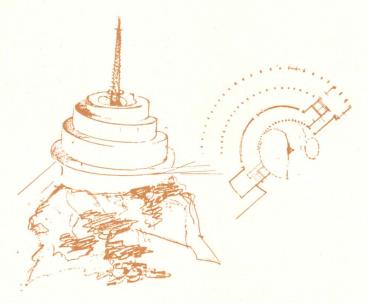


The V. C. Morris Shop built in San Francisco in 1948 was Wright's first realized spiral form, a further development in his search for continuity.

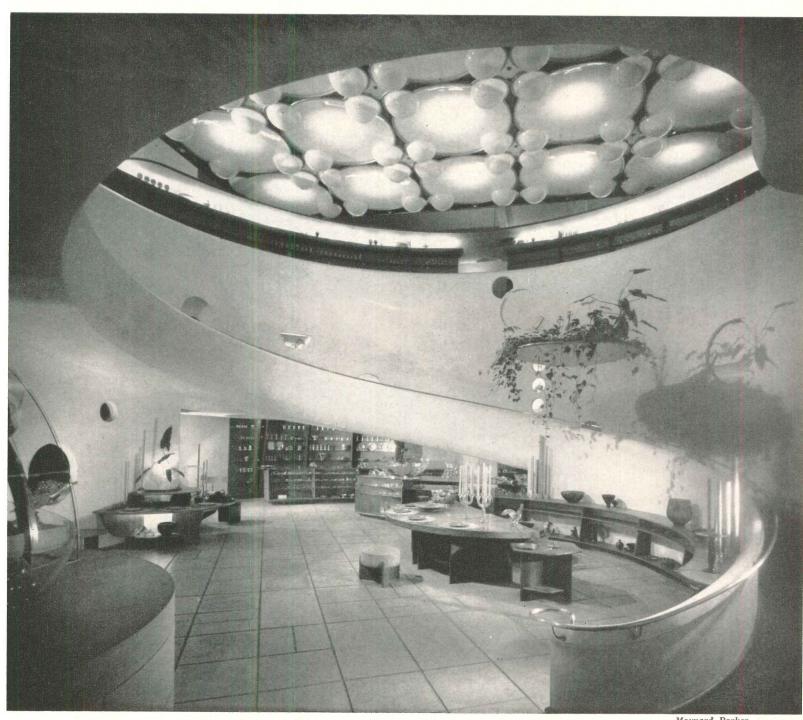


It had an ancestor, in a little known scheme of 1925 for Gordon Strong, to crown his land at the top of Sugar Loaf Mountain in Maryland. Sketch below left is an early realization, further development is shown at lower right. Wright and his client Strong thought of the project as an "automobile objective," a place to drive on Sunday from either Baltimore or Washington with a great view and refreshments at the end. Edgar Kaufmann calls it a planetarium. Strong, unfortunately lost interest. The spiral of V. C. Morris is enclosed within the building which presents a continuous brick façade to the street broken only by a great round Richardsonian entrance arch. No chance to design with the circle has been missed. Note ceiling in photo at right.

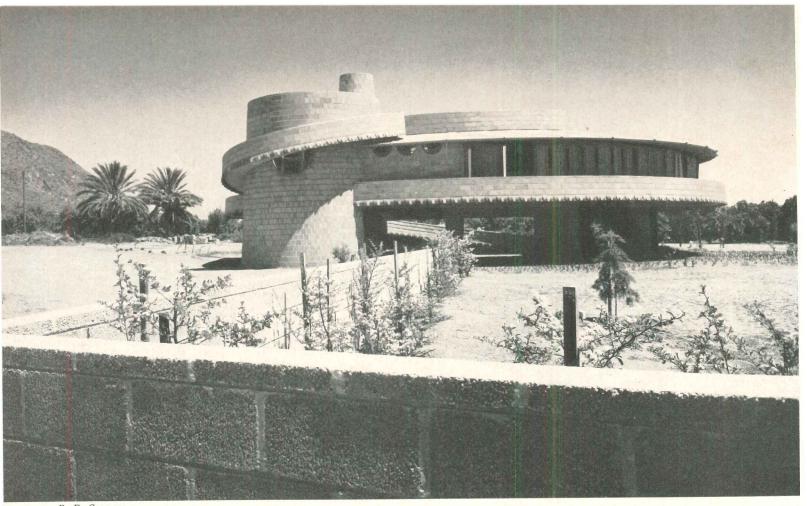
Pencil studies by Frank Lloyd Wright



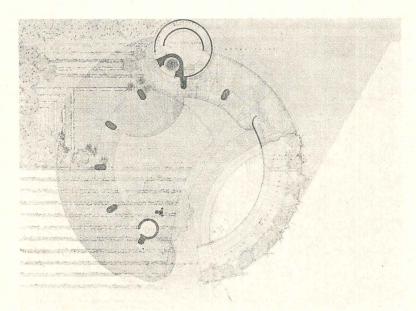


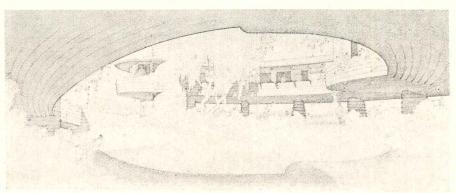


Maynard Parker



P. E. Guerrero

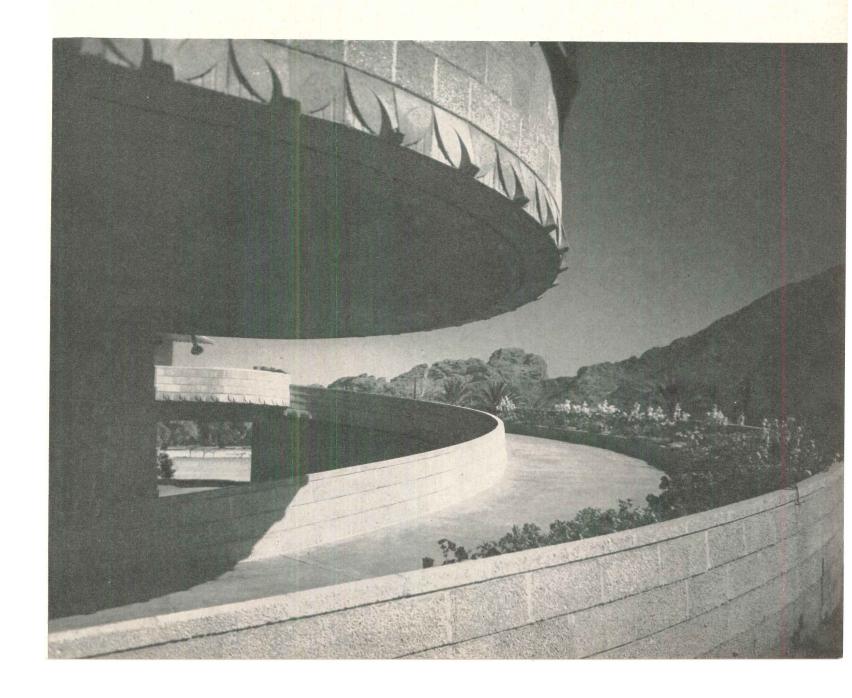




A SPIRAL FREE OF ENCLOSING WALLS

In house for son David, Wright makes a bolder use of form

Built in 1952 near Phoenix, Arizona, it is made of concrete block. This house seems very strange indeed unless viewed as part of Wright's late struggle to achieve even greater plastic continuity. As in the prairie houses the principal rooms are on the second floor allowing the landscape to be enjoyed from the small height Wright thought proper for viewing from a house. The living and sleeping areas are reached by means of a gently sloping ramp lined with flowering plants. The spiral encloses a garden within it, a rich contrast to the open desert beyond its exterior curve.



THE LAST SPIRAL

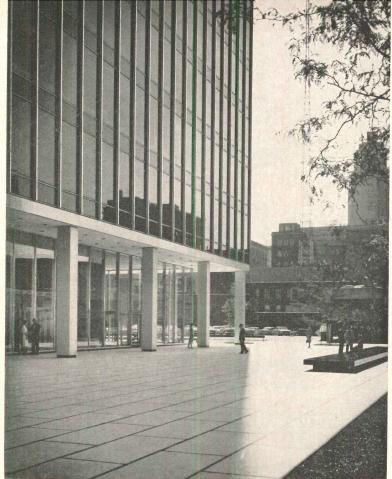




© Ezra Stoller

Although perhaps it never should have been a museum, the Guggenheim is the culmination of Wright's struggle for a timeless continuity. In 1908, in the first of the series of articles for ARCHITECTURAL RECORD called *In the Cause of Architecture* Wright made this prophesy for his future: "The work shall grow more truly simple; more expressive with fewer lines, fewer forms; more articulate with less labor; more plastic; more fluent, although more coherent; more organic."





Hedrich-Blessing photos

Executive Office Building Libbey-Owens-Ford Glass Co.

LOCATION: Toledo, Ohio

ARCHITECTS: Skidmore, Owings & Merrill

STRUCTURAL ENGINEERS: Severud-Elstad-Krueger Associates

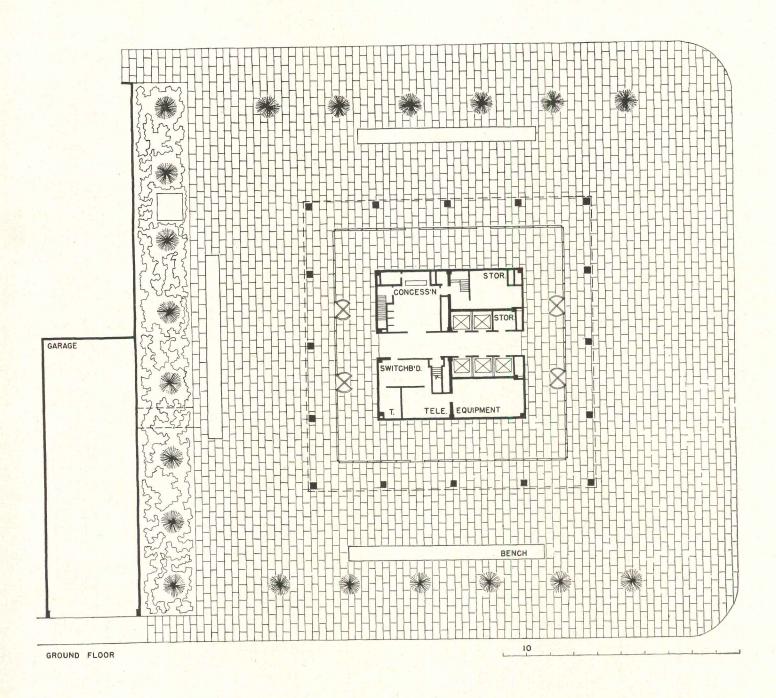
MECHANICAL ENGINEERS: Guy B. Panero Engineers

CONTRACTORS: George A. Fuller Co.

This office building has a number of attributes that set it apart from many others. It functions superbly for the needs of its occupants. Relationships between the building, its site, and its surroundings have been planned with considerable care. Layouts of office floors were closely studied. Most importantly though, the building is impressive as an example of what an architectural firm concerned with complete design can accomplish when it has a good client to work with. The building is designed—in the largest sense—from the overall concept to the smallest detail. This was possible because the talent of the architects was augmented by that of L-O-F, whose president, George P. MacNichol Jr. accepted the responsibility of acting for the clients.





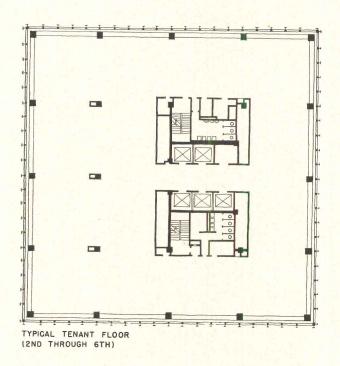


L-O-F Office Building

If this office building is successful, a large part of the credit must go to the completeness of the architectural services and the positive attitudes of the clients. The architects were deeply involved in every aspect of the building, from the selection of the site, its size and shape, through the complete design of the building and all of its components, down to the selection or design of the furniture. Ultimately, the architects selected nearly all of the office interior planting, desk-top calendars, ash trays, desk sets, furnishings, and the like.

The result of this is that every detail of the building works; each harmonizes with all of the others and with the whole; joints line up wherever they meet. Textures in the building are coordinated; colors blend with and complement each other. Importantly too, the individual elements of the building and its furnishings are integrated into a system. This not only makes for successful design but it becomes possible to systematize procurement and maintenance of building parts and furnishings.

What comes out, finally, is complete architecture (it has been called total by some) which was quite usual in other periods of history, but not so common these days. This building was designed by the architects, from the overall concept to the smallest detail. In this case, the design has been concerned not only with emotional content, but with technology, not with concept or function alone, but with a workable blending of both.

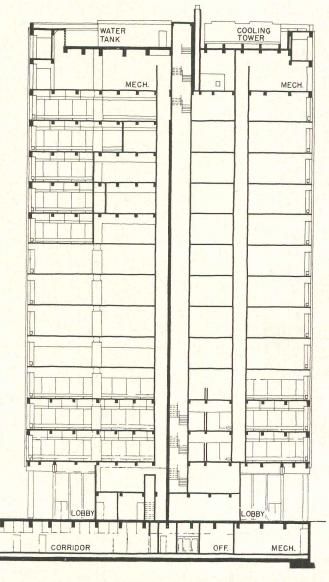


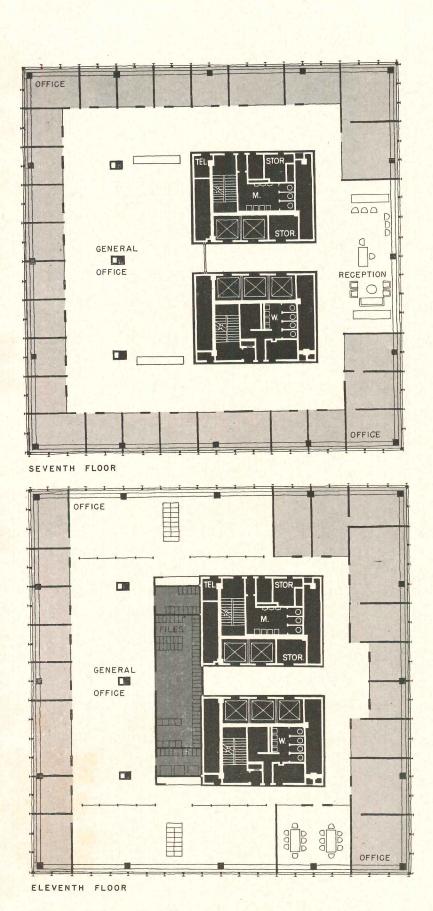


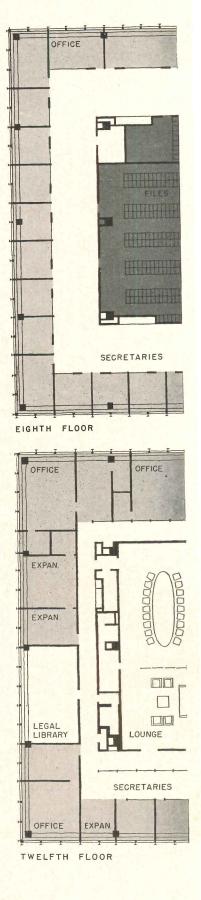
Hedrich-Blessing

The architects have been interested, for some time, in using an off-center service core in an office building. Here, they have been able to translate the interest into an actual structure. Elevators, chases, and other service facilities have been grouped together in the usual manner, then moved toward the front of the building. This resulted in the creation of a range of sizes and characters of interior space, not possible in a building with the core at its geometrical center. On the ground floor, the core extension provides space for telephone equipment and the like

GARAGE



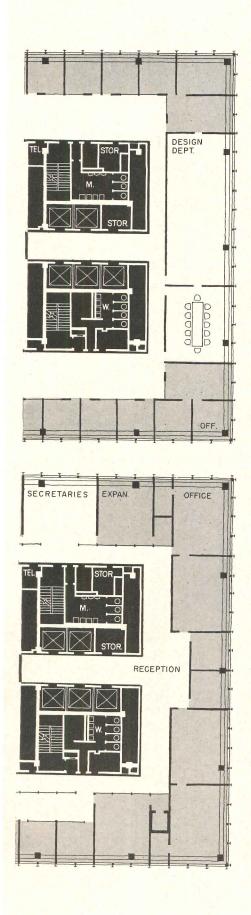


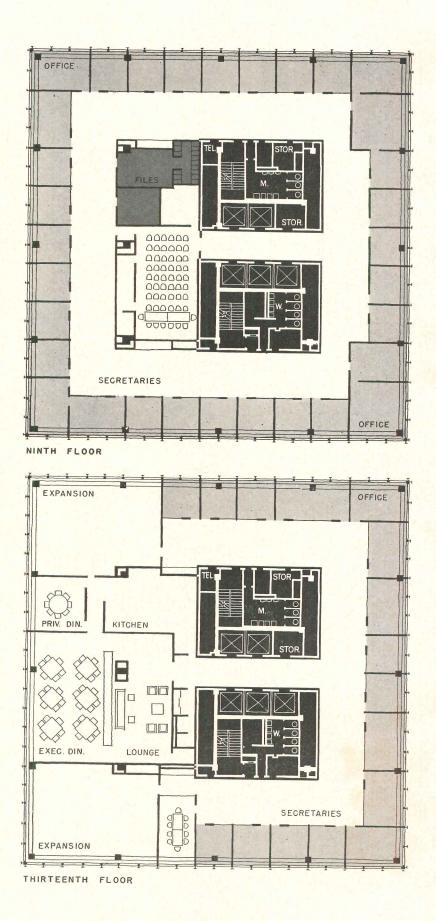


L-O-F Office Building

The plans give some indication of the variety and flexibility made possible by the use of an off-center service core. All of the floors shown on this page are occupied by L-O-F, but similar variations may be had on the leased floors. The seventh floor contains L-O-F's main reception area. From here, visitors are directed to offices located on this floor, or any of the

six above, occupied by the company. Usable space on this floor is subdivided to provide large private offices and ones of medium depth—some with fairly shallow secretarial space adjoining, others with deep pool space. On the eighth floor, arrangements are similar except that the core is extended to provide a deep general file room. The ninth floor contains a





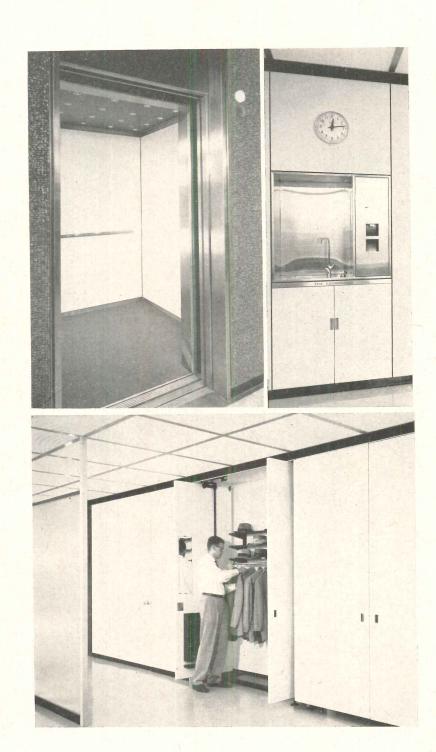
few large private offices and a number of smaller ones. All have secretarial spaces adjoining. Special areas such as an auditorium and file space are placed in the core extension. Floor eleven contains a number of private offices and two general offices. The file area next to the core is much smaller than that on the eighth floor and adjoins a spacious pool area. On

the twelfth floor, the officers of the company have their offices. The core extension contains the board room and its adjoining lounge area. Also on this floor (at the bottom and left side of the plan) are the legal offices and law library. The thirteenth floor contains such special facilities as the executive and private dining rooms, kitchen, lounge, and spaces for expansion









L-O-F Office Building

The illustrations on this page show the manner in which some of the elements of the building have been handled. At the extreme left, top is an office floor elevator lobby. Below it is the ground floor lobby. The floor here is light tan terrazzo with $1\frac{1}{2}$ -in. black slate divider strips. This flooring continues outside to form the surface of the plaza. Lobby walls are finished with mosaics made from Venetian glass tesserae, in four shades of blue. Stainless steel is used for elevator doors and frames, and the frames of the telephone booths.

Elevator cabs have red carpeting, white high-pressure laminated plastic walls, black ceilings, and stainless steel trim. Even such items as the call buttons and the frame for the inspection certificate were designed particularly for this building. Elements such as the drinking fountain and storage closet shown indicate the precision of the details. This becomes even more apparent in such details as the fire extinguisher cupboard under the drinking fountain and hanger heights in the closet







Hedrich-Blessing photos

Shown are the main reception area on the seventh floor, the board room lounge, and the executive dining room. The board room and lounge have an unpolished travertine floor, natural straw on the walls, and an acoustical ceiling. Furniture and furnishings (here, as everywhere else either designed or selected by the architects) include chairs and a sofa upholstered in tan leather or blue-black wool fabrics and beige rugs. Table-tops are glass or elm burl veneers. The executive dining room is similar, except that the walls are white sand-floated plaster and chair bottoms are cane.

Office areas throughout the building are equipped with movable partitions with various combinations of painted panels, teak, and roughrolled plate glass. Executive offices (such as those of the president and executive vice president shown top, right) have acoustical ceilings with incandescent downlights. Other offices have uniform luminous ceilings of aluminum honeycomb with fluorescent fixtures located above grid

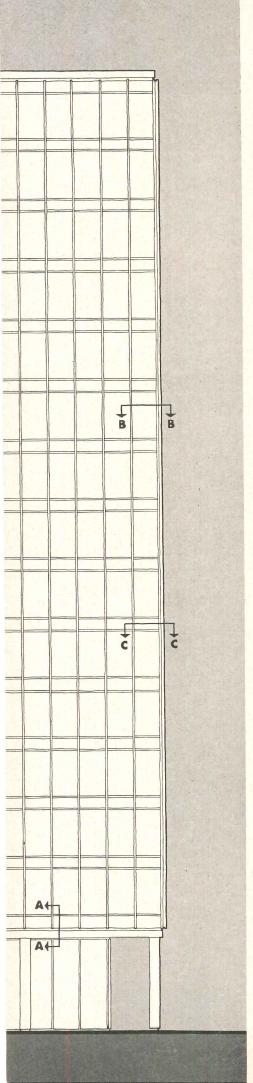


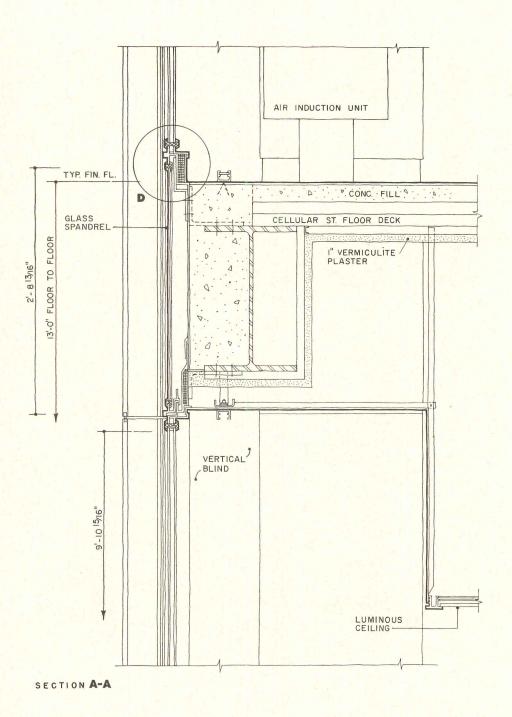


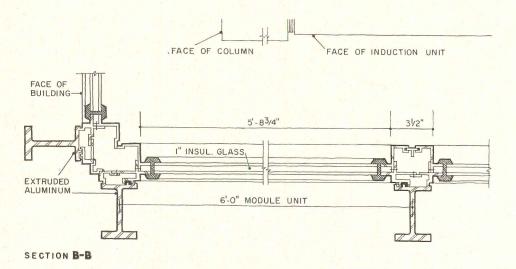


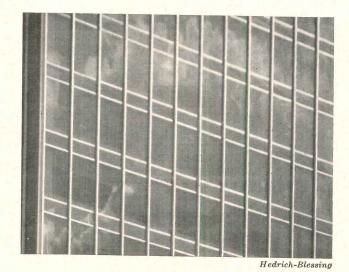










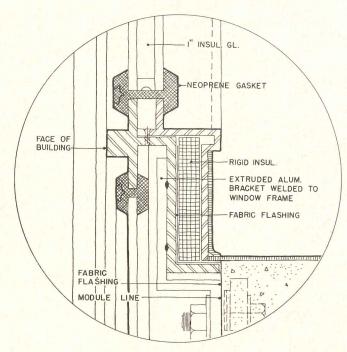


L-O-F Office Building

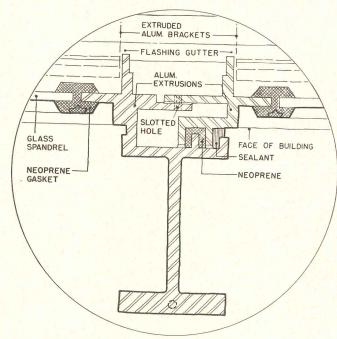
It would be difficult, if not impossible, to find a single detail of the L-O-F building which has not been closely studied and finely detailed and constructed. The curtain wall used will give some indication of the completeness of the design, and will serve as one example of the sort of attention given by the architects to all of the elements of the design.

The wall has been worked out on a six ft horizontal module. This dimension was chosen because of a combination of factors, including room sizes desired, flexibility of use, technical wall considerations, and appearance inside and out. The frame is aluminum; the panels are the company's spandrel glass; the windows are L-O-F double glazing. Spandrel and view glass were glazed into the frame with neoprene gaskets installed with zipped-in strips of the same material. The bases of all windows are insulated where they meet the spandrels. An electric-powered window-washing platform, operating from a track on the roof, is used for efficient cleaning of the entire wall.

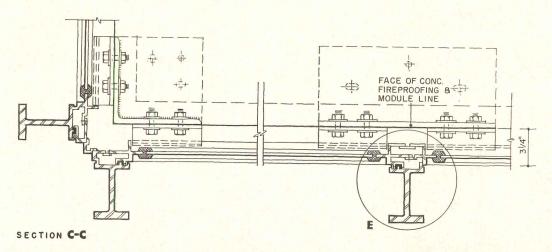
In place, the wall is clearly defined and elegant. It relates well with the interior, its major and minor elements. Most of all, it functions as an efficient and workable curtain, excluding light or allowing it to enter, retaining heat or keeping it out, subject to the will of the occupants

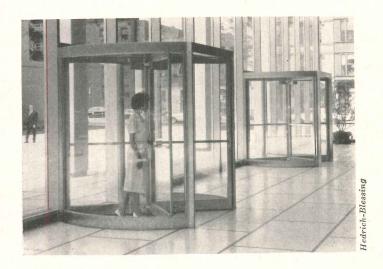


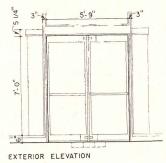
DETAIL D

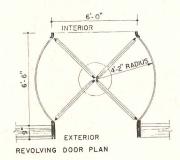


DETAIL E





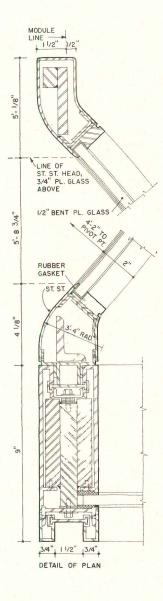


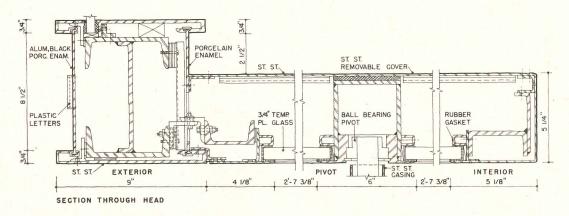


L-O-F Office Building

Another example of the attention given to detail by the architects of this building, and the results of this attention, is the main entrance and revolving door. The design of this building element incorporates some standard parts, but its success depends on the way these have been combined with non-standard units designed by the architects.

The entrance has an almost overwhelming simplicity of appearance and use. As is indicated in the sections, this is deceptive, since the results were obtained by careful analysis and detailing of each of the smallest parts and of the entire assembly. What is not indicated here, except by inference, is the great mass of sketches, the large number of conferences, the skill and backbreaking labor expended in thorough design







Stanford Apartments. John Carl Warnecke & Associates, Architects

BUILDING TYPES STUDY 287

Probably the biggest news in apartments at this time is the strengthened attitude of the FHA to urge and promote better design and quality in apartments of all types, in addition to the long needed revisions of the Minimum Property Standards for multi-family units, which have been in progress for some time. Partial results of these revisions—due to the urgency with which FHA feels they are needed—will be published sometime early in 1961, with the rest to follow later. The lead article for this study, by Neil Connor, provides a thoughtful discussion of this new FHA program.

The eleven apartment developments which complete the study, five completed buildings and six projects (most of which are now under construction), were selected to reflect some of the newer thinking on the subject, and perhaps leads towards solving some of the problems. They range from small units to developments of great scale, and represent a wide geographic spread.

Also included are some tables indicating some of the newly-revised FHA room count and minimum room size standards, and the increased mortgage limits. The result of these revisions is often a higher allowance.

APARTMENTS

ARCHITECTURAL RENAISSANCE IN FHA APARTMENT HOUSING

BY NEIL A. CONNOR, A.I.A.

Director, Architectural Standards Division
Federal Housing Administration

In the last few years there has been a noticeable improvement in the architectural quality of FHA-insured apartment projects. More and more are designed by dedicated architects and show the influence of creative imagination.

The new interest of the architectural profession in FHA-insured housing can be attributed to a number of factors. One is FHA's greater concern with quality in recent years and its recognition of the value of professional service in the design of such housing. Increasing availability of new and better materials, the introduction of air conditioning, wider use of mechanical equipment, new and more advanced construction methods, have all helped to produce better FHA housing. At the same time, rising incomes among families in the moderate income group for whom FHA-insured housing is built have helped create a demand for well-designed housing.

The amount of architectural talent displayed in FHA-insured projects has varied considerably since the agency was established in 1934. In its early years FHA employed a number of well known architects, and under their influence some fine apartments were built. Starting about 1940, as war clouds formed, quantity became the paramount goal, and quality of both design and materials deteriorated. There was not much improvement until 1954 when major changes were made in the National Housing Act and in the FHA organization.

Architecturally speaking, an amendment to the Act made at that time to require cost certification from builders or sponsors was perhaps the most important legal change. Under this provision, the builder or sponsor of a multifamily project has to certify to the actual amount paid the architect, which precludes the old practice followed by some sponsors of skimping on architectural services to reduce their cash equity requirements. About the same time, a schedule of architect's fee percentages was worked out by FHA in collaboration with A. I. A.

FHA Influence on Apartment Housing

FHA insures mortgages on projects of rental housing (under Title 11 Section 207), cooperative housing (Section 213), rental housing in urban renewal areas (Section 220), and rental housing specially designed for elderly tenants (Section 231). Because of this insurance, which is written under provisions of law and FHA policy, favoring a sponsor financially, the agency has a considerable influence on much of the apartment housing currently produced. The National Housing Act limits the over-all mortgage amount that FHA can insure. It also places limitations on the maximum ratio of loan to value (or, in some FHA programs, loan to replacement cost), and on the insurable mortgage amount per room (or, in most sections of the Act, per unit if the project averages fewer than 4 rooms per unit) for example see table on page 201 for Sections 207 and 213. FHA requires that rent schedules, financial arrangements, and management policies be subject to its approval, and the property must meet FHA minimum standards.

Architects' Fees

In the more favorable climate produced by new receptive attitudes of the FHA, architects have been aided in obtaining reasonable fees by the FHA's willingness to include in its estimates an architect's fee reflecting current practices and, through the process of cost certification by the sponsor, the architect is now assured of obtaining the fee certified as paid. The FHA, however, does not prescribe or limit the fee agreed to by owner and architect.

The fee used for processing by the FHA is determined on the basis of what is found to be appropriate to the services rendered, taking into consideration the kind of service expected, the professional practices and fees customary in the locality, the extent, cost, and complexity of the work, the amount of development, design investigation and studies, and

coordination with government agencies by the architect and his consultants, and the degree of repetition in planning and detail.

The architect's fee covers architectural services, together with all structural, mechanical, and other engineering services required in the design and preparation of complete working drawings and specifications, as well as preliminary sketches, drawings, studies, and (if included) supervision. FHA encourages but cannot insist on supervision.

When investigation and tentative determination of the architect's fee have been made, it is then checked with the FHA Schedule of Architect's Fee Percentages. The schedule ranges from 7 percent for a total cost of \$100 thousand to 2 percent on \$1 million and over. The percentages shown in the schedule contain no provision for supervision. When supervision is provided, an increase of up to one third may be allowed. The rates shown are exceeded only in exceptional circumstances when higher rates are clearly justified by findings of the insuring office.

The architect's fee percentage is applied to the total of the estimated costs for on-site improvements to land, structures, and the builder's fee.

Should the question of allowing the actual cost of the architect's services arise, the FHA's position is that the fee allowed is the Commissioner's estimate of reasonable current cost for comparable services and is not intended to prescribe or limit the amount the mortgagor may agree to pay the architect.

Owner-Architect Agreement

The FHA has developed owner-architect agreements for use in FHA projects in order to define more closely the function and responsibilities of both principals and their relation to the FHA in the period in which FHA has an interest in the projects. The forms were prepared in collaboration with the American Institute of Architects and are designed to assure equitability for owner and architect.

FHA Measures to Encourage Quality

Adjustment of room count

The restriction in the National Housing Act on mortgage amounts per room or per living unit may present difficulties to owners and architects because of cost variations in different parts of the country. It means that there must be a room count as well as a count of living units. With contemporary planning where living, dining, cooking, and sleeping facilities are often combined in one room, FHA has found itself in a position where one room could no longer be considered to be one room. This has often led to design for room count rather than for market preference and good planning, because sponsors, in order to coordinate costs with available mortgage amounts,

TABLE 1: Allowable Room Count and Minimum Room Sizes for Separate Rooms

		- 1 Maria					
Name of Space	Room	NO-BR	1-BR	2-BR	3-BR	4-BR	Least Dimension
		Min. area (sq. ft.)	Min. area (sq. ft.)	Min, area (sq. ft.)	Min. area (sq. ft.)	Min. area (sq. ft.)	
LR	1		160	160	170	180	11'-0"
DR or D-area	1	F 12 1	100	100	110	120	8'-4"
К	1	_	60	60	70	80	5'-4"
K'ette	1/2	40	40		<u> </u>	_	3'-6"
BR	1	_	120	80	80	80	8'-0"
Total area, BR's	1		120	200	280	400	_
Other Room	1		80	80	80	80	8'-0"
Bath	1/2	_	_	_		-	
Half-bath	1/4	_	-	_	_		
Foyer	1/4	20	20	20	20	20	4'-0"
Balcony or Porch	1/4	70	70	70	70	70	6'-0''
Terrace	1/4	120	120	120	120	120	8'-0"

TABLE II:
Allowable Room Count and Minimum Room Sizes for Combined Spaces

17 A 2 1 1 1 1 2 1 1		LIVING UNITS WITH						
6	Comb.	No-BR	1-BR	2-BR	3-BR	4-BR		
Combined Space	Room Count	Min. area (sq. ft.)						
LR-D area	11/2	_	200	200	200	230		
LR-D area (DR size)	2		240	240	260	270		
LR-D-area-BR	2	240	_	_		_		
LR-BR	1	190				_		
K-D area	11/2	100	110	110	120	140		
K-D-area (DR size)	2	1 - 1 - 1 · 1	150	150	160	180		
K'ette-D-area	1	80	80	<u>_</u>				

TABLE III:
Increased Mortgage Limits for Representative Cities

		ELEVATOR-TYPE				GARDEN-TYPE				
		Sections 207 and 220		Section 213		Sections 207 and 220		Section 213		
CITY	4 or More Rooms Per Unit	Less than 4 Rooms Per Unit \$9400+	4 or More Rooms Per Unit	Less than 4 Rooms Per Unit \$9400	4 or More Rooms Per Unit	Less than 4 Rooms Per Unit \$9000	4 or More Rooms Per Unit	Less than 4 Rooms Per Unit \$9000 +		
	Per Room		Per Room		Per Room		Per Room			
Boston, Mass.	3800	800	4100	1100	2700	200	2900	400		
New York, N. Y.	4250	1250	4250	1250	2900	400	3100	600		
District of Columbia	3700	700	4000	1000	2500	_	2700	200		
Philadelphia, Pa.	3600	600	3900	900	-	_	_	-		
Jackson, Miss.	3100	100	3300	300	2500	_	2700	200		
Miami, Fla.	3600	600	3900	900	2600	100	2800	300		
Chicago, III.	4250	1250	4250	1250	3100	600	3300	800		
Minneapolis, Minn.	3400	400	3700	700	2500		2700	200		
Houston, Texas	3200	200	3400	400	2500	-	2700	200		
Topeka, Kansas	3700	700	4000	1000	2800	300	3000	500		
Los Angeles, Calif.	4250	1250	4250	1250	3000	500	3200	700		
Seattle, Wash.	4100	1100	4250	1250	2700	300	2900	400		

Note: There are a series of qualifications for specific applications in using these tables, which space does not permit to be included here. For complete data, check with the nearest field office of the F.H.A.

have insisted on obtaining maximum mileage from the room count which often limits the mortgage. To correct this, FHA now makes allowance in the room count for balconies, terraces, bathrooms, foyers, etc., thus encouraging additional planning features.

New minimum property standards

Currently, the FHA is revising its minimum property requirements for three or more living units with the help of a distinguished advisory committee representing the architectural, land planning and construction fields. The members are: Architect Robert E. Alexander, F.A.I.A., Los Angeles; Architect Alvin L. Auginoe, A.I.A., Washington; Architect Ieoh Ming Pei, A.I.A., New York; Architect Norman J. Schlossman, F.A.I.A., Chicago; Architect Edwin Weihe, A.I.A., Washington; Land Planner Carl Gardner, Chicago; Builder George N. Seltzer, Cleveland.

All these men have had extensive experience with apartment buildings and are making major contributions in this field. There are high expectations that the new FHA standards for multifamily dwellings will be as effective as were the standards published in 1958 for one- and two-family dwellings.

Most of the problems facing the FHA in revising its multifamily standards have to do with site planning, building planning, fire protection, and mechanical equipment. Some of the more critical questions being studied are:

- Reconciliation of FHA standards with varying building codes
- 2. Density and coverage
- 3. Parking, both open and in garages
- 4. Yard and court dimensions and distances between buildings
- 5. Space and arrangement of rooms and apartment units, together with light and ventilation considerations
- 6. Fire protection limitations
- 7. Heating and air conditioning

It must be clearly understood that FHA standards are minimum. Quoting from the FHA Underwriting Handbook:

"The minimum nature of statutory and Minimum Property Requirements and Standards must be recognized. During analysis, careful consideration is given to the fact that the project must often exceed minima in order to provide accommodations, services and amenities to continue to attract the desired tenancy at rentals required for a successful enterprise. Factors that may necessitate exceeding minima are: appropriateness for the class of property as indicated by anticipated rent levels; preferences of the market; size of families and their living customs; and type of structure. Comparability with competitive housing is essential but not the sole criterion, as the property must also cope with possible future

competition. Therefore, observance of sound trends and the provision of a high degree of livability will minimize obsolescence and enhance the properties desirable as security for a long term mortgage.

"Personal whim and prejudice shall be avoided in decisions affecting higher requirements. Care is also exercised that the extent to which such requirements exceed minima is reasonable as to character, cost and appropriateness for the subject project." (Sec. 72610.2)

Architects and others sometimes question the need for FHA standards. In an insurance operation as large and far-flung as that of FHA, involving the assumption of risk on long-term, high-percentage mortgages secured by a great variety of properties, it is essential to have a minimum basis for acceptance —to say, "We will not go below this." That is all the standards are. The difficulty of recruiting qualified professional people to staff the 75 FHA insuring offices also makes it necessary to have fairly specific instructions on many points that industry believes should be resolved on a case-by-case basis. The inadequacy of many local building codes further contributes to the need for minimum standards. Housing designed by a competent architect would usually far exceed these standards, and the standards should not be onerous from an architect's viewpoint.

Evaluation of new materials and methods of construction

Technological developments in the building field and the resulting array of new products make it essential to have some sort of evaluation of them. This is done in a rather modest way in the Architectural Standards Division of FHA in Washington, which was set up when the FHA was reorganized in 1954. Most of the functions of this division had previously existed. In fact, there were instructions in the FHA property standards as far back as 1935 directing the field offices to send questions on new materials and construction to Washington for analysis. This is far more necessary now than ever before because of the tremendous increase in new products and the complexity of evaluating them.

Technical studies program

FHA has had a technical studies program in effect for about four years, at an annual expenditure of about \$300 thousand. The projects studied are all related to problems the FHA has found in its operations concerning methods and materials. Generally speaking, no project is undertaken without consultation with the Technical Studies Advisory Committee appointed for the FHA by the Building Research Advisory Board of the National Academy of Sciences. Advice is obtained from this group on whether industry itself can find answers or whether FHA must do the work or pay to have it done.

As might be expected, a major portion of the

TITLE II Secs. 207 & 213

(1) Title and Section of	(2)	(3) Type of Construction (urban or rural non-	(4) Minimum Number	(5)	(6)
the Act	Purpose	farm unless specified otherwise)	of Family Units Per Insurance Contract	Amount Insurable	Loan-Value Ratio
(I) (II) (V)	Finance proposed or rehabilitated rental housing: (a) Private corp. (b) Supervised corp.	Detached, semi-de- tached, row, or multi- family.	8	\$20,000,000 private corporation \$50,000,000 supervised corpo- ration. A. Garden-type: \$9,000 per unit if less than 4 room average; otherwise \$2,500 per room. B. Elevator-type: \$9,400 per unit if less than 4 room aver- age; otherwise \$3,000 per room.	90% of estimated value.
Section 207 Mobile Home Courts (V) (II)	Finance proposed or rehabili- tation of existing mobile home courts.	Appropriate to trailer courts or parks.	50 or more spaces.	\$500,000 per project or \$1,500 per space.	75% of estimated value of property after improvements are completed.
Section 213 Project Management (I) (V)	Finance proposed construction; Finance rehabilitation; Finance acquisition of existing struc- tures by non-profit coopera- tive; Finance acquisition from an Investor-Sponsor.	Detached, semi-de- tached, row, or multi- family.	8	\$20,000,000 private corporation \$25,000,000 supervised corpo- ration. A. Garden-type: \$9,000 per unit if less than 4 room average; otherwise \$2,500 per room. B. Elevator-type: \$9,400 per unit if less than 4 room average; otherwise \$3,000 per room.	A. Proposed construction 97% of replacement cost. B. Existing construction 97% of appraised value.
Section 213 Project Sales (I) (VI)	Finance proposed construction of dwellings for sale to members of nonprofit corporations.	Single family detached, semi-detached or row.	8	\$12,500,000. Same as A & B under management or a sum computed on separate mortgage for each dwelling equal to total of max. mtge. amt. under Sec. 203b whichever is greater.	97% of replacement cost.
Section 213 Individual Sales (IV)	Finance individual mortgage on property released from Project Sales Mortgage.	1-family.		Unpaid balance of project mort- gage allocable to the individual property.	Unpaid balance of project mortgage allocable to the individual property.
Section 213 Project Investor Sponsored (I) (V)	Finance Proposed or rehabili- tated housing by corporation intending to sell same to non- profit cooperative.	Detached, semi-de- tached, row, or multi- family.	8	\$20,000,000 private corporation \$25,000,000 supervised corp. A. Other than Elevator: \$9,000 per unit \$2,500 per room B. Elevator Structures: \$9,400 per unit \$3,000 per room	90% of Replacement Cost.

- 1 Or such higher maximum dollar amounts as the Commissioner may authorize because of cost levels but not to exceed \$1,250 per room without regard to the number of rooms being less than 4 or 4 or more per unit.
- V Certificate of actual cost required.
- VI Certification to mortgagor of FHA Estimate of Replacement Cost required.

- II No discrimination against families with children.
- IV Eligible for open-end advances.

funds has gone into work involving site conditions. One very useful recent project has been the development by the Massachusetts Institute of Technology of a simple method of testing soils. It involves an instrument, a soil potential volume change meter, which has been used for similar work before but has never before been calibrated to permit the use of tables easily understood by field people.

The Outlook for Apartment Housing

Interest in apartment housing is definitely on the uptrend. In the 1950's, emphasis in housing construction was chiefly on suburban developments of individual homes. To some extent this tendency is being reversed as more people come to prefer the advantages of living in town. The urban renewal activ-

ity underway in many cities is also bringing people back from the suburbs. The growing popularity of cooperative ownership is another factor, and the predicted population explosion in the 60's and 70's will certainly increase the need for apartments.

The prospect of a growing demand for rental housing is of course very significant to architects, and any architect interested in the possibilities should become familiar with the requirements of the market, with financing possibilities and with FHA.

As most architects realize, the time is past when they were expected to confine their efforts to design, coordination, and supervision. Increasingly, a sound knowledge of costs, building economics, and the mechanics of Government housing agencies is expected of the architect and enhances the value of his services to his clients.





Apartments For A College Campus

Stanford Apartments, Palo Alto, California

John Carl Warnecke & Associates, Architects

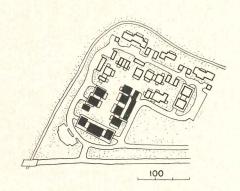
Stefan Medwadowski, Structural Engineer

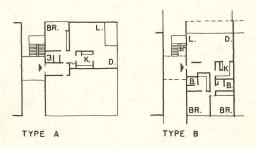
Kasin, Guttmen and Malayan, Mechanical Engineers

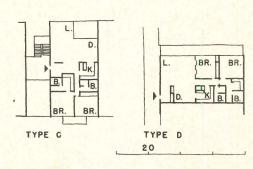
Lawrence Halprin, Landscape Architect

Twenty-eight acres in the northeast section of the Stanford University campus has been acquired by the Willow-Creek Corporation (a group of private investors) on a long-term lease for this luxury apartment development.

Three buildings of the total project have now been completed on 3.7 acres of the site, and contain 54 individual apartments. Apartments range from 1100 sq ft minimum, and average 1350 sq ft. Rents vary from \$330 to \$420 per month. A second group of buildings, as shown on the plot plan, are planned for construction on an additional 4-plus acres; at least one of these new buildings will be a multi-story building as shown in the sketch below right. Some of the apartments in the second group will be larger, with rents up to \$700. All buildings will be ranged around landscaped malls, parks and outdoor party areas. The buildings have concrete frames, stucco exteriors, wood panelling and harmonizing colors and finishes on the interiors. Rooms are spacious, and each apartment has an outdoor patio or deck.



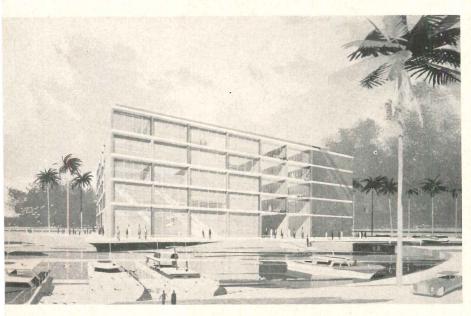


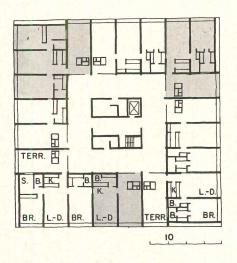












A New Scheme For Terraced Units

Sun & Surf Club

Boca Raton, Florida

Bertrand Goldberg Associates, Architects and Engineers

Described by the architect as "houses in the sky," these apartments make a big effort to establish a degree of individuality and flexibility for each unit. To avoid the use of long, narrow corridors, the scheme was devised around a central core, flanked by a wide promenade. Unusually big, open terraces are planned within the shell of the structure, and are separated from the promenade by 6-ft louvered screens—giving air and light to the whole area. The terraces double as outdoor living rooms (complete with barbecue and bar) and as entrance foyers (with storage and coat closet).

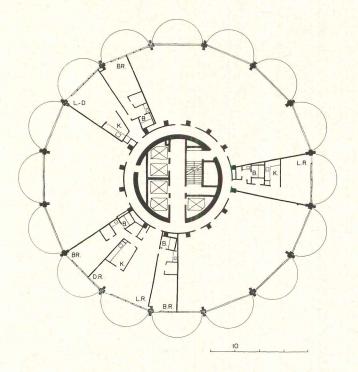
The 113-ft-square building is divided into regular bays which give 13-ft-8-in. interior room and terrace widths. Rooms are banked into four groups of four, with a terrace at each side, giving a total of eight units per floor. Knockout panels between all rooms in each bank permit a number of room combinations, some of which are shown in the plan.

Chicago's New City Within A City

Marina City, Chicago, Illinois

Bertrand Goldberg Associates, Architects and Engineers Building Service Employees' International Union, Sponsor





Adjoining the Chicago River and its State Street Bridge, Marina City's complex of office building, theater, and apartment and parking towers was designed explicitly to try to help retain middle-income families in the city. In addition, the \$36,000,000 center will include a marina for 700 small craft, a restaurant, skating rink, health club with swimming pool, bowling alley, shops, a semi-public park, and a sculpture garden on its 3.1-acre site. Completion is scheduled for late 1961, and financing is insured by the FHA under Title VII of the National Housing Act.

Eighteen floors of parking area form the base of the two 60-story concrete towers which, it is claimed, will be the tallest apartment buildings in the world. It has also been pointed out that the Building Service Employees is the first labor organization to finance such a non-cooperative semi-luxury project for the general public.

In each tower, the apartment units fan out from a 35-ft central core containing all utilities and mechanical equipment. Each room of the 900 apartments will have a heat pump and private balcony.

Bill Engdahl, Hedrich-Blessing



Lift Slabs For Suburban Towers

Huron Towers Apartments, Ann Arbor, Michigan

King & Lewis, Inc., Architects

Future House Apartments, Inc., Contractor

Morton L. Scholnick and Seymour Dunitz, Owners

This project is said to be the most ambitious use of the Youtz-Slick Lift-Slab system in several areas: "the tallest lift-slab structures ever attempted in the United States", and "each floor slab is heavier and larger in area than any used by this method before."

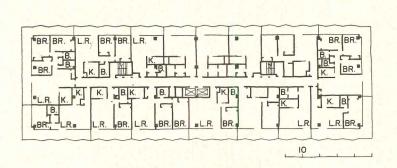
The clean-cut design clearly expresses the structure, and has exteriors of floor-to-ceiling glass curtain walls, set back from the slab edges to give each apartment a balcony. All living rooms have sliding glass doors. Balcony railings are of exposed-stone aggregate facing on 2-in. pre-cast concrete panels, secured to the slabs by aluminum verticals.

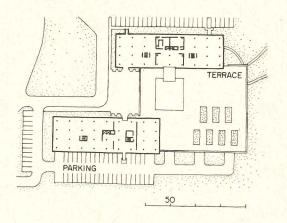
Each tower has 12 floors, and contains 180 apartments. The ground floor of one building will be used for shops, beauty salon, pharmacy and valet service. The other is devoted to lobby space. Each room in the apartments has a built-in heating and air conditioning unit. A three-level garage is built into the cliff below the main terrace.











Individual Plans For Co-op Owners

Diamond Head Apartments, Honolulu, Hawaii

Diamond Head Land Company, Owners

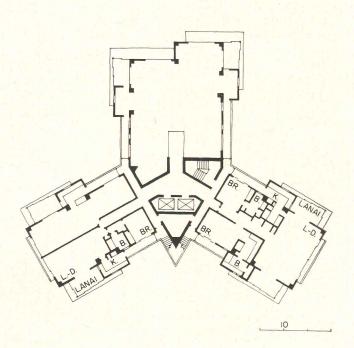
Vladimir Ossipoff and Associates, Architects

Park & Yee, Structural Engineers

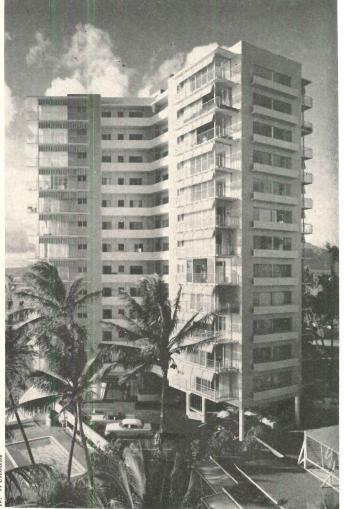
Hawaiian Dredging & Construction Co., Ltd., Contractor

Wynn Nakamura, Electrical Engineer

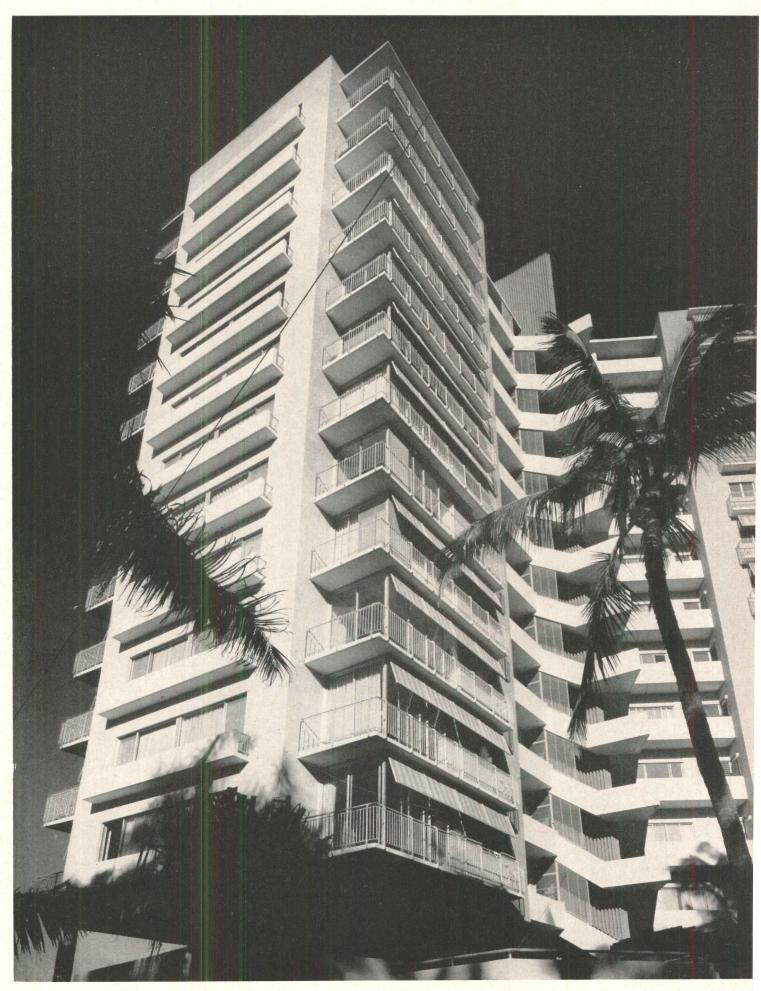
This variation on the central core scheme is a cooperative apartment, with individual owners for each unit. To allow maximum freedom for each owner to adapt his apartment to his own needs, a loft-like structure was evolved, with clear spans in two of the wings of about 32 ft, and 40 ft in the third. A pre-stressed concrete framing system was chosen "because it could produce these spans with the least amount of deadweight in the structure. This feature is very important because of the poor foundation condition at the site." There is an open lobby-lanai on the ground floor which also serves for tenant-owner meetings. Balconies were originally unglazed, but changed to give "a larger square foot area" in the apartment sales quotations.







B Wom



ARCHITECTURAL RECORD October 1960

A Replanned Area For Philadelphia

This urban renewal scheme for improving Philadelphia's Eastwick section and the adjoining industrial area, fits a pattern of row houses and garden apartments along a slightly irregular pedestrian mall. The apartments (black on plan) are all immediately adjoining this walk or "greenway," as are most of the shopping, school and other facilities. Each apartment unit will have greenery on one side and a parking area on the other. The two sketches at right show the general neighborhood character of these two zones.

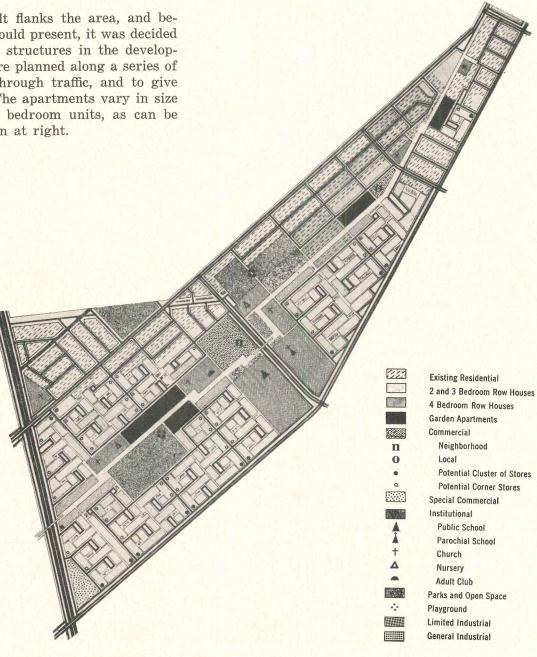
A large industrial belt flanks the area, and because of the view this would present, it was decided not to include high rise structures in the development. The row houses are planned along a series of cul-de-sacs to prevent through traffic, and to give a more intimate scale. The apartments vary in size from efficiency to three bedroom units, as can be noted in the partial plan at right.

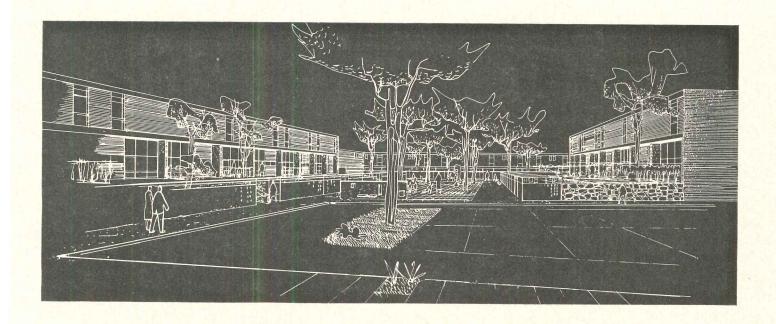
New Eastwick, Philadelphia, Pennsylvania

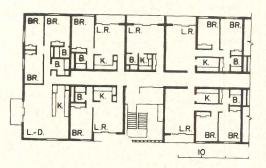
Reynolds Metals Company, Samuel A. Berger, and

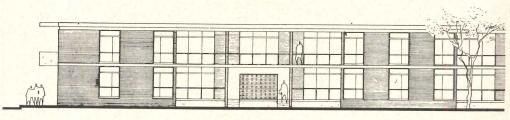
Henry A. Berger, Sponsors

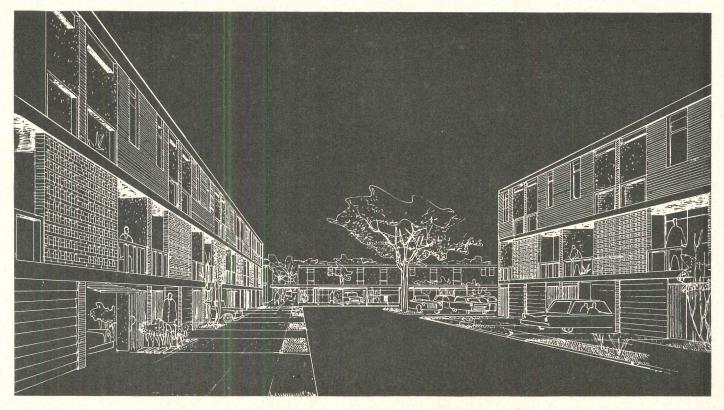
Doxiadis Associates, Inc., Architects











Maisonettes For London

Housing At Bethnal Green, London

Denys Lasdun and Partners, Architects

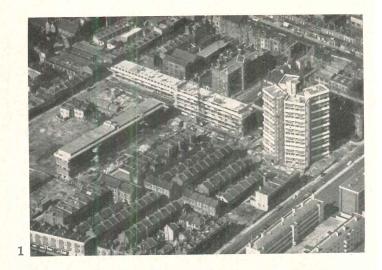
The planning of many housing projects seems to be derived from little more than the literal application of an essentially abstract diagram, with a minimum of attention to the actual problems of the site or the tenants. This low cost housing in London demonstrates very clearly the advantages of a design that is based upon particular rather than general considerations. Part of the success of this development is due simply to intelligent planning, and part to a reappraisal of the concept of the tower block, which has resulted in a radical departure from the slab and cruciform buildings that have formed the axiomatic basis of so many projects in the past.

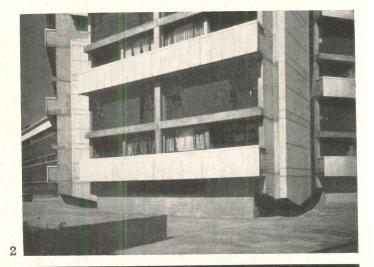
The essential planning unit of the Claredale Street scheme is the two floor maisonette. There are two six-story blocks containing the largest and smallest maisonette types and a fifteen-story cluster block of two-bedroom maisonettes which has small apartment units on the fifth floor. The six-story blocks are set at right angles to each other and their placement in relation to the cluster block minimizes the possibility of the residents of one apartment seeing into any of the others. (Photos 1 and 3)

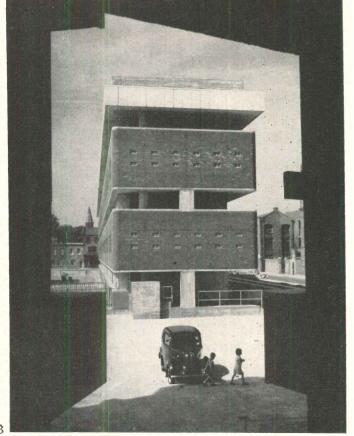
The cluster block is formed by a central stair, service and elevator tower with four separate blocks grouped around it. This cluster system isolates the individual maisonettes from the major sources of noise and permits each to be oriented so that it receives full sun during some part of the day. Access to the maisonettes is on a skip-floor basis, the non-access floors of the central block serving as enclosed drying yards, which could also be used for shops or as a garden area.

The access and living balconies have been strongly accentuated, permitting the maisonettes to read as individual units. The building thus attains a domestic scale which is in keeping with surrounding construction, and each tenant's apartment becomes a separate and identifiable entity. The balconies also create an architectural matrix which is strong enough to control and subdue even the most virulent curtain designs. (Photo 2)

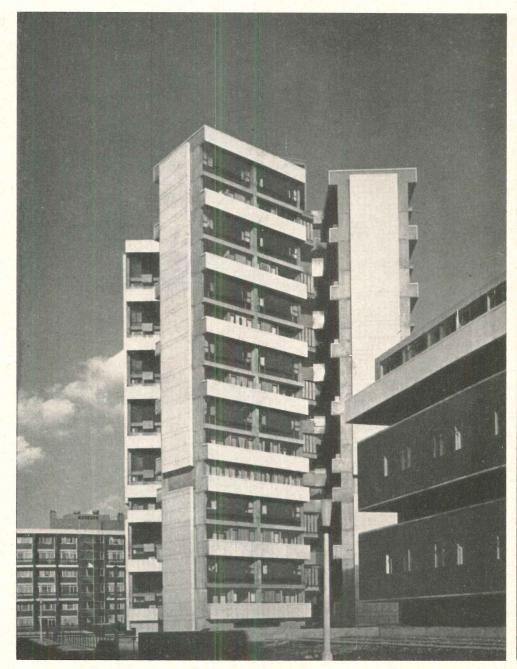
Construction is based on a reinforced concrete cross-wall system with intermediate columns to reduce the floor spans, and both *in situ* and pre-cast concrete elements were utilized. Pre-cast facing and beams were hoisted into place by tower crane.





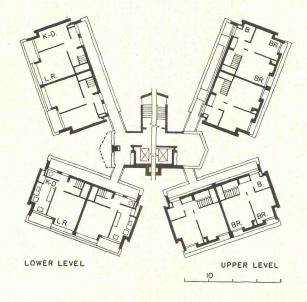


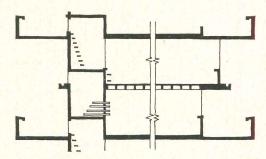
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Sectional diagram of typical maisonette in the cluster block. Access is from the balcony on the left, the balconies on the right are private. Bedrooms are always on the upper level, floors within each unit are of timber. Note the escape ladder from the bedroom level to the balcony of the maisonette above

High-Low Rise In Washington

Capitol Park Apartments, Southwest Redevelopment

Project B, Washington, D.C.

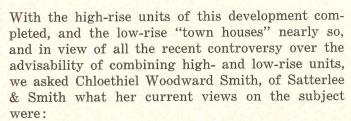
Satterlee & Smith, Architects

Mayer, Whittlesey & Glass, Consulting Architects

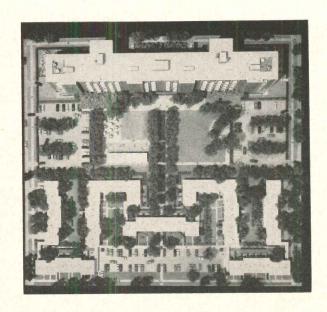
Ralph Eberlin, Site Engineer

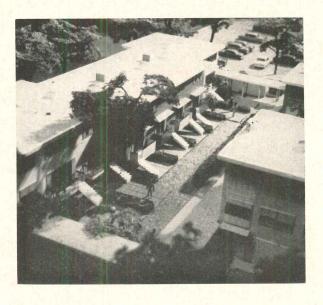
Dan Kiley, Landscape Architect

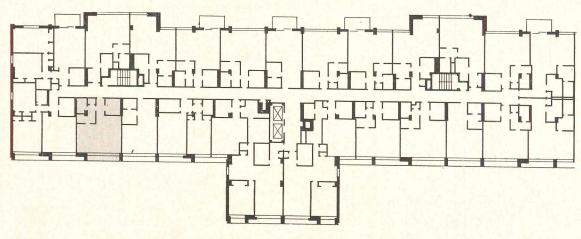
Severud-Elstad-Krueger, Structural Engineers



"Precisely because we didn't think any 'low-rise' family wanted to live as close to the elevator building as they had along the avenues, we placed a single elevator structure close to the major entrance (street side) of the block, kept the lower floor open so that no apartment was located lower than 15 ft above the street level, and kept 220 ft of open space between the elevator building and the first row of houses . . . Early next year families will be moving into the town houses . . . then it will be possible to study this 'high-low' theory. I am sure of one thing—a view from an elevator building across distant low structures is fine and the low structures do not feel walled by the high. How distant is the question. A small huddle of low structures too close to the high isn't right."















ARCHITECTURAL RECORD October 1960

A Computor Aids Structural Plans

Barrington Plaza, Los Angeles, California

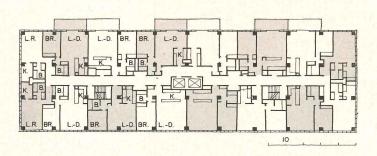
Barrington Plaza Corporation, Owners

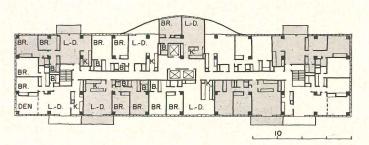
Daniel, Mann, Johnson & Mendenhall, Architects

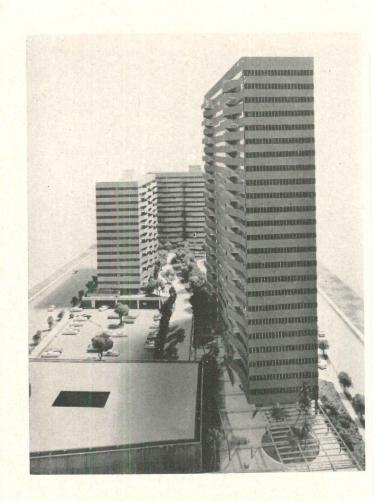
Armstrong & Scharfman, Landscape Architects

Electronics lent a hand in the careful analysis for this big 712-apartment-unit project now under construction. In planning the structural steel framing for the main 26-story building, a computer was programmed to test all possible solutions for a single frame running the full height of the building. The development is being constructed under Section 220 of F.H.A. Urban Renewal Financing. To meet the budget requirements, several basic design decisions were made: the use of ribbed aluminum industrial siding for all spandrels, carried on a light frame of rolled channel sections, and furred, lathed and plastered on the inside; omission of central air conditioning and use of the ceiling as envelope fireproofing for floor framing and thin floor slab; partitioning of solid plaster on long-length gypsum lath.

The project is a fairly self-contained community, with its three towers (the lower ones have 17 floors), a two-story commercial building, and a two-level partly underground garage for 900 cars.













Ben Schnall

Apartments For An Island Resort

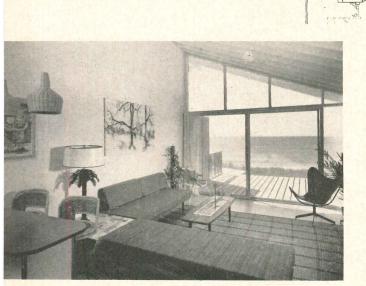
Island Pines Apartments, Fire Island, New York

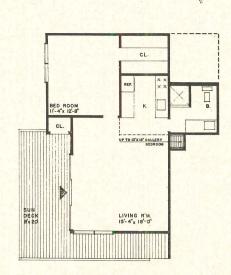
Bertram Lee Whinston, Architect

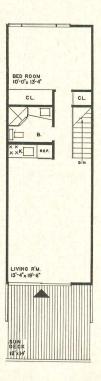
Blitman Construction Corp., Contractor

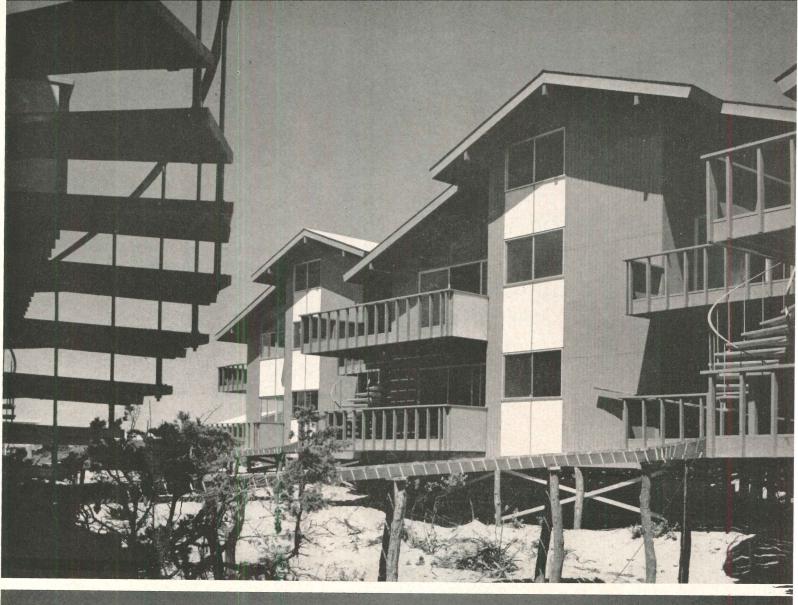
Along with the spate of "second homes" cropping up everywhere is this kind of development—which may be the beginning of a new apartment type. It is an apartment project of 100 units, planned as a cooperative summer community on Fire Island, a narrow 40-mile long spit of beach which has become a famous resort. Each unit is for sale, with an annual maintenance charge.

The Island is in a fairly undeveloped, natural state, with no roads (only a jeep taxi runs along the beach). Paths connecting buildings consist, for the most part, of raised boardwalks. The design of these apartments sought to harmonize with these surroundings, while still preserving a certain urbanity of convenience. To give some individuality, the outlines and roofs of the units were consciously varied. The site covers two acres, with the Atlantic Ocean at one side, Great South Bay on the other. Many apartments are duplexes as the ones shown.







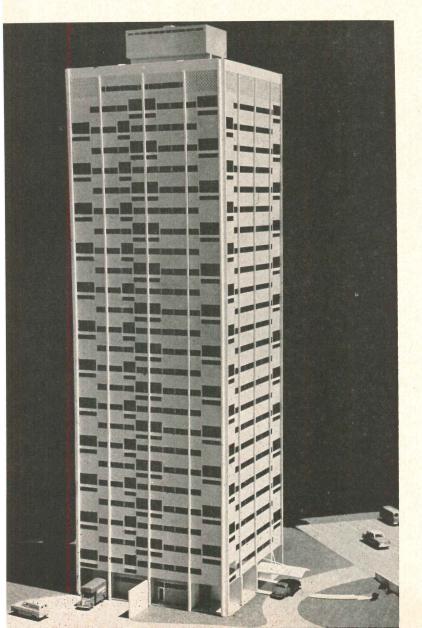


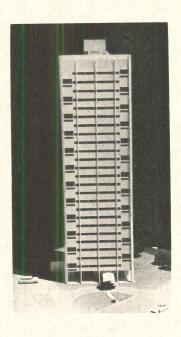


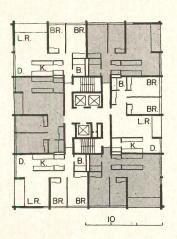
Apartment For An Australian Park

Apartment House in Sydney, Australia Harry Seidler, Architect This apartment tower is designed to take full advantage of a handsome site from which there is a wide range of fine views. The larger apartments all have two exposures, and the smaller ones have been given preferred orientations. The fenestration is designed to eliminate external sun control devices and is of two basic types, 2 ft 6 in. high horizontal strip windows in bedrooms and kitchens and full height sliding glass doors that open on to recessed balconies from all the living rooms.

Construction is based on a system of *in situ* reinforced concrete cross-walls, which have been utilized in the planning to provide added sound insulation, particularly between living and sleeping areas. There is enough parking space planned to accommodate at least one car per apartment, with 40 per cent of the parking under cover. Space for four shops has been provided at ground floor level.







Architectural Engineering

How High the Jet?

"Mushrooming installations, numerous articles in the architectural, building and other magazines, and requests for information on our spray nozzles indicates that the decorative water fountain has become again an important element in architectural and landscape design"-from a new catalog by Schutte and Koerting Company. We would like to think that the RECORD has been a factor in stimulating such interest—on the design aspects through its highly successful 1958-59 series on "Water and Architecture" by Elizabeth B. Kassler, and in mechanics through two AE articles, "Engineering of Lighted Fountains," by Robert E. Faucett, July 1959 and "Fountains: Effects and Mechanics," August 1959. Objective of this latter article was to relate visual effects of recent installations to the equipment required to produce them, and a point was made of the lack of information for the designer. While there was ample hydraulic data on pressures and flow rates, rarely was it related visually to the shapes and sizes of fountains. Fortunately the S and H catalog has remedied this situation by presenting spray characteristics in tables and drawings. The catalog is available from Schutte and Koerting Company, Cornwells Heights, Bucks County, Pa.

Thin Walls of Clay

Last October an AE article described a research program at the Structural Clay Products Research Foundation in which prefabricated plate girders of clay masonry units had been developed with a thickness of only $2\frac{1}{2}$ in. A possible application could be load-carrying spandrel girders in curtain walls. SCPRF put up a demonstration building at Geneva, Illinois simulating a one-story school utilizing plate girders 6-ft high and over 20-ft long. Now the first large-scale application of the "SCR building panel," as it is called, has been made in a store under construction in Chicago in which 27 preassembled plate girders, 4-ft wide and 19-ft high are set on end to form a saw-tooth wall. Each girder contains 19 factory-cast panels, 1-ft wide and 4-ft long. The steel reinforced panels are fabricated of aquamarine ceramic glazed clay units 12 by $2\frac{1}{4}$ in. by $2\frac{1}{2}$ -in. thick. Originally, the architects, Camburas and Theodore of Chicago, specified a brick wall which would have had to be 12-in. thick to take the wind load.

Keeping Fallout Out

A 52-page guide to provide architects and engineers with procedures and standards for evaluating the fallout shelter potential of existing structures, for modifying structures to improve their value as fallout shelters, and for the preliminary design of new structures has recently been issued by the Office of Civil and Defense Mobilization. This guide emphasizes procedures for collecting, analyzing and summarizing information on potential shelter areas. The main sections include: shielding fundamentals, shielding calculations, space and ventilation, water supply and sanitation, power supply and other factors, community survey procedure. Full title is Fallout Shelter Surveys: Guide for Architects and Engineers, NP-10-2 National Plan Appendix Series.

The Power of a Motor

1960 man takes power steering, power lawn mowers, power boats all for granted, but it's doubtful is he's anticipated the full range of possibilities in a power home—motorized, that is. There's a house in Ft. Wayne, Indiana that boasts 100 fractional horsepower motors for doing everything from conveying ashes from the fireplace to a flower bed, to trapping bugs in said flower bed, to lowering bunk beds for the kids, to closing drapes, to circulating water for a fountain. All this is not so surprising when you learn that the owner, Lisle Hodell, is general manager of GE's General Purpose Motor Department.

This Month's AE Section

LIGHTING FOR ARCHITECTURE, The Lighting System: 3 Fixture Facts and Building Factors, p. 222.

BUILDING COMPONENTS: Air Conditioning Systems for Large Office Buildings, p. 239. Product Reports, p. 245. Literature, p. 246.

LIGHTING FOR 3 ARCHITECTURE

The Lighting System: Fixture

a. The Total Lighting System: Illumination and Brightness

b. Lighting System Efficiency: Work Plane Illumination

C. Lighting System Efficiency: Light Levels and Room Use

d. The Lighting Materials: Light Sources

e. The Lighting Materials: Room Surfaces

The basic problem with lighting is that designers have not understood it in the way they have other building disciplines. Lighting methods have for the most part been considered as being isolated from the other components of the building.

The purpose of this article, therefore, is to relate lighting qualitatively and quantitatively to its surroundings. It will give a "common sense" understanding of the relationships between light sources and room surfaces, supported by a new type of

A. THE TOTAL LIGHTING SYSTEM: ILLUMINATION AND BRIGHTNESS

The charts at right (Figures 1 through 9) indicate a schematic method for analyzing the relationships between primary light sources—daylight as well as various artificial lighting systems—and room shapes and reflectances, and for determining their effect on the brightness distribution and illumination levels within a room.

By diagramming the surfaces which will receive direct light from the source being considered, the effectiveness of these surfaces can be estimated for various combinations of surface reflectances and various positions for such primary light sources as fixtures and windows.

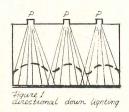
For instance, with directional downlights placed so that they do not directly light the walls (Figure 1), the brightness of the ceiling obviously must depend on the reflectance of the floor. Because the ceiling can receive no direct light from the fixtures, it must be darker than the directly-lighted floor even if it is white. If the floor is a light color, it becomes secondary light source, the

reflected light making it possible for the walls as well to become major secondary sources, particularly in small rooms where the walls occupy a relatively large percentage of the total surface area.

When walls or floor or both are light-colored and highly reflective, the ceiling is lighted by these secondary sources. As its brightness increases, the horizontal work plane illumination becomes more uniform. The illumination gradient shown in Figure 1 is based on a relatively dark floor (10 per cent reflectance) and relatively light walls (50 per cent reflectance). If both walls and floor were dark, the gradient shown would be more dependent on direct light and hence more uneven. If both were very light, secondary sources would make a greater contribution, the illumination levels would tend to even out and the curves of the gradient would be shallower than shown.

A similar schematic analysis can be used in studying the characteristics of other systems. Figure 2, for example, shows that with general diffuse lighting, all room surfaces receive direct light from the fixtures. As a result, the brightness of each is more independent of the brightness of the others and each becomes a secondary source, supplementing the

ARTIFICIAL



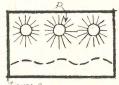


Figure 2 general diffuse lighting

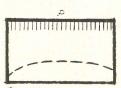


Figure 3 Large area ceiling lighting (luminous or indirect)

others. The horizontal illumination level is more uniform than with directional downlighting, as indicated by the shallower curves of the gradient, and illumination of vertical planes would also be more uniform.

Non-directional sources, like this one and the area lighting system diagrammed in Figure 3, are much more affected by the wall reflectances than are directional systems when

Facts and Building Factors

by William M. C. Lam, Consultant: Coordination of Lighting and Architecture

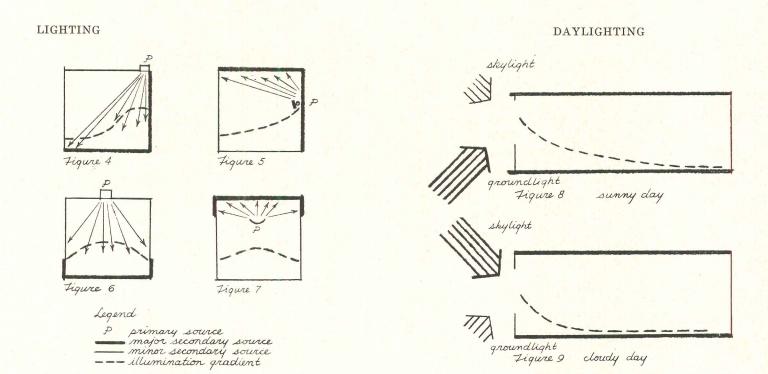
graphic presentation to better portray the visual effects of lighting systems.

Many lighting designs fail because of the absence of analysis of needs beyond consultation of a handbook figure for a particular building type. Little planning goes into establishing desirable brightness patterns and meeting the demands for local or general illumination.

Even when these objectives are recognized, they are not often accomplished very directly, if at all, because the components (fixture types and room surface reflectances) are selected before the analysis begins, so that the calculations are limited to determining merely "how many," and the question of how "how" is lost in the shuffle.

It may seem that the objectives are unattainable "cost-wise" or "efficiency-wise," because of the assumption that room sizes, shapes and reflectances are fixed, without actually realizing what they mean in terms of the total lighting design.

Realistic programming of lighting cannot call for exact quantity and quality objectives; thus, schematic analysis should be sufficient for many situations. Even when the situation is more critical, schematic analysis must, in any case, precede more precise calculations. A "common sense" design will start from such a schematic analysis of all the possible combinations of light sources and room variables—and it will result more often in execution of the desired objectives.



reflectances are higher than 50 per cent, particularly in small rooms; the walls can in fact assume major importance as supplementary light sources. Conversely, dark-colored walls would absorb a large portion of the light supplied by the fixtures.

The three basic systems shown in Figures 1, 2 and 3—and the variations diagrammed in Figures 4 through 9-would appear most different if all room surfaces were black, in which case only the primary sources would be visible and there would be no secondary sources. They would appear most alike if all surfaces were white since all surfaces would then act as secondary sources and all would have much the same brightness.

Similar reasoning can be used in predicting the effects of daylighting, either alone or in combination with artificial systems. However, in the case of daylighting, assuming no direct sun, the differences in lighting conditions depend more on the relative amounts of skylight and ground reflected light than on the total quantity of light passing through the windows. (On cloudy days the sky is essentially a diffused light source

continued on following spread

a. TOTAL LIGHTING SYSTEM

continued from preceding page

about five times as bright as the ground; on a sunny day, the ground is about three times as the sky.)

The type of analysis just described should enable one to project a mental image of relative surface brightnesses resulting from a given lighting system in a room with varying combinations of reflectances.

Such a "mental image" is crystallized in the room diagrams on the opposite page, which indicate the calculated average brightnesses of surfaces in large and small rooms lighted by the basic systems previously discussed.

This quantitative data verifies what could be expected from the analysis of the inter-action between primary sources and room surfaces. It also shows why specification of footcandles alone does not describe any particular visual results. Each of the rooms sketched has an illumination level of 100 footcandles and the same combination of room reflectances. Yet there can be a 20 to one difference in the average brightness of

the surfaces within the room, depending on whether the light is directed to the lightest-colored surface or the darkest.

When reflectances of the various room surfaces are very different, directing the light on the darkest surface as with a downlighting system produces the lowest average room brightnesses, but it also minimizes the range of brightness between the various surfaces. The opposite is true when the light is directed on the lightest-colored surface.

The brightness ratios within a room can also be projected by relating the average surface brightnesses to the brightness of a task at the same illumination level and to the brightness of the lighting equipment being considered.

In general, directional sources have a wide range of brightnesses, depending on the type of louver or reflector and on the angle of viewing. Non-directional sources producing equal quantities of illumination have, on the other hand, a surface brightness inversely proportionate to their surface area. For example, if large luminous fixtures covering 50 per cent of the ceiling were used instead of a full luminous ceiling, they would

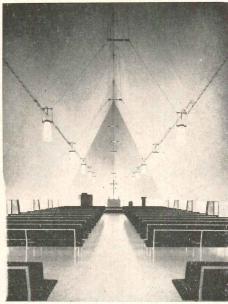
have to be twice as bright to produce the same amount of illumination, while similar fixtures covering 10 per cent of the ceiling would have to be 10 times as bright.

The differences in brightness and brightness ratios produced by artificial lighting systems should be considered most carefully when the room lacks the leveling influence of daylighting, which often contributes relatively uniform, high level light to surfaces that the artificial system would leave unlighted.

Even so, if the contrast of a fixture with its background is a problem, the brightness ratio can be kept within bounds by reducing the brightness of the fixture or increasing the brightness of the background. Fixture brightness is most easily reduced by using directional fixtures, or by increasing the size of non-difixtures. Background rectional brightness can be increased by using a lighter color, by adding illumination from secondary sources through higher reflectances or simply the use of more fixtures, or by lighting the background directly from another primary source, or by selecting and positioning the fixtures so that they also help to light the background.







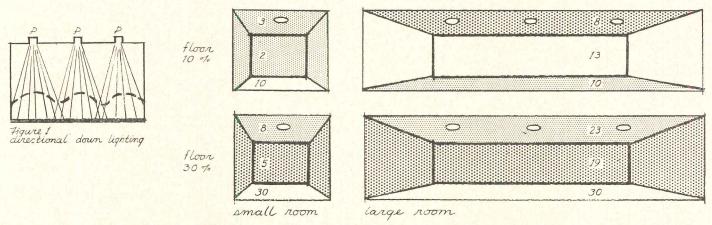


Above left: Since all surfaces receiving direct light are dark-colored, system has low efficiency in producing brightness. Ceiling lighted only by floor reflectance must be darker than floor, and apparent darkness of room is heightened by contrast of dark surfaces with very bright fixtures. Left: Without help of daylight, brightness ratios must be high because primary sources cover relatively small portion of ceiling. Dark walls and floor provide little secondary lighting for brightness or to light solid portion of ceiling. Above: White ceiling is a secondary source utilizing ground-reflected daylight, greatly reducing the "glare" of small, high-brightness lanterns and windows. Above right: Dark surfaces may be suitable unless long occupancy or visual tasks are involved. (Reflectances affect brightness by factor of 1000, illumination by only 2 or 3.)

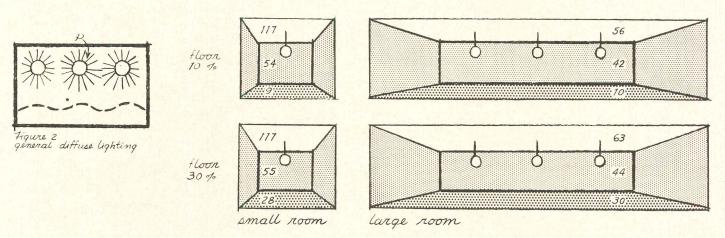
LIGHT SOURCES

TYPICAL LIGHTING SYSTEMS AND RESULTING BRIGHTNESS RATIOS

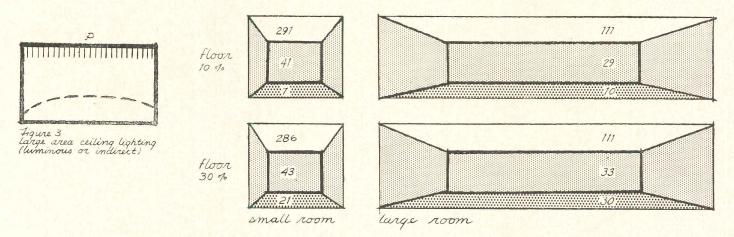
Relative Brightness of Room Surfaces at 100 Footcandles (reflectances: ceiling 80%, walls 50%, floor as shown)



With directional downlighting, ceiling, which receives no direct light from fixtures must be darker than floor regardless of floor reflectance. However, lighter floors increase effectiveness of walls as secondary sources, thus brightening ceiling and helping to level out sharp curves shown as characteristic of illumination gradient on horizontal work plane



General diffuse systems throw direct light to all surfaces so that relative brightnesses are affected primarily by surface reflectances. All surfaces act as secondary sources with the walls assuming particular importance, especially in small rooms. Note that the gradient, though still non-uniform, is less "bumpy" than that of down lights.



With large ceiling lighting systems the ceiling itself is the primary source and its brightness is relatively high. Walls and floor are secondary sources which correspond to those produced by general diffuse lighting, and have about the same relative brightnesses. The illumination level is more uniform than with either of the other two basic light systems

b. LIGHTING SYSTEM EFFICIENCY:

WORK PLANE ILLUMINATION

For many spaces, particularly those in which the precise quantity of light provided is not a crucial factor, a qualitative analysis of the interrelationship of the lighting system components (fixtures and room surfaces) and the illumination levels and relative brightnesses they produce may constitute the greater part of the lighting design. For other spaces, however, such as offices and drafting rooms where horizontal tasks are dispersed over a large area, the efficiency of the lighting system in producing illumination on a horizontal work plane is a major aspect to be considered.

The efficiency of a lighting system in producing horizontal illumination is called its *coefficient of utilization*, which is defined as the quantity of light distributed on the work plane divided by the quantity of light emitted by the fixtures, and describes the efficiency of the *total* lighting system, taking into account the characteristics of both the lighting equipment and the room.

Coefficients of utilization for lighting systems using various standard fixtures are readily available from equipment manufacturers, and are summarized in such lighting manuals as the *IES Lighting Handbook* published by the Illuminating Engineering Society. While this exact c.u. data need not be known until the last step of the design process (de-

termination of the number and type of fixtures needed to produce the planned brightness and illumination levels), a comparative picture of their efficiencies is helpful in the preliminary evaluation of possible systems. For this reason, coefficients of utilization for several basic systems are presented on the opposite page in graphs that also show the effects of the room factors influencing system efficiency. Since the light absorbed by the room surfaces, combined with the light losses within the fixture, determines the percentage of the light generated by the lamps that is actually delivered to the work plane, the major room factors to be considered are shape and color of room surfaces. In fact, handbook c.u. data on standard fixtures is given for several room ratios (see opposite page) and reflectance combinations for room surfaces.

An understanding of these factors will make it possible to determine early in the design

- a) how to make the most efficient use of a preselected lighting system, and
- b) what type of lighting system would be most efficient with a preselected combination of materials having famous reflectances.

For example, if for various reasons a design dictates use of an indirect lighting system, its efficiency can be increased by specifying light-colored room surfaces. Or if a room is to have dark red brick walls, greater efficiency can be achieved by using direct or local lighting, which is relatively independent of wall reflectances.

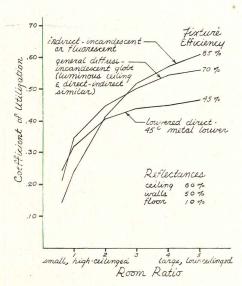


Figure 1
FIXTURE EFFICIENCY VS. SYSTEM EFFICIENCY

effect of room factors

LIGHTING SYSTEM	M	OUNTING HT	RATIO
12 by 12	by	11 ft ra	oom
recessed direct		11 ft	.7
luminous ceiling		9 ft	.9
general diffuse		8 ft	1.1
indirect		8 ft	1.1
30 by 30	by	14 ft re	oom
recessed direct		14 ft	1.3
luminous ceiling		12 ft	1.6
general diffuse		10 ft	2.2
indirect		10 ft	2.2

Comparing efficiencies of lighting systems requires an understanding of the effect of room ratios, which are a function of width and length of room and height of primary light source above the work plane

C. LIGHTING SYSTEM EFFICIENCY: LIGHT LEVELS AND ROOM USE

In evaluating lighting systems for specific buildings, there may be objectives other than providing uniform horizontal illumination. Frequently non-uniform light distribution may be called for because of the plan or projected use of a space, the need to work with an existing system such as daylighting, or the need for

a combined system that will suit a range or room uses and conditions.

In such cases, the system must be evaluated by its ability to provide the amount of light needed, where it is needed; the average illumination in the room, as measured by the coefficient of utilization, is relatively insignificant. Since almost any lighting system delivers varying quantities of light in various areas of a room, the designer should be familiar with the nature of the light gradients of representative systems.

For instance, many buildings are

used almost exclusively during daylight hours when there is always a large quantity of available light with a characteristic gradient (see diagrams opposite) that can be reinforced or balanced for the desired effect.

With electric lighting alone, local tasks can usually be lighted more efficiently by local lighting than by a general lighting system with non-uniform distribution; or, since room brightness must also be provided, by localized general lighting or a combination of local and general lighting.

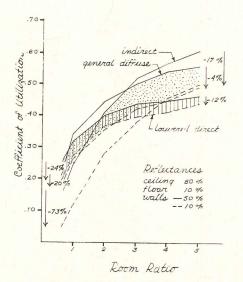
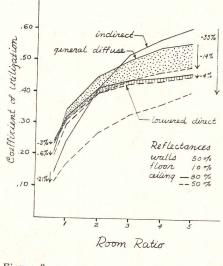


Figure 2
WALL COLOR VS. SYSTEM
EFFICIENCY
effect of reduced wall reflectance



.70

Figure 3
CEILING COLOR VS. SYSTEM
EFFICIENCY
effect of reduced ceiling reflectance

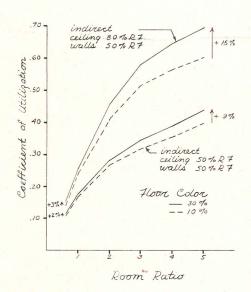


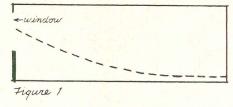
Figure 4
FLOOR COLOR VS. SYSTEM
EFFICIENCY
effect of increased floor reflectance

Figure 1 shows the effect of various room proportions on the efficiency of the basic lighting systems analyzed in Section A, with the room having a fixed combination of surface reflectances. Note that the fixture efficiencies listed bear little relationship to the efficiency of the lighting system as a whole, which varies widely according to the room factors. In general, fixtures that redirect and reduce the lamp brightness (e.g. louvered downlights) are less efficient as fixtures, but are more independent of such room factors as shape and color. Non-directional fixtures like diffuse and area sources, on the other hand, are themselves more efficient, but also more heavily dependent on the room surfaces as secondary light sources for efficiency of the system.

With the combinations of room reflectances shown in Figure 2, all lighting systems are very inefficient in small, high-ceilinged rooms in which the ratio of wall area to total surface area is high. This suggests the use of localized lighting, asymetrically distributed general lighting, and/or high wall-reflectance rooms. With large rooms or with lighting systems which throw light directly on the work plane, the wall colors have relatively less effect on system efficiency. While only the reduction in coefficient of utilization caused by a decrease in wall reflectance is shown here, corresponding increases in efficiency can be expected with higher wall reflectances, a factor that assumes particular importance when non-directional lighting systems are being considered.

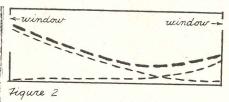
Figure 3 shows the effect of ceiling color on system efficiency. As might be expected, ceiling color is most important when rooms are large, and when the ceiling receives direct light from the fixtures, thus becoming a principal secondary source. Ceiling color is less important in large rooms with direct lighting, but even then it is a substantial factor if the floor is highly reflective. As shown in Figure 4, floor color has a similar effect. Since a bright floor cannot by itself add any light to the horizontal work plane (though it can help to illuminate vertical tasks), high floor reflectance becomes increasingly effective as the reflectances of walls and ceiling increase, since these surfaces are then better able to redirect light reflected by the floor back to the task.

LIGHT DISTRIBUTION FROM TYPICAL LIGHTING SYSTEMS



Familiarity with light gradients makes it possible to combine systems for desired effects. For example, unilateral daylighting can be reinforced or balanced by other systems as shown here

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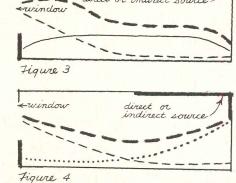


Legend

--- daylight

--- artificial symmetrical

--- combined sources



C. LIGHTING SYSTEM EFFICIENCY

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LIGHT DISTRIBUTION
RELATED TO ROOM USE

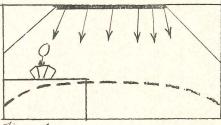


Figure 1 general lighting

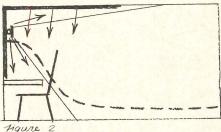
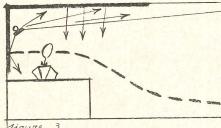


Figure 2 Local Lighting



sigure 3 localized-general lighting

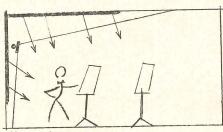


Figure 4 vertical lighting from wall on ceiling

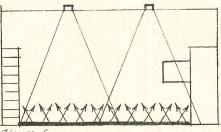


Figure 5 vertical lighting from floor

Figure 1: Most illumination gradients drop off near the walls, which may be important work areas. Figure 2: Builtin work areas pinpoint the need for local task lighting even more. Figure 3: Limitations of room use dictated by the plan (placement of doors, closets, etc.) may also suggest that general lighting be localized. Figure 4: A music room or art studio calls for vertical lighting, which can best be provided from a large area source: windows in a small room, a luminous ceiling or diffuse sources in a large one. Figure 5: Strong downlighting reflected from the floor may help to light the bottom shelves of a bookcase, but it is little help in lighting file cabinets

Right: In a small room which calls for asymmetric lighting, a single wall with high reflectance and high illumination can make a positive contribution to light distribution. Above right: Plans which dictate placement of desks against walls almost always suggest an asymmetric illumination gradient. This could have been more positively expressed here by increasing the width of the luminous band at left and eliminating the series of rectangular fixtures which deliver light where no light is needed. Far right: Study booths in a library need local lighting to supplement the general illumination

d. THE LIGHTING MATERIALS: LIGHT SOURCES

The most effective light pattern for a space is suggested by the building's structure, plan and materials, together with the lighting requirements dictated by such factors as room use. But in order to produce these patterns, it is necessary to understand the properties of light and light sources, their relation to the building, and the limits within which they can be manipulated.

This discussion will deal primarily with the properties of theoretical sources—point, line and area; directional and non-directional.

Two sketches in the first row opposite show light distribution from non-directional point sources in space and on a surface. The corresponding line sources consist of an overlapping series of these point sources, while non-directional area sources consist of a series of line

sources. For this reason, the properties of line and area sources can largely be projected from the properties of point sources.

The same light source may often be considered as either point or area depending on its angular size, which is basically a function of its placement. An incandescent lamp may be an area source in relation to a pencil two inches away from it, but a point source in relation to a pencil two feet away.

Since the quantity of light radiated in any direction from any light source is a function of its brightness and projected area, modifying the basically non-directional distribution of a point source by refraction (lenses), shielding (louvers) or specular reflection (polished enclosures) will cause it to have a different brightness when viewed from different angles. This explains the "distortion" of the directional point source diagrammed, as compared to the non-directional "norm." If the source is recessed, for example, the projected area, and hence the brightness, will be greatest

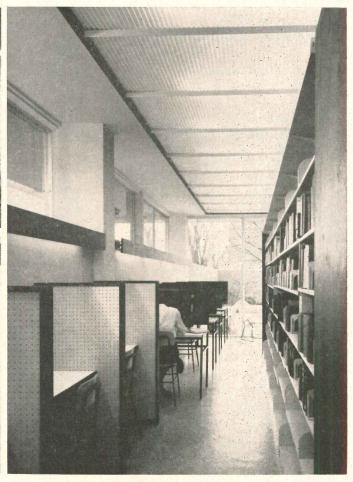
when the source is viewed from below and will decrease gradually as the viewing angle approaches the horizontal. Similarly, a directional area source such as a louvered ceiling or fixture can be thought of as a series of points or a series of lines, but it will have the same directional properties as a shielded point or line source, regardless of its greater size.

With this in mind, it becomes a simple matter to visualize the light distribution from directional sources and to interpret candlepower distribution curves for typical fixtures. Since the light from any point source can be thought of as a series of concentric cones, drawing a cone that includes most of the distribution curve will indicate where most of the light will fall. If the curve itself is a straight-sided cone, no light is directed outside it, and the patterns made on an intercepting plane will have a sharp boundary between light and dark. Conversely, rounded sides, because of the decreasing intensity of the outer cones of light, indicate a

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DIRECTIONAL

NON-DIRECTIONAL



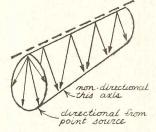
suspended



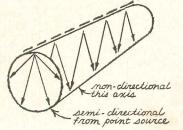
NON-DIRECTIONAL

Line

Point

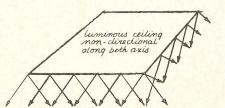


non-directional this axis



area





Diagrammatic analysis of properties of theoretical sources gives basic information on actual equipment as well. The theoretical sources shown here are all based on the point: line sources and directional area sources can be thought of as a series of point sources; non-directional area sources, then, can be thought of as a series of line sources

d. THE LIGHTING MATERIALS

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"soft" boundary. A flat bottom indicates that the intensity of light from the cones on a plane perpendicular to their axis will be uniform, while a pointed end indicates that the central cones of light are more intense.

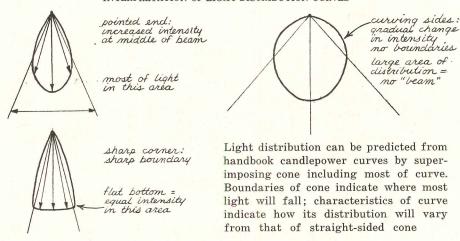
Even though the basic conical distribution of a point source can be modified by blocking off parts of it or adding non-directional components, the light radiating from a point remains essentially a cone, and the patterns made on intercepting planes perpendicular, parallel or oblique to its axis can be visualized accordingly.

The fact that the basic cones of light can be only slightly modified also means that precise brightness can be more easily obtained by manipulating reflectances than by manipulating illumination levels or light distribution. Planes of a room can be sharply defined by color differences, but illumination or brightness gradients are smoothed out by the secondary light sources.

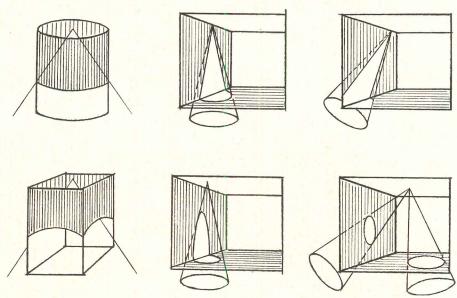
Examination of the light distribution from various sources will also suggest the position from which the source can best produce the desired brightnesses. Keeping a point source at a uniform distance and angle from all parts of a surface is the easiest way to achieve uniform lighting, since it permits minimum directional control. Thus a flat surface can be lighted most uniformly when the source is centered at a maximum distance from it. For uniform brightness on curved or multi-planar surfaces such as vaults or folded plates, the shape of the light distribution required from the fixture can be calculated by computing the distance and angle of incidence of light from a potential light source position to various points on the surface.

This is not the case with diffused area sources where the illumination is a function of the brightness and the included solid angle of the light source as "seen" from the point illuminated. When the included angle is large, source brightness and resulting illumination are almost equal. Thus changing the ceiling height (distance from source to surface) in a large room affects the light level

POINT SOURCES INTERPRETATION OF LIGHT DISTRIBUTION CURVES

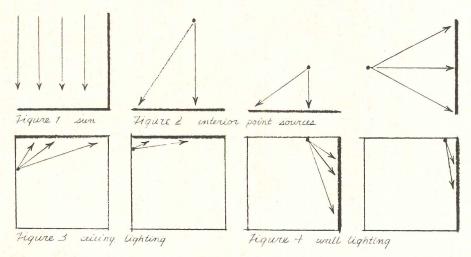


LIGHT PATTERNS PRODUCED BY POINT SOURCES ON INTERCEPTING PLANES



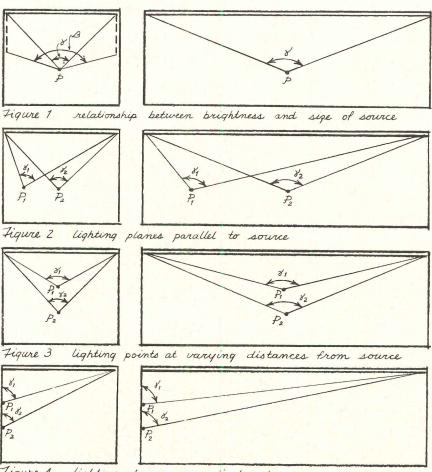
Since distribution from point sources is essentially conical in spite of fixture variations, light patterns necessarily will correspond to those produced by a cone of light

LIGHTING A PLANE FROM A POINT



Planes are lighted most evenly by points centered at maximum distance from them. (Sun is ideal point source.) If this position is impractical because source would be viewed, or for other reasons, it should be approximated as closely as possible

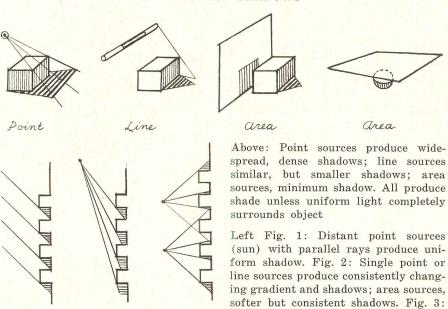
AREA SOURCES A PLANE FROM AN AREA SOURCE



Tigure 4 lighting planes perpendicular to source

Intensity of light from area source at any point is function of solid angle γ . Since included angles from various points on horizontal planes vary more in large rooms than in small, light levels at those points vary accordingly. From points on vertical planes, angles and light levels vary more in small rooms

SHADES AND SHADOWS



Tig. 1

Fig. 2

Multiple point or line sources produce

confusing multiple shadows.

very little since the included angle is little changed. On the other hand, when the included angle is small, as in a small or high room, the ceiling may have to be twice as bright to produce equivalent illumination. Using the walls as additional sources, however, can increase the solid angle so that the required illumination level can be achieved with a lower brightness source.

The character and quantity of illumination from line sources corresponds to that of point sources on one axis and that of area sources on the other. The illumination varies with the included angle, which is a function of both the length of the source and the distance from the lighted surface. Since increasing the length of a linear source increases the included angle more when the source is distant from the surface than when it is close, the increase in illumination due to an increase in fixture length is large at distant points, and very small at points close to the fixture. For the same reason, the illumination gradient from a long fixture is more uniform than from a shorter fixture of the same cross-section.

The intensity of shadows depends on the amount of light blocked off by the shadow-casting object. This in turn depends on the relative size and position of the light-casting source, and the shadow-casting object, and on the distance between the object and the shadow-receiving surface.

Because of its distribution characteristics, if a point source is the only light source, it always produces a widespread and dense shadow. On the other hand, shadows from area sources vary greatly in spite of the common misconception that any large area source is "shadowless." It is true that large diffuse sources produce minimum shadows, but the only really shadowless source is one that completely surrounds the objects with uniform light. Shadows produced by directional area sources can be as strong as those from point sources.

In any case, the density of the shadow is rarely as significant as its form. Simple shadows from a single consistent source often contribute to the interpretation of three-dimensional forms; complex shades and shadows from multiple sources are invariably confusing.

e. The Lighting materials room surfaces

Since room surfaces are a large part of the luminous (or visual) environment, they should be used positively as secondary light sources to increase the lighting system efficiency and to redistribute the light as desired. While this implies light colors, it in no way suggests that the environment need be bland and monotonous. On the contrary, the seeming disadvantage of a limited range of reflectances can be turned into a definite design asset:

- 1) Dark colors in small areas—chairs, pictures, doors and so forth—may help to define a space in which most surfaces are light-colored, with very little adverse effect on lighting efficiency.
- 2) In large areas, chromatic differences may be used instead of value differences. Because colors have selective absorption, a gray that absorbs light across the entire spectrum actually absorbs more light after multiple reflections than does a definite color of the same reflectance.
- 3) In all lighting systems, there are areas like the ceiling in very small rooms or the walls in large low rooms where dark colors can be used with minimum effect on the system's efficiency of light distribution. Dark

colors can also be used when a specific light distribution rather than an average level is the objective, in which case the reflectances of certain walls or other surfaces become relatively less important than they would otherwise be.

Maintaining comfortable brightness ratios also depends on the relative positions of light and dark surfaces:

- 1) In general, dark colors should not be used for the immediate background of tasks (on desk tops, for example), for window walls, or for ceilings with bright recessed fixtures. If fixtures must be recessed on a dark surface, equipment with low surface brightness should be specified. A small dark area against a large light background is more comfortable than a small bright light source against a dark background.
- 2) When uniform brightness is more important than maximum utilization of light, and a dark surface is desired for design reasons, maximum illumination should be directed to that surface. When utilization of light is important, the dark surface should be kept in the position of the least important secondary source.
- 3) High brightness ratios can also be used positively, as when a dark background is used to increase the apparent brightness of a display or store window.

Materials by their very nature sometimes create special problems. Transparent and opaque materials can produce specular reflections (mirror images) with brightnesses approximately equal to that of the reflected source.

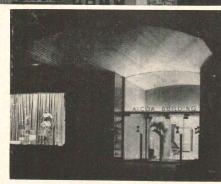
If a matte surface is not desirable or possible, and the image is objectionable, the image problem can be solved by:

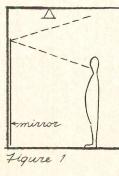
- 1) Reducing the brightness of the source.
- 2) Positioning the source so that the unwanted image is not normally viewed. For example, when the vertical specular surface is below eye level (Figure 1), the light source should be above the specular material; when it is above eye level (Figure 2), the source should be below.
- 3) Increasing the brightness of the area surrounding the objectionable image. In the case of opaque specular material (Figure 3), reflections can be minimized by using maximum reflectance and illumination on the specular surface so that its overall brightness approaches that of the image as nearly as possible. In the case of transparent specular materials, essentially the same technique is used, except that the light colors and high illumination are used on surfaces surrounding the reflecting material. In Figure 4, the brightness of objects in zone "B" would have to be increased in order to reduce the apparent reflections in area "A" of the show window. Illumination at "C" would have no effect on this particular reflection.

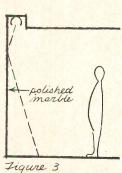
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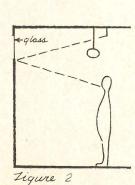


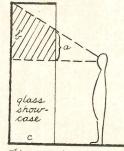
Above: With glass transoms, reflections of fixtures, as well as view of fixtures in adjacent rooms, can be easily avoided by positioning primary light sources below the level of the glass. Right: The lack of specular or fixture reflections on the glass adds elegance to this canopied entrance. Far right: sketches show various methods of preventing reflections of light sources in polished materials—mirrors, glass and marble

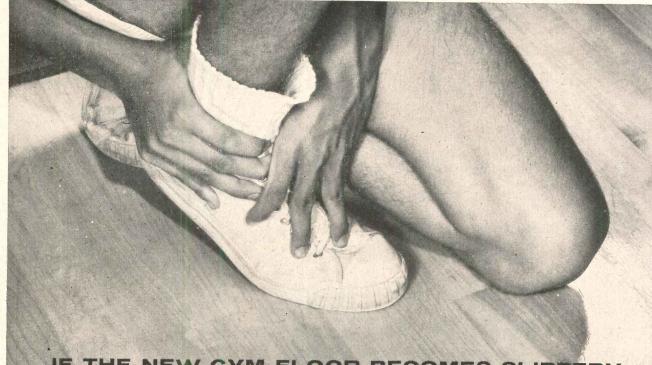












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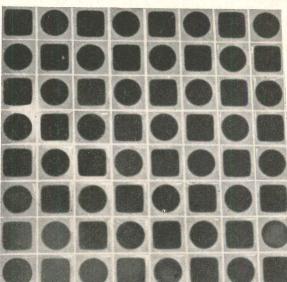
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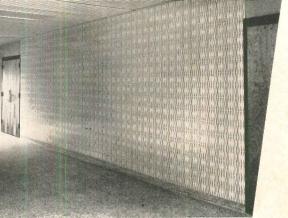
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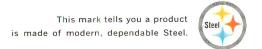
Children's Hospital is right in the middle of Pittsburgh's famed medical and cultural center. The beautiful addition shown here was erected quickly and quietly; the hospital's services weren't interrupted during construction. Note the Stainless Steel mullions and window frames. They'll keep their good looks because the rain will keep them clean. Two more points about those windows: they were roll-formed, a process that keeps their cost competitive with other types, and they pivot for easy cleaning.

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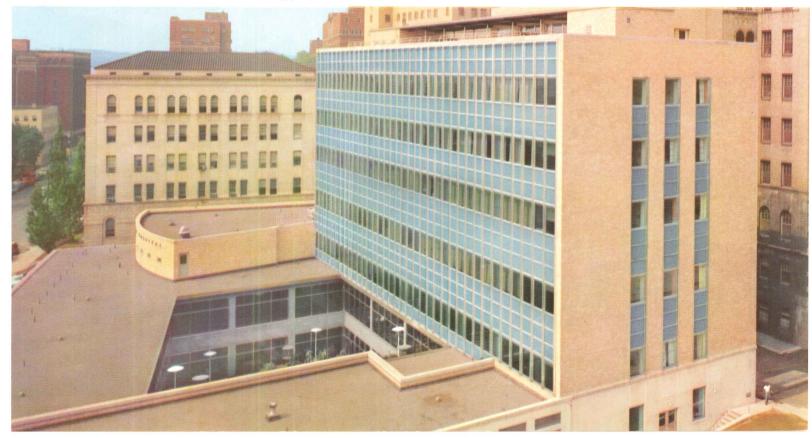
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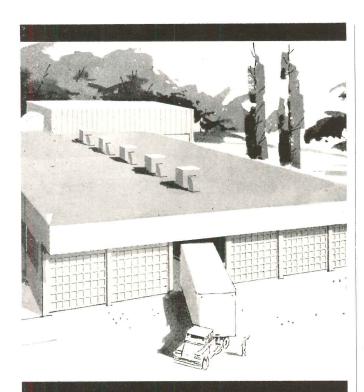






Architect: Alfred D. Reid Associates, Pittsburgh, Pa. General Contractor: Mellon-Stuart Company, Pittsburgh, Pa. Curtain Wall Fabricator and Erector: Trio Industries, Bridgeport, Conn.



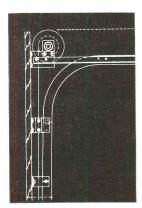


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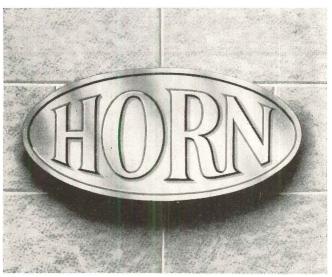


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AIR CONDITIONING FOR LARGE OFFICE BUILDINGS

by Gordon V. Bond, Carrier Corporation

Greater attention is being focused on the design of air conditioning systems to relate them as closely as possible not only to the performance requirements, but to the plan and structure as well. This article outlines load characteristics of office buildings and the systems that match

It's a foregone conclusion that every new large office building will be air conditioned. Because of the large cooling loads air conditioning systems have to handle due to the sun, lights and business machines, a large part of the building cube and building budget is taken by air conditioning. Thus there is increasing concern for selecting a system that best fits the particular requirements and design of a given building. If a choice of systems is made early enough, adequate space can be provided for equipment and ducts, while still allowing the architect freedom of design. Formerly air conditioning was added like frosting to a cake. Now an air conditioning system may be integrated with the plan and structure for optimum economy and space utilization.

Central station systems of either the "all-air" or "air-water" types are used most frequently. Choice depends upon many factors and can be made only after a thorough study of their respective advantages and limitations.

In an "all-air" system, all of the cooling and dehumidifying is accomplished by air distributed from a central station to a conditioned space. Examples are:

1. Multi-zone central station units

with single duct distribution.

- 2. Single duct systems with terminal reheat.
- 3. Single duct systems with variable volume terminals.
- 4. Double duct systems.

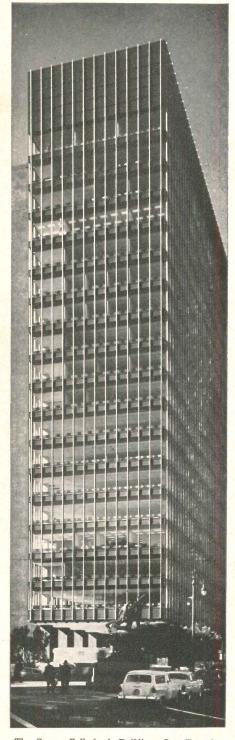
An "air-water" system distributes only sufficient air to furnish ventilation and dehumidifying capacity to a conditioned space. The remainder of the cooling load is handled by a coil in the terminal unit which is connected to a central source of cold water. Examples are:

- 1. Induction systems.
- 2. Radiant cooling systems.
- 3. Fan coil units with primary air supply.

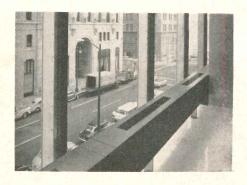
"All-air" and "air-water" systems are further classified as high or normal velocity and high or normal pressure.

High velocity systems have duct velocities in excess of 2000 ft per minute, and high pressure systems are those in which a pressure drop at the air terminal may exceed .025 in. water gauge.

Before the kind of air conditioning system to be used can be considered, a study of the basic load patterns of a building must be made. Every building can be divided into two main zones—exterior and interior (See Figure 1, next page). Each zone



The Crown Zellerbach Building, San Francisco, California; Associated Architects: Hertzka & Knowles and Skidmore, Owings & Merrill



Building Components

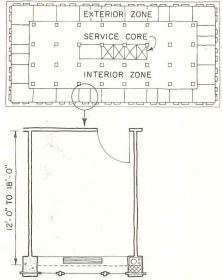


Figure 1: Typical block type building showing interior and exterior zones

OUTSIDE TEMPERATURES AT WHICH LOSS TO THE OUTSIDE IS BALANCED BY HEAT OF PEOPLE, LIGHTS, SUN

75° UNOCCUPIED ROOM without people, lights, sun

70° PEOPLE LOAD ONLY

36° LIGHT LOAD ONLY

31° PEOPLE AND LIGHTS

-2° SUN LOAD ONLY

-46° PEOPLE, LIGHTS

ROOM AREA: 130 sq ft EXPOSURE: South, in December LIGHTS: 5 watts per sq ft PEOPLE: one per 100 sq ft GLASS RATIO: 60 per cent ROOM TEMPERATURE: 75° usually requires a different kind of air conditioning system.

The interior zone is the area in the center of the building which is not influenced by the sun or widely fluctuating outdoor temperatures. The exterior zone is the area around the periphery of the building which extends from the outside wall toward the interior to the first partition line, or, in open areas, a distance of 12 to 18 ft.

INTERIOR ZONE

The interior zone is relatively easy to air condition because the loads are always positive, requiring cooling at all times. This area is not influenced by the widely fluctuating and reversing load of the exterior but is limited to the heat gain from people, lights and business machines. The only exception to this would be a top floor space with considerable roof exposure which adds a reversing transmission load.

The loading is relatively light compared with that of the exterior zone and may be calculated quickly when the watts per sq ft and the occupancy have been determined. Table 1 shows the interior zone heat gain in Btu's per sq ft and the cfm of air required for an "all-air" system for various lighting loads. The cfm is given for a range of differentials between room temperature and supply air temperature. The table is based upon an occupancy of 100 sq ft per person which equals 2.2 Btu per sq ft. With the relatively high lighting loads which average 5 watts per sq ft today, the effect of people on the internal load is small—that is. only about 11 per cent of the total.

When lights are on constantly, any variation in the occupancy will have a negligible affect on the temperature and little, if any, control will be required. If, on the other hand, lights are subject to individual control, the drop in load may be substantial and the degree of control required will depend upon the supply air temperature and whether or not the space is isolated or open to other lighted areas.

With a 10 F differential between supply air and room temperature, a wide fluctuation in load would not seriously affect the room temperature. However, with a 25 F differential, the room temperature theoretically could approach the 50 F supply air temperature in an occupied space with the lights out. For this reason it is recommended that to minimize controls and simplify internal zone air conditioning systems (i.e., eliminate use of reheat), interior lights should be wired to a central switch on each floor or occupancy zone so that they will be on at all times the building is occupied.

The total air quantity required for handling normal interior zone loads (See Table 1) is usually only slightly more than that required for ventilation and dehumidifying. This is particularly true where low supply air temperature is used (25 F diff.). An "all-air" type system will be the most economical choice for an interior zone unless the light load is extremely high and considerably more air must be used than is required for ventilation.

The quality of room conditions to be maintained and the zoning required will determine the type of "all-air" system selected. If only a few isolated spaces, such as conference rooms in office buildings, need individual control, a single duct constant temperature system could be installed in the general areas with terminal reheat or variable volume control for special rooms.

A double duct system may be indicated for an interior zone if there are a variety of spaces and loads in which individuals control their own lighting. The power savings realized from turning off lights in a few unoccupied spaces from time to time will not balance the extra cost of control.

Any variation in room temperature desired by the occupants of partitioned interior spaces can usually be made during the initial air balance. Subsequent changes due to rearrangement of the space may require duct changes as well as rebalance of the air.

TABLE 1: INTERIOR ZONE LOADS AND AIR QUANTITIES

			(FM PER SQ	FT					
WATTS PER	BTU*	Temperature Differential (Room Temp.—Supply Air Temp.)								
SQ FT	SQ FT	10°	15°	20°	25°	30°				
3	12.4	1.15	0.77	0.58	0.46	0.38				
4	15.8	1.46	0.98	0.73	0.59	0.48				
5	19.2	1.78	1.19	0.89	0.71	0.59				
6	22.6	2.09	1.40	1.05	0.84	0.70				
7	26.0	2.61	1.75	1.31	1.05	0.86				
8	29.4	2.92	1.96	1.46	1.18	0.96				
9	32.8	3.24	2.17	1.62	1.30	1.07				
10	36.1	3.56	2.38	1.78	1.42	1.18				

^{*} Based on occupancy of 100 sq ft per person

EXTERIOR ZONE

The exterior zone of a building presents an extremely complicated problem for an air conditioning engineer. The basic load of lights and people that make up the interior zone load are also the steady load of the exterior zone. However, to complicate matters, the variable loads of transmission through the outside walls and windows plus the fluctuating sun load are superimposed upon it. This requires a very flexible air conditioning system, capable of balancing loads which may change from a cooling requirement to a heating requirement, on different sides of a building, or even adjacent rooms if one is shaded and the other sunlit.

Even without the sun shining, cooling will be required until a point is reached when the heat loss from the space due to transmission is equal to the heat from lights and people. With modern high light intensities, this point may be reached at temperatures as low as 20 or 30 degrees outside. When the sun shines through the windows it instantly adds to the net load in the space requiring additional cooling capacity.

The chart shows the outside temperatures at which the transmission heat loss is balanced by the various internal heat gains and sun. At temperatures above these balance points, cooling will always be required in a space; at temperatures below these balance points, heating will be required. The example shown is for a typical office building with 60 per cent glass, five watts per square foot, 100 sq ft per person and a western exposure. The balance points, of course, will vary in buildings with other load characteristics.

It can be seen from an analysis of exterior zone loads that an air conditioning system must have capacity either to heat or cool individual exterior spaces at any time. Moving shadows from adjacent buildings can require heating for a non-sunlit space that may be next to a space with full sun load which will require cooling. This would also be the case where the northern exposure requires heating while the southern

TABLE 2: EXTERIOR ZONE LOADS AND AIR QUANTITIES (max.)

					PER (CENT G	LASS F	RATIO				
\\\ A TB &	2	0	3	0	4	0	5	0	6	0	7	0
WATTS PER SQ FT	Btu sq ft	Cfm sq fi										
3	30.0	0.81	37.4	1.01	44.8	1.21	52.2	1.41	59.6	1.61	67.0	1.81
4	33.4	0.90	40.8	1.10	48.2	1.30	55.6	1.50	63.0	1.70	70.4	1.90
5	36.8	0.99	44.2	1.19	51.6	1.39	59.0	1.59	66.4	1.79	73.8	1.99
6	40.2	1.08	47.6	1.28	55.0	1.48	62.4	1.68	69.8	1.88	77.2	2.08
7	43.6	1.17	51.0	1.37	58.4	1.57	65.8	1.77	73.2	1.97	80.6	2.17
8	47.0	1.26	54.4	1.46	61.8	1.66	69.2	1.86	76.6	2.06	84.0	2,26
9	50.4	1.35	57.8	1.55	65.2	1.75	72.6	1.95	80.0	2.15	87.4	2.35
10	53.8	1.44	61.2	1.64	68.6	1.84	76.0	2.04	83.4	2.24	90.8	2.42

Based on—100 sq ft per person • Western Exposure • 4 pm August • 95 F Outside • 75 F Inside • Depth of Exterior Zone—15 ft • Ceiling Height—9 ft • White Venetian Blinds • Supply Air Temperature 50 F.

TABLE 3: AIR HANDLING APPARATUS SPACE REQUIREMENTS, FT

	DO	OUBLE DI	JCT	SI	NGLE DU	СТ	INDUCTION		
CFM	L	w	н	L	w	н	L	w	н
4000	14-0	13-0	7-0	10-0	13-0	8-6	18-0	15-6	7-6
6000	16-0	13-0	8-0	12-0	13-0	8-6	20-0	17-0	7-0
8000	16-6	14-0	8-0	12-6	14-0	8-6	21-0	17-0	7-0
10,000	18-0	16-0	8-6	14-0	16-0	9-6	24-0	20-0	8-0
14,000	18-6	20-0	8-6	14-6	20-0	9-6	25-0	20-0	9-0
18,000	19-6	20-0	9-6	16-0	20-0	11-0	26-0	20-0	9-
24,000	20-6	20-0	11-0	17-6	20-0	12-0	28-0	20-0	11-0
30,000	22-0	20-0	13-6	19-0	20-0	14-0	29-0	20-0	12-0
35,000	24-0	22-0	15-0	21-0	22-0	15-0	30-0	24-0	13-0
40,000	26-0	22-0	15-0	23-0	22-0	16-0	32-0	24-0	15-0

NOTE: These dimensions are approximate • Some awkward duct arrangements may require extra space • Space has been allowed for service of equipment • Based on factory-built apparatus • Field fabricated built-up units usually will require more space

sunlit exposure demands cooling. Table 2 shows the maximum cooling load for a typical exterior zone for various lighting loads of watts per sq ft, and per cent glass ratio. Also shown is the cfm of supply air per sq ft required with an "all-air" system supplying air at a 25 F temperature difference between the room and supply air temperature. The Btu loads shown are the basic interior zone load of lights and people plus the maximum heat gain from the sun and transmission, based on a western exposure, at 4 p.m. in August with 95 F outside temperature. Note that the load and cfm more than double when the glass ratio is increased from 20 per cent to 70 per cent. Also compared with the load of the interior zone space, the exterior load, even with 20 per cent glass ratio, is approximately 50 per cent more.

An important factor to consider when designing an air conditioning system for an exterior zone is the effect of downdrafts from a cold window or wall. Downdraft is caused by room air which, cooled by the cold glass, slides down the inside surface of the window and across the floor. The seriousness of this effect depends upon the surface temperature of the glass and the type of air distribution in the space. Without a counterflow of warm air upward from the windowsill, in extremely cold weather the downdraft can blow across the floor at velocities up to 100 ft per minute and temperatures 10 to 15 degrees below the air temperature at the breathing zone. Air distributed vertically from the windowsill, up the face of the window, and across the ceiling will effectively offset the downdraft and provide excellent room air distribution with very little temperature gradient between floor and ceiling. If it is impossible, due to space considerations or other limitations, to provide air distribution from under the window, other means of providing heat in that location, such as baseboard radiation, should be used.

Another problem of the exterior zone of a building is the discomfort caused by radiation to large exterior glass and wall surfaces at low outside temperatures. As yet, there is no effective solution to this problem, although it can be minimized by use of double glazing. This is not a serious problem with low glass ratios or where temperatures normally stay well above the freezing mark. However, in the modern, all glass buildings, with 70 per cent or more glass area, venetian blinds must be closed or other shielding devices used to curtail this disturbing radiation effect.

Radiant panels in the ceiling have been used as a means to offset the effect of radiation to the cold glass area. This method has not proved to be the answer in all cases.

In order to use the large areas of glass without substantially increasing the cost of the air conditioning, large overhangs, deep window reveals, movable sun shades, and special tinted glass have all been used to reduce the sun load.

As with the interior zone, simplified operation and a less expensive control system will result if the building is occupied. This is particularly true in buildings with high lighting loads because with the lights on heating will not be required until relatively low outside temperatures are reached. With modern high-intensity lights, heating is not a serious problem for office buildings today, but rather the main concern of the architect is to design a building for maximum efficiency during the cooling cycle, which generally occurs during the major portion of the year.

SELECTION OF THE EXTERIOR ZONE SYSTEM

To meet widely fluctuating conditions of the exterior zone which may vary from maximum cooling to heating in adjacent areas in the building, a system must have two fluids which it can supply to a conditioned space—one hot and one cold. There are at least two popular systems which can satisfy these conditions economically. First, the "all-air" double duct system which mixes cold

air with warm air to provide the necessary supply air temperature to satisfy the load. Secondly, the induction type "air-water" system which heats the ventilation air supply to offset the transmission loss and supplies cold water to the coil at the terminal unit to provide any cooling may be required.

For some buildings the simplest and best system from a performance standpoint is the "all-air" terminal reheat system. All of the cooling is done with the supply air, and any variations in temperature are obtained from a hot water or steam reheat coil at the terminal unit.

A re-examination of the loading and cfm per sq ft required for a typical exterior zone will show that a tremendous amount of air will have to be supplied to take care of cooling requirements. In the north, where it is necessary to provide air supply or heating under the windows to offset downdraft, large supply ducts would be required for either a single duct terminal reheat system or a double duct design. An induction system cuts air supply to the minimum required for good ventilation, dehumidification and flushing. With this system, the major portion of the cooling load can be handled with the chilled water coil fed by relatively small pipes. Only a small quantity of water is required to furnish the cooling capacity because water is over 200 times more efficient as a heat carrying fluid than air.

Even though adequate ventilation can be obtained by furnishing .25 cfm per sq ft of outside air for an office building, the primary air of an induction system should be limited to a minimum of .4 cfm per sq ft to provide adequate flushing of odors and ample dehumidification capacity. This means that with an induction system only about one quarter of the air necessary for an "all-air" system needs to be supplied to the space, and a tremendous saving in the size of ducts and primary air apparatus will result.

One disadvantage of the induction system compared with an "all-air" system is its limited capacity for flushing odors. The "all-air" system

TABLE 4: DIAMETERS—ROUND DUCTS (in inches)

has a much greater supply air quantity which is returned from the room to a central station apparatus. Thus, smoke concentration and odors may be controlled more efficiently.

What then is the "break-even point" where an "all-air" system can be considered economically feasible? To answer this question, we must evaluate a number of factors:

1. Geographical Location

An "all-air" system should be considered for a building in the South, Southwest or on the West Coast, where temperatures rarely go below 30 F for more than a few hours at a time. In these regions, air can be distributed from ceiling or side wall outlets, where it is easier to find space for the large ducts required. Also, in some cities, particularly in the southwest, sheet metal is more economical to use than water piping.

2. Glass Ratio, Orientation and Shading Devices

An "all-air" system definitely should be considered in a building where the lighting load is relatively low and the glass ratio is 20 to 30 per cent. Several studies have been made which would indicate that an "allair" system may compare favorably in owning and operating costs with an "air-water" system if the exterior loads do not exceed 30 Btu per sq ft. Careful planning of the orientation of a building together with shading devices or special glass, may keep the exterior load within the economical limit for an "all-air" system.

3. Space Required for Equipment and Ducts

"All-air" systems undoubtedly would be more widely used in large buildings if it were not so important to save space. An induction system is more commonly used here, because the air supplied has been reduced to the absolute minimum and is distributed at high velocity to further reduce duct size.

High velocity distribution has been used with "all-air" systems for some time. However, before deciding on the use of a high velocity system, one should evaluate the added cost

DUCT DIAMETERS CFM 3000 Fpm 1500 Fpm 500 8 6 1000 12 8 1500 14 10 2000 16 12 4000 22 16 20 6000 28 8000 32 22 10,000 36 24 15,000 42 30 20,000 50 35 25,000 55 38 30,000 42 60 35,000 65 46 40,000 70 50

TABLE 5: INDUCTION SYSTEM MAXIMUM RISER SIZES

	BAY WIDTHS									
NO. OF FLOORS	1	10		20		22		24		
	Cfm/sq ft		Cfm/sq ft		Cfm/sq ft		Cfm/sq ft			
2	4	5	4	5	4	5	4	5		
4	6	6	6	7	6	7	6	7		
6	7	7	7	8	7	8	7	8		
8	7	8	7	8	8	9	8	9		
10	8	9	8	9	8	10	8	10		
12	8	10	9	10	9	12	9	12		
14	9	12	9	12	10	12	10	12		
16	9	12	9	12	10	12	10	14		
18	10	12	10	12	12	14	12	14		
20	10	12	12	14	12	14	12	14		

Based on—15 ft Bay Depth • Up to Approx. 4000 ft/min. over 1000 cfm • up to approx. 2800 ft/min. under 1000 cfm • 1 bay per riser.

TABLE 6: AIR CONDITIONING TONS PER SQ. FT.

WATTS PER	SQUARE BLDG. All Exposures Per Cent Glass							RECTANGULAR BLDG. East-West Long Side Oriented			
SQ FT				Per Cent Glass			Per Cent Glass				
,	25	50	75	25	50	75	25	50	75		
3	.0029	.0032	.0035	.0029	.0032	.0035	.0031	.0033	.0036		
4	.0032	.0035	.0038	.0032	.0035	.0038	.0033	.0036	.0039		
5	.0035	.0038	.0041	.0035	.0038	.0041	.0036	.0039	.0042		
6	.0038	.0041	.0044	.0038	.0041	.0044	.0039	.0042	.0045		
7	.0041	.0044	.0047	.0041	.0044	.0047	.0042	.0045	.0048		
8	.0044	.0047	.0050	.0044	.0047	.0050	.0045	.0048	.0051		
9	.0047	.0050	.0053	.0047	.0050	.0053	.0048	.0051	.0054		
10	.0050	.0053	.0056	.0050	.0053	.0056	.0051	.0054	.0057		

Based On: Single glazing—Standard glass \circ White Venetian blinds \circ 95 F Dry Bulb, 78 F Wet bulb outside \circ 75 F Dry Bulb, 45% R.H inside \circ 100 sq ft per person \circ 0.25 cfm per sq ft outside air \circ Square building, 35% exterior zone \circ Rectangular building, 50% exterior \circ Exterior zone—15 ft deep \circ 9 ft ce.ling \circ Net air conditioned area 75% of Gross

of the system in comparison with space saved.

The biggest saving in duct and apparatus space is obtained by lowering the supply air temperature, thereby reducing the air quantity required. It is impractical to go below a 50 F supply air temperature unless an after cooling coil is used to remove the fan heat, or a blowthrough system is designed where the fan heat is absorbed in the main cooling coils.

Reducing the air quantity, of course, is the only way to keep the main air conditioning apparatus to a minimum size. Increasing air velocity merely reduces duct size. If the minimum air quantity can be distributed to the terminal outlets at velocities under 2000 ft per minute without taking up too much duct space, a saving will be made in first cost as well as operating cost. If the velocity must be doubled in order to save space, the duct static pressure loss will go up four times, and the horsepower of the fan will approximately double. In addition, noise will become a problem and the air terminal device will require a sound absorber and pressure reducing section. When such a system also needs volume control, constant volume regulators must be supplied at each outlet to maintain stability if the controls cause the duct pressure to fluctuate.

Let us examine how much space is actually saved when we design for high velocity with its added fan horsepower and system complications. It is impractical to use rectangular ducts with high velocity, high-pressure systems because of extra bracing required. The most economical distribution is obtained with round, spiral conduit, which is relatively inexpensive and light enough to be installed in long sections at a considerable saving in labor. Conduit, also, can be used for low velocity, low pressure distribution systems.

For a given air quantity, doubling the velocity and thereby cutting the sq ft cross-section of the duct in half only reduces its diameter approximately one-quarter. Furthermore, a low velocity rectangular duct can be used which would have the same or even a shallower depth than the round duct used for high velocity. A study of the space required for air distribution may reveal that it is more economical, particularly for an interior zone system, to use a low temperature, low velocity distribution system.

An "all-air" system will require return air ducts. They are usually located in the core of the building and serve as the exhaust system when 100 per cent outside air is used during intermediate seasons when the outside air temperature is low enough to provide necessary cooling. Return air fans are usually installed which either discharge air directly outside the building on the exhaust cycle or return the air to the intake of the supply apparatus on the return cycle.

The returns for an induction system are relatively small because of the low supply air quantity. A substantial overall saving in duct space is one of the main advantages of this type of system for large multistory buildings.

Today, factory-assembled air handling units are available for large cfm capacities at fan static pressures up to 7 in. Table 3 gives the approximate apparatus room size for single duct, double duct and induction system air handling equipment for various cfm capacities. This table is included as a guide to architects so that sufficient space for apparatus can be planned in the early stages of the building design.

Table 4 shows duct diameters for various air quantities at velocities of 1500 and 3000 ft per minute. Table 5 shows the size of exterior risers for induction systems for a given number of floors and various bay widths based on the minimum primary air quantity of 0.4 cfm/sq ft.

4. Analysis of Owning and Operating Costs

It is almost impossible to compare costs of owning and operating an "all-air" and an induction system because the analysis depends upon so many factors which vary from build-

ing to building. Several main factors should be considered when making the comparison between the two types of systems.

The fan horsepower of an "allair" system will be considerably higher than the combined fan and water pump horsepower of the induction system. If a building requires night-time and weekend heating, this can be done very simply with the induction system by merely running the water pump and using the terminal units as gravity convectors. With the "all-air" systems, the fans must be run to provide heat. However, two speed fans can be used to reduce the horsepower during the heating cycle, and may also be under the thermostatic control so that they are only in operation when the building requires heat. Return air fans require considerably more horsepower with an "all-air" system than with an induction system.

An induction system will require approximately the same amount of apparatus and duct space regardless of external zone load. In an "all-air" distribution system central apparatus and terminal size reduce as the exterior zone load decreases. Therefore a point is reached at approximately 30 Btu per sq ft loading when an "all-air" system may compare favorably with an induction system in owning and operating cost. In addition, if overhead distribution is acceptable without radiation, an "all-air" system still will be less expensive to install.

With Table 6 the architect may calculate quickly the approximate tonnage required for air conditioning a building.

In summary, the choice of an air conditioning system for an office building must take into consideration that the loads in the interior and exterior zones are quite different in degree and character. The interior zone always requires cooling. The exterior zone will require cooling most of the time, but heating periodically on cold, cloudy days. The interior load generally is constant; the exterior load will fluctuate and will require more cooling than the interior.

Low Silhouette Air Conditioner Solves Window Wall Problem

One of the problems confronting architects and engineers in the past has been how to use fan-coil air conditioners efficiently without creating unsightly interior and exterior decorator arrangements. The solution has been found in a new fan-coil unit called the "Low-Boy" Airditioner, which is only 141/2 in. high or about half the height of standard fan-coil units. Designed specifically for floor level or low windows, the unit is centrally located at the window base a few inches from the wall so that the conditioned air blankets the window exposure, offsetting heat gain or loss and maintaining desired temperatures. At the same time it prevents obstruction visually or for light and provides ample clearance for draperies.

The "Low-Boy" utilizes two small-diameter pipes and a condensate drain and is fed hot or chilled water from a central source. The pipes, drain and electrical lines are en-

PIPING CONNECTIONS REVERSIBLE COIL ACCESS DOOR (BOTH SIDES)

DRAIN DRAIN PAN MOTOR BLOWERS JUNCTION BOX

closed in a metal cover or chase above the floor.

The unit's simple piping eliminates the need for expensive ducting with subsequent reduction of floor build-up. Also, the basic unit is ideal for existing buildings with only the addition of direct piping. No "ripouts" are required to make room for central duct system. Individual room control assures maximum control

over heating performance, air delivery and sound level.

Some additional features are multi-speed motor control, quiet operation, low power consumption and ease of maintenance.

Four standard units are available in lengths from 44 in. to 96 in. and in a choice of six colors. Modine Mfg. Co., 1500 DeKoven Ave., Racine, Wis.

Epoxy Resins Replace Cement As Binder in Terrazzo-Type Flooring

A newly available flooring material combines the classic beauty of terrazzo with the cost saving advantages of modern plastics. Durazzo resembles conventional terrazzo, but utilizes an epoxy resin compound as binder instead of cement. Recently completed tests indicated that, on the average, Durazzo is one fifth the weight and one fourth the volume of conventional terrazzo, and provides greater strength and stability. Its surface is glossy, non-skid, nonglare, and impervious to acids and other harmful materials, and weather changes. Durazzo can be used inside or out on roofs as well as floors, and in kitchens, rest rooms and other places where the use of terrazzo has been restricted by grease and waterstaining problems.

Aggregates are not limited to marble, but may include stone, glass and metal as well as resilient materials such as fibers and cork. They range in size from fine powder to egg size components. Vivid colors, hitherto impractical, are now possible because they are locked in and

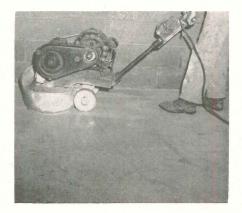
made color fast by the epoxy resins.

The trowel-applied material requires no dividing strips, unless desired, and a complete installation can be made in 24 to 48 hours over any smooth surface, the recommended thickness depending on the size of the aggregate selected. Every *Durazzo* installation is custom-formulated and engineered for the specific requirements to be encountered. *Durazzo*, *Inc.*, *Garfield*, *N. J.*

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Laboratory Equipment

Metal Scientific Laboratory Equipment Catalog (A.I.A. 35-E) covers complete line of industrial metal laboratory furniture, laboratory fume hoods, and plumbing and electrical fixtures. Catalog 109, 142 pp. Kewaunee Technical Furniture Co., 3006 West Front St., Statesville, N. C.

Sarco Condensed Catalog

Gives technical details, dimensions and capacity data on the most widely used devices in Sarco's line of steam traps, temperature regulators and heating specialties. 12 pp. Sarco Co., Inc., 635 Madison Ave., New York 22, N. Y.

Forced Draft Scotch Package Units Describes Kewanee Scotch Type packaged boilers for high and low pressure commercial and industrial applications. These boilers can be fired with natural gas, all grades of fuel oil or a combination of both. The bulletin contains ratings, dimensions and technical data in easy-to-read tables. Bulletin No. 149D, 12 pp. American-Standard Industrial Division, Detroit 32, Mich.*

Weather Sensitive Comfort Controls Folder gives complete information on how inside comfort can be governed by Weather-Man, Weather-Flo and Weather-Chron controls for electric heat, steam, hot water, warm air or radiant panel systems. Bulletin No. G-0260. Automatic Weather Control Devices, Div. of American Machine and Metals, Inc., Western Springs, Ill.*

Penco Steel Lockers

Describes and illustrates nine locker styles for use in offices, schools, industry, etc. Also presented are locker design and construction features, and a planning aids section for more efficient, economical locker layout. Catalog No. 6000, 24 pp. Penco Div., Alan Wood Steel Co., 200 Brower Ave., Oaks, Pa.

Lighting for Parking Areas

Recommended Practice for Outdoor Parking Area Lighting discusses basic considerations in this type of lighting problem, and describes in detail types of equipment, pole spacing and mounting heights. Sections on minimum illumination requirements, color, economics, and recommended maintenance are also included. 50¢. Publications Office, Illuminating Engineering Society, 1860 Broadway, New York 23, N. Y.

Porcelain Enameled Tanks

... for Domestic Hot Water Service describes the tank metal, its porcelain enamel lining, and other details such as tank capacity, working pressure, cathodic protection, inspection, testing, marking and labeling. Commercial Standard CS115-60, 10¢. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Condulets for Corrosive Locations (A.I.A. 31-C-71) Bulletin 2699 is a reissue with additional information. Corrosive substances are listed in tabular form with appropriate corrosion-resistant metals and finishes used in Crouse-Hinds Condulets. 18 pp. Crouse-Hinds Co., Syracuse 1, N. Y.

Simpson Acoustical Products

(A.I.A. 39-B) Describes and illustrates acoustical products such as Forestone woodfiber acoustical ceiling tile; Forestone ceiling board and roof deck; standard and random drilled acoustical tile; fissured mineral tile; and others. 20 pp. Simpson Logging Co., 2033 Washington Bldg., Seattle 1, Wash.*

Fountain Catalog

Presents information on soda fountains and soda units equipped with Super-Soda draft arms and matching stainless steel ice cream cabinets. Specific parts are described and optional equipment is listed. The Bastian-Blessing Co., 4203 W. Peterson Ave., Chicago, Ill.*

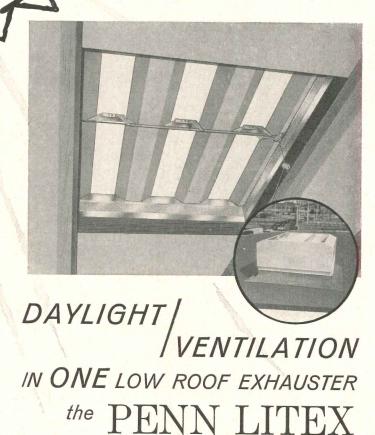
Polyethylene Plastic Pipe

Commercial Standard CS197-59 covers improvements made in flexible polyethylene plastic pipe and requirements for material, workmanship, dimensions, working pressure, field pressure, etc. Methods of marking and indicating compliance are included. H. A. Bonnet, Commodity Standards Div., U.S. Department of Commerce, Washington 25, D. C.

*Additional product information in Sweet's Architectural File

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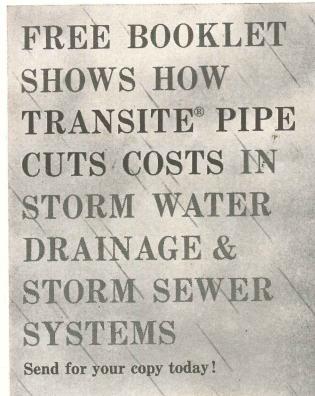


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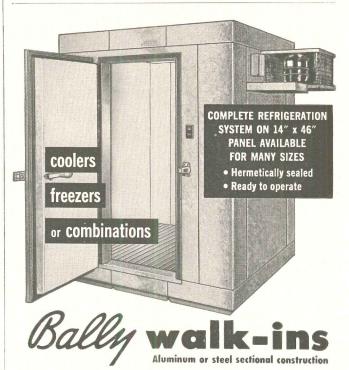
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continued from page 245



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School Heating, Ventilating System A new method for heating and ventilating schools will reduce costs by as much as ten per cent, according to the manufacturer. Working on the principle of high velocity induction, the system is similar to the forced warm air systems commonly found in homes but differs from them in that more air is circulated and each outlet contains a coil for reheating room air induced through it. The reheat coil acts like a baseboard con-

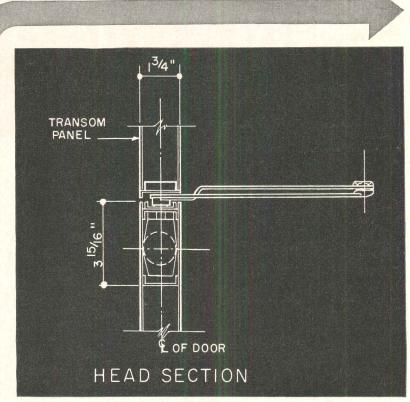
vector at night and during weekends, eliminating the need to send warm air from the central system into the rooms during this period. The central system also permits easier maintenance, reduced noise and the use of a larger and more effective filtering apparatus. Carrier Corp., Syracuse 1, N. Y.

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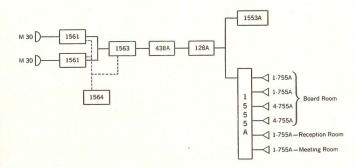
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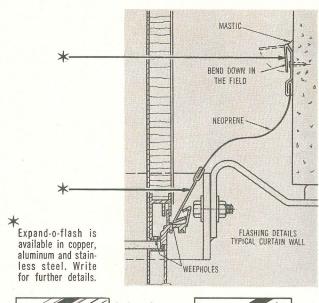
*Shrader Sound, Washington, D.C.



ALTEC LANSING CORPORATION

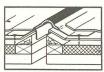
A subsidiary of Ling-Temco Electronics, Inc. 1515 S. Manchester Ave., Anaheim, California 161 Sixth Avenue, New York 13, New York

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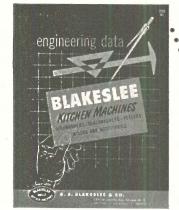
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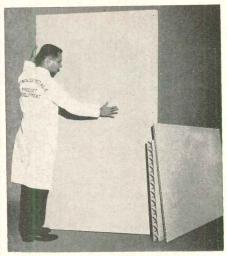
Sudden darkness from power failure can bring heavy losses. You need Exide Emergency Lighting Systems to provide the necessary illumination at such a time.

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The Electric Storage Battery Company

Product Reports



Aluminum Structural Panel

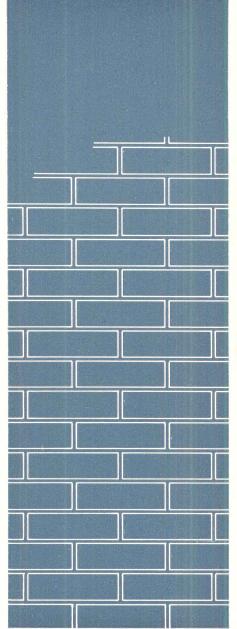
A panel composed of two flat sheets of aluminum bonded to a core of either corrugated or delta-formed aluminum sheet is expected to speed and simplify construction of homes and other buildings. The corrugated core gives the entire panel structural strength and air pockets provide adequate insulation. No sheathing, masonry, painting or finishing is necessary. Reynolds Metals Co., Richmond 18, Va.



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The Hi-Lo Dimswitch, a new electronic dimmer, makes it possible to tune room lights to 30 per cent brightness as well as full off and full on. In the dim position, it uses proportionate current, thus decreasing electrical costs and increasing lamp life. The switch, which matches standard wall switches in size, shape and finish, operates on single pole, three-way and four-way circuits and comes in either regular or interchangeable QST size for single or multiple gang boxes. Slater Electronics Corp., 45 Sea Cliff Ave., Glen Cove, N. Y.

more products on page 260



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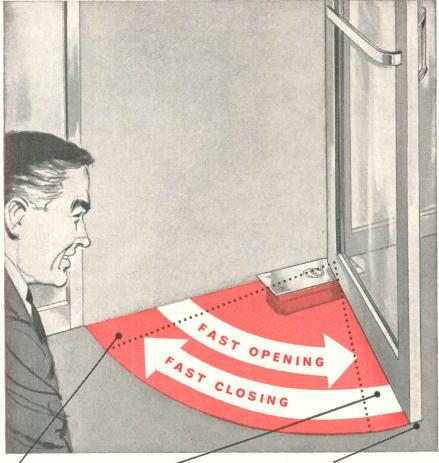
color is certainly one important factor, and Hanley Company offers you building materials (Duramic® Glazed Brick and Duramic®Glazed Structural Facing Tile) that meet this important consideration. Our color specialists have developed an excellent range of true colors to meet your most exacting specifications. Standard colors run from rich solids to beautiful pastels . . . some with speckle, mottled or matte finish . . . there are 49 in all. Design with the knowledge that here is a material that will not fade, is self cleaning, made from the finest Pennsylvania clays, and in the widest range of colors. Our sales people will be happy to assist





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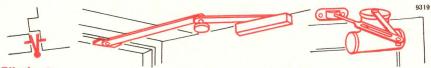
Latching speed slowed by hydraulic cushion

Shocking stops overcome by Hydra-Cushion slowdown Positive back stop 90° or 105°

The new Dor-O-Matic Hydra-Cushion concealed-in-floor door control gives maximum protection to doors and frames. Stops and overhead holders which cause damaging shock when doors are banged open are unnecessary! Now doors are gently cushioned to a stop by an adjustable hydraulic action as they approach open position. No need for expensive, heavy-duty anchor or pivot reinforced hinges because the Dor-O-Matic Hydra-Cushion eliminates the damaging stresses transferred to hinges and door frames when doors are brought to a smashing halt. Positive built-in back stop . . . and built-in hold open . . . eliminate door or floor applied stop devices.

Available for either offset or center pivoted doors. Write for complete information on these new No. 2500 and 2600 series

Hydra-Cushion door controls.



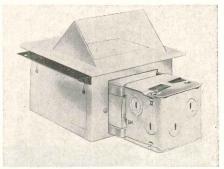
Eliminate damaged doors, frames, butts . . . overhead door holders . . . overhead door closers



division of REPUBLIC INDUSTRIES, INC. 7358 West Wilson Avenue Chicago 31, Illinois

CANADA: Dor-O-Matic of Canada, Ltd., 550 Hopewell Ave., Toronto 10, Ontario

Product Reports



Recessed Lighting Unit

A 40 degree recessed "wall washer" unit, completely prewired, has been developed for specialized lighting applications. The diecast one-piece frame is 7½ in. square with a finish opening 6¾ in. square. Sixty-watt bulbs are recommended. Prescolite Mfg. Co., 2229 Fourth St., Berkeley, Calif.

More Efficient Fluorescent Lamp

A new phosphor combination now makes possible a fluorescent lamp that not only provides higher efficiency but also greater economy in lighting costs. It is designed to provide 15 per cent more light than standard 40-watt lamps, and 36 per cent more than daylight-type lamps. Made in the universal preheat, rapid-start design, the lamp fits all present fixtures and ballasts. Westinghouse Electric Corp., Box 2278, Pittsburgh 30, Pa.

Sound-Reducing Safety Glass

A combination of transparent panels of a special laminated safety glass and Saflex polyvinyl butyral plastic sheet helps in suppressing many undesirable noises. This new material is "tuned" to be especially effective in damping sounds at frequencies of 1,000 to 4,000 cycles per second, the range of many vocal and mechanical sounds. Monsanto Chemical Co., Springfield, Mass.

Nylon Floor Tile

A new floor tile made of shredded nylon plus other chemicals and pigments provides toughness, wear-durability and anti-skid qualities. Suitable for both indoor and outdoor use, it is resistant to acids, alkalis and cigarette burns, and requires no polishing. It comes in solid colors and simulated marble patterns. High Point Chemical Co., Inc., Port Washington, L. I., N. Y.

more products on page 264

Great new things are shaping up in concrete block



Atlas Masonry Cement provides the right mortar

This is "slump block." It is a decorative concrete masonry unit that resembles adobe brick or weathered stone. Usually integrally colored, "slump block" produces unusual effects in masonry construction. It is available from local concrete block producers in a variety of widths, lengths, colors and textures.

Whether "slump block" or other masonry units are used, ATLAS MASONRY CEMENT continues to be the preferred basic material in mortar. It makes a smooth, workable mix... gives a strong bond... provides durable joints that are uniform in color. Complies, too, with rigid ASTM and Federal Specifications. Literature on request. Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

M-82

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WESTINGHOUSE ON-THE-WALL COOLER

Hides unsightly plumbing—makes floor cleaning easier!

This slim, smartly styled "Wall Line" Water Cooler offers special advantages not found in conventional coolers. A real space-saver, it extends only $12\frac{1}{2}$ inches from the wall. Other coolers with exposed plumbing jut out from 6 to 10 inches further.

By completely enclosing unsightly plumbing, the new Westinghouse ends cleaning problems. There's nothing to catch trash under or behind it—nothing to become scuffed. Units may be installed at any desired height. When they're mounted on the floor, the bubbler's just right (31 in.) for children. The new Westinghouse Onthe-Wall Cooler is one of a line that gives you

Westinghouse

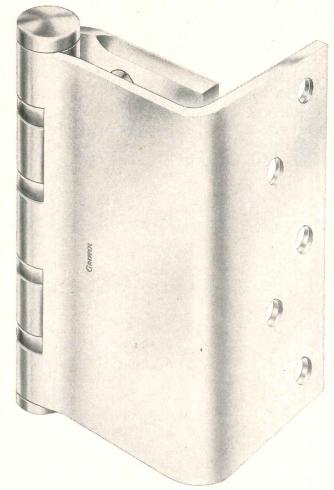


complete flexibility in cooler placement—flush to wall... on the wall... and in the wall. For full information, call your Westinghouse Distributor, listed under "Water Coolers" in the Yellow Pages. Or fill in and mail the coupon to us.

Specify Electric Water Coolers for school use—only slightly higher than non-refrigerated wall fountains. You can be sure...if it's Westinghouse.

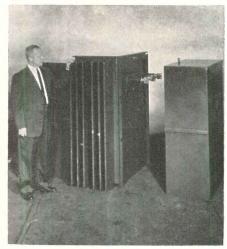
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Columbus, Ohio Gentlemen: Please send ful "Wall Line" Water Coolers	l information on your new
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Product Reports



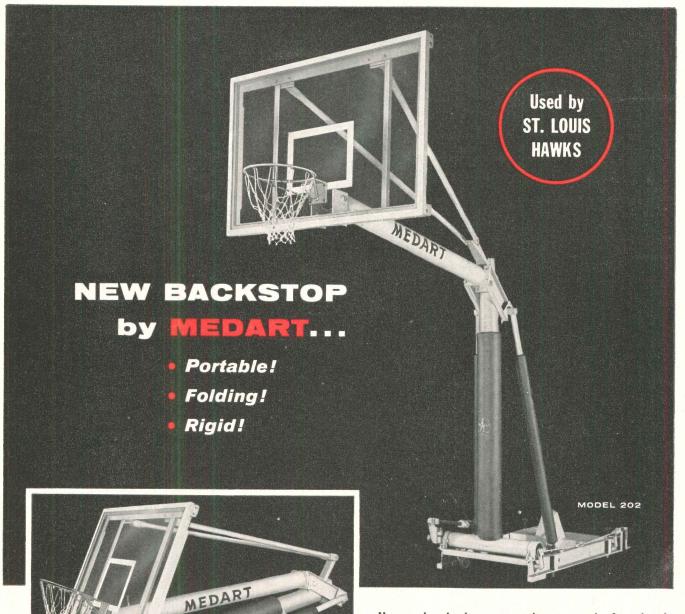
Pad Mounted Transformer

A new commercial pad mounted transformer, low in cost and versatile in application, has been especially designed for suburban areas with heavy low voltage load concentration. Elimination of all unnecessary gauges and accessories results in an uncluttered exterior with locked and tamper-proof high and low voltage enclosures which accommodate either cable or bus work. Available in three phase sizes. Allis-Chalmers Manufacturing Co., Milwaukee 1, Wis.



Multicare Unit for Patient Care

A new hospital casework unit designed to answer the needs for hospitalized patients' comfort and morale, consists of table top with storage below, wall service panel, cubicle curtain and wardrobe space. The unit extends from the wall adjacent to the patient's normal bed position. Some of the advantages for both patient and hospital staff are patient's access to room controls, direct communications and personal needs normally available only to the nurse. Basic units are custom-made to meet individual hospital requirements. St. Charles Hospital Casework Systems, St. Charles Mfg. Co., St. Char-



Compact! Model 202 folds to a height of only 50", and requires a storage floor space of just 54" or 72", depending on type of bank, x 121". Backstop is quickly raised to playing position with an easily-operated hydraulic pump, or lowered to folded position in seconds by release of a safety lock and valve.

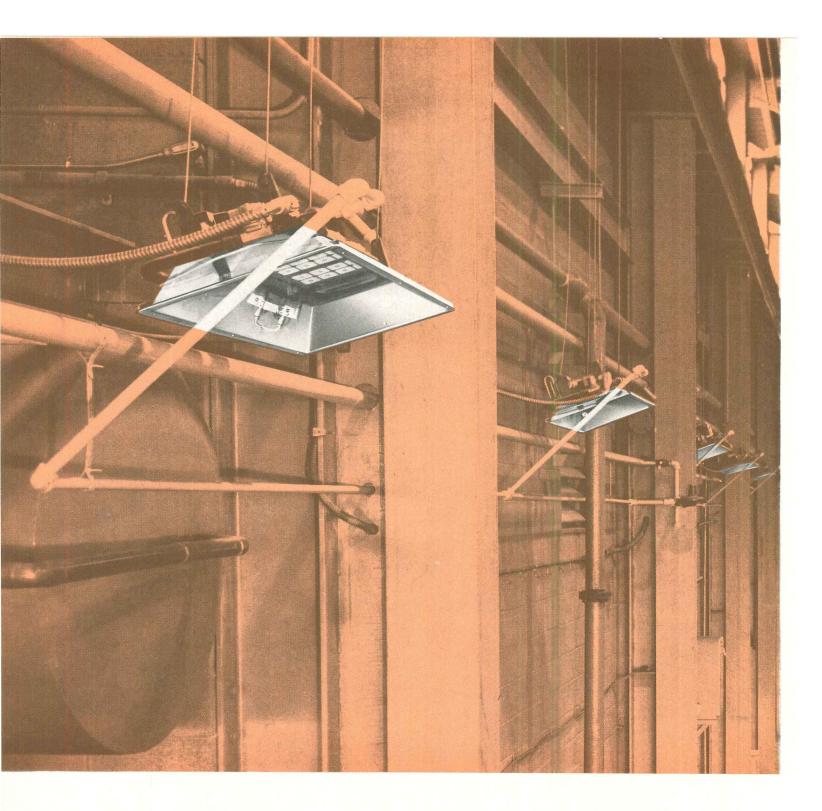
No overhead pipe suspensions — ready for play in minutes — rolls easily, quickly into storage

- Model 202 eliminates custom-built overhead suspensions, cables, winches and costly installation without the slightest sacrifice of rigidity.
- Four of the Model 202 replace six suspended backstops normally used in most gyms—4 for practice, 2 for spectator games.
- Extremely rugged construction. For play, base rests on floor-protective pads and is anchored into 4 floor plates.
- For easy moving, a single handcrank raises backstop on to 4 rubber-tired ball-bearing casters that protect the finest floor finish.
- Furnished with official fan-shaped or rectangular backboards of glass, steel or wood.
- Protective laced-on pads for vertical support column and braces, as well as base, available.

Ask for complete details.



265



Universal-Cyclops equips new Coshocton plant with PERFECTION SCHWANK Gas Infra-Red Heaters

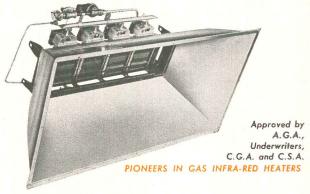
Amazing Comfort Plus \$3,470. Fuel Savings



After an extensive investigation of all types and methods of space heating, Universal-Cyclops Steel Corporation chose Perfection Schwank Gas Infra-Red Heaters as the best available method of heating their new ultra modern stainless strip steel plant at Coshocton, Ohio. They have installed Perfection Schwank Heaters exclusively except for office areas and use (352) 48,000 BTU units to maintain a constant temperature of 65°F. over a high bay floor area of 320,000 square feet. These units provide silent and trouble-free operation. In addition, the working conditions maintained by these heaters, uniform temperature, warm floors and machinery, and cleanliness are a boom to production and a great asset in the close tolerance, fine finish operation to produce Universal-Cyclops high quality stainless steel.

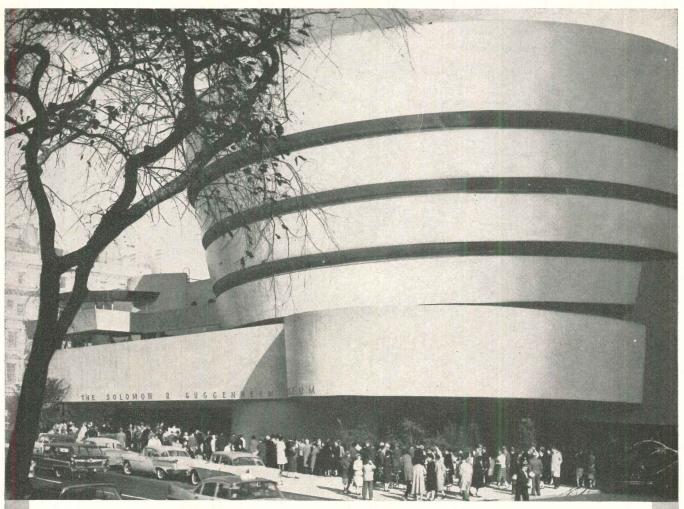
Satisfaction such as this is standard among the more than 25,000 enthusiastic users of Perfection Schwank Gas Infra-Red Heaters. Call, write or wire for complete information.

80' Wide, 785' long, 52' high main bay of Universal-Cyclops Coshocton Plant. The entire plant (exclusive of office space) is heated by Perfection Schwank Gas Infra-Red Heaters; has concrete floors, insulated steel roof and non-insulated walls.



Under Schwank U.S. Palents 2,775,294 and 2,870,830 and pending applications.

PERFECTION 1135 Ivanhoe Rd., Cleveland 10, Ohio



The Solomon R. Guggenheim Museum, New York, New York Architect: Frank Lloyd Wright General Contractor: Euclid Contracting Corp., New York, New York

ONLY

REINFORCED CONCRETE Provides such Freedom of Design



Interior view of the museum showing spiral ramp galleries.

As a pioneer in contemporary building design, Frank Lloyd Wright used reinforced concrete freely in the achievement of his most outstanding building designs. His famous Guggenheim Museum in New York City is a monument to his creative genius and an excellent example of the design freedom possible with this flexible construction material.

Concrete Reinforcing Steel Institute 38 South Dearborn Street Chicago 3, Illinois



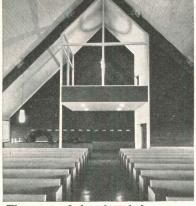
16-6



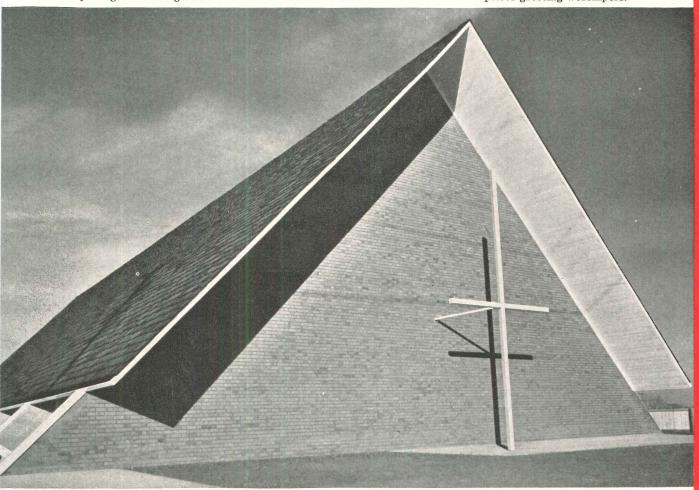
A unique departure from the traditional is the three-sided communion table, situated at the left below the choir loft. The floor area shown is ceramic tile. Natural wood finishes and surrounding painted surfaces add contrasting texture to the adjoining brick and glass.



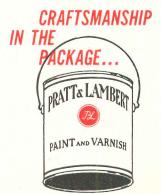
The uncluttered space contributes to the congregation's full view of the church. Folding doors form a background for the lecturn and chairs of the clergy. When these doors are open this area can be utilized as a stage or platform for other church activities.



The rear of the church houses a glass enclosed, sound-proof "cry" room for small children accompanied by their parents. A decorative planter and superbly-modern lighting fixture are tasteful, visual surprises greeting worshipers.



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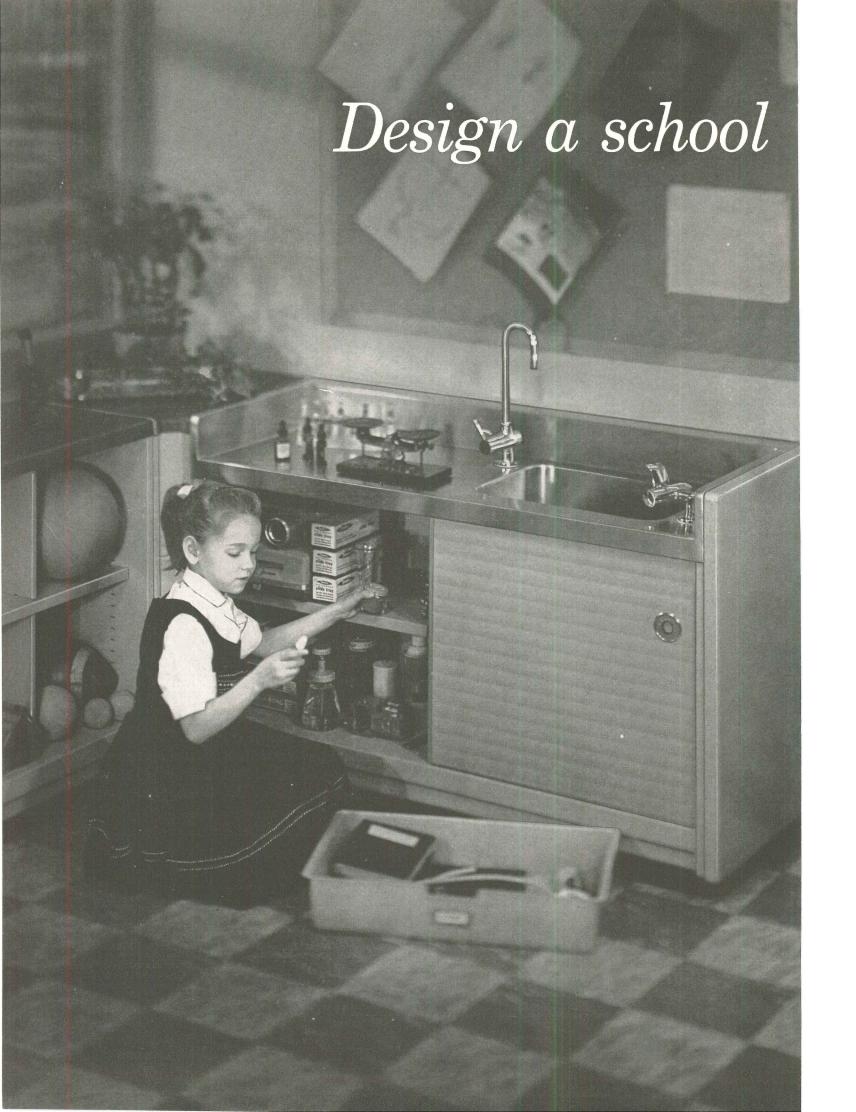
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Professional-level, color planning service by experienced Pratt & Lambert representatives...the suggestion of distinctive color plans, in addition to recommendations of authoritative painting specifications, is available upon request and without obligation. Please write: Pratt & Lambert Architectural Service Department, 3301 38th Ave., Long Island City 1, N.Y., 4900 S. Kilbourn Ave., Chicago 32, Ill., 75 Tonawanda St., Buffalo 7, N.Y., 254 Courtwright St., Fort Erie, Ontario.

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around the classrooms

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so the core of your design will be efficient classrooms or "learning spaces."
Classroom productivity calls for the right indoor climate at all times
and flexible facilities that encourage pupil participation—active learning.
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This classroom ensemble includes a Nesbitt Syncretizer unit ventilator or a
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You know Nesbitt: an originator, not an imitator, of classroom comfort equipment,
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■ A longer school year is looming as an economic necessity. Summer comfort conditioning for classrooms helps to realize this economy by reducing the plant cost per pupil-hour. Many schools on nine-month schedules already need mechanical cooling and dehumidification at certain times of year. Where summer classes are being held or are contemplated, the Nesbitt Year-Round system is a justifiable investment. As you well know, designing the building for most economical air-conditioning use can save more than enough to pay for the difference in cost between the two systems . . . but either way: going Nesbitt will mean *more learning per school dollar*. Send for publication SP-1060.



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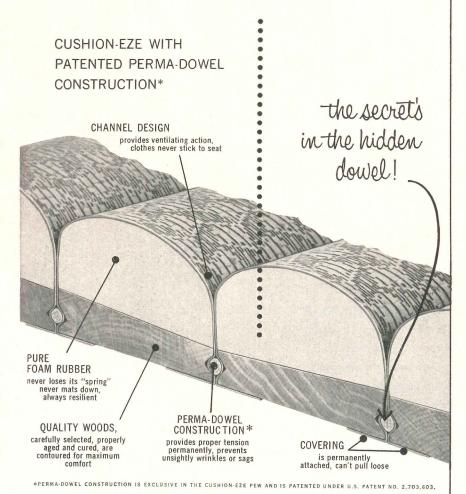
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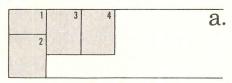
ORIGINATORS AND MANUFACTURERS OF IMPERIAL AND CRESTWOOD PEWS • CUSHION-EZE and add-a-cushion foam cushioning • Custom-designed Church Furniture

LIGHTING FOR 3 ARCHITECTURE

The Lighting System: Fixture Facts and Building Factors

CREDITS

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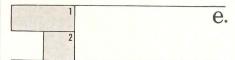
- 1. Courtroom. Courtesy Eggers Plywood Co. 2. University of South Carolina, Columbia,
- S. C. Lyles, Bissett, Carlisle & Wolff, Archts.; Edward D. Stone, Assoc. Archt. Photo: Joseph W. Molitor
- 3. Warren Methodist Church, Warren, Mich. Yamasaki, Leinweber & Assocs., Archts. Photo: Baltazar Korab
- 4. Southland Center, Dallas, Texas. Welton Becket & Assocs., Archts. & Engrs. Photo: John Rogers

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- 1. Pepsi Cola Building, New York, N. Y. Skidmore Owings & Merrill, Archts. Photo: Ezra Stoller
- 2. Children's Hospital, Boston, Mass. Photo: Photo International, Inc.
- 3. Bennington College, Bennington, Vt. Pietro Belluschi & Carl Koch & Assocs., Archts. Photo: Ezra Stoller

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1. Alcoa Building, Pittsburgh, Pa. Harrison & Abramovitz, Archts.; Mitchell & Ritchey and Altenhof & Bown, Assoc. Archts. Photo: Courtesy of Aluminum Company of America 2. Stoughton Elementary School, Stoughton, Mass. The Architects Collaborative, Archts. Photo: Louis Reens

CORRECTION

Solomon R. Guggenheim Memorial Museum, Article 2. Lighting Designer: Alfred A. Binder. Photos: Courtesy American Lighting Corporation



There is nothing like stainless steel for HOMES AND HOME PRODUCTS

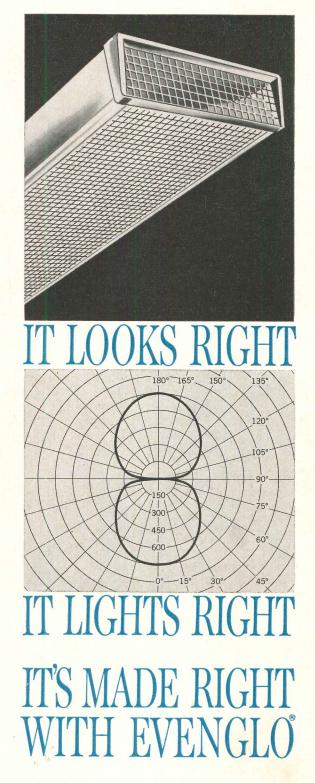


McLouth Steel Corporation, Detroit 17, Michigan

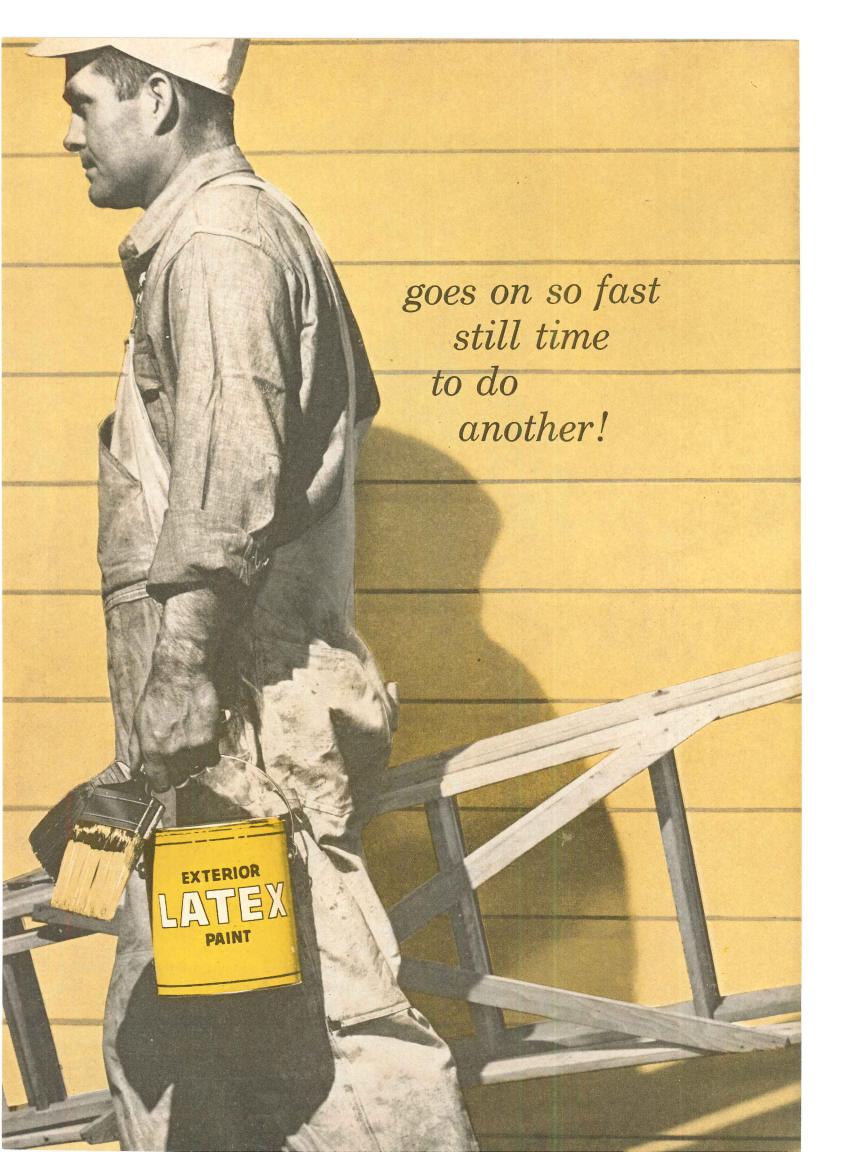
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M°LOUTH STAINLESS STEEL





Benjamin Electric's new Catalina lighting fixture has smooth, uninterrupted lines; there is no visible hardware to mar its clean, sculptured look. It Looks Right. The Catalina is only 3½" from top to bottom. It's available in 4' and 8' lengths, both lens or louver bottom. This fixture is easy to install and gives soft, shadow-free illumination. It Lights Right. The louvers, side panels, and decorative end caps of the Catalina are made from versatile Evenglo polystyrene, a Koppers plastic that comes in a complete range of whites and pastels, can be molded or extruded in practically any size or shape. It's Made Right. Light-stabilized Evenglo is tough, lightweight, and dimensionally stable. For more information on Evenglo polystyrene and for a list of manufacturers using Evenglo in fluorescent fixtures, write to Koppers Company, Inc., Plastics Division, Dept. AR 100, Pittsburgh 19, Pennsylvania.



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can practically cut painting time in half. They flow smoothly - go on quickly and easily. Use them on previously painted or oil-primed wood, on masonry and most other surfaces. Moisture resistant in minutes, they're completely dry within the hour, with a tough waterproof film that resists sunlight, dust, fog, mildew, salt air, wash-offs or streaks. Clean-up is with soap and water. Their durability in all climatic areas measures up to other types of exterior paint.

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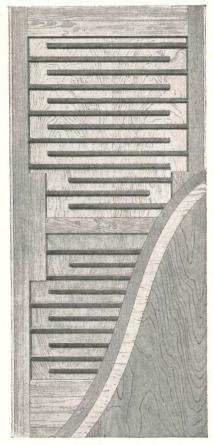
ARCHITECTURAL DOORS

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HASKELITE BRICK-BLOCK SOLID CORE DOORS

Only carefully dried, selected woods are used for the core, frame and faces—resulting in doors of extra durability with maximum resistance to warping and other defects. All Haskelite doors are available in a wide variety of standard and special faces (including metals, plastics and exotic woods) to meet all architectural requirements of any type modern building construction.



HASKELITE

HOLLOW CORE DOORS

Are precision constructed of the finest materials. Haskelite Hollow Core Doors hang straighter, open and close easier, are easier to install. Seven-ply construction provides peak resistance to distortion—eliminates core and frame show-through. Specially reinforced frame accommodates most special hardware. Backed by a guarantee against delamination.

All Haskelite doors are quality built ... advanced **Thermo-Bonding** process uses pressure and heat to resist distortion ... **Unitized Frame Construction** provides outstanding structural rigidity ... **Velvetized Surface** brings out the full natural beauty of face veneers ... doors can be factory prefit and prefinished per architectural specifications.

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Haskelite doors are available in special lengths and widths to allow the architect greater freedom of design and to simplify installation . . . Haskelite will fabricate, prefit and prefinish doors to your exact specifications. Another advantage of specifying Haskelite doors is the enduring quality of their specially selected face veneers. There's lasting client pride and satisfaction in Haskelite installations.

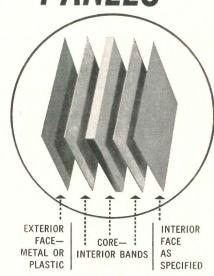


HASKELITE
PARTICLE-BOARD SOLID CORE DOORS

No other doors offer so many structural advantages at so moderate a price. They combine a substantial, solid appearance with lightness of weight and low sound transmission. Resinimpregnated core has fire-retardant and moisture-repellent characteristics. Specified by leading architects from coast to coast. Like all Haskelite doors, they are fully warranted in writing.



HASKELITE CURTAIN WALL PANELS



Virtually Unlimited Fabrication to Your Specification

Haskelite Curtain Wall Panels come in a wide choice of faces, cores and colors to provide almost unlimited design and structural freedom. They open up a wide range of design and installation advantages.

Haskelite Curtain Wall Panels:

- ... are light in weight ... cut handling, shipping and installation costs
- . . . have high impact resistance
- ... are flat; wave-free surface will not buckle unaffected by temperature changes
- . . . are permanently insulated—have low thermal conductivity, will not absorb moisture
- ... are completely factory-prefinished ready for installation

It will pay you to specify Haskelite Curtain Wall Panels. For complete information see Sweet's Architectural File 3e/Ha or phone or write:



HASKELITE MANUFACTURING

DIVISION EVANS PRODUCTS COMPANY Grand Rapids, Michigan

Office Literature

continued from page 246

The Glassart Studio

(A.I.A. 26-A-25) Brochure describes the methods and materials used in the creation of stained glass. The group works with glass in four techniques; lead, concrete, mosaics and most recently, lamination. The Glassart Gallery, 47 West Fifth Ave., Scottsdale, Arizona.

Socket Head Cap Screws

Contains complete dimensional data on both the "1960 Series" and the "1936 Series" to help in deciding whether to shift over to the new design now or at a later date. Separate thread length charts are also provided. B. E. Olsen, Standard Fasteners, 2701 Washington Blvd., Bellwood, Ill.

Rubber Insulation

... for Wire and Cable includes data charts and graph explaining the load carrying capacity, reliability, versatility and long life of Silastic insulated wire and cable. Dow Corning Corp., Midland, Mich.*

Anti-Corrosive Paints

Technical bulletin No. 5 is devoted to *Aluminox* and heat resistant paints used where decoration is desired along with chemical and heat resistant properties. Bulletin No. 6 describes "double coat" paints which yield a dry film thickness equal to two standard coats. *Subox*, *Inc.*, *Fairmount Plant*, *Hackensack*, N. J.

Useful Pumping and Hydraulic

. . . Engineering Data covers cost of electrical pumping, how to survey a deep well, methods for testing pumps, and other practical information including many useful charts and problem-solving formulas. Bulletin No. EM-77 Peerless Pump-Hydrodynamics Division, 301 West Avenue, 26, Los Angeles 31, Calif.

Acoustic Terminal Control Units . . . for All-Air High-Velocity Systems (A.I.A. 30-J) provides information on three ceiling models and two window perimeter models plus data on system noise and tables of static-pressure losses and regains. Catalog No. 1060, 36 pp. Carnes Corp., Verona, Wash.

*Additional product information in Sweet's Architectural File

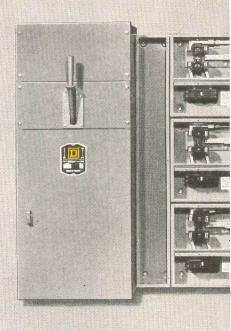
more literature on page 284

INTRODUCING BALANCED MOMENT BASE SPANS 60' to 130' KARRI-MORE FREE STANDING T-FRAME COLUMN BALANCED MOMENT BASE FINISH FLOOR LOW-COST ERECTION TRUSS TYPE A TRUSS TYPE C . NO BEARING WALLS WWW WW TRUSS TYPE B TRUSS TYPE D • LARGE COLUMN-FREE AREAS FREE STANDING T-frames eliminate bear-ing walls and expensive perimeter foundations. TRUSS TYPE G • EASILY EXPANDABLE UMBRELLA ROOF TYPE * Patents Pending FUTURE EXPANSION Write for Catalog TILL PROD I am interested in Shlagro T-Frame



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easy as hanging a picture.

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PLAN YOUR OWN ARRANGEMENT — Available wall space for the service and grouping of meters is frequently limited — and of a particular size and shape. Required locations of service and load conduits vary with each job. With E-Z STACK you have freedom of arrangement.

TEMPLATE LAYOUT — For installation convenience E-Z STACK devices include a full size template and wall mounting hanger brackets. Templates, attached to the wall, accurately position the hanger brackets for each device. Brackets on the wall interlock with clips on the back of the device.

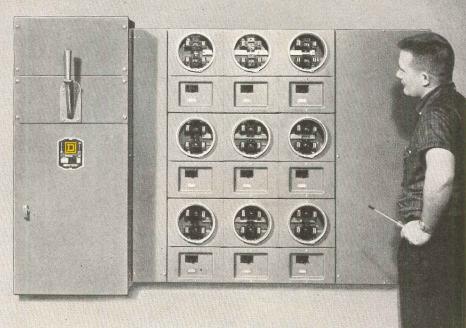
AVAILABILITY — All E-Z STACK devices can be ordered by catalog number from authorized Square D Distributors as they are needed. Individually cartoned, the final decision as to the meter arrangement and size of the circuit breaker disconnect for



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each apartment can be determined at the Distributor's counter.

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GETALL THE FACTS! Send f Bulletin No. SL-27 featuring E-Z S ing devices, a complete catalogi tions, suggested arrangements, a SQUARE D COMPANY • c/o Depart Mercer Road, Lexington, Kentucky	for new Service Equipment STACK design multi-meter- ng of features, specifica- and bills of material.
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PHOTO BY EZRA STOLLER

Vibroflotation®

was used to compact the sandy soil at Sarasota Senior High School



Vibroflot machine in action. Each compaction consumed 3 or 4 tons of sand

The foundations for the new Sarasota Senior High School, Sarasota, Florida, were built on sand compacted by Vibroflotation. 260 compactions were made to an average depth of 13 feet.

Vibroflotation provided a substantial savings over piling foundation solution. Additional savings were realized through elimination of all formwork for footings.

Proven applications of foundations upon sand total 100+ contracts throughout the U.S. A. and Canada.

Write for Booklet A-26

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930 FORT DUQUESNE BOULEVARD, PITTSBURGH 22, PA.

Office Literature

Sanitation Handbook

Lists complete range of sanitation and maintenance aids, with a description of the uses, performance, economies, guarantees and packaging of each. 44 pp. Huntington Laboratories, Inc., Huntington, Ind.*

American Standards Specification . . . for Polysulfide Base Sealants for the Building Trade covers application of polysulfides to concrete, aluminum, stainless steel and glass surfaces and can also be used as a frame of reference for suggested minimum performance of sealants. No. A116. Thiokol Chemical Corp., Trenton, N. J.

Light Reflectance Charts

Answer common queries on light reflectance values of *Mastic Tile* products. The chart shows the difference in reflectivity of asphalt and vinylasbestos tile colors. *Mastic Tile Div.*, *Ruberoid Co.**

Ballasts for Fluorescent Lamps

Contains data and prices for full line of ballasts and gives application and operating information. 20 pp. General Electric Co., Schenectady 5, N. Y.

New Directions in Chalkboard

(A.I.A. 35-B-1) Describes typical applications of *Colorlith* chalkboard in partitions, surfacing and paneling, and in special classroom units. Data on physical properties, installation details, and suggested specifications are also included. 16 pp. *Johns-Manville*, 22 East 40th St., New York 16, N. Y.*

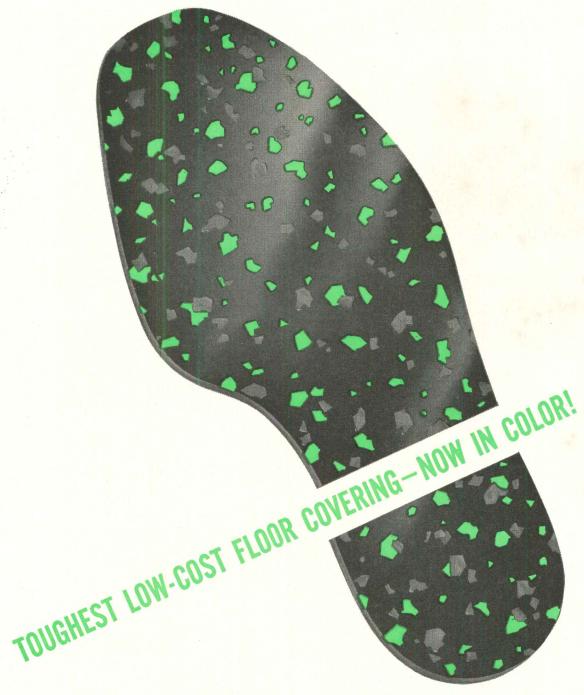
Consoweld Laminated Plastic

(A.I.A. 35-C-12) Discusses Consoweld laminated plastic, with information on finishes and properties, and descriptions and illustrations of patterns and colors. 12 pp. Consoweld Corp., Wisconsin Rapids, Wis.*

RKL Building Specialties

Describes and illustrates RKL line of concrete inserts and accessories, masonry anchors and specialties, iron work accessories for rough carpentry, and lathing and furring accessories. Catalog No. 7, 24 pp. RKL Building Specialties Co., Inc., 23-86 48th St., Long Island City 3, N. Y.

*Additional product information in Sweet's Architectural File



Pabco Mastipave steps out with a new look — in color. Colorful new **Deco Tread** Mastipave. Vinyl chips add a bright, decorative effect and make maintenance even easier than before.

It's the same rugged compound that for years has supplied the toughest floors...in hospitals, schools, factories, department stores, warehouses, churches, sanitariums, laboratories, offices, public buildings. In many installations it's still going strong after 30 years of hard wear! Good reason why every building needs Mastipave. Lay it anywhere with minimum surface preparation.

Deco Tread Mastipave — Terra cotta with sandalwood and beige chips, black with chips of gray and green; in 3 foot wide rolls, 30 yards long and $9" \times 9"$ tiles.

Regular Mastipave — Terra cotta, black and green; in 3 foot wide rolls, 30 yards long and $9'' \times 9''$ tiles.

Grip Tread Mastipave — With exclusive non-slip traction surface, terra cotta; in 3 foot wide rolls, 30 yards long.

For anyone selling or servicing the vast institutional-commercial market, write, on your letterhead, for free folder on the bright profit opportunities available — the Mastipave way.



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VARIETY! DESIGN FREEDOM!





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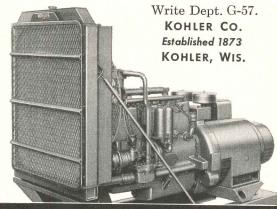
KOHLER ELECTRIC PLANTS

Widespread hazards, inconvenience, discomfort and loss occurred in places without standby power during the 13-hour power failure in New York's Manhattan last summer. Hospital surgery was performed

without proper lighting; patients were served by candlelight. Buildings of many kinds had no use of lights, air conditioning, elevators, freezers.

Kohler electric plants are reliable, easy to install for emergency power made vitally important by today's increasing dependence on electrical equipment. To help you write specifications for varied applications, Kohler Co. will send on request a manual with complete data on sizes from 1000 watts to 100 KW, gasoline or diesel.

MODEL 100R81 100 KW, 120/208 volt AC. Stand-by. Remote start.



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Washington Topics

continued from page 60

gineers for open space and parkland ought to be considered and resolved on their merits. It is impracticable, in my judgment, to approve Federal funds for urban renewal projects without considering the effect which proposed Federal-aid highways may have on the redevelopment areas, and vice versa. The need for intelligent adjustment of all these and other values and interests in both local and Federal programs becomes more pressing as rebuilding programs in major cities throughout the nation—and particularly in states like New Jersey-assume even greater proportions."

The Case-to-Mason letter made this telling point—"It does not make sense for the Federal government, on the one hand, to spend millions of dollars to fight slums and decaying city centers, only, on the other hand, to take other steps which tend to promote the spread of blight in the same communities."

It was held that without appropriate review, new roads in the Federal Interstate Highway System create serious problems of urban decay for the communities involved.

Administrator Mason's reply to Senator Case agreed that "something should be done to assure the long-range effectiveness of comprehensive planning for our urban areas." It expressed wholehearted agreement with the Case goals but raised the point that local interests should have a strong voice in determining the best avenues of planning for their future growth.

Local Voice Upheld

Senator Case had suggested an amendment to the 1956 highways act providing that no road traversing an urban area should be approved as a part of the Interstate Highway System without certification by the Housing and Home Finance Agency that it would not have a detrimental effect upon the community as a whole and would not be inconsistent with sound future development.

The full support of the Federal government should be behind any effort to close the gap between the action programs and the planning which has been done, Administrator

continued on page 292







For strength ... economy ... versatility

Two advantages of using steel joists are readily apparent in this printing shop: wide, column-free expanses of floor space, easy solution to placement of ductwork, pipe, and conduits.

Five good reasons for designing with Steel Joists

EASY TO INSTALL UTILITY SERVICES

The open webs in Bethlehem Steel Joists allow for the passage of pipe, wires—even heating lines—in any direction. The open webs also greatly simplify installation of conduit and wiring for recessed lighting fixtures.

FIRE-RESISTANCE

Steel joists in combination with floor slab and plaster ceiling form a barrier with up to four hours' fire-resistance, depending on slab thickness and the type of plaster. And greater fire-safety is of particular importance in multi-story buildings such as hospitals, apartments and schools.

NON-SHRINKING, NON-WARPING

Building maintenance is greatly simplified when you design with joists. They provide non-shrinking, non-warping construction which eliminates sagging floors and cracked ceilings.

COLUMN-FREE SPACE

Steel joists are ideal for long spans such as auditoriums, gymnasiums, garages, stores. And in any building they give a maximum of column-free space.



Steel joists arrive at the job site fully fabricated, ready for immediate placing.

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Joists arrive at the job fully fabricated and tagged, ready for immediate placing. Two men can easily place small joists, and a simple derrick lifts the larger sizes.

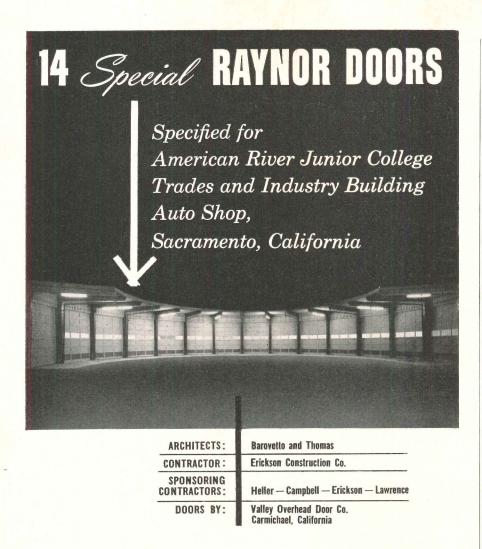
These are some of the important advantages you get when you design with Bethlehem Open-Web Steel Joists. Bethlehem Joists are fully approved by the Steel Joist Institute.

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BETHLEHEM STEEL





The eye appeal and versatility of Raynor Doors highlight the circular design of the American River Junior College Auto Shop shown above.

The perfection with which Raynor Doors so completely create the desired effect and meet the exacting specifications of outstanding architectural designs such as this, is accomplished through Raynor Advanced Sectional Door Engineering Know-How. Built complete under one roof, Raynor Doors embody only the finest materials available . . . employ construction features such as exclusive "Graduated Seal" . . . three-way stress construction . . . heavy-duty galvanized hardware and "Lifetime Guaranteed" Dorlux panels.

Whatever your specific design problem may be, the Raynor Engineering Department will provide the correct solution. Contact your nearest Raynor Distributor or write direct.



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Dixon, Illinois Hammonton, New Jersey



Washington Topics

continued from page 288

Mason noted, in holding that local responsibility and local initiative are the keys to successful urban development.

Plans themselves are the responsibility of state and local governments having jurisdiction over the respective areas, the housing chief pointed out. His letter asked why, in those areas where citizens have agreed upon plans for community improvements, they could not have a voice in the plans for roads that traverse their urban area.

Mr. Mason also wrote Senator Case that he would like to discuss methods with him and implied the two were in complete agreement on goals. "Because of the very nature of Federally-aided highways involving the joint interests of states, counties and local communities, it is really a complex problem," his letter stated. "I am sure you will be glad to know that this problem is now under study by the Executive Branch. Several different types of studies are under way to come up with alternate solutions to a problem that, as you point out, certainly needs attention."

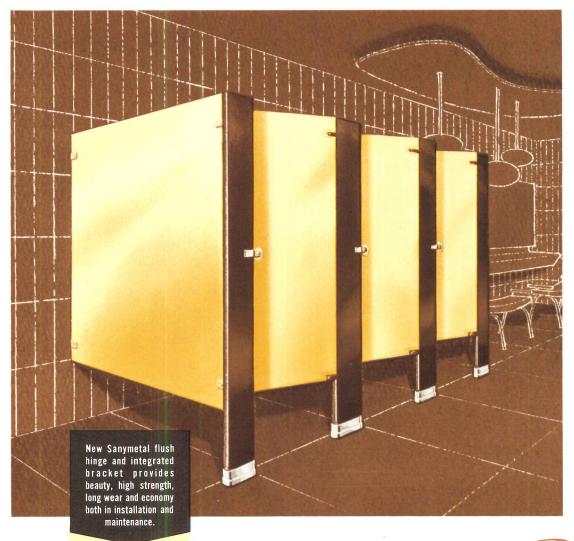
The HHFA head also called attention to what his agency feels to be one of the most urgently needed facets of comprehensive planning—mass transportation systems. States and localities are being urged in their Section 701 programs to place greater emphasis on the integration of transportation planning and planning for future urban development.

USPHS Schedules Conference on Water Resources "Crisis"

While HHFA was seeking to improve the supply of manpower for tackling urban development and housing problems, the U. S. Public Health Service of the Health, Education, and Welfare Department was concerning itself with a developing crisis in pure water supplies.

Surgeon General Leroy E. Burney had told a steering committee in August that the country was surely headed for a water crisis in the current decade unless the American people did a much better job of

continued on page 300



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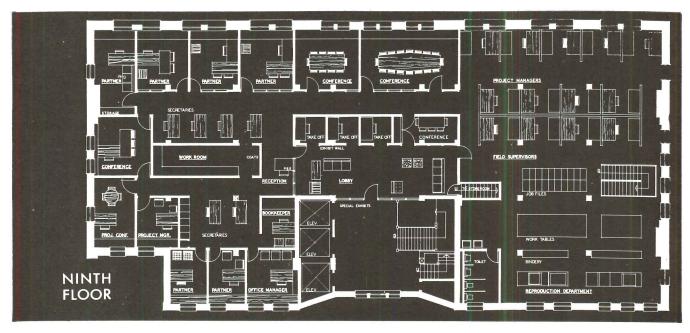
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Nameplate identifies every compartment



DALTON-DALTON ASSOCIATES, A DYNAMIC PRACTICE, STREAMLINED RY SOUND PLANNING AND COMMUNICATIONS

Cleveland's historic Old Arcade building houses the unusually progressive architectural firm of Dalton-Dalton Associates. Typical of the approach that has earned them responsibility for current projects ranging from one to $15\frac{1}{2}$ million dollars is their continuing research and study of advanced structural forms and systems unrelated to current projects.

They have also found that they can best serve the interests of their clients and their own efficiency by providing a broad range of design and engineering services. These include site planning and landscape architecture . . . color and furnishings selection . . . business management, etc.

The Dalton-Dalton offices provide a colorful, interesting, stimulating environment for staff and clients alike. Efficient work flow and good industry communications go hand in hand here.

This is reflected also in the firm's attitude of cooperation with F. W. Dodge. When the Dodge Reporter calls, he is referred to the manager or partner in charge of the project

about which an inquiry is made. Dalton-Dalton benefits from this direct line of communication. When a Dodge-alerted salesman calls, he is better prepared to helpfully discuss work in progress with busy principals.

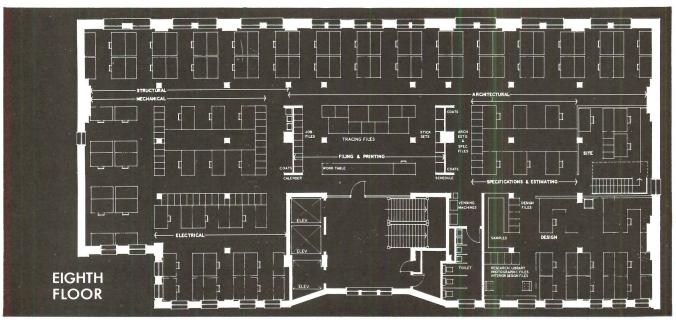
Plans and specs filed in local Dodge Plan Rooms help divert traffic and inquiries away from their offices, Dalton-Dalton and their clients benefit because Dodge Reports expedite wider ranges of bids and material quotations.

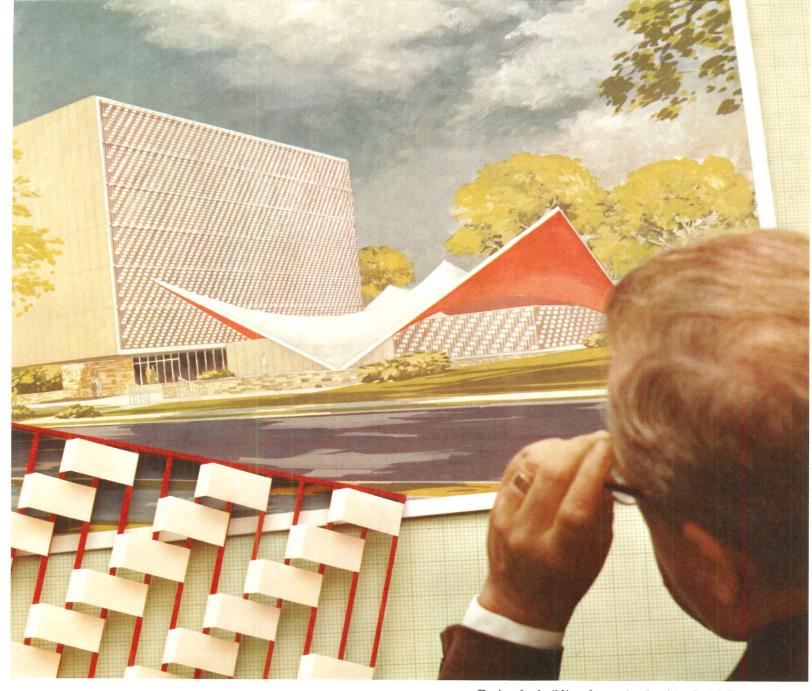
Dalton-Dalton's emphasis on this smooth exchange of information is further evidence that DODGE REPORTS ARE A VALUABLE COMMUNICATIONS LINK BETWEEN THE ARCHITECT AND THOSE WHO SERVE HIM.

DODGE REPORTS

CONSTRUCTION NEWS DIVISION 119 West 40th Street, New York 18, N. Y.







Design for building decoration by Altenhof & Bown, AIA

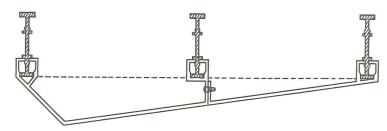
Pittsburgh architect envisions office center with Alcoa Sol-Dec Screens

Architects have already begun to explore the variety of exciting new opportunities for sun-screening and ornamentation offered by Alcoa* Sol-Dec Screens. Office centers with screen curtains are but one application. Others are facings for new or old schools, hospitals and commercial buildings; overlays on cooling towers, penthouses, lobby walls and canopy soffits; vision screens and barriers for rooms, patios and gardens.

Sol-Dec Screens come in 11 standard patterns, or your own designs, at reasonable cost. Their surprising economy is a product of design simplicity, involving only three basic precut extrusions—panelettes in either flat or contoured profile, I-beams 8 in. on center designed to span 12 ft, and a clip member. Panelettes can be alternately snapped to the front and back of the I-beams so as to give a three-dimensional effect.

*Trademarks of Aluminum Company of America

Precut aluminum panelettes in custom finish or Alcoa Alumalure® colors snap on to miniature I-beams—are locked in place with pliers.



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A letter will bring you all the information needed to explore Sol-Dec Screens' versatility at your own drafting board. Alcoa's veteran counsel is available without obligation to help you adapt this newest architectural treatment to your requirements. Write: Aluminum Company of America, 1823-K Alcoa Building, Pittsburgh 19, Pa. World-wide sales through Alcoa International, Inc., 230 Park Avenue, New York 17, New York.



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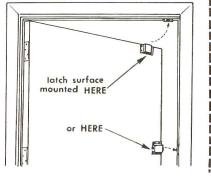


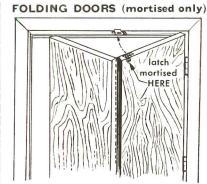
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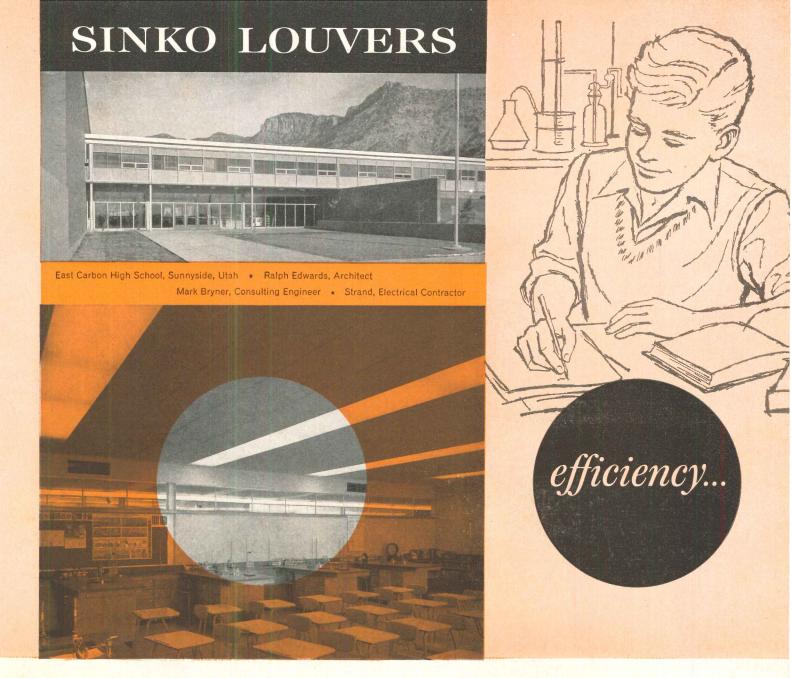




see functional display at Booth 52 • NBHA convention

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Western Lighting of Los Angeles, California selected Sinko THIN-CELL Louvers because of their EFFICIENCY in providing adequately diffused lighting in the school rooms of the East Carbon High School, Sunnyside, Utah.

Through this efficient lighting system, the East Carbon High School has provided their students with 90 foot candles of illumination, in accordance with the new Recommended Illuminating Levels recently adopted by the Illuminating Engineering Society.

The installation consisted of special type fixtures using two 40 watt cool white lamps on 11" centers, with a plenum height of 12".

Achieved with this installation was a maintained 90 foot candle of soft diffused light.

Whatever your lighting requirements might be, check into the EFFICIENCY of Sinko THIN-CELL Louvers.

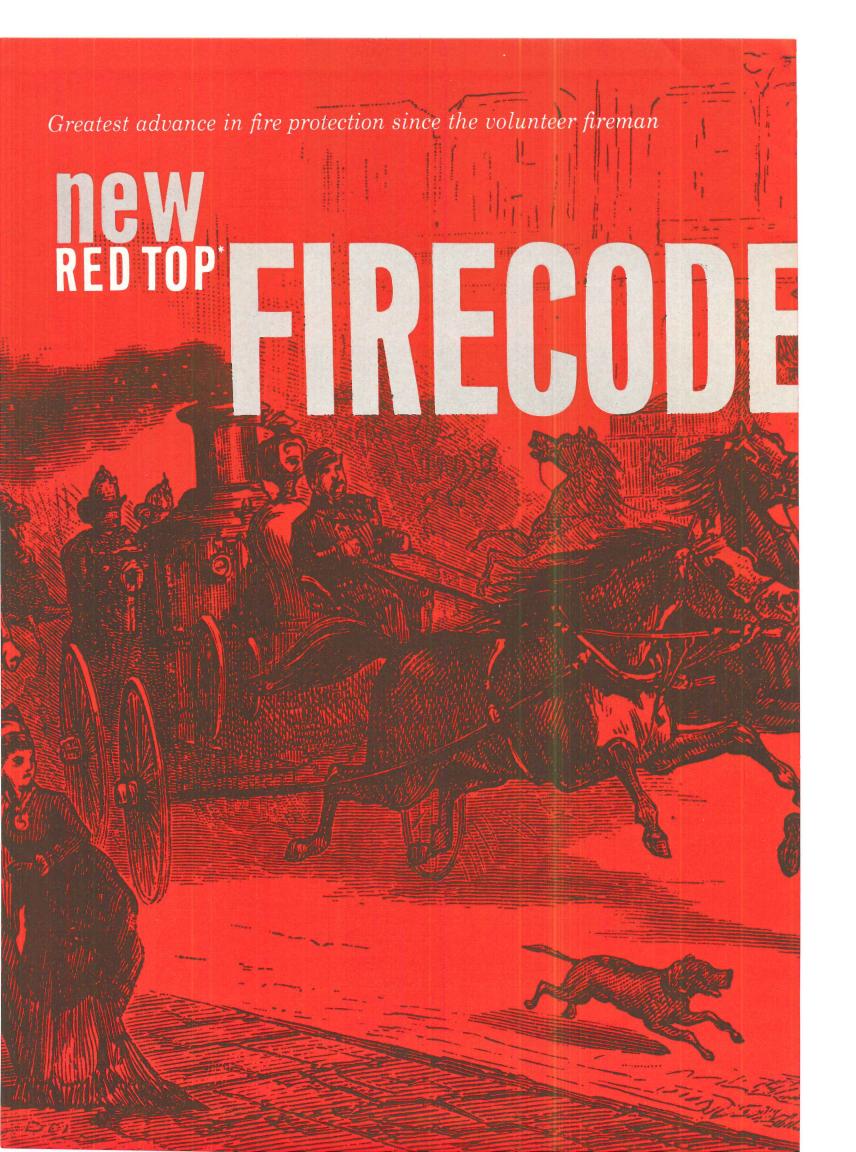


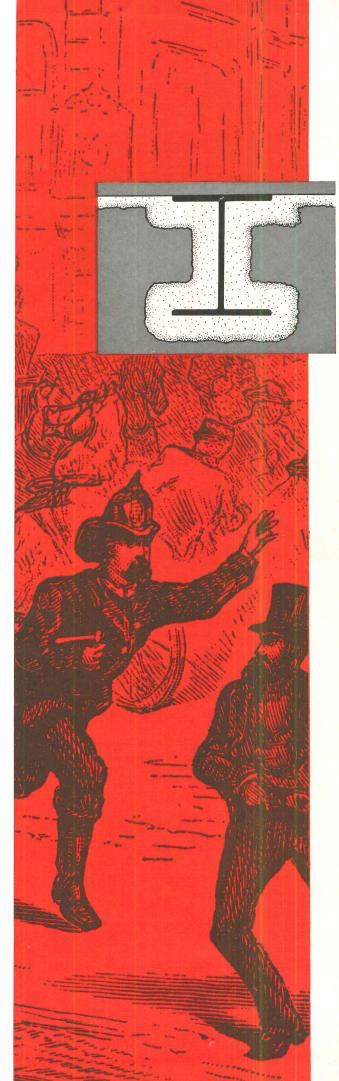
We invite you to write for Bulletin 32A which gives you complete details on Sinko THIN-CELL Louvers,

SINKO MANUFACTURING AND TOOL COMPANY

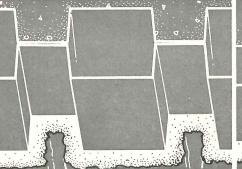
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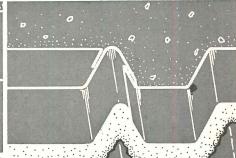






RED TOP FIRECODE Plaster sprays directly to corrugated, flat or cellular steel units . . . steel beams or columns may be sprayed directly or boxed and sprayed.





SPRAY-ON PLASTER

One coat contact-fireproofs steel deck assemblies at low cost—gives you the fire rating you need

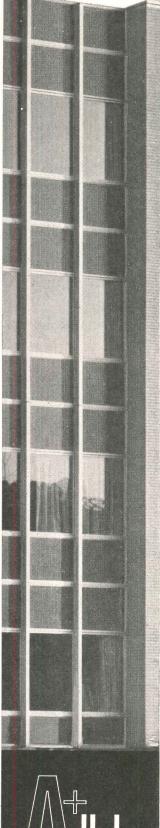
The greatest advance in low-cost fire protection for steel frame structures in over half a century: new, one-coat Red Top Firecode Plaster. It saves labor. One man can spray it directly to steel decks, supporting beams and columns to provide the exact fire rating needed . . . with no hand tooling. It saves plaster, too. A single contour application, which adheres to steel with a super-strong bond, is sufficient for nearly all steel deck assemblies. Ask your U.S.G. representative for complete details on this improved fireproofing at substantially less cost, or write United States Gypsum, Dept. AR-07, 300 West Adams St., Chicago 6, Illinois.



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name	Architect
firm	Builder
address	Owner

Washington Topics

continued from page 292

cleaning up water resources. And USPH also was planning a conference on its problems.

This was the National Conference on Water Pollution scheduled in Washington, D. C., December 12-14.

This meeting has a dual goal: (1) to establish substantial agreement on national goals for water pollution control; and (2) to obtain agreement on the specific programs needed to reach these goals.

Dr. Burney sets out the purpose of the conference in this statement: "Since the start of World War II, construction of water supply and pollution control facilities has lagged far behind national needs. These needs will continue to grow during the 1960's as the result of population increases, the further concentration of people in metropolitan centers, and sharp increases in the use of water by households, farms, and industry.

"Partly because of public apathy toward the water problem, the United States has accumulated a huge national deficit in needed facilities. In a number of communities and in some river basins, citizens, governmental authorities, and industry have done a good job of cleaning up rivers and other water sources. But in many other places much more aggressive action is necessary if mounting demands for clean water are to be met and if the public health is to be protected. . . . We need to apply more sanity to sanitation."

Four panels during the conference will concentrate on water pollution and our changing times, meeting the growing competition for water, keeping water clean, and research and training.

Congress Refuses GSA Bid for Shelters in U. S. Buildings

A General Services Administration request for funds to build fallout shelters in government buildings—both existing and new—went the way of so many proposals before the short session of the 86th Congress. It was turned down.

GSA long had entertained hopes of spending \$2 million on the shelter continued on page 304

windows and

curtain walls



Spang Headerduct will feed electric, telephone and intercom wiring into floor cells on 28 of the 32 floors at First City National Bank Building, Houston, Texas. This will provide service wherever it's needed and permit speedy changes to meet any future requirements,

In 1990 this Spang Headerduct wiring system will be as modern as it is today!

Houston's new First City National Bank Building is prepared electrically for any future requirements

Nobody knows what kind of electrical service the tenants of First City National Bank Building, Houston, Texas, will need in the year 1990. But this new building will be able to handle their requirements through this SPANG Headerduct system.

Over 31,000 ft of SPANG Headerduct have been installed from the second through 29th floor of the 32-story building to carry electric power, telephone and intercom wiring under the floors.

Future wiring requirements can always be made quickly, because the wiring is accessible by removing the SPANG Headerduct access box covers. This eliminates costly digging into concrete, repairing and redecorating. Cellular floor cells carry the wiring from the headerduct to all parts of the floor at regular intervals, providing convenient wiring service wherever it's needed.

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SPANG Underfloor Duct systems help builders stay modern longer. The engineered design of these products simplifies installation and assures a lifetime of satisfactory service. To suit your requirements, you have a choice of Standard Underfloor Duct, Double-Capacity Duct and Headerduct—plus a complete range of service outlet fittings. For complete information mail the coupon below.

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Corporation, Houston, Texas Electrical Contractor: Fischbach & Moore of

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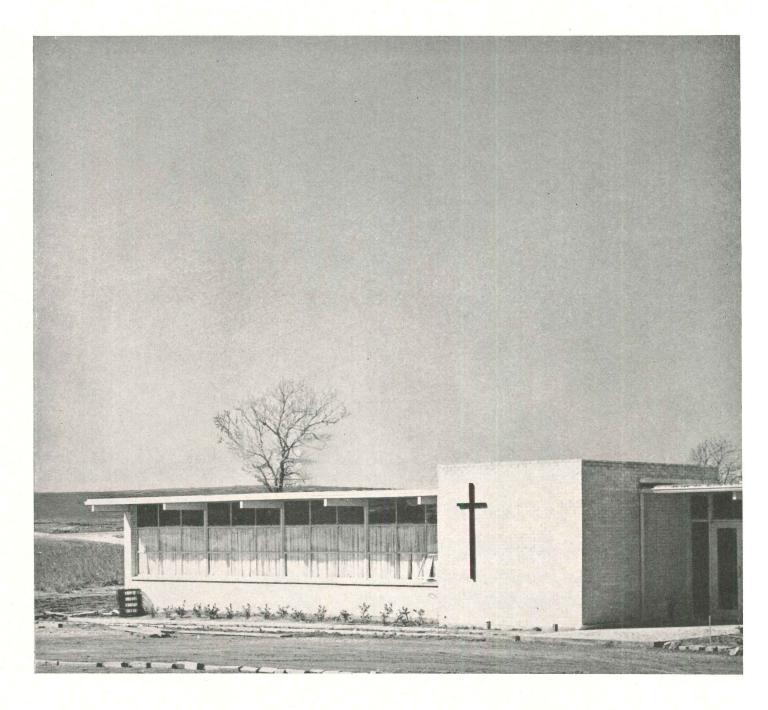
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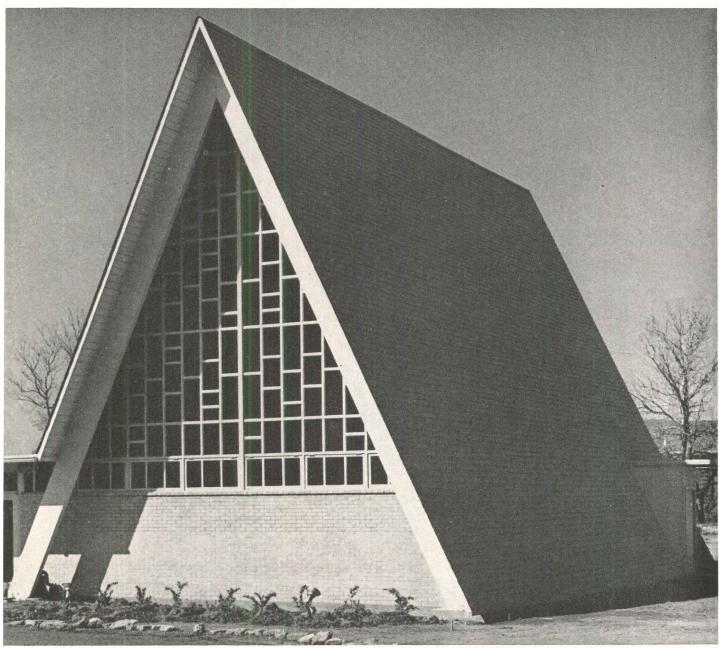
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After careful study backed with successful experience in previous jobs, the architect specified gas and Arkla. "The main reason is performance. What

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St. James Episcopal Church, Dallas, Texas. Designer: Jack Hemphill

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Arkla-Servel Sun Valley 3½ and 5-ton gas air conditioners are compact, central units that eliminate the need for fans, window air conditioners or sep-

arate cooling units. They cool, heat, clean, dehumidify and distribute air for year 'round comfort at low cost.

For larger installations: Arkla-Servel 25-ton gas absorption units use low pressure steam from a gas-fired boiler as the source of energy for the chillers. They're compact, easy to install and adjust automatically to

> heat loads. They do not cut out at high loads, since capacity increases with rising temperatures.





3 1/2 and 5-ton

GAS-OPERATED ARKLA-SERVEL AIR CONDITIONING UNITS lowest operating costs • fully automatic operation • long dependable service packaged construction • compact size • easy installation

Washington Topics

continued from page 300

areas in standing structures, and \$5.2 million in new projects. The regular budget request had been turned down earlier this year, so the White House sent a supplementary document to the appropriations committee of the House asking that the money be voted before the 86th Congress quit for good.

The original budget request sought the \$2 million for incorporation of fallout shelters in alterations to existing buildings and \$11.1 million to convert projects proposed in the fiscal 1961 building program to include the shelters. The House refused to vote any funds for the purpose on the first try, and the Senate approved \$6.4 million. When the bill got to conference, however, the Senate amount was dropped. This prompted the Administration to make its supplemental request in August.

The subcommittee handling the supplemental request for independ-

ent offices held no further discussions on the fallout shelter matter but Chairman Thomas (D-Tex.) did submit for the record a newspaper article indicating that the fallout peril may be less than had been estimated.

State and Local Public Works Seen Hurt by New Tax

The Treasury Department's announced intention to tax interest paid on state and municipal bonds was attacked by a New York City organization known as the Conference on State Defense made up of principal national organizations of governors, mayors and other city officials, state attorneys general and county officials.

The grounds for protest were based on argument that the move would seriously impair all non-Federal public works programs. The Conference asked that the proposed regulation, announced August 18, be withdrawn or corrected. It asserted that the proposal jeopardized the traditional and constitutional immunity of state and local securities from Federal taxation.

The Conference said that governors and mayors expressed instant concern because the Treasury move directly affected the financing of their various public works programs. The development was said to constitute a threat to funding local school, highway, river and harbor, hospital and sanitation projects.

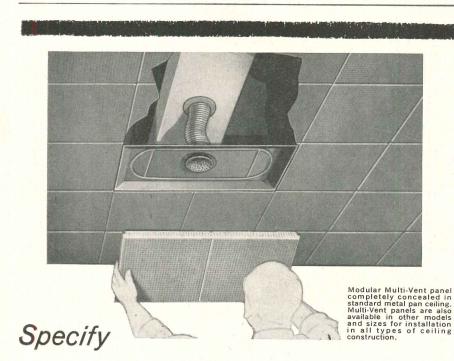
HHFA Will Dramatize Need for Urban and Housing Personnel

American education is being called upon to step up the tempo of its teaching in the urban and housing field. Doing the calling is the Federal government's Housing and Home Finance Agency.

Housing Administrator Norman P. Mason announced that he would convene a two-day conference this fall in an effort to meet a growing need for more trained manpower. College and university administrators and faculty will attend.

Mr. Mason explained his motive this way: "The tremendous increase in urban and housing activities in our cities and towns in the last dec-

continued on page 308



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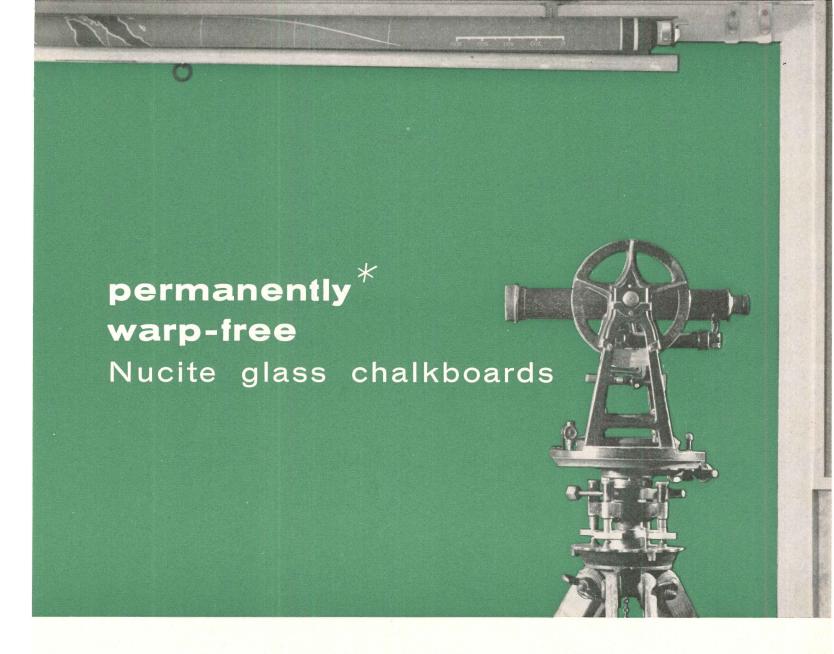
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Other benefits? Plenty. They're non-fading, thoroughly washable, exceptionally legible, easily erased, resistant to just about every kind of damage. And they never require refinishing. In every way, they're the finest chalkboard available. Yet, they cost less than high-grade, heavy gauge steel boards—the next closest thing to chalkboard perfection. Five sight-engineered colors. Send for samples . . . or see Sweet's 23e Agents and dispersion of the sample of th

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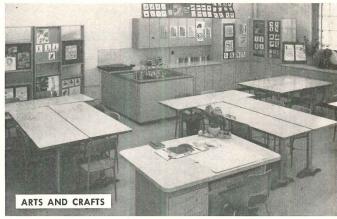
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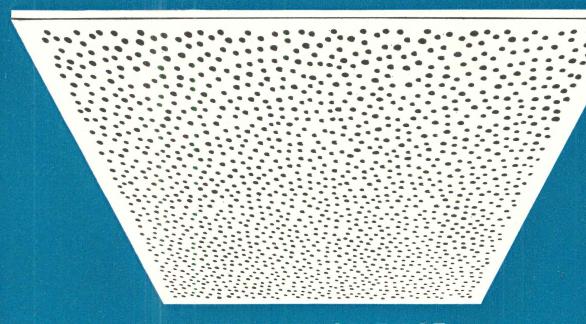
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Washington Topics

continued from page 304

ade has created an increasing demand for trained people and greater knowledge. Governmental bodies and private industry are both feeling the pinch of shortage of skilled manpower on urban problems. Our needs for basic training and study on the problems of 'inner space' are as immediate as those for outer space."

He noted that many educational institutions already have estab-

lished special studies, classes and even departments in the urban and housing field. The higher educational system, he feels, has the obligation of supplying much of the training and study that is needed.

"I believe that we need to extend and accelerate this work to keep pace with the efforts of our communities to plan and develop their future," he commented. "We are asking these educators to meet with us to see what our educational institutions can do to achieve this and how we can best help them."

Plans for the conference are being worked out by Dr. M. Carter McFarland, HHFA's director of the division of economics and program studies. He is being assisted by Dr. Ernest Fisher of Columbia University, Dr. James Gillies of the University of California in Los Angeles, Dr. Donald Stone of the University of Pittsburgh, and Dr. Arthur Weimer of the University of Indiana.

Prior to the conference three survey papers will be prepared for advance study by those attending later. One, to be prepared under the direction of Dr. Stone, dean of the Graduate School at the University of Pittsburgh, will survey curricular developments in colleges and universities especially designed to provide training in urban development and housing.

A second paper, to be prepared by Dr. Richard U. Ratcliff, Professor of Land Economics, University of Wisconsin, will review research planned or being undertaken in these fields in higher educational institutions, and the kinds of research needed in the future.

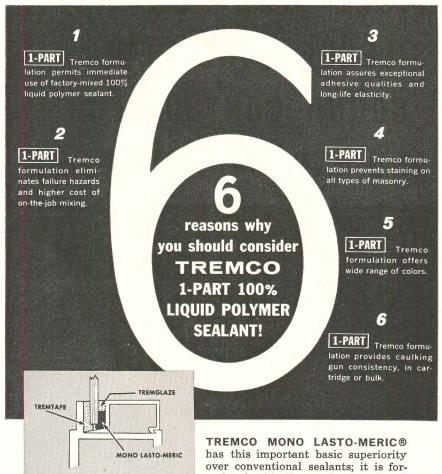
The third paper, to be prepared by HHFA's staff, will present the wide variety of career opportunities that have developed in public and private fields under the impact of increased activity on urban development and problems.

Mr. Mason said the papers would present the basis for the conference discussions. Some 40 to 50 educational representatives from large and small schools and from related fields of interest will be selected to attend.

Three More Atlas Bases Ready But Program Still Lags

Three more Atlas intercontinental ballistic missile bases were made combat-ready late in August and brought to nine the number of such installations certified as completed and operational. But the construction program still was lagging behind its proper schedule.

Warning of the slow-down in base construction was sounded earlier this year with Congress, the Defense continued on page 314



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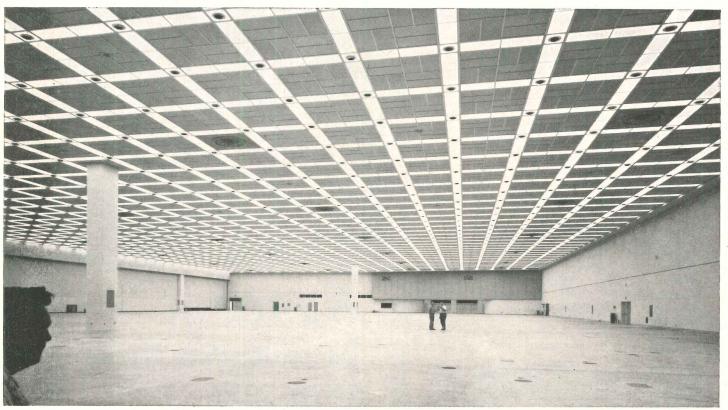
FLEXIBLE LIGHTING...

Space limits a complete description of the Sylvania lighting installation at Cobo Hall. If you are interested in a full detailed report, it will gladly be sent on request. Simply write to Sylvania Electric Products Inc., Wheeling, West Virginia.

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Sylvania's louvered ceiling provides 135 footcandles of general lighting for over 100,000 square feet of display area. Complete system consists of outrigger-type fixtures with eight 75-watt Instant Start lamps installed in a grid arrangement.



One of three 100,000 sq. ft. exhibit halls lighted with Sylvania's 2' x 8' and 2' x 2' Troffers in a modular pattern.

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Cobo Hall, Detroit's new exhibition center, features one of the largest and most flexible lighting installations ever made.

On both floors of this vast exhibition hall Sylvania provides the versatile lighting needed for a wide variety of exhibition uses.

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Through circuiting, six different general lighting levels up to 135 footcandles can be obtained. Keeping with the flexibility theme, each 2' x 2' unit contains fluorescent lamps for general lighting and one 500 watt incandescent swivel-type spot for highlighting exhibits.

On the first floor where smaller equipment will be displayed an entirely different lighting system is used. Sylvania's luminous louvered ceiling provides 2-level lighting control—either 70 or 135 footcandles—for over 100,000 square feet of display area. Again incandescent spots are installed on 14' square modules to highlight displays.

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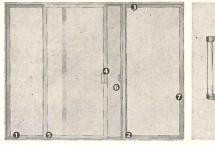


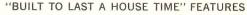
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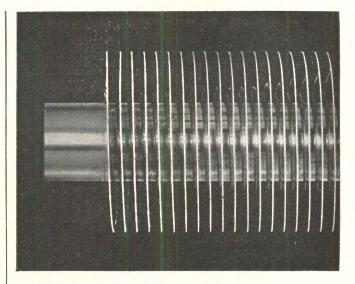


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paneling, gypsum board. Floors: carpeting over concrete on ground floor; carpeting over Tim-Deck on mezzanine floor. Roof: felt and tar with crushed aggregate surface over Tim-Deck and rigid insulation. Heating: gas-fired forced air. Lighting: incandescent fixtures. Area: 7,309 square feet. Cost: \$11.63 a square foot.





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Washington Topics

continued from page 308

Department, contractors and subcontractors embroiled in studies of the cause and recommendations for speedier achievement. New methods of managing the planning and construction of the essential bases were worked out during the summer at the Pentagon.

There was general agreement that complicated relationships between the military services and their civilian contractors and subcontractors had brought about unwarranted delays in getting the installations underway and finished. The Air Materiel Command now has been given supreme responsibility. Site activation is in the hands of Major General Thomas P. Gerrity, Ballistic Missile Center, Englewood, Cal.

It is expected that the rearrangement of authority will bring about a speed-up in base construction and in due time quiet the criticisms of management procedures that marked the summer of 1960.



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Labor Okays Home Mortgages as Pension Fund Investments

The AFL-CIO executive council took a significant step in Chicago in August which is expected to pour billions of new dollars into the home mortgage market. This will be from labor pension funds—local union welfare fund reserves.

Organized labor was not unmindful of the benefits to accrue to it in such an arrangement. The release of funds was expected to make housing mortgage money more readily accessible at a cheaper rate and indirectly affect lending rates of banks and other institutions, driving them downward.

The investment would yield an estimated five per cent whereas the funds (some \$30 billions of them) now are invested mainly in Federal government bonds paying approximately three per cent.

There was the hope on the part of the executive council that pouring the pension reserves into home mortgages would tend to erase discounting practices in the arrangement of Federal Housing Administration and Veterans Administration loans which have added to housing costs. And then, a general stimulation of the home building market was certain to result in more jobs for the building trades.

Elmer A. Lundberg Nominated To Head Producers' Council

A new slate of officers for the Producers' Council, Inc., national organization of building product manufacturers affiliated with the American Institute of Architects, has been proposed to the membership. The list will be acted upon at the 39th annual meeting of the Council and its Chapter Presidents Conference to be held in the Drake Hotel, Chicago, October 5-7.

Presidential nominee is Elmer A. Lundberg, architect, and director of architectural services for the Pittsburgh Plate Glass Company. He is 1960 vice president and has been active in Council affairs for many years. Upon election he will succeed H. Dorn Stewart, New York, president of the Barrett Division of the Allied Chemical Corporation.

Nominated for first vice president continued on page 322

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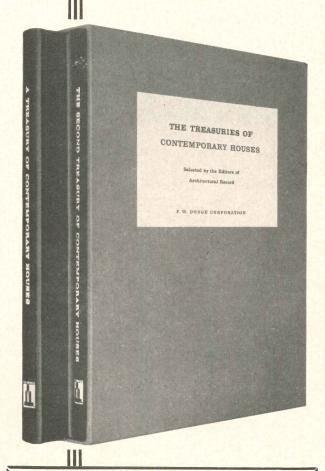
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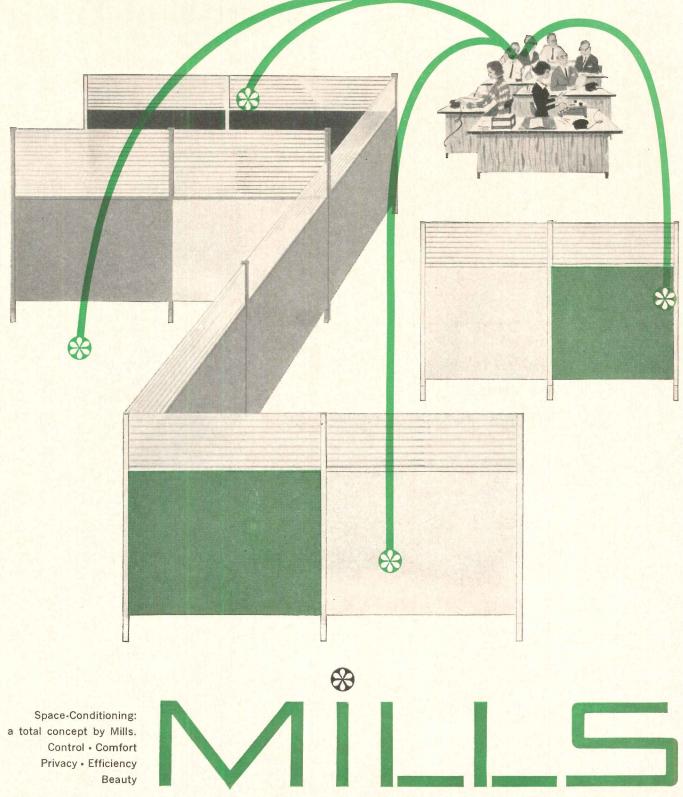
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Irwin T. White residence-Architect: John Terence Kelly

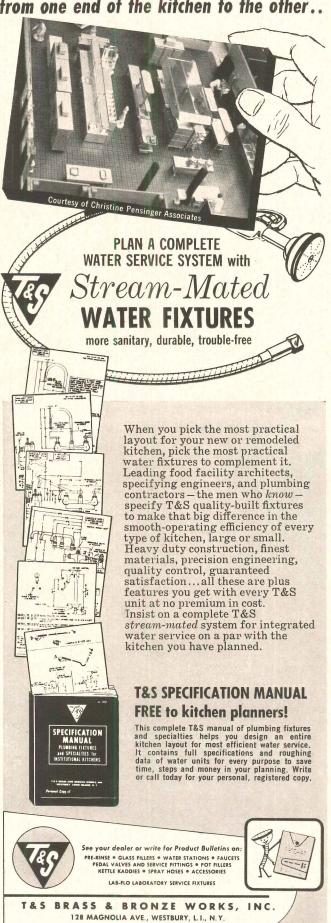


Japanese lighting... Structoglas style

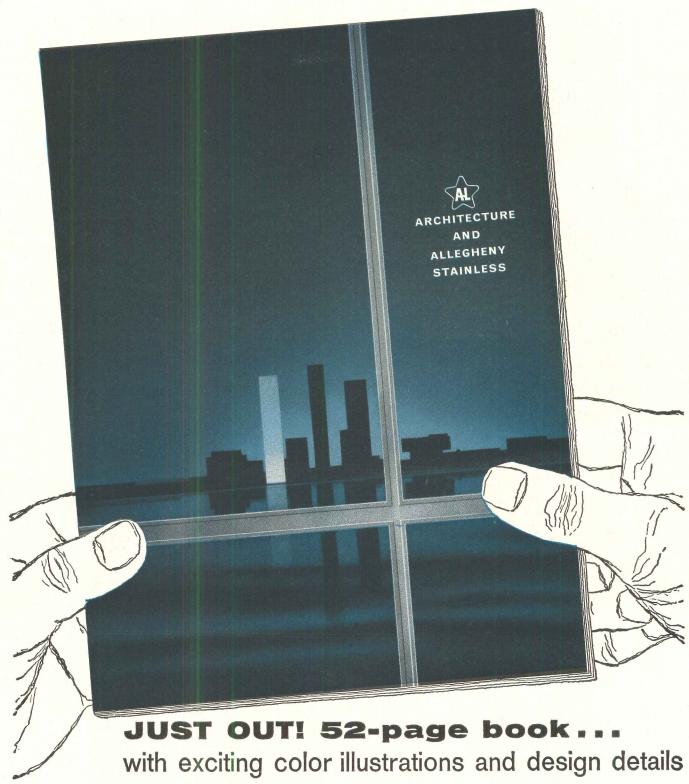
Architect John Terence Kelly achieves glare-free natural lighting in this new home with shatterproof Structoglas panes. These versatile translucent panels add their Japanese quality light to two areas: in bedroom window walls (used with a fiberglass inner mat to form a "sandwich") and in cypressframed windows between balcony, bedroom and living room. Wherever you want translucent lighting effects-with great strength and beauty-specify Structoglas. Write Structoglas Inc., Dept. 1002, Cleveland 20, Ohio, for catalog and samples.



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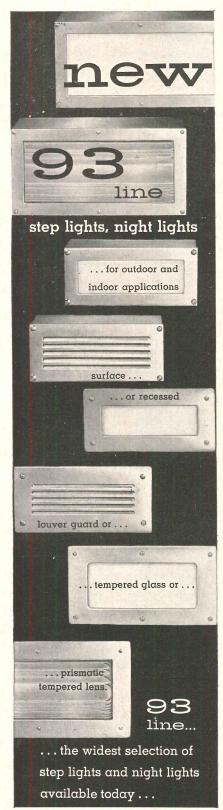
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Washington Topics

continued from page 314

is Donald A. Proudfoot, Seattle, marketing manager for Simpson Timber Company. Robert W. Lear, New York, director of marketing services for American Radiator and Standard Sanitary Corporation, is proposed for the position of second vice president. Earl F. Bennett, director of architectural sales for the Koppers Company, Pittsburgh, has been nominated for secretary.

Addenda

The National Science Foundation announced that total funds for the performance of basic research in the United States reached a level of \$1 billion in 1959-60. A statistical series compiled by NSF indicated that basic research funds rose from around \$430 million in 1953-54 to more than \$830 million in 1957-58, an increase of 93 percent. Total research and development funds in the United States reached a \$12 billion annual level for 1959-60, NSF said.

The Senate public works committee approved 79 federal building projects to be constructed in 42 states at an estimated federal cost of \$919.8 million. It also approved 37 projects for alteration of existing federal buildings at an estimated cost of \$37.1 million.

The law requires that the public works committees approve any project submitted by GSA which costs more than \$100,000. The cost limit is \$200,000 for alterations or improvements to existing buildings.

Architects and specifying engineers have received a brochure from the National Association of Plumbing Contractors urging them to include all mechanical equipment in the mechanical contract as opposed to specifying that it "be furnished by others."

A covering letter explained that the inclusion of all kitchen, laboratory, hospital and other equipment requiring piping connections would substantially reduce headaches for the owner, architect, mechanical contractor, and equipment supplier.

In all parts of the country ... North, South, East and West, owners and architects are specifying that their new air-conditioned buildings be constructed with Robertson Q-Air Floor. They have recognized in this new construction system a distinct method of saving money in the face of ever-rising construction and operating costs.

Q-Air Floor is the same strong, weightsaving cellular steel sub-floor as Robertson's well-known Q-Floor, but in addition to carrying telephone and power lines, it carries hot and cold air for air-conditioning as well. Occasional pairs of extra-wide structural cells fit in with the normal Q-Floor system (with no change in the two-foot module) and carry the air to mixing units for discharge into the room. As seen below, this structural innovation provides you with very substantial savings.

The Q-Air Floor distribution system is actually a third advantage to users of this versatile sub-floor. For the past 25 years owners of Q-Floor buildings have been reaping the benefits of Q-Floor's structural and electrical features . . . the clean, quick, dry construction gives earlier occupancy and its electrical layout freedom permits unlimited choice of desk and partition location, to provide the most efficient and economical office routine.

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Since Q-Air Floor permits an average saving of a foot of space between each suspended ceiling and the floor surface above, a twenty-story building can be built at the same height as a nineteen-story structure built by older methods. This results in a substantial saving in structural steel, walls, piping... in fact every building material that is installed from floor to floor.

Old Way 20 stories

YEARLY FAN POWER COSTS CUT 30%

The Q-Air Floor system includes the Robertson Aerator, a mixing device with an exclusive seasonal changeover feature. Full fan power is used only for peak summer cooling. The rest of the year the perimeter Aerators operate at about 65% of air volume. Other systems operate perimeter terminals at 100% air volume all year. With the use of the changeover feature at the perimeter, fan power costs can be reduced up to 30%.



of peak volume

During the winter, Robertson Aerators calify aerators satisfy heating requirements at 65% are and system the back to 65% deliver 100% vol-ume and system tem back to 65%



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St. Paul, Minnesota, Bergstedt, Hirsch, Wahlberg & Wold, Inc., Architects and Engineers; Schuett-Meier Co., Structural Engineer; Steenberg Construction Company, Contractor.



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MD CORPORATION

Pittsburgh, Pa., Gerard & McDonald, Architects and Engineers; M. W. Stuldreher, Assoc. Arch.; Ragnar Benson, Contractor.



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cuts costs

for builders

everywhere



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POLICE HEADQUARTERS

Fresno, California, Walter Wagner & Partners, Archs. and Engrs.; Wm. A. Brooks, Structural En-gineer; Lewis C. Nelson, Contractor.



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Engineer; Blanchard Constr. Co., Contractor.



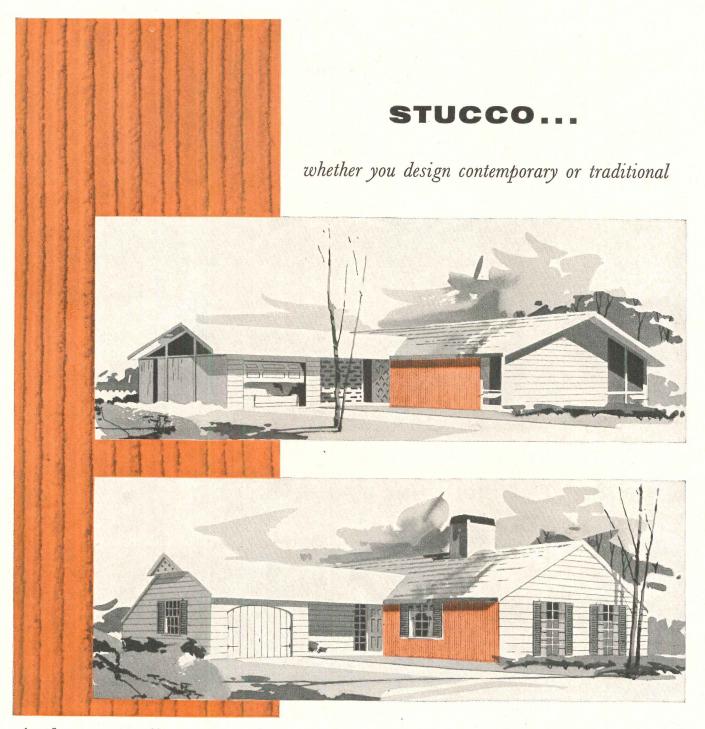
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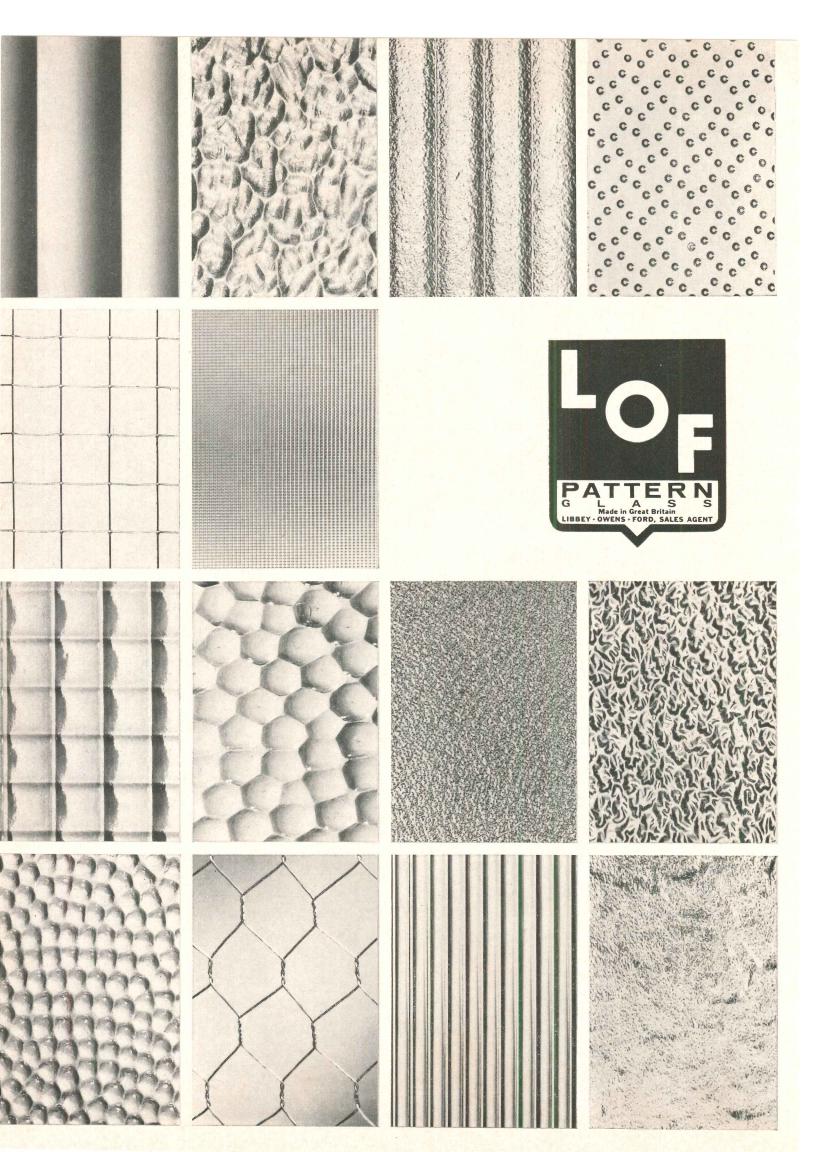
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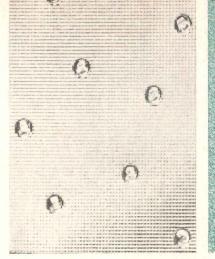
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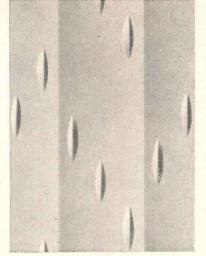
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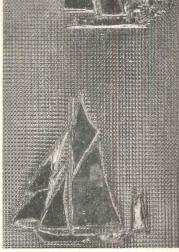
organization to improve and extend the uses of concrete



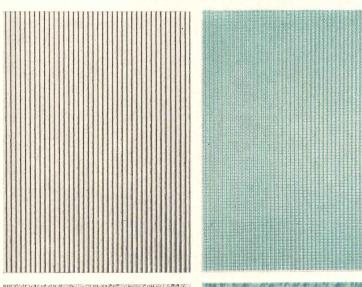






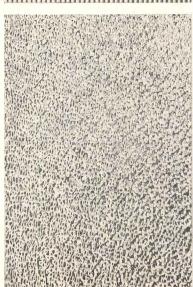


L·O·F announces... pattern glass



This exciting family of patterns (shown approximate size) features twenty-six combinations of patterns and textures, including wired and heat absorbing glass. Two thicknesses in many patterns, three in some. Sizes up to 60" x 120", one wired pattern 72" x 132".

Ask your L·O·F Glass Distributor (listed under "Glass" in the Yellow Pages) to show you actual glass samples. Or send the coupon for free booklet which reproduces patterns actual size. It also gives Pattern Glass names, weights, sizes, thicknesses and transmission values of diffused light.





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The Record Reports

On the Calendar

 $October_$

- 2-5 Conference of National Association of Housing and Redevelopment Officials—Statler-Hilton, Detroit
- 5-7 39th Annual Meeting and Chapter Presidents Conference, Producers' Council— Drake Hotel, Chicago
- 6-16 11th Annual Decorators Show; theme: "Avenues to the Decorative Arts"—Pan Pacific Auditorium, Los Angeles
- 8-16 10th Pan-American Congress of Architects—Buenos Aires
- 8-16 American Institute of Decorators Show—Seventh Regiment Armory, New York
- 9-13 National convention (third of three in 1960), American Society of Civil Engineers—Boston
- 10-12 National Fall Conference and Exposition, National Office Management Association— Biltmore Hotel, Atlanta
- 11-14 Eighth annual workshop convention, Architectural Woodwork Institute—Sheraton Park Hotel, Washington, D. C.
- 11-15 Annual meeting, American Council of Independent Laboratories—Deauville Hotel, Miami Beach
- 12-15 Annual New York State Association of Architects Convention; theme, "Challenge of the Sixties"—Whiteface Inn, Lake Placid, N. Y.
- 17-21 48th Annual National Safety Congress—Conrad Hilton and other hotels, Chicago
- 17-21 National Metal Exposition— Philadelphia
- 18-21 Semi-annual meeting, National Society of Professional Engineers—Hilton Hotel, Denver
- 19-23 15th annual convention, California Council, American Institute of Architects—Yosemite National Park
- 21-23 14th annual meeting, National Trust for Historic Preservation—Hilton Hotel, Pittsburgh
- 22-23 Fourth Annual National Executive Marketing Conference, sponsored by the Industry Advisory Committee of the National Housing Center—Roosevelt and Monteleone Hotels, New Orleans
- 23-26 1960 National Planning Conference, sponsored by Community Planning Association of Canada; theme, "Planning for the Smaller Communities"
 —Sheraton Connaught Hotel, Hamilton, Ont.
- 23-27 Annual meeting, American Institute of Planners—Philadelphia
- 24ff Seventh Advanced School for Home Builders; through Nov. 2—University of Illinois campus, Urbana, Ill.
- 27-28 16th annual conference, American Society of Industrial Designers—Edgewater Beach Hotel, Chicago
- 30ff 38th annual convention, American Institute of Steel Construction; through Nov. 3—Hotel Greenbrier, White Sulphur Springs, W. Va.

continued on page 332



New \$13 million Vancouver, B. C., Post Office



Jennite J-16 is the original . . . the world's most widely used coating for blacktop pavements. It protects leading airports, playgrounds, parkways and parking lots.

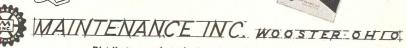
Architects' specifications for the new Vancouver Post Office called for surface sealing the 260 x 285 ft. helicopter landing deck atop the 5th floor and main block roof.

Jenniting, of either new or old asphalt, seals out frost and water. It retards drying action of the sun, stops oxidation, eliminates destructive damage of gasoline and oil . . . keeps the surface free of dangerous, loose particles . . . doubles asphalt pavement life.

In addition, the satin black Jennite surface is tough, easy to clean . . . long lasting, attractive.



For complete information about Jennite J-16, write for Bulletin M-2992. Also, see our catalog in Sweets.



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this helpful new booklet will answer many of your questions about cafeteria planning

- How large should it be?
- How much seating capacity will I need?
- How much equipment will I need?
- How many serving lines should there be?
- How many people can be fed hourly?
- How many employees will it require?
- Will it fit the budget?

COMPARE YOUR NEEDS WITH THE FLOOR PLANS AND DETAILED DESCRIPTIONS OF THESE TEN INSTALLATIONS, SHOWING...

- Total Area Seating Capacity Equipment Used
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You'll find a full range of cafeterias by types, sizes and costs selected from locations from coast to coast ... with a handy chart which enables you to compare them statistically according to cost per foot of equipment, square feet per man, etc.

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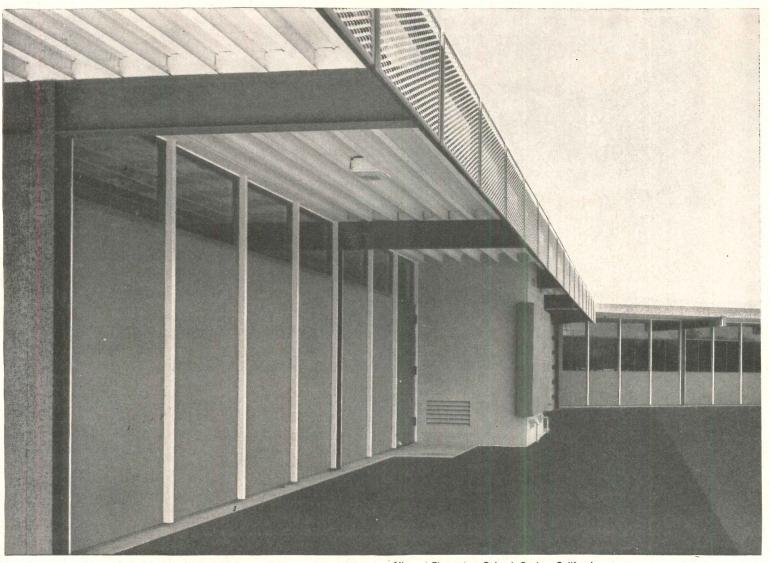
mail the coupon today!

A real time and trouble saver for you... you would have to travel hundreds of miles and spend many weeks to gather the data found between the covers of this booklet. Prepared by Bastian-Blessing, Cafeteria Service headquarters for both planning and equipment.

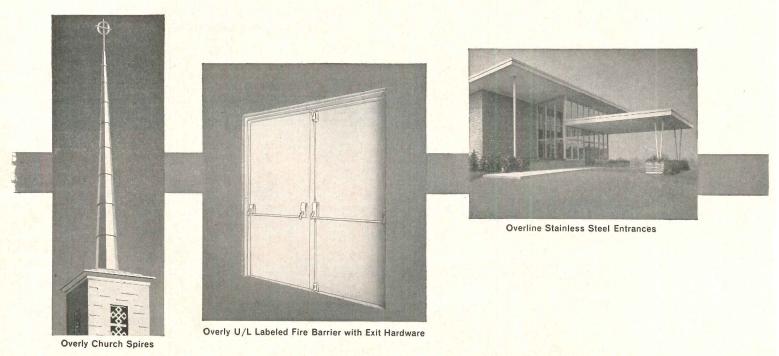
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Vincent Elementary School, Covina, California Architect: H. L. Gogerty, Los Angeles General Contractor: Berry Construction Company, Ontario, California





When is a door not a door?

When it's a panel! Economy, utility and design were the primary qualities chosen by architect H. L. Gogerty, F.A.I.A., when he used Overly Hollow Metal Doors and Panels in the design of the Vincent and Mesa Elementary Schools in Covina, California.

Architect Gogerty adapted the economical Overly Door* for a novel use as fixed wall panels, blending the efficiency of mass production, simplified erection procedures and the fire safety standards provided by Overly's U/L labeling program.

Overly Doors and Panels provide these schools with fire safety far beyond that offered by average panel and door products. The construction technique—welding Overly panels to Overly mullions on either side and to steel members at top and bottom—permits savings in building time and materials. Equally important, these panels and doors are heat and moisture resistant, protecting the school against air conditioning loss and water penetration.

Whether your next project be a school, hospital, hotel or office building, it will pay you to consider Overly Doors and Panels. Overly offers the architect the largest selection of door products available today, as well as over 90 different door designs. Other Overly architectural products include Overly Batten-Type Roofs, Overline Stainless Steel Entrances, Overly Tilt-A-Front Construction, and Overly Church Spires and Crosses. For the finest in architectural craftsmanship, why not contact Overly.

*Overly catalogs a larger number of different door designs than any other manufacturer. Overly Doors may be seen at the following installations: First National Bank Building, Fort Worth, Texas; O'Hare International Airport, Chicago, Illinois; Libbey-Owens-Ford Building, Toledo, Ohio; The Beverly Hilton Hotel, Los Angeles, California; and the John J. Kane Hospital, Pittsburgh, Pennsylvania.



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The Anchitect's Craftsman



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The Record Reports

November

- 10-12 Semi-annual meeting of Consulting Engineers Council—Penn-Sheraton Hotel, Pittsburgh
- 10-14 20th annual convention, Society of Industrial Realtors—Dallas
- 13-16 Seventh Annual National Retail Lumber Dealers Association Building Materials Ex-
- position—Brooks Hall and Civic Auditorium, San Francisco
- 14-15 Conference on Prestressed Concrete, sponsored by the Prestressed Concrete Institute —Biltmore Hotel, Los Angeles
- 14-16 Annual convention, Structural Clay Products Institute—Diplomat Hotel, Hollywood, Fla.
- 14-18 45th National Hotel Exposition—the Coliseum, New York
- 15-17 Fall Conferences, Building Research Institute—Shoreham Hotel, Washington, D. C.
- 21-22 Conference on Prestressed Concrete, sponsored by Prestressed Concrete Institute— Sheraton-Palace Hotel, San Francisco
- 27ff Winter annual meeting, American Society of Mechanical Engineers; through Dec. 2—Statler-Hilton Hotel, New York
- 28-30 Semi-annual meeting, American Society of Refrigerating Engineers—Chase-Park Plaza Hotel, St. Louis

December_

- 12-14 First Industrial Building Congress, held concurrently with the Industrial Building Exposition—Coliseum, N. Y.
- 12-15 Atomic Industry Exhibition and Annual Conference, and winter meeting, American Nuclear Society—Masonic Memorial Temple, Fairmont and Mark Hopkins Hotels, San Francisco.

Office Notes

Offices Opened_

Charles H. Harper and Douglas Drake, architects, have set up offices under the name of Charles H. Harper & Associates, 2001 E. Capitol Drive, Milwaukee, Wis.

Max R. Garcia, A.I.A., has opened an office at 2721 Jackson Street, San Francisco.

Gordon Powers, A.I.A., former partner of Powers & Kessler, announces the opening of his office for commercial and industrial practice and consulting at 14 W. 44th St., New York 36.

Joseph S. Ward and Associates, Inc., Consulting Soils and Foundation Engineers, have opened offices and a soil testing laboratory at 1015 Chestnut St., Philadelphia.

Elliott Gitlin, A.I.A., and Marvin J. Cantor, A.I.A., announce the formation of a partnership for the practice of architecture under the name of Gitlin and Cantor, A.I.A., Suite 525, 261 Constitution Ave., N.W., Washington, D. C.

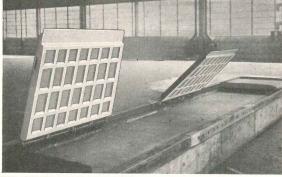
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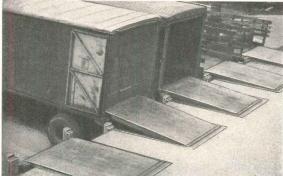
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You get a choice of five manual ramps, 20,000 pounds capacity. Platform swings to nearly vertical position—trailer doors can be opened after trailer is parked at dock—overhead doors can be closed in front of platform. Only three moving parts. No levers project. Side-to-side platform adjustment.

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ALPHAI

BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

news and notes from the field

Tips on Finishing Air-Entrained Concrete

Concrete made with air-entraining cements differs from regular or non-air-entrained concrete in that it contains millions of minute, completely separated air bubbles. It was developed to produce concrete that would resist the effects of freezing and thawing. It also improves workability; results in less bleeding or surface water; less segregation; and has less tendency to dust when steel trowel finished.

Steel trowel finishing of air-entrained concrete requires slightly different techniques to prevent pulling or tearing of the concrete surface. To determine these specific differences, Alpha engineers, with the assistance of experienced finishers, ran a series of practical tests. These conclusions resulted:



1. Moisten the grade to prevent absorption of water from the mix.

2. Wheel, shovel or chute mix into place—do not flow.

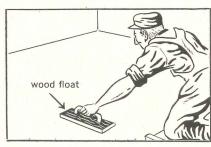


3. Level and tamp into place with strike-off screed



4. Delay wood floating for 30 to 40 minutes after the concrete is placed. If stickiness appears when wood floating is started substitute a magnesium darby float—use sparingly and in a flatter position than for regular mixes.

... or



4-a. If the wood float is used, steel trowel sparingly in about 10 to 20 minutes after the wood floating is completed. Don't overtrowel. If stickiness appears, delay troweling for 15 or 20 minutes or until stickiness disappears.



5. Give final steel troweling when thumb pressure barely dents the concrete surface.



6. Final troweling compacts the surface, leaves it smooth. The trowel produces a ringing sound but not as noticeable as with regular mixes.

7. Start curing as soon as possible without marring the surface. Use waterproof paper, curing compounds, wet burlap or ponding with water.

A Stiff Mix is Easier to Finish



Good if vibration is used.



Maximum slump for air-entrained concrete.



Too wet—will make air-entrained concrete sticky.

Don't use a wetter mix than is necessary for satisfactory workability. New mixes should always be tested before use on jobs because air-entraining cements and admixtures perform differently with different materials.

There is no great difference in finishing air-entrained concrete compared to regular mixes except that care must be taken not to overtrowel concrete in the early stages. This causes tearing and stickiness. A stiff mix is much easier to finish than a wet one. The air bubbles in the concrete impede the passage of fines and water to the surface so there is less danger of dusting caused by overtroweling or overfloating. However, there is more danger of a soft surface if the curing step is not carried out. Alpha experiments proved that when considerable pressure is used in the final steel troweling, a harder wearing surface will result.

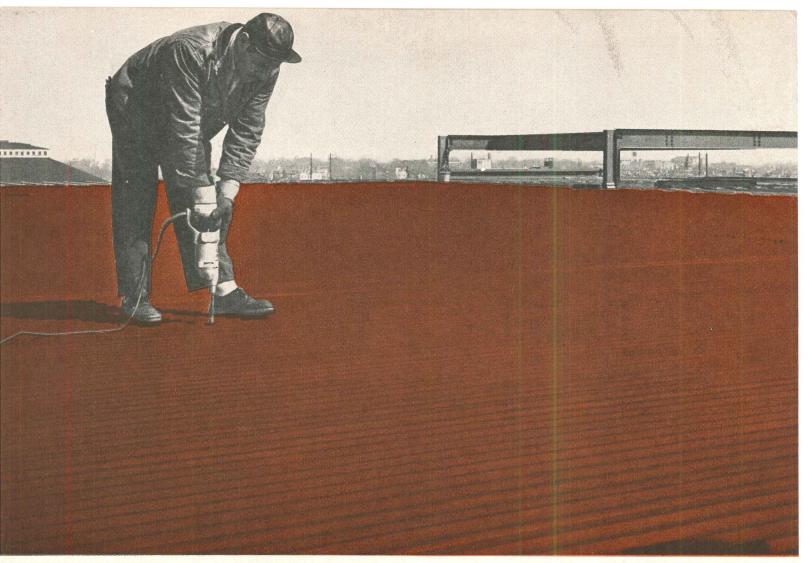
More Information

Write for a copy of the Alpha Craftsmanship in Concrete folder: "Steel Trowel Finishing Air-Entrained Concrete".



PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.



Coated Fab-Form's red oxide coating shields the base steel from corrosive elements in concrete. Here, on the roof of Looman Associates Office Building in Trenton, N. J., coated Fab-Form was installed by a four-man crew in just one day.

Architect, Kramer, Hirsch & Carchidi; Structural Engineer, Leonard Busch; Contractor, Belli Co.; all of Trenton. On this job, Fab-Form was distributed by American Steel Engineering Co., Philadelphia.

HOW TO SEE RED-AND LIKE IT

Pittsburgh Steel's New Coated Fab-Form Has "Better Corrosion Resistance," Says Philadelphia Contractor; "Goes Down Faster Than Other Steel Forms"

When a builder gets blood in his eye, you can bet he's scowling at a cost sheet.

But many a contractor, architect and builder is seeing red these days —and liking it.

They're the alert people who have used Pittsburgh Steel Company's coated Fab-Form, a new corrugated, permanent steel form for concrete floor and roof slabs.

They were quick to see these Fab-Form benefits:

- Bonderized, baked-on, redoxide coating—shrugs off bad weather and shields the base steel from corrosive elements in concrete.
- Extra length—standard sizes or custom cut up to 28 feet, 3 inches.
- Extra width—32-inch cover width, the widest available.

- Deeper corrugation—full 5% inch in high-tensile (90,000-100,000 psi), 27-gage cold-rolled steel.
- Case in Point—G&H Steel Service of Drexel Hill, Pa., has laid 200,000 square feet of Fab-Form on two jobs designed for poured floors and roofs over steel joists.

G&H installed about 100,000 square feet of coated Fab-Form in the seven-story Looman Associates Office Building at Trenton, N. J.

Selected over other types of corrosion-resistant, permanent steel forms, coated Fab-Form lengths were engineered to the structural layout. Special 27-foot, 3-inch lengths saved the contractor—Belli Company of Trenton—material, time and installation costs.

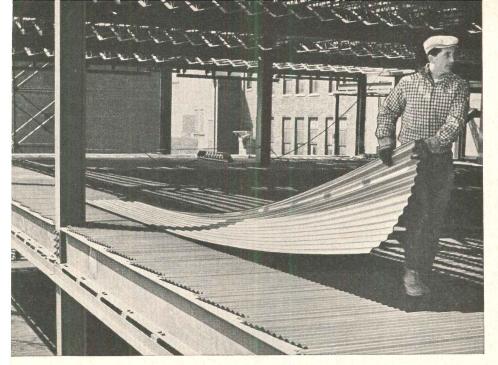
Joseph H. De Vido, Belli job superintendent, said:

"Fab-Form's extra-long length and wider width certainly helped to get these floors and roof poured faster. Its protective coating definitely makes a cleaner job. I'm convinced the red oxide finish has better corrosion resistance than other coated sheet material.

"Weather and rough handling don't seem to have any effect on the coating."

• Easier, Faster—G&H Foreman Bob Tindall agrees that longer, wider Fab-Form—with fewer end and side laps—"goes down faster" than other steel forms.

Using self-tapping screws to fasten Fab-Form to bar joists, Tindall and



Extra-long lengths of coated Fab-Form, 27 feet, 3 inches, were specially commended by job superintendent on Looman Building job. "Fab-Form's extra-long length and wider width certainly helped to get these floors and roof poured faster," he declared. "I'm convinced the red oxide finish has better corrosion resistance than other coated sheet material."



Precision-manufactured, Fab-Form easily fits around obstructions such as columns and pipes. Installation was easier and faster because corrugations line up precisely on end laps.

his three-man crew averaged a day and a half to install each floor on the Looman Building. Installing the obstruction-free roof deck took just a day.

Tindall said installation was easier and faster because Fab-Form's corrugations lined up precisely on end laps. No extra fitting effort was needed.

Fab-Form comes in plain steel, too, for applications where corrosion resistance is not a major factor.

G&H Steel Service first got Fab-Form's benefits when it installed 100,000 square feet of plain Fab-Form for floor and roof of Snellenburgs Department Store's new suburban branch in the Lawrence Park Center near Philadelphia.

• Time, Material Saved—Sizes on this engineered Fab-Form layout ranged from standard 12-foot, 3-inch lengths through special lengths up to 19 feet, 9 inches. This gave maximum savings of material with minimum installation time.

As with the Looman Building, Fab-Form was laid over steel joists with self-tapping screws to support a three-inch poured concrete roof and floor. Pittsburgh Steel's welded wire fabric was laid to give the slab reinforcement.

Job Superintendent Smith Harris of G&H Steel Service reported that installation was fast. Work crews had less trouble fitting side laps and matching end laps with Fab-Form than normally is encountered with other types of steel forms. He said:

"We ordered Fab-Form in lengths engineered to the job. Fab-Form's 32-inch cover width means fewer side laps and its longer lengths, fewer end laps. That adds up to less waste material and speedier installation —which means more money in our pocket."

If you, too, have blood in your eye from studying floor and roof deck costs, look to Pittsburgh Steel's new Fab-Form. Its built-in benefits will go to work for you. Write today for Fab-Form literature that shows how. Or, contact the nearest Pittsburgh Steel Products Division district sales office listed below.

Trained sales engineers are available to help you.



Self-tapping screws fasten uncoated Fab-Form sheets at Snellenburgs suburban store near Philadelphia. Architects and Engineers, Thalheimer and Weitz; Contractor, McCullough-Howard & Co., Inc., all of Philadelphia.

Fab-Form

Pittsburgh Steel Products

a division of Pittsburgh Steel Company



Grant Building

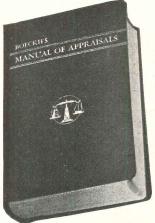
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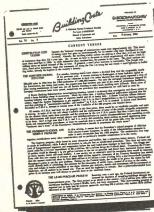


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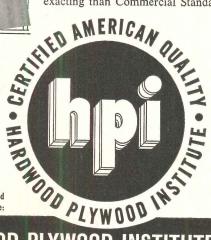
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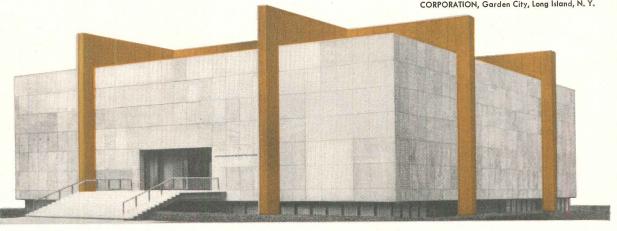


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Architect: PHILIP JOHNSON ASSOCIATES, New York, N. Y. General Contractor: GEORGE A. FULLER COMPANY, Boston, Mass. Florication and installation of bronze by GENERAL BRONZE CORPORATION, Garden City, Long Island, N. Y.



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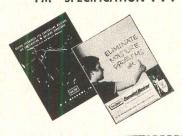
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New Firms, Firm Changes ____

Fischer and Frichtel, Inc., community building firm, announce the appointment of Roger Montgomery, associate professor of architecture at Washington University in St. Louis, as a consultant to their design staff.

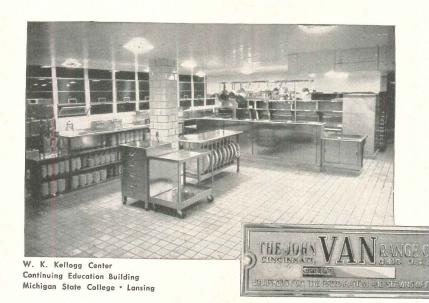
H. S. Smith has withdrawn as a partner of Stanley Engineering Company of Muscatine, Iowa, and Chicago. He leaves for graduate work and research at the State University of Iowa, to be followed by teaching. The remaining partners in the firm are C. Maxwell Stanley, Arthur E. Stanley and Sanford K. Fosholt. There are two associates, Roy F. Vanek and Frank W. Edwards.

New assignments for three members of Stanley Engineering Company are as follows: Murray Sedgley, head of Construction Group; Lowell Titus, head of Civil Department of the Design Group; and Paul Sehnert, head of the Chicago Department of

the Design Group.

S. W. Brown, Consulting Engineers, announce the appointment of Timothy J. Allen as Chief Engineer-Electrical in an acceleration of the company's expansion program. The firm of S. W. Brown has headquarters at 405 Lexington Ave., N. Y.

Henry B. Grant, Jr. and James F. Dowden, Jr. have been named as associates in the architectural office of Deeter & Ritchey, 3 Gateway Center, Pittsburgh 22.



source of pride for Michigan State, all hotel men and Van

- The illustration above shows the regular dining room serving section of the main kitchen of the Continuing Education Building at Michigan State College... a part of the new W. K. Kellogg Center. The equipment here is only a part of Van's contribution.
- Here and throughout Architect Lewis J. Sarvis of Battle Creek allotted space as Van engineering indicated was required by the unusual problem of serving up to 150 house guests in the hotel and up to 1200 in the banquet room and private dining rooms for the large groups who will come for refresher training.
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August D'Amours, Architect, 760 Est. Boul. Henri Bourassa, Montreal. Ernest T. H. Bowen II, A.I.A., 5224 Neptune Way, Tampa 9, Fla.

Flanagan & Black Ltd., Consulting Mechanical and Electrical Engineers, 201 West Mall, Etobicoke, Ont.

Sir Alexander Gibb & Partners, Consulting Engineers, 42 Charles St. East, Toronto 5.

Johnson-McWhinnie, Architects, 1060 University Ave. West, Windsor, Ont.

Kinnich & Gunderson, Architects, 11604 W. North Ave., Milwaukee 13, Wis.

Milton Klein, A.I.A., 2332 Morris Ave., Union, N. J.

William L. Pereira & Associates, Planning & Architecture, 5657 Willshire Blvd., Los Angeles 36.

Samborn, Steketee, Otis & Evans, Engineers and Architects, Libbey-Owens-Ford Bldg., 811 Madison Ave., Toledo 2, Ohio.

Alfred H. Siewert, Architect, 2811 W. North Ave., Milwaukee 8, Wis.

M. Tony Sherman & Associates, Architects and Engineers, 1700 Sans Souci Blvd., Miami 38.

S. Thomas Stathes, A.I.A., 3902 Knowles Ave., Kensington, Md.

Robert J. Strass, Inc., Structural Engineers, and Hartman-Strass, Inc., Civil Engineers, 2344 No. Oakland Ave., Milwaukee 11, Wis.

A. B. Swank Associates, Architects, 3415 Cedar Springs Rd., Dallas 19.

Thorshov & Cerny, Inc., Architects-Engineers, 300 First National Concourse Bldg., Minneapolis 2, Minn.

Bertram A. Weber, Architect, 234 South Wabash Ave., Chicago 4.

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more news on page 344



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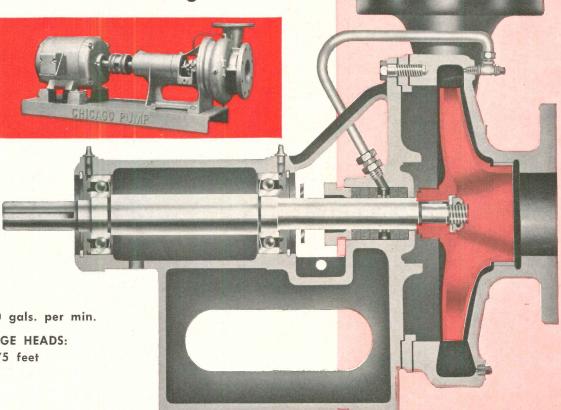


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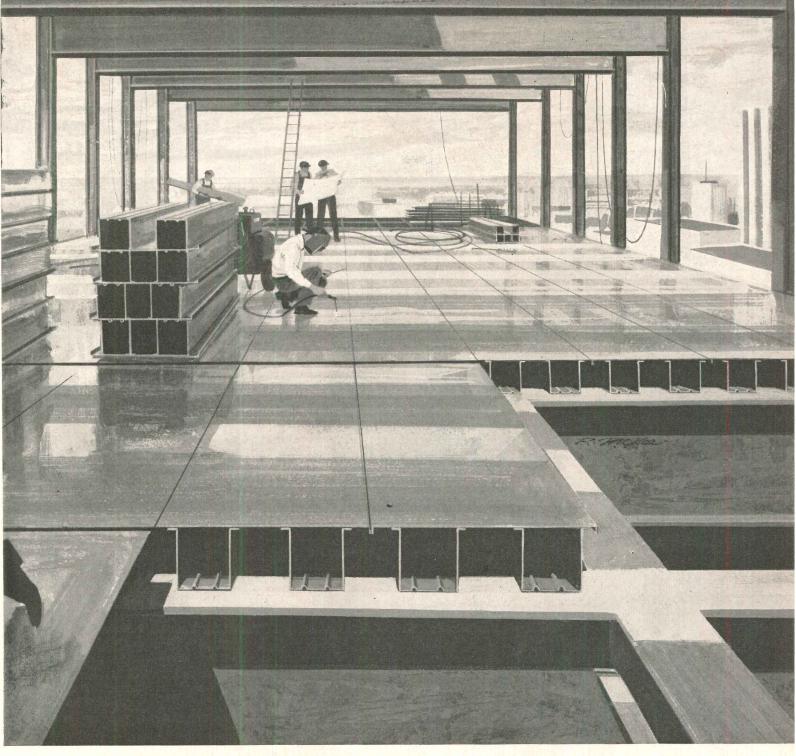
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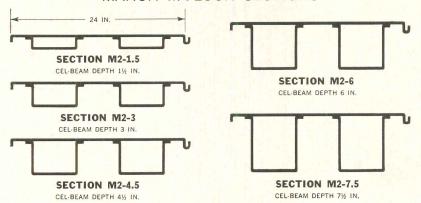


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A.S.L.A. Conference Seeks Better Use of Space

More than 300 of the nation's leading land and city planners attended the American Society of Landscape Architects' 61st annual convention in New York. The New York Chapter served as host. Climax of the threeday conclave, whose theme was "Planning for Space," was the presentation of 12 professional and two

student awards by Norman T. Newton, president.

Receiving the Certificates of Award for "high professional quality" were A.S.L.A. members: Shurcliff and Merrill, Boston; Godwin and Bell, Raleigh, N. C.; Royston, Hanamato and Mayes, San Francisco; Arthur G. Barton, Glendale, Cal.; Sasaki, Walker and Associates, Watertown, Mass.; Lawrence Halprin, San Francisco; Scruggs and Hammond,

Peoria, Ill.; Robert Zion and Harold Breen, New York; Harland Bartholemew and Associates, Honolulu; and Eckbo Dean and Williams, San Francisco.

Student awards went to Dominic A. D'Addario of Cornell University for his thesis for his Master's Degree in Landscape Architecture, and to Pennsylvania State University for its exhibit at the convention.

The citation for the "City of the Decade", made by the New York Chapter of the A.S.L.A. on the basis of a pre-convention survey of leading landscape architects throughout the country, was awarded to Pittsburgh. Cited for the "boldness in concept and skill in execution" of its long-range urban renewal and redevelopment program, Pittsburgh was also praised for its smoke-control program, for the development of the Golden Triangle, and for the "unusual coordination of its private and public interests, operating under governmental administration."

New York City was singled out for its "dedication to open-space planning," as characterized by the setbacks of new buildings on Park Avenue and the "broad application of light, air and space" to such projects as Idlewild Airport, the United Nations and the planned Lincoln Center.

Los Angeles was generally acknowledged to have faced unique population pressures during the past decade and was praised for its solutions. Earning special mention were the city's "renowned and still growing system of freeways, its bold downtown redevelopment program and the excitement of its best architecture."

Philadelphia was cited for its "comprehensive planning and careful neighborhood analyses, demonstrated sense of direction in the redevelopment and rehabilitation of housing and continued efforts to promote public understanding of good planning." Especially praised was the city's creation of open space, such as the Mall at Independence Hall, without sacrificing "the historic monuments which contribute so much to its individual character."

The awards were given at the annual dinner of the A.S.L.A. convention at which the principal speaker was architect and engineer R. Buck-



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continued on page 352

FUNCTIONAL AS A FAUCET

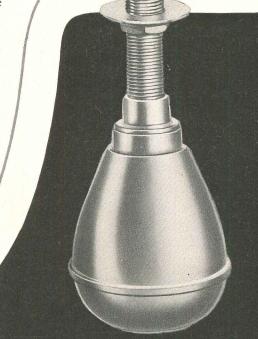


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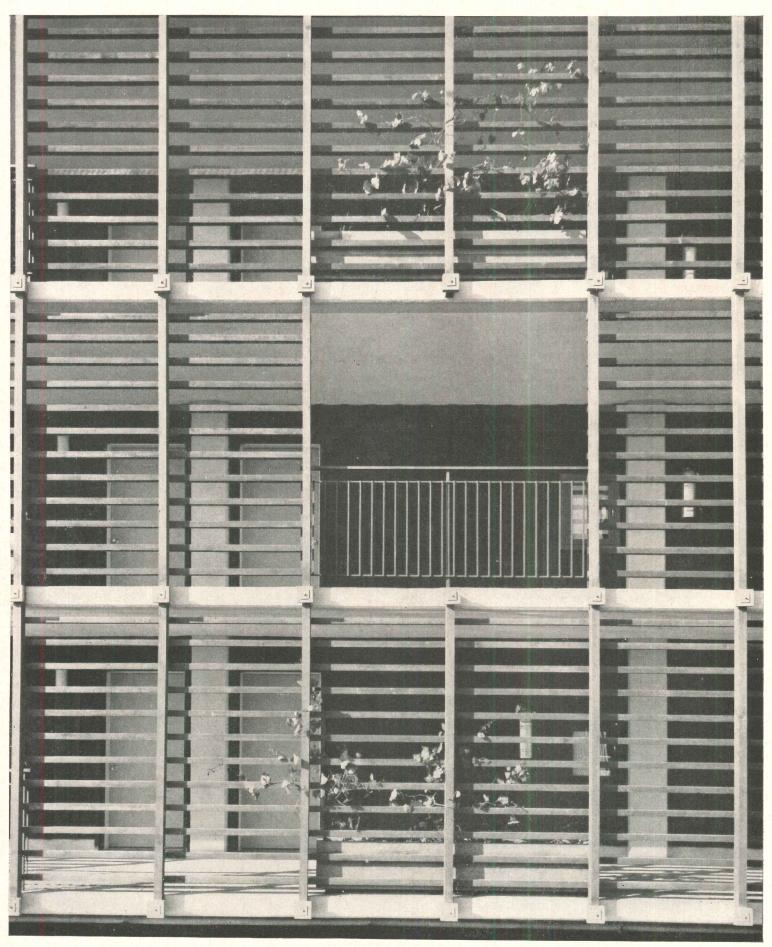
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FOR WALL MOUNTING, SPECIFY THE HANDSOME TEAR DROP . . .

Sparkling all-metal Watrous Tear Drop soap dispensers are vandalproof. Exclusive "Eagle Eye" indicators show when refilling is needed.



Wood puts up a good front on this multi-dwelling structure. The wood semi-open facade not only gives a distinctive appearance to the building, but also gives the occupants privacy, light, ventilation and view, all at the same time. Ernest Kump, architect.

Structurally and decoratively, the all-purpose material

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Wood proves again its capability to draw various building materials into a well-coordinated entity. Here wood blends in excellent taste and design with adjacent bricks and glass. Joseph Wythe, architect.

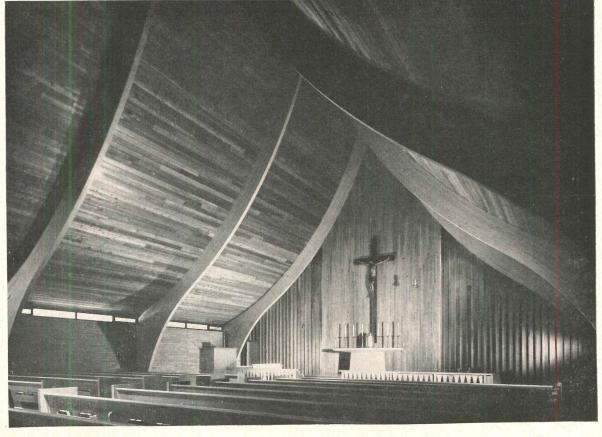
The *versatility* of wood gives you free rein in designing structures that are most complimentary to you and rewarding to your clients. There are practically no limits to your creativity with wood. Vaulted ceilings in places of worship, beamed ceilings in homes that blend with the site, custom features that give any building a luxury look. All such modes of expression can be yours with all-purpose wood.

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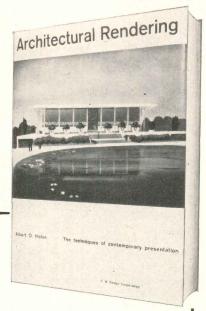
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Subdued, yet magnificent, is this combination of wood beams, wood ceiling, wood walls and wood pews. The remarkable acoustical qualities of wood please the ear as well as the eye, reverently receiving hymn and prayer. Edward D. Dart, architect.



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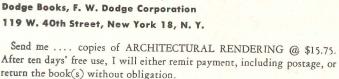
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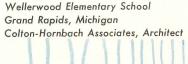
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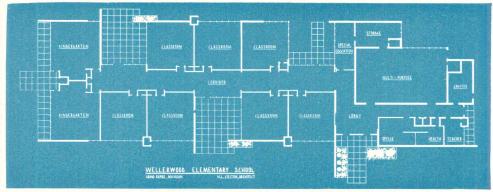
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Albert O. Halse, A.I.A., one of the foremost teachers of delineation in the United States, has had 30 years of experience as a designer, architect, and professional renderer, and has been a successful color consultant and interior designer as well. For 13 years he has taught delineation at the School of Architecture, Columbia University, during which time he has been able further to develop, test, and prove the theories and principles of delineation set forth in this book. He is well known also as a practicing New Jersey architect, and he was recently honored by the Architects' League of Northern New Jersey for his distinguished service to the profession of architecture.







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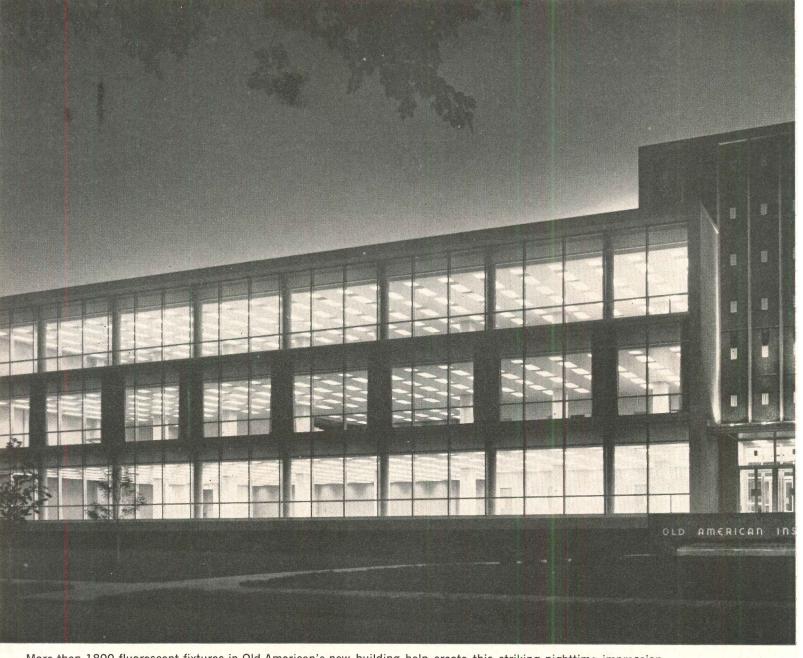
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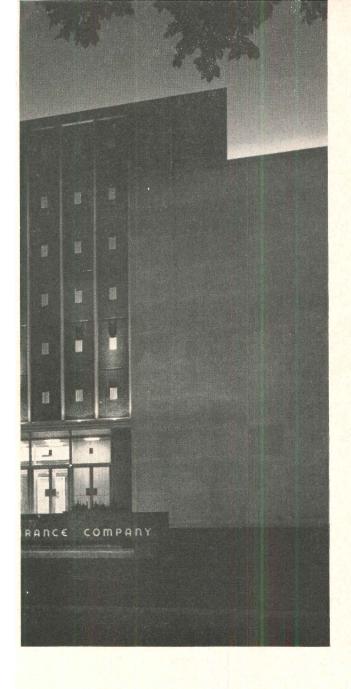
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A.S.L.A. Conference

continued from page 344

minster Fuller. His address, entitled "A Tentative Re-Entry into the Garden of Eden," placed the landscape architect, a worker with nature's materials, as the designer with the most inevitable chance to participate in the "reconstruction of Eden" which Mr. Fuller suggested is, technologically at least, very nearly environmentally possible today.

"Our goal," he said, "should be to bring ourselves as close to nature as we can without being punished by it . . . As he has come to understand and direct nature into channels allowing his own benefit, man has begun to emerge from his fortress cocoons. . . . We have the design and material tools to re-create an Edenlike existence . . . where a controlled and guided nature may replace the barriers created in fear. . . . Design principles developed in

Geodesic Domes, which duplicate nature's own coordinates, make it possible to construct hemispheric trellises almost invisible. By growing leafy and flowered bowers over these trellises, so growths are congruent with structural members, we transform the trellises into 'invisible architecture'. Two such bowers, one nested about ten feet within the other, separated by a transparent shell, furnish man with an environmental control appliance that uses rather than opposes nature.... People living in . . . close harmony with nature will surely come to think and react differently than people who have been fighting nature and hiding in rigid and opaque for-

Mr. Fuller feels that "these people might well be the first pioneers in the evolving new human-universe relationships and the discoverers of new modes of being." He called upon the United States to deemphasize what he called "Weaponry" and devote its energies instead to "Livingry," remarking that this country must reverse the current trend of emphasis on arms production or "the probability is high" that we will tumble from our position of leadership in the economic world.

Other speakers during the conference were: Richard C. Guthridge, New York landscape architect; Michael M. Harris, Harrison & Abramovitz, Architects, New York; Louis I. Kahn, Professor of Architecture, School of Fine Arts, University of Pennsylvania; Morris Ketchum, Jr., Ketchum & Sharp, Architects, New York; Newbold Morris, Commissioner, Department of Parks, City of New York; James Felt, Chairman. New York City Planning Commission; John P. Veerling, Chief, Aviation Planning, Port of New York Authority; Harold G. Thompson. Chief of Design, New York City Park Department; and Russell H. Riley, Harland Bartholomew & Associates, St. Louis.

Subjects under discussion were: city planning and zoning, regional planning and highway planning, problems of jet airports in relation to land use, landscape design at the urban level, for country homes, for outdoor living, reports on planning for the 1964-65 New York World's Fair, and college and school site planning.



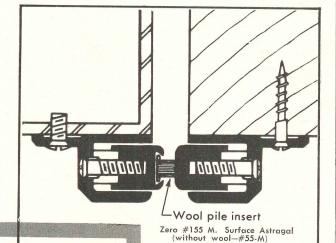
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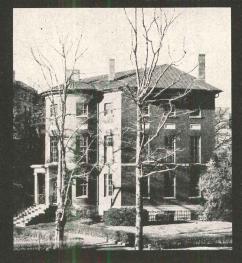
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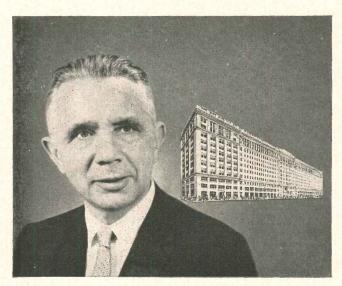
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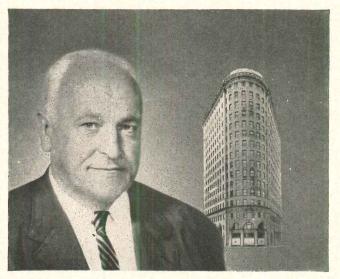
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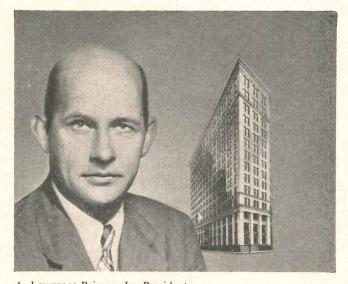
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and more and more managements of existing buildings specify them at modernization time.

Selecting an elevator system is a key decision which deserves your personal attention and approval. As a building owner or manager, it pays you well to investigate before you invest. Make arrangements to see this eye-opening, behind-the-scenes demonstration soon by calling the Westinghouse Elevator Division Sales Office in your city.



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Cornell Planners Discuss National Housing Policy

"Housing—Whose Responsibility?" was the title of the Third Annual Spring Conference of the Organization of Cornell Planners held on the Cornell campus in mid-March. Sponsored by the student organization to stimulate interest in and discussion of the planning function and to give professionals and students an opportunity to meet and consider

current problems, the conference actually focused mainly on the theme "The Design of a National Housing Policy," the title for the last of the four seminars. Participating were some of the country's leading planning and housing authorities.

Design objectives for the urban environment and ways to achieve them were discussed by Edmund N. Bacon, executive director, Philadelphia City Planning Commission, and Burnham Kelly, now Dean of Cornell's College of Architecture. Mr Kelly suggested areas for managerial innovations, indicating his belief "that corporations are faced with . . . the realization that they must recapture the design responsibility . . . We are going to build in this country as much urban structure in the next 30 years as we did in the whole historical development of the country . . . The real infighting of control is going to occur in picking the developer, negotiating the financial deal, and handling the provision of services. Are the planners ready? Have they any plans?"

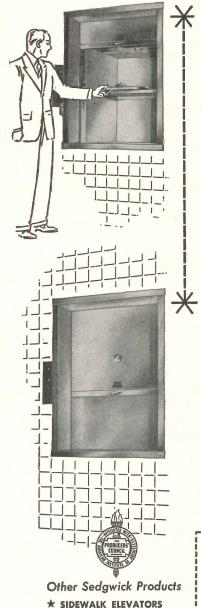
Mr. Bacon differed with the opinion of James E. Lash, executive vice president of ACTION, that there was a danger that planners go overboard to impose their own ideas. According to Mr. Bacon, "The truth of the matter is, that under our democratic system, there are plenty of controls to prevent the planner from being successful in imposing his own ideas. The great danger is that the planner fails to produce his own ideas in the first place. The danger of having your ideas accepted too quickly is very obscure. . . . The failure is the failure of the planners to produce valid and exciting ideas for people to follow through on.

"I said that 'policy should grow out of the rich soil of experience gained through action,' and I now assert to you from a very real period of political battle in Philadelphia that design is one of the most potent weapons we now have in use."

A comprehensive outline of the evolution of the U.S. housing policy and programs was given by Professor Thomas W. Mackesey, dean of the College of Architecture at Cornell, and Carl Feiss, consultant on community planning. E. Everett Ashley, III, director, Statistical Reports and Development Branch, Housing and Home Finance Agency, outlined the challenge of the housing problem in the sixties.

In a final session, two new housing studies directed toward a design for a national housing policy were reviewed and discussed: the Rockefeller Study which underscores the use of urban redevelopment housing as a stimulant to economy, stresses the need for a more comprehensive unit of planning, and points to the responsibility of the continued on page 360

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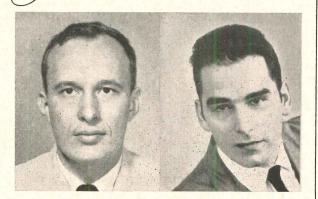


THE JURY Reading from left to right:

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Cornell Planners

continued from page 356

individual in stimulating the attack on urban blight and the need for public and private economic sectors to work together; and the Fisher Study which recommends a loosening of Federal controls over local authorities and a long-range research and planning program aided by Federal funds and carried out primarily at a local level.

In direct response to the conference theme, "Housing—Whose Responsibility?", there were no very surprising positions taken. Carl A. Willsey, chairman, Committee on Education National Association of Real Estate Boards, answered: "... private enterprise and not the Federal government ..."

Lester Eisner, Jr., Assistant Commissioner of Housing, New York State Division of Housing: ". . . the role of the State and Federal agen-

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cies should be to help in areas where the locality needs assistance. . . . The government agencies are simply service agencies rendering partnership assistance to fill temporary gaps, and the long-range goal is to provide a climate where private enterprise may assume leadership in housing, as it does in other industrial areas."

John D. Lange, executive director, National Association of Housing and Redevelopment Officials, advocated a clear definition of responsibilities. "Traditionally, the roles of the three levels of government have been: Federal—financial assistance and standards; states—permissive legislation with supplemental financial assistance for state programs; and municipalities—initiation, planning, design, construction, execution of projects.

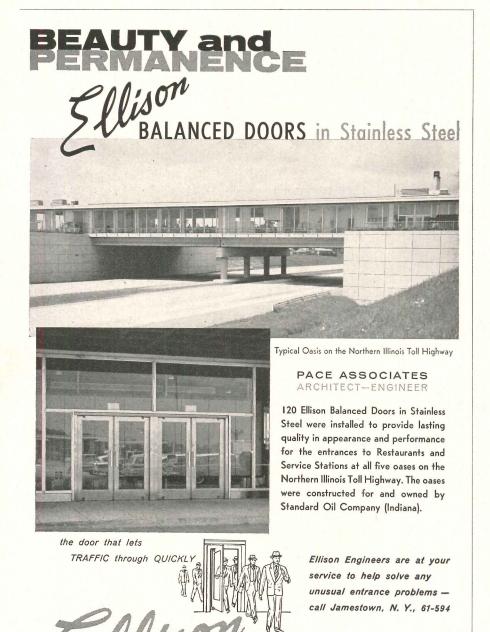
"The proper policing of Federallocal contracts and the protection of the Federal purse can be accomplished without maximizing the Federal role. Proper adjustment of the role of Federal officials . . . will do more to aid the objectives of the program."

Tracy B. Augur, Assistant Commissioner of the Urban Renewal Administration: "... the planning and replanning of the urban environment is a public responsibility whereas its building and rebuilding is essentially a private responsibility."

Mr. Bacon: "... it is your responsibility. The objectives toward which we are working are the social, economical, and political conditions which will exist at the arrival of our objective. ... If you are really planners, you will conceive of yourselves as citizens and a vital force in this democratic system of the creation of policy which you will make."

Mr. Feiss: "We should consider seriously the concept of a department of urban affairs . . . so that, in the cabinet of the President, there will be one man responsible for urban problems who knows and can visualize the relationship of various proposals at the level of the cabinet. This might alleviate the many contradictory, conflicting and overlapping programs."

Proceedings of the conference are available for \$2.00 from the Organization of Cornell Planners, College of Architecture, Cornell University, Ithaca, New York.





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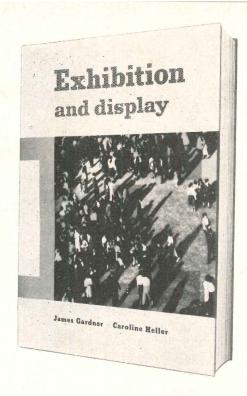
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EXHIBITION AND DISPLAY studies the problems of designing exhibits to explain, create atmosphere, and sell — the three activities which, alone or in combination with each other, are the objects of any exhibit. It also examines the methods and underlying principles used to achieve these objects. Its thorough criticism of scores of displays apply the principles outlined in a practical way. For the specialist, there is a technical appendix on procedure.

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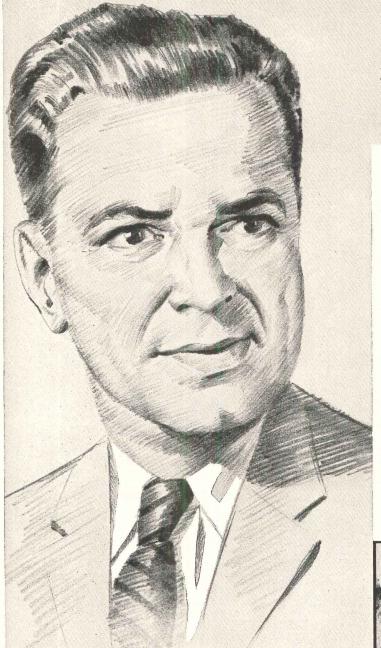
James Gardner is a leading designer noted for such projects as the British Pavilion at the 1958 Brussels Exhibition.

Caroline Heller has worked as writer and lecturer for the United Nations, the British Government, and a number of private corporations.

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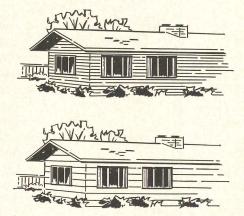


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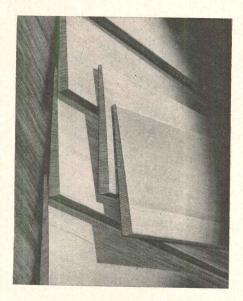
The many advantages of wood as a siding material are easy to see in the bevel sidings manufactured by Weyerhaeuser. They are grouped as narrow bevels, having a nominal thickness of ½" and a choice of 4", 6", and 8" widths... and wide bevels, having a nominal thickness of ¾" and a choice of 8", 10", and 12" widths. Although they are available in several species, this is generally not a consideration because Weyerhaeuser's high standards of quality and uniformity in manufacture give them all very similar strength and performance characteristics.

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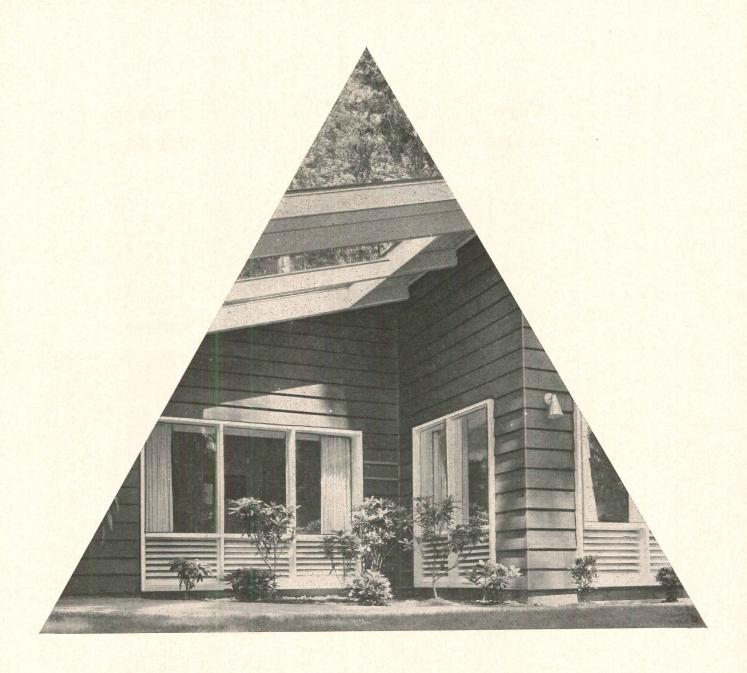
in weight and easier to handle . . . increases its strength properties . . . makes it more stable and more durable. Solid wood siding also adds measurably to the total insulation in a home, adds extra rigidity to the framing, and provides high impact and abrasion resistance, with the result that it will look "new" indefinitely with only moderate maintenance.



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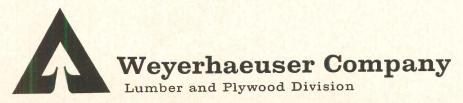


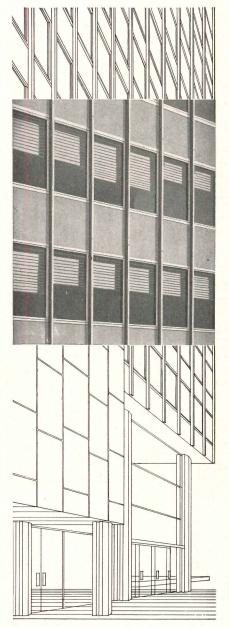
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THE RECORD REPORTS

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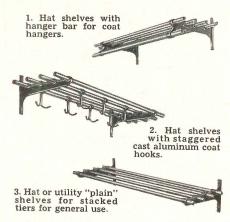
At present, foundations for the terminal building, designed by Eero Saarinen and Associates, are near completion. The structural portion will be completed by April, 1961.



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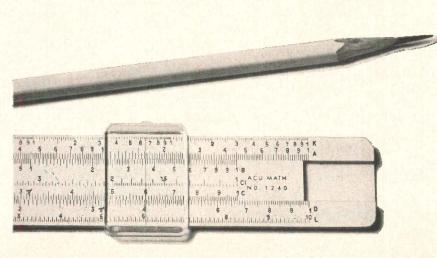
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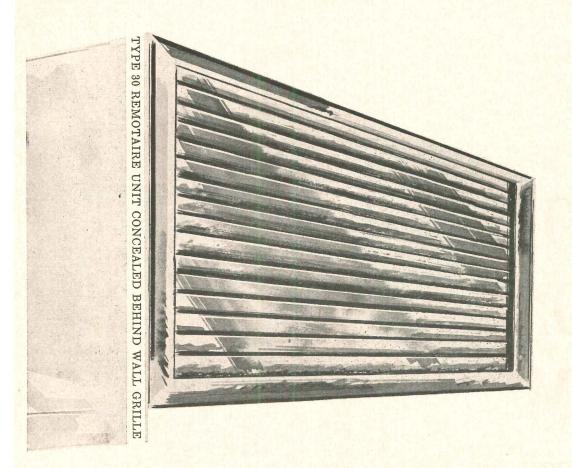
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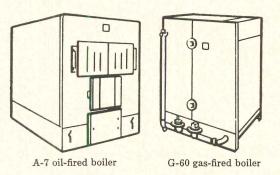
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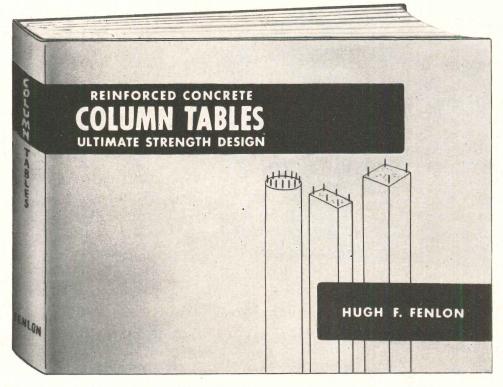
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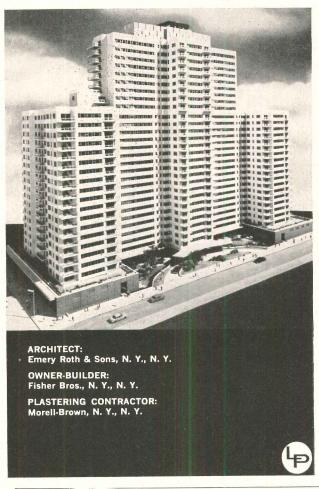
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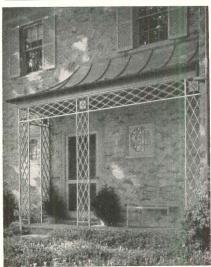
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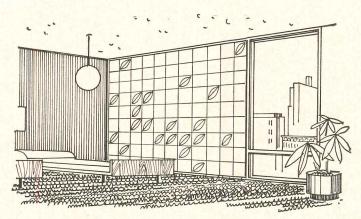
It's flexible base bar carries 120 sharp prongs to the foot, curved and staggered in varying angles to cover a complete 180° arc. And, being of nickel stainless steel, it doesn't substitute one form of maintenance for another won't streak or discolor other building materials.

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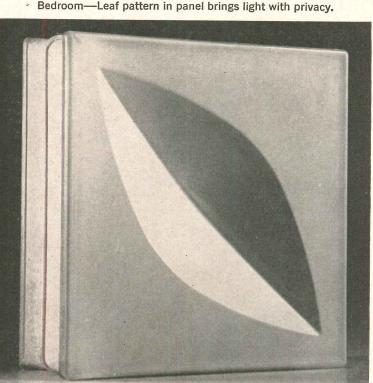
COMPANY OF AMERICA

DEPARTMENT 310 1722 - 1st Avenue Rock Island, Illinois

New PC Sculptured Glass Modules for

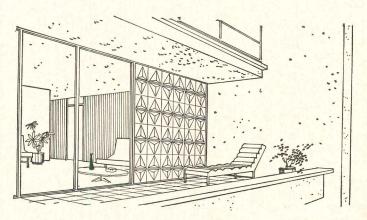


Bedroom—Leaf pattern in panel brings light with privacy.

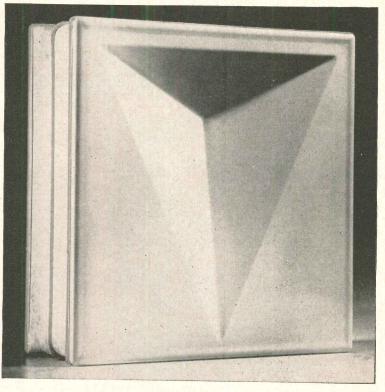


The material is glass, and that means translucency and durability. The product gives you much more color, pattern, and texture all in one.

Used in apartment planning, PC Sculptured Glass Modules control light as they achieve design. The patterns enrich the interior, distinguish the exterior through a visual play-back of light and shade that is bold, yet not aggressive; decorative, yet subtle. And



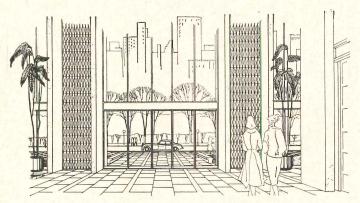
Balcony—Pyramid pattern enriches exterior; transmits light.



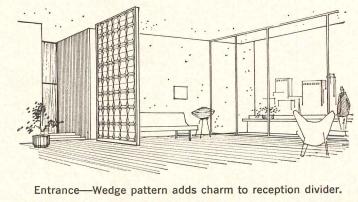
all this without sacrificing that "open feeling" so essential to apartment environments. The product's light transmitting qualities range from the transparent to the translucent, to partially opaque tones.

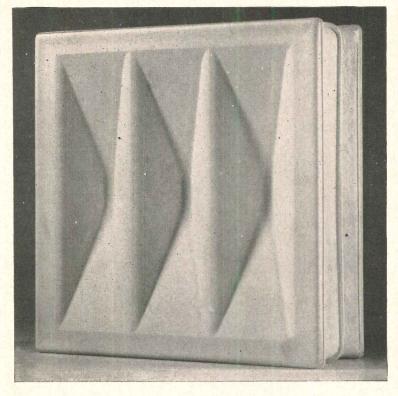
Considerations of economy favor this product, too. One operation gives you a finished wall, decorated on both sides. The high insulation factor, equivalent to a 12" thick masonry block wall, suggests economy in

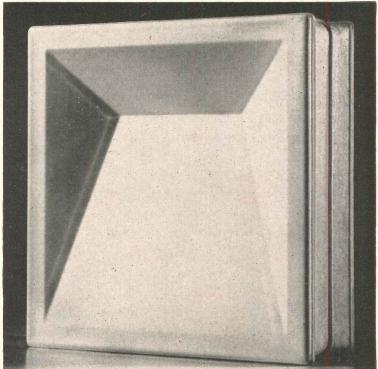
Flair and Flexibility in Apartments



Lobby—Harlequin pattern accents the entrance area.







air conditioning or electric heating. Mortared construction practically eliminates maintenance. And expensive accessories such as drapes, curtains and other sun shades are often unnecessary.

PC Sculptured Glass Modules are available in the four face patterns shown above. The patterns are pressed into both sides of the unit to a depth of approx-

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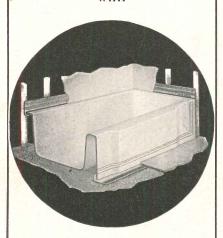
come in clear glass, plus eleven ceramic colors applied to one face only. The unit is 12 inches square. It is available on architects' specifications only.

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Required Reading

Technical . . . cont. from page 78

freehand graphical means; and on mathematical problems solvable by graphical means.

ELEMENTARY ENGINEERING MECHAN-ICS. By Eugene George Key. John Wiley & Sons, 440 Fourth Ave., New York 16. 457 pp., illus. \$5.50.

A text book for students in non-degree technical programs explaining statics, dynamics and engineering applications in terms requiring only elementary mathematics.

STRUCTURAL ENGINEERING. By Nathan S. Glassman and Harry H. Graef III. Dept. A, International Business Services, 1026 20th St., N.W., Washington 6, D. C. 96 pp., illus. \$7.50.

Designed as a "data and work book" for those preparing for architectural registration examinations.

PLUMBING, HEATING, AND PIPING ES-TIMATORS' GUIDE. By Paul G. Davis. McGraw-Hill Book Company, 330 W. 42nd St., New York 36. 213 pp. \$6.50.

HOW TO DESIGN AND INSTALL PLUMB-ING. By A. J. Matthias Jr. and Esles Smith Sr. American Technical Society, 848 E. 58th St., Chicago 37, Ill. 446 pp., illus, \$4.95.

SIMPLIFIED DESIGN OF REINFORCED CONCRETE. By Harry Parker. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, 303 pp., illus. \$6.50.

The second edition of a standard introductory text first published in 1943.

ALL ABOUT SWIMMING POOLS. Arco Publishing Company, Inc., 480 Lexington Ave., New York 17. 144 pp., illus.

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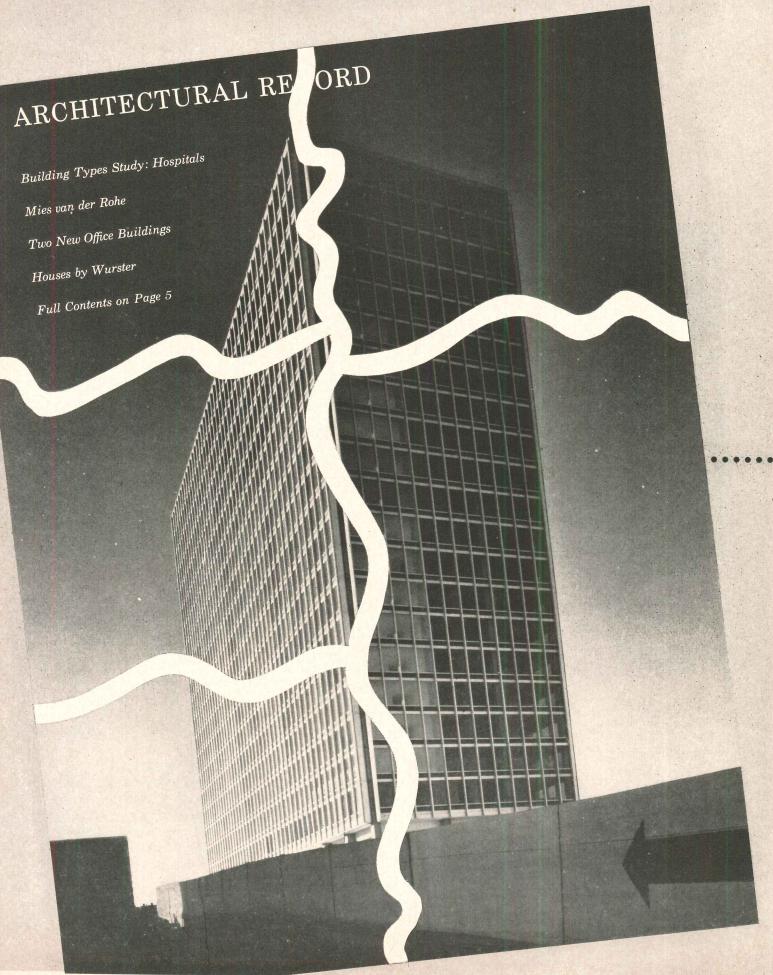
Here two Carrier Hermetic Centrifugals with a total capacity of 850 tons supply chilled water for air conditioning. Conditioned air and water services are delivered to Weathermaster Units installed end to end to form a continuous 10-by-12-inch railing around the perimeter of each floor. The smart, tailored look is shown in the office above.

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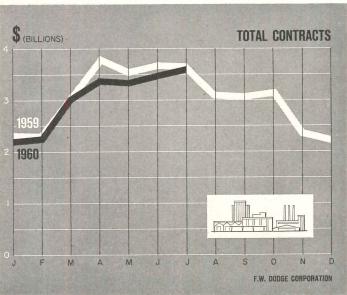
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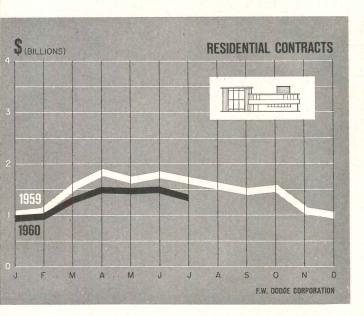
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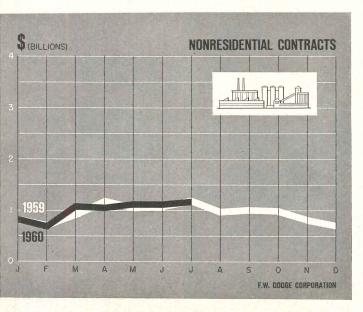
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Current Trends in Construction



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APARTMENTS MAINTAIN STRONG SHOWING

THERE IS no gainsaying the fact that 1960 has not been a spectacularly good year for housing in general. Yet one segment of housing—apartment buildings—has done considerably better than the other types. Through July, according to the Dodge figures, contracts for new apartment buildings totaled \$1,148,000,000. While this total was about five per cent below the corresponding period of 1959, it still represents the second highest dollar volume ever reported for apartment building contracts. So far this year, apartments have accounted for 19 per cent of all dwelling units reported, as compared with 17 per cent last year. There is evidence that the typical apartment built this year is larger and more expensive than it was last year.

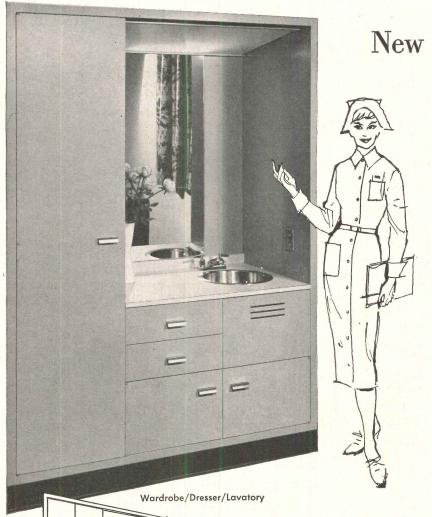
ONE COULD speculate at length on the reasons for the increased popularity of apartments. Perhaps the simplest explanation is that we have neglected apartments in the postwar period. In some postwar years, apartments accounted for less than 10 per cent of housing units built, as compared with ratios of 30 per cent or more during the 1920's. The "growingest" adult population groups now and for some years to come are the elderly and the young, both presumably more inclined to favor apartment dwelling, by choice or by economic necessity. There is perhaps some disenchantment on the part of a number of homeowners with the pitfalls of home maintenance and the perils of commuting, although it is hard to detect any real back-to-the-city movement on the part of suburbanites, most of whom seem reasonably content.

SOME QUESTION about the immediate future of the apartment building market can be raised by a look at the government's vacancy figures. These indicate that as of the second quarter of 1960, 7.3 per cent of all rental units were vacant and available for rent, as against 6.7 per cent a year earlier and 2.6 per cent in 1950. This 7.3 per cent rate for rental units contrasts sharply with the vacancy rate of only 1.2 per cent for homeowner units, and implies that the rental housing market is becoming saturated. However, there are some footnotes to the figures worth considering. One is that about a third of the rental units vacant were substandard in terms of plumbing facilities; and about half of the vacant units were not in apartments, but in one- or twofamily buildings. Finally, it is worth noting that there were sharp geographical differences in the rental vacancies. ranging from 10.6 per cent vacant in the West, down to only 4.4 per cent in the Northeast. It seems reasonable to conclude that while the vacancy figures raise a few warning flags, there is still a large market for the right kinds of rental units in the right places.

GEORGE CLINE SMITH

Vice President and Chief Economist

F. W. Dodge Corporation



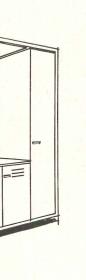
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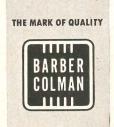


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