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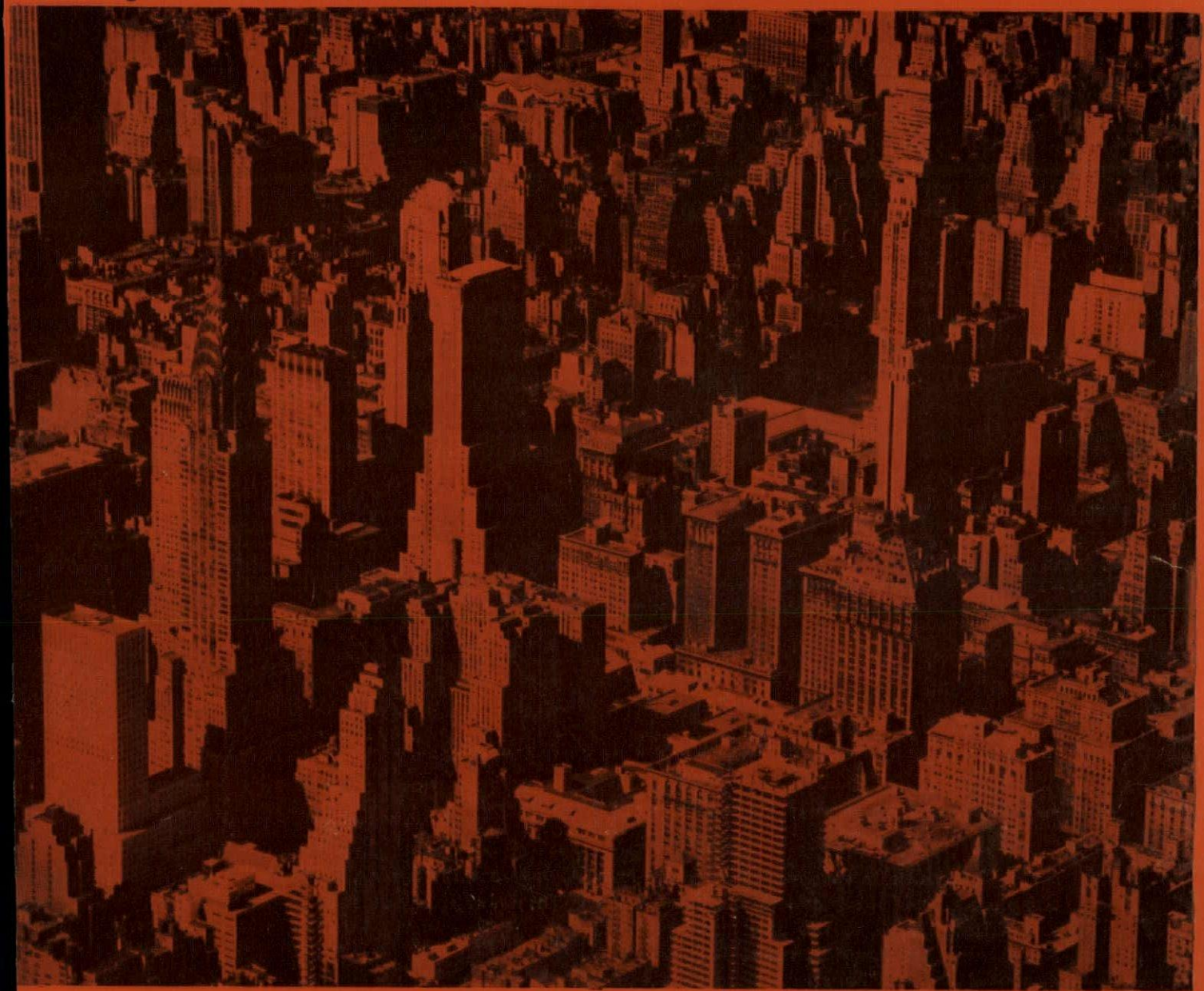
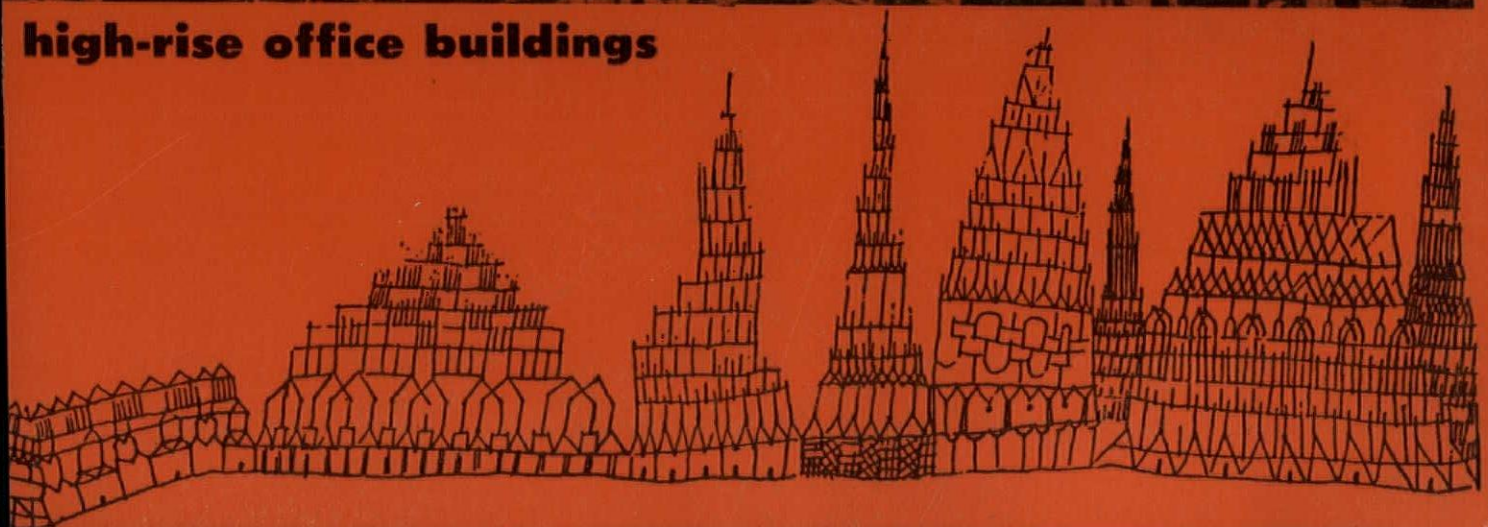


high-rise office buildings



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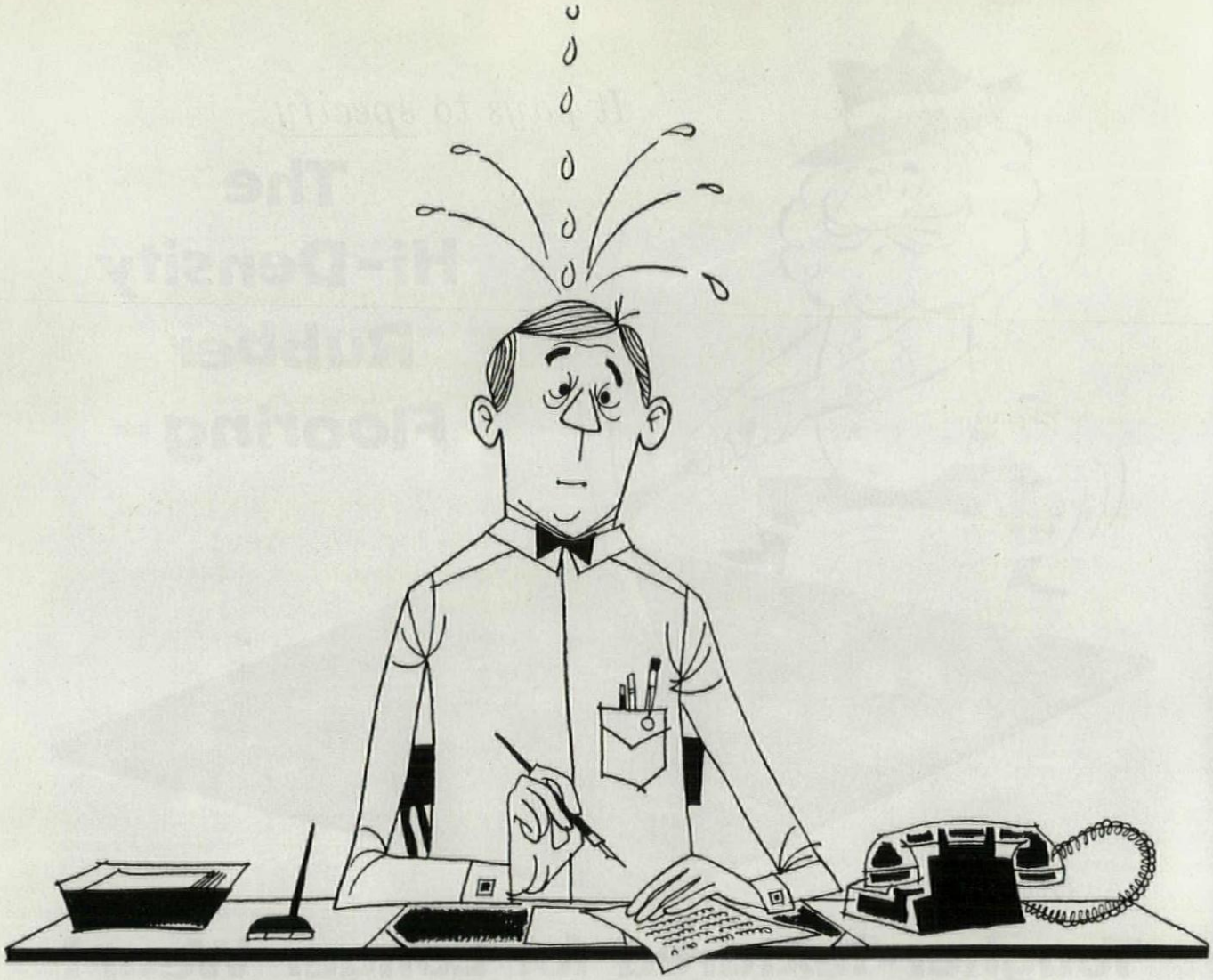

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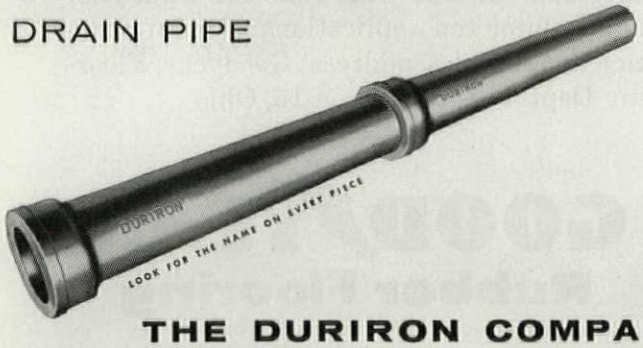

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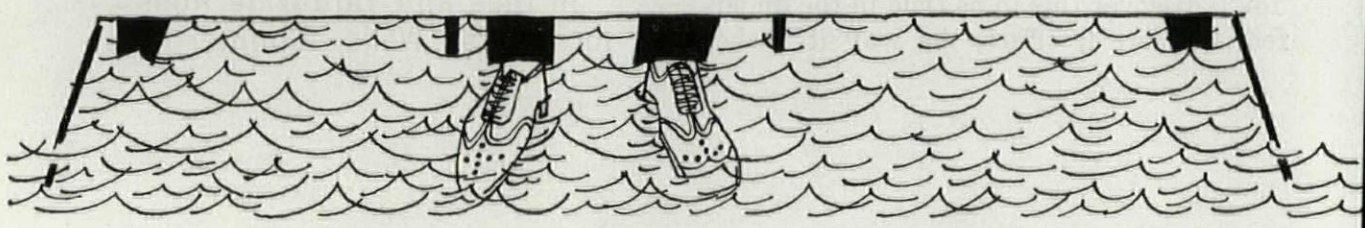

PROGRESSIVE ARCHITECTURE

June 1957

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Volume XXXVIII, No. 6

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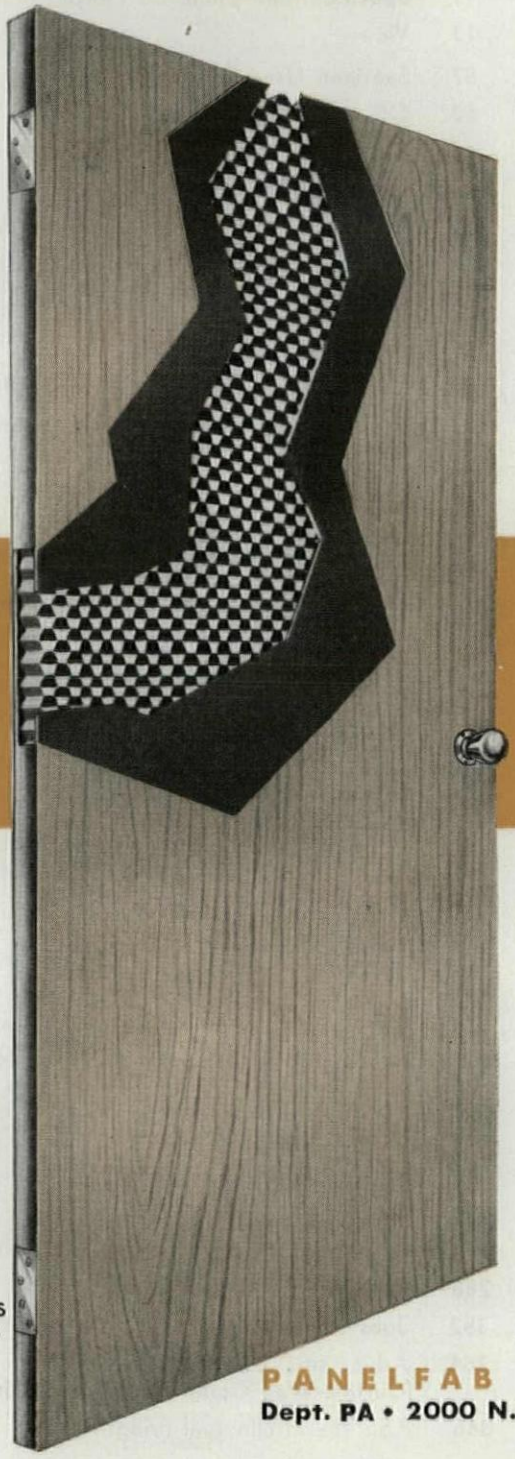

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It's the Law by Bernard Tomson

P/A Office Practice *article discussing the distinctions and relationships between zoning and regulatory ordinances.*

If a municipality may not lawfully zone property in order to prohibit a particular use, to what extent may that use be regulated? A municipality may not accomplish indirectly what it lawfully cannot do directly, but the line between prohibition and regulation of use is not always subject to clear definition.

In last month's column, it was pointed out that the validity of zoning, when applied to a prior nonconforming use, depends in part upon the substantiality of the property interest of the owner in such use. However, it is clear that where the property interest of the owner in a prior nonconforming use is such that the municipality cannot constitutionally prohibit such use by means of zoning, it does not necessarily follow that the municipality is precluded from regulating that use.

In a recent New York case (*Town of Hempstead* v. *East Meadow Realty Corp.*) the Town of Hempstead sought an injunction restricting the defendant from operating a sand and gravel business on property owed by the defendant. Under the local zoning law excavation of sand and gravel was prohibited in the area in which the defendant's property was located.

The defendant's property consisted of a 38-acre tract which had been used for the sand and gravel business since 1927, whereas the zoning ordinance of the Town had been adopted in 1930. The defendant contended that the zoning ordinance was invalid, in so far as the Town sought to apply it to its property.

The Court ruled that the defendant was entitled to use its premises for the excavation of sand and gravel, on the ground that a nonconforming use which existed prior to the adoption of the zoning ordinance is a vested right, of which the owner could not be constitutionally deprived.

Subsequent to this decision, the Town of Hempstead instituted a proceeding to enjoin the same defendant from continuing its mining operations, because of its failure to comply with a regulatory ordinance of the Town relating to sand removal and other excavations. This ordinance was adopted in 1945, and required persons engaged in excavation to immediately refill the excavation with clean, nonburnable fill during the course of their operations.

The defendant contended that the judgment in the earlier litigation, which permitted the continuance of the prior nonconforming use, constituted an adjudication of the issues raised by the Town in respect to the regulatory ordinance. The Court, however, rejected this contention, pointing out that the zoning ordinance and the regulatory ordinance were two separate and distinct laws, and that it did not follow that the right to continue a use precluded regulation of that use. The Court said:

"The earlier litigation and the present lawsuit are identical so far as parties plaintiff and defendant are concerned. However, the issues determined in the earlier litigation are not the same as those raised by the present lawsuit. In the former litigation the basic issue which was tried and determined was the existence or nonexistence of a nonconforming use under the zoning ordinance of the Town of Hempstead. That has been determined by a judgment which declares that the defendants do possess such a nonconforming use and that it entitles them to make such use of the entire 38 acres. The present suit is not concerned with the zoning ordinance at all. The ordinance which is involved in the present lawsuit is entirely separate and distinct from the zoning ordinance and is entitled 'Sand Bank and Pit, Topsoil Removal and Other Excavations Ordinance of the Town of Hempstead.' In this present action the town seeks to compel the defendants to comply with the provisions of that ordinance or to terminate its operation."

Under its "police powers" a municipality has the right to regulate the use of property in the interest of the health, safety, and welfare of the community. Unrestricted exercise of this power, however, could result in burdensome restrictions on the use of the property as would in effect prohibit such use. On the other hand the failure to exercise the power could result in the creation or continuance of a nuisance or the extension (as distinguished from preservation) or a prior nonconforming use.

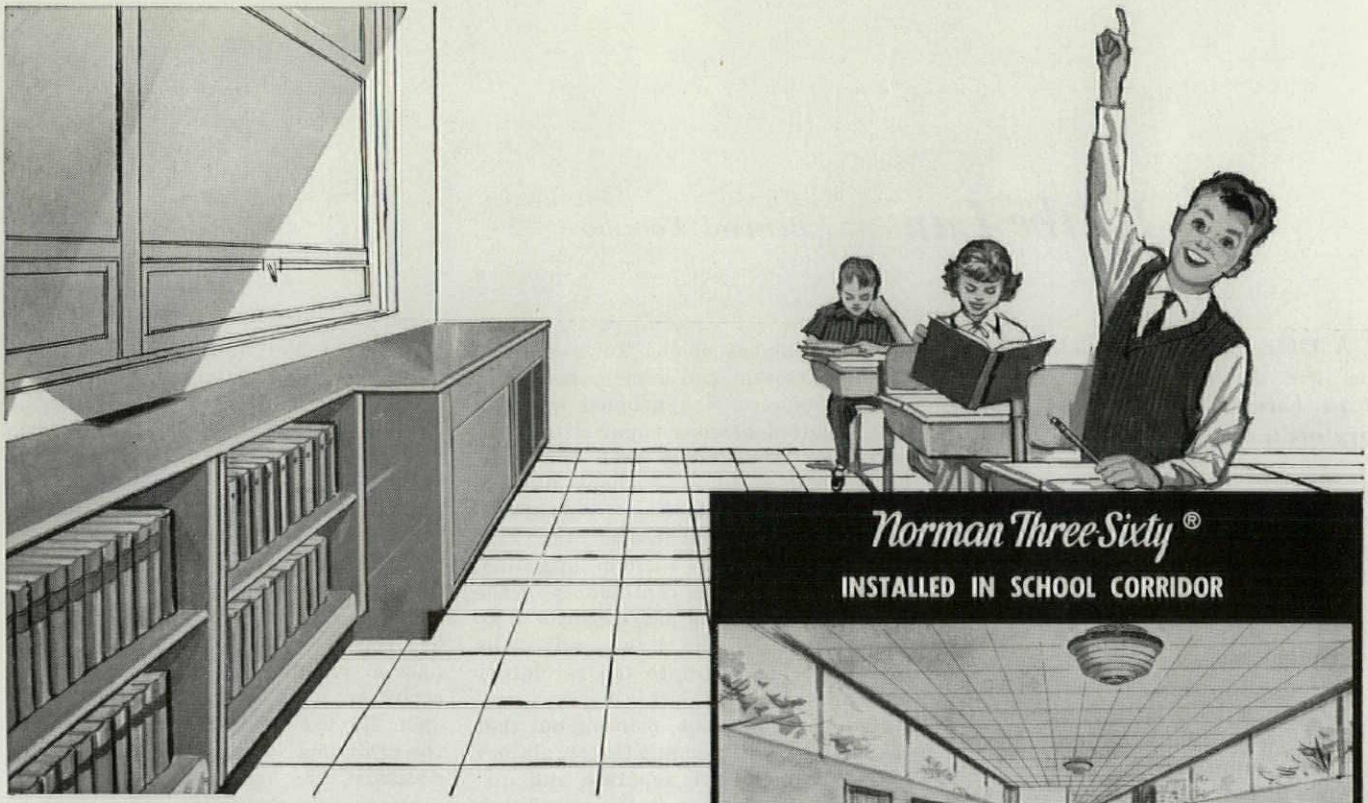
Some of the difficulties implicit in the attempted regulation of the use of property is illustrated by the case of *Town of Somers* v. *Camarco*, which was discussed in last month's column. In that case the Town ordinance under judicial review not only regulated the method of excavating sand and gravel but also limited the area that could be excavated to 5 acres.

The majority of the New York Court of Appeals ruled that the defendant had a vested right to excavate his entire tract of land of 55 acres based upon its use prior to the adoption of the ordinance. Consequently, it was unncessary, the majority of the Court asserted, to determine what was a proper exercise of the Town's "police powers."

The minority of the Court, however, pointed out that the defendant had only utilized a portion of his property for excavation and therefore no vested right to excavate the entire tract was created by the prior limited use. Thus, the minority contended, a 5 acre limitation for excavation, as applied to the defendant's property, was a reasonable exercise of the Town's power to prevent the creation of a nuisance. The minority opinion stated:

"If the law were otherwise, if a single excavation in a given area of a large parcel of land were to create vested rights in the entire tract, a special privilege would be conferred upon sand and gravel operators, which is not recognized even in the case of substantial buildings and structures. Indeed, if the rationale at the court's decision were sound, a dog kennel run, a mink farm, or a piggery, existing on one acre of ground at the time of the passage of a zoning law prohibiting such use, could be extended without limit over the owner's entire tract, no matter how large its acreage. Yet such an expansion of a nonconforming use would, I venture, never be sanctioned, any more than would be the extension or an enlargement of a nonconforming building which might have involved an original investment of hundreds of thousands of dollars."

Undoubtedly, the attempts of municipalities to regulate the use of property, where they cannot rezone the same, will engender further and continuing litigation.



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Mechanical Engineering Critique *by William J. McGuinness*

P/A Office Practice *column on air distribution for air conditioning in high-rise office buildings.*

In the anatomy of architecture, the bones and arteries represented by structure and equipment, are undergoing a great slimming process. A step forward in this direction is the design of the frame and the air-distribution system of the new Medical Towers Building in Houston, Texas (*see page 192*). The challenge of structure is in adapting it to the needs of the design and the ever-increasing bulk of the mechanical facilities. How well this challenge was met in Houston is evident in the efficient and economical frame. Mechanical design, however, faces directly the problem of the expanding volume of the services of distribution, especially in a building for the medical profession. Not the least of these is air conditioning.

In the shaping of the mechanical physiology of high-rise office buildings there have been several strong trends. Getting everything off the floor and thus concentrating mechanical services of supply (and return) in the ceiling has facilitated the greatest possible flexibility in office planning, including the anticipation of future changes. The elimination of risers for steam, water, and air at exterior wall columns has removed the bulk of furring at this valuable building surface. As a result, exterior rooms can make the best use of natural light and view. Horizontal strips of glass are possible; slim mullions can divide the exterior surface to furnish edges for the partitions between offices. Finally, the choice of the top floor as the location for the air-handling equipment, fed only by pipes for steam and chilled water through the core, makes it possible to lift and separate the tower from the ground or from the base structure, with minimal connecting services.

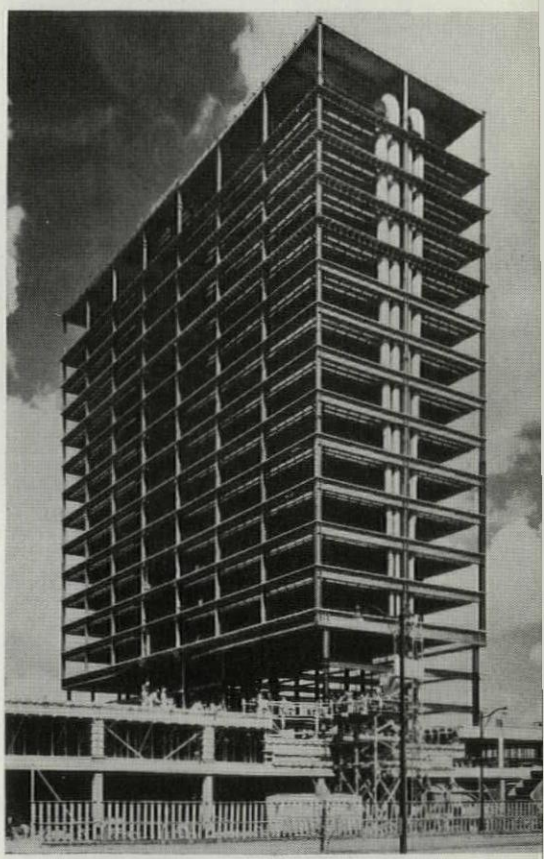
The omission of convectors for heating at the perimeter is suitable in Texas, where the heating problem is not great. For the Medical Towers Building, an all-air system was chosen to supply heat and also handle the larger problem of air conditioning. It is a dual-duct (one hot and one cold), high-velocity system. Steam boilers and water chillers in the basement serve the two air-handling central-station units on the top floor. Steam is converted to hot water for use there. Air distribution is downward at the end walls by pairs of ducts, each set of which supplies one quarter of the building through dual branches on each story directly under the floor above. At terminal points in the ceiling near offices, attenuation boxes slow down the air and quiet it before delivery to the rooms through ceiling air diffusers. At other points in the ceiling, return air passes into a plenum between the ceiling and the structural floor above, and thence to vertical chases in the core back to the units on the top floor.

This kind of system may really be said to create a new form. All distribution lies neatly in planes; vertical ones at the ends of the structure and horizontal ones below each floor (*construction photograph*). The rambling, tree-like duct structure of former systems has been collated. The use of high-velocity air makes the duct system very compact. It is interesting to compare this with the conventional arrangement using low-velocity air. In this method it was rather impractical to supply a large number of stories through a central vertical duct, which became very large by the cumulative capacity of the several floors. The usual solution was to locate air-handling stations on each floor, supplied by pipe stacks for chilled water and for steam or hot water. Bulky supply and return branches of the duct system served the spaces on each floor.

It is likely that more disputes arise over adjustment of cooling-air temperatures than of heating-air temperatures. Differences of opinion can arise between occupants of adjacent rooms in the same suite, between tenants on the same floor, and ultimately between tenants and owner. Any system which attempts to select and deliver a proper degree of cooling and humidity control, even with correct provisions for zoning, is likely to be subject to criticism. Relief for the owner is had by putting the choice of climate in the hands of each tenant. This is accomplished by furnishing each space with an automatic blending device which draws hot and cold air from the dual-duct system and mixes them to conform to the setting of a thermostat in the space. Permanent flexibility is assured by the fact that the terminal boxes in the various areas are fitted with flexible runouts so that ceiling diffusers can be relocated at will.

Each air-handling unit on the top floor has a capacity of 87,000 cfm of conditioned air, totalling 174,000 cfm. In each unit 13,000 cfm of fresh air is brought into the system, filtered, preheated and precooled to be mixed at 50 F saturated, for summer and winter operations. The fresh air represents about 15 percent of the air handled. The supply air is then mixed with 74,000 cfm of return air, the total mixture passing over mat filters. About 40 percent of it then passes through activated-carbon filters for the removal of odors. This is most important in a medical building, where odors from laboratories and other medical processes are likely to accumulate. Total air of 87,000 cfm is then taken into a fan and blown through a hot deck or cold deck of coils, depending on the requirements in the spaces below. After distribution through the vertical down-feed ducts and the perimeter ducts, flexible ducts carry the air to high-velocity units over the ceiling of the respective doctors' suites. The general design is based on maintaining 75 F and 50 percent RH. In the basement there are two low-pressure fire-tube boilers which supply steam for domestic hot water and for conversion to hot water for use in air-handling units. Centrifugal compressors aggregate 600 tons of refrigeration. The lower portion of the building is supplied by a separate, single duct, low-velocity all-air system.

Architects were Golemon & Rolfe, Houston, with Skidmore, Owings & Merrill, Consulting Architects. Consulting Engineer was Bernard Johnson & Associates.



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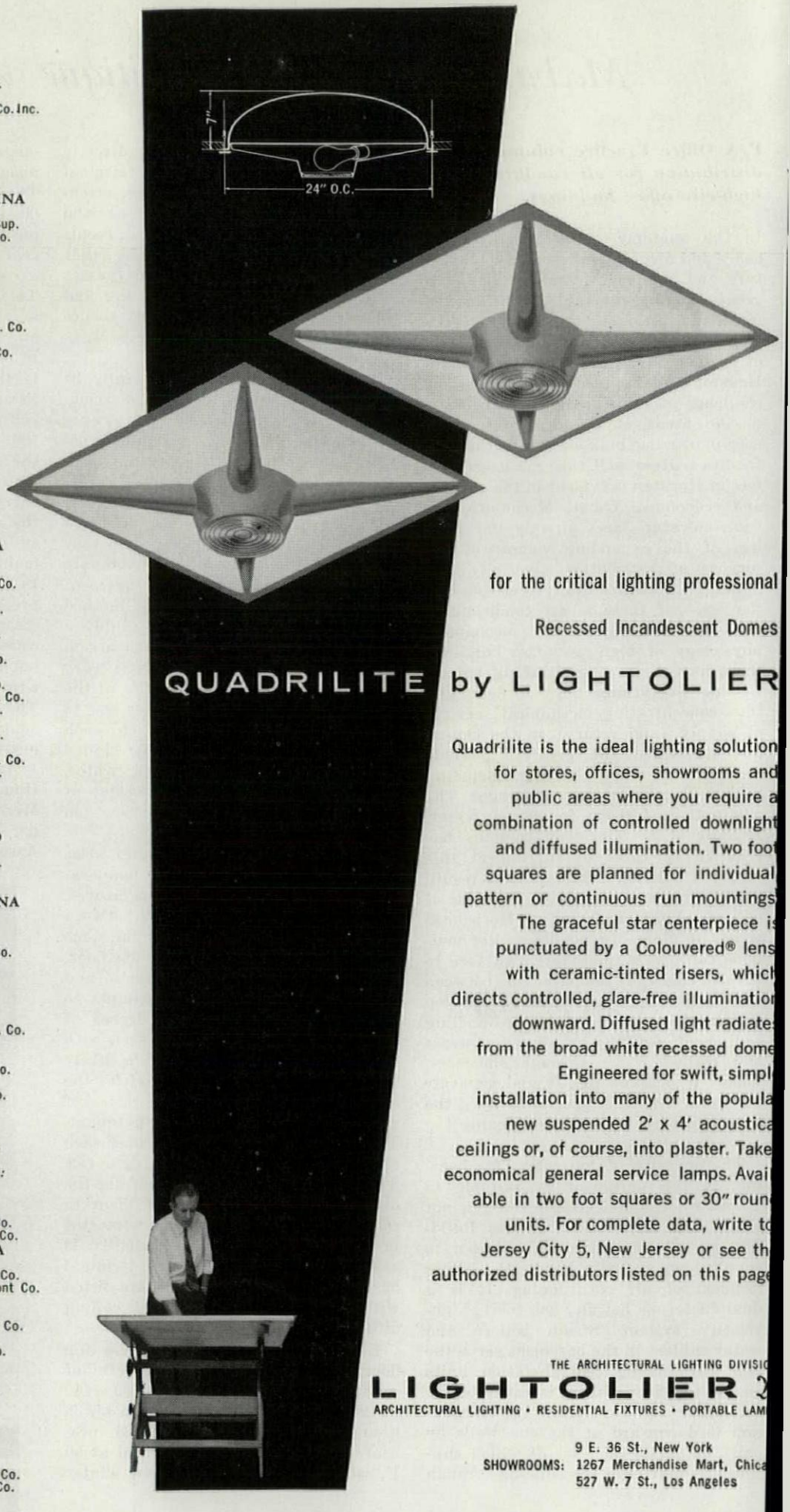

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Guaranteed or Reliable Estimates

P/A Office Practice *article asking the questions: what is the responsibility of the architectural profession to design buildings which meet the client's budget; how much is the architect to blame when bids come in at a figure above that budget?*

The questions above have come very sharply to the attention of P/A's Editors in recent months from several completely separated sources:

Item. Several months ago Bernard Tomson wrote a column on the subject of *legal* responsibilities in this area, and suggested contract revisions which would clarify the architect's traditional nonresponsibility for preliminary estimates. Several readers reacted strongly, maintaining that this was a head-in-the-sand attitude which made the package dealer's arguments seem valid; that the problem was not legal evasion of responsibility, but the finding of ways to fulfil clients' needs and meet budgetary limitations.

Item. In an Eastern community, a school job is far exceeding the budget and the funds available through bond issues, because someone made a bad error in preliminary estimates of soil conditions and foundation costs. The architects may be sued. If that is silly, who *is* responsible for what has become a tragedy to the town's citizens?

Item. In a major city, two large school projects, running into quite a few millions of dollars in cost, were recently bid, with the lowest figures in each case more than half a million over the budget to which the architects had presumably been working. The School Commission officials are furious at all architects at the moment.

Item. In another city, Architect A has a substantial reputation, well merited, for having his jobs (schools, churches, commercial building) bid within a few hundred dollars of the budget. Architect B, on the other hand, has a bad score in this respect. However, Architect B is a famous architect, with his work published all over the world. Architect A says, plaintively, "Doesn't he have the same responsibility that I have in this matter? Shouldn't he respect the client's available funds? Shouldn't this factor be taken into consideration when people say he's a great architect?"

In the belief that this is a very important question of architectural office practice, P/A here simply *raises* the question and a few supplementary problems that it leads to, in the hope that some discussion, some case histories, and possibly some solutions may be suggested by readers of the magazine.

1. Is there a *need*, in the first place, and is there a *responsibility*, in the second place, for the designer of buildings to find ways of assuring the client that complete contract documents will produce bids within a stated budgetary limitation? If the answer is *no*, then we can drop the whole subject. If the answer is yes, then isn't it obvious that: (a) the architectural profession must meet this need; or (b) another group (the "package dealers"?) will meet it?

2. Assuming a *yes* answer to the first question, is it then reasonable for the architect to continue insisting that he cannot guarantee preliminary estimates? Before answering this question, arguments on both sides would have to be examined.

For the standard "I am not liable" sort of contract: the architect has no way of controlling bids on the open market. With price fluctuations, busyness or hungriness of bidders, and many other factors to be considered, an architect would be insane to try to *guarantee* a cost which, at a certain point, gets completely out of his control. The owner must take certain risks and is in any event responsible for work done by the architect up to the bidding period. Hence the disclaimer of responsibility is necessary; and because of recent court decisions, Tomson's suggestion for new wording which "would make it difficult for the Owner to claim successfully an oral agreement by the Architect pertaining to maximum cost" is desirable.

For the owner's desire to be sure that bids will not exceed his budget: at the point of bidding, the owner already has a nonrecoverable (unless a court rules otherwise) investment in drawings and specifications. If the lowest acceptable bid exceeds the greatest available investment, either the project has to be dropped (we know of a recent instance where the owner threw up his hands and quit); the greater amount of money has to be spent, with the owner assuming other sacrifices (the community mentioned earlier has had to drop plans for another school); or expensive changes have to be made in the drawings and specifications to bring bids down, the result being hashed-up, obviously unplanned alterations at the wrong time.

3. Finally, if serious, unprejudiced examination of these first two questions indicates a need to improve the present situation, which of two solutions should be studied: a change in methods of practice toward *guaranteed* estimates; or an improvement in present accepted practice toward *reliable* estimates?

There are quasi-professional groups, already mentioned, which do guarantee estimates. The basic position of the professional architect—advisor, technician, artist, arbitrator, and all the rest—is lost in such a case, and that is obviously too great a sacrifice even to consider.

How then, can more reliable estimates become part of the normal architectural services?

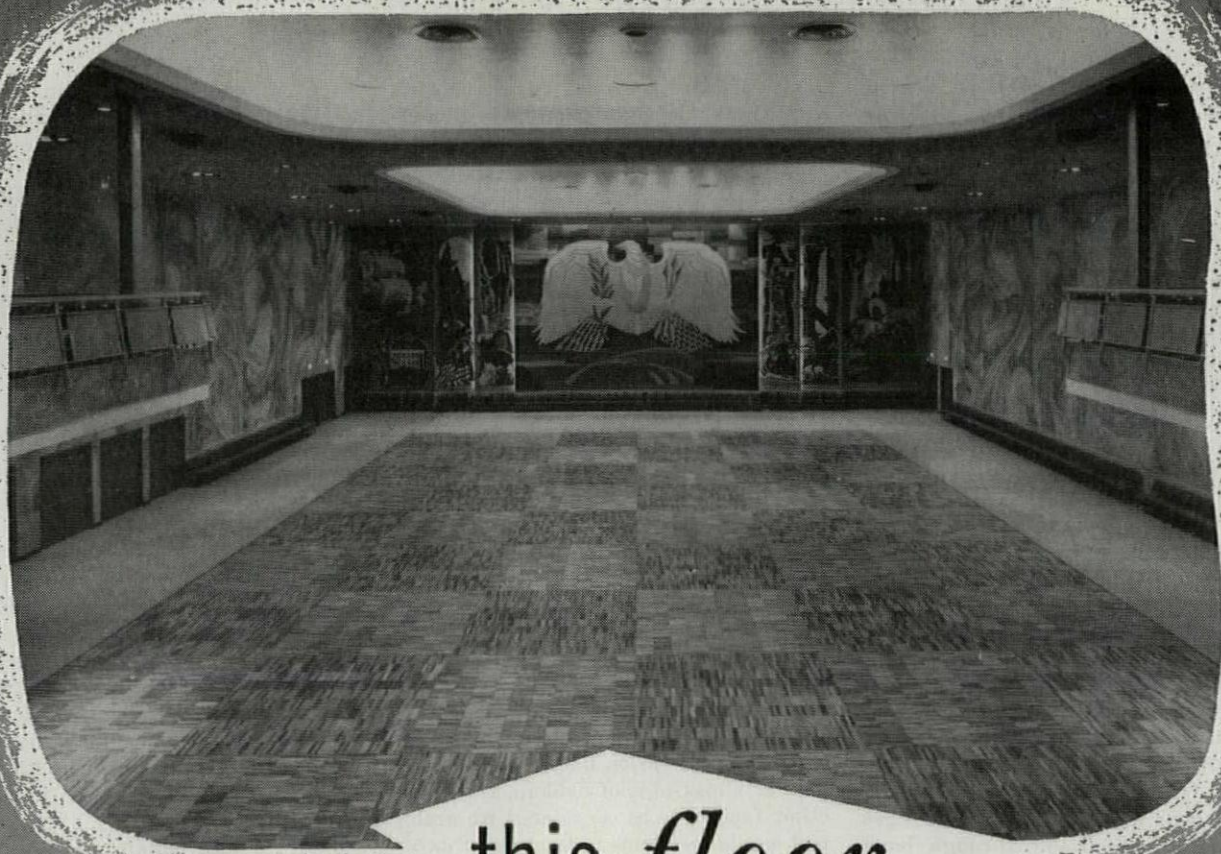
4. Should periodic cost-control checks of the drawings and specifications be made as routine a drafting-room practice as, for instance, preparation of details, or checking of shop drawings? Architect A tells us that the secret of his success in providing reliable estimates is precisely that practice. "The costs get out of hand," he claims, "when preliminaries go into the drafting room. Each little improvement in design, each bright idea added by job captain, designer, or draftsman, *may* be adding dollars to the cost of the job." It would seem sensible, then, not to discourage the bright ideas, but to check (how often; twice during the drafting-room period—once half way through, once again just before completion?) to see if costs have been added. How many architects, even careful ones, do this?

5. How should these checks be made, if they are considered desirable? On a square-foot or cubic-foot estimate basis? One man says *no;* there is even, he claims, a great difference in cubic foot costs in the four compass directions within the same metropolitan region. By calling in a friendly contractor? This is a sure way, a prominent architect tells us: "Jim L. Filler Co. or the Tanner Construction Corporation will always give me a good check at any time." Is this a truly professional method? Or should a qualified quantity surveyor be hired, just as professional architectural and engineering services are hired, to make cost-control surveys at these check times, based on quantity take-offs and applicable unit costs?

•

Whatever the answers of the individual practitioner to the questions raised above may be, P/A's Editors believe the subject should be further examined. It is our hope that various points of view may be expressed, so that further discussion can be carried out in this space.

A focus of social life in the Nation's Capital: the mammoth Grand Ballroom, Sheraton-Park Hotel, Washington, D. C. Seated several thousand at the Eisenhower Testimonial Dinner.



this *floor..*

is the center of the architectural design

Properly treated and maintained, the floor complements and enhances the beauty of the interior design. But — without proper treatment, the same floor can destroy the unity of the design, disrupt the architectural theme.

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Dept. A-4

Conductive Flooring in Hospitals by Harold J. Rosen

Choosing the proper flooring for hospital operating suites has been a problem for many years among architects, hospital administrators, and others confronted with the problem of reducing the number of fires and explosions caused by static electricity igniting anesthetic gases. The most effective way of preventing the accumulation of electrostatic charges in operating suites is to provide a floor which is designed to dissipate static electricity, and provide a path of moderate electrical conductivity between all persons and conductive equipment making electrical contact with the floor.

The National Fire Protection Association (NFPA) Standard No. 56, "Recommended Safe Practice for Hospital Operating Rooms" establishes a lower limit of 25,000 ohms resistance for conductive floors and an upper limit of 1,000,000 ohms.

In addition to its electrical characteristics, flooring in hospital operating rooms must be sufficiently durable, smooth, impervious, nondusting, and noncrumbling to permit thorough cleaning.

There is perhaps no other area in the hospital that is as critical as the operating room, and no expense should be spared in utilizing materials here that will safeguard everyone—patient, doctor, and nurse.

One of the flooring materials that has been used successfully in these areas is conductive ceramic tile. It possesses the required electrical conductivity, is impervious to most of the pharmaceuticals used in the operating room; withstands repeated washings, is nondusting, does not indent under the weight of heavy operating tables, and is unlikely that its electrical resistance will increase with age and exceed the upper electrical resistance limit permitted by the NFPA recommendation.

The following should be incorporated in your specifications for conductive ceramic-tile flooring in hospital operating rooms.

A. *MATERIALS*

1. *Ceramic Tile:* Conductive ceramic tile shall meet the performance and test requirements for conductive flooring of the current issue of National Fire Protection Association Standard No. 56, "Recommended Safe Practice for Hospital Operating Rooms."

2. *Pulverized Electrically Conductive Cement Mixture:* Shall be acetylene carbon black of 100% compression produced by the thermal decomposition of acetylene gas under carefully controlled conditions, compounded and machine mixed at point of manufacture as follows:

Mix 2 pounds by dry weight of acetylene carbon black with 98 pounds of Portland cement in a mechanical mixer, blending the two components until uniform distribution of the carbon black throughout the mixture has been achieved. The blended material shall then be passed through a suitable high-speed pulverizer.

If the mixture has become air slaked or dampened in storage or transit it shall not be used.

3. *Conductive Flooring Adhesive (Thin-set Method):* Shall be an adhesive with electrically conductive properties, having a resistance of over 25,000 ohms and less than 150,000 ohms, when tested in accordance with NFPA Pamphlet No. 56. The contractor shall submit an affidavit that the conductive adhesive complies with the foregoing.

B. *TESTING CARBON BLACK AND PORTLAND CEMENT MIXTURE*

1. One hundred grams of the mixture shall be screen tested on a standard Ro-Tap, through a No. 40 sieve for one minute. The residue retained on the sieve shall not exceed 0.1%.

2. Fifty grams of the mixture shall be tested for electrical resistance, using an ohmmeter as described in Section 6-2 (b) of NFPA Standard No. 56. Place the sample on a metal plate. On the same plate, at a distance of approximately 3 inches, place 1 electrode. Place the second electrode on the sample so that it will provide approximately a ⅛ inch thickness of the sample between this electrode and the metal plate. The resistance measured shall be less than 1000 ohms.

C. *SETTING BED MORTAR*

Shall consist of 1 part of the acetylene carbon black and Portland cement mixture and 3 parts sand, by dry weight. Dry mix these materials until the color is uniform before addition of water. Add water and wet mix until consistency is uniform. All blending and mixing must be done under responsible supervision. Place batches within a reasonably similar time after mixing.

D. *INSTALLATION (MORTAR METHOD)*

1. *Installation of Setting Bed.* Concrete subfloors must be clean and saturated with water immediately before mortar setting bed is placed. Spread setting bed mortar and screed to provide a smooth level bed. Setting beds shall be not less than one inch thick.

2. *Setting Ceramic Tile Floors.* Sprinkle dry pulverized acetylene carbon black and portland cement mixture, without sand, over setting bed surface while mortar is still plastic. The dust coat shall thoroughly cover the setting bed, shall be wetted if necessary, and troweled to a pasty consistency immediately before setting of the tile. The sheets must not be pregrouted nor a skim coat applied to the backs of the tile. Press and tamp tile into setting bed until true, level, and flush with the finished floor lines. Joints shall be straight and of even width not exceeding 1/16" the full depth of the tile.

E. *INSTALLATION (THIN-SET METHOD)*

1. *Preparation of Sub-Floor.* Surfaces that are to have thin-setting beds applied directly thereon, must be dry, cleaned free of all paint, oil and grease and shall be true, firm and of proper texture to insure bond and moisture impermeability or repellency.

2. *Leveling Uneven Surfaces.* Install a leveling coat or underlayment on all uneven or rough surfaces. Leveling coat shall be of material suitable for reception of adhesive. Manufacturer's directions for application of underlayment shall be followed strictly.

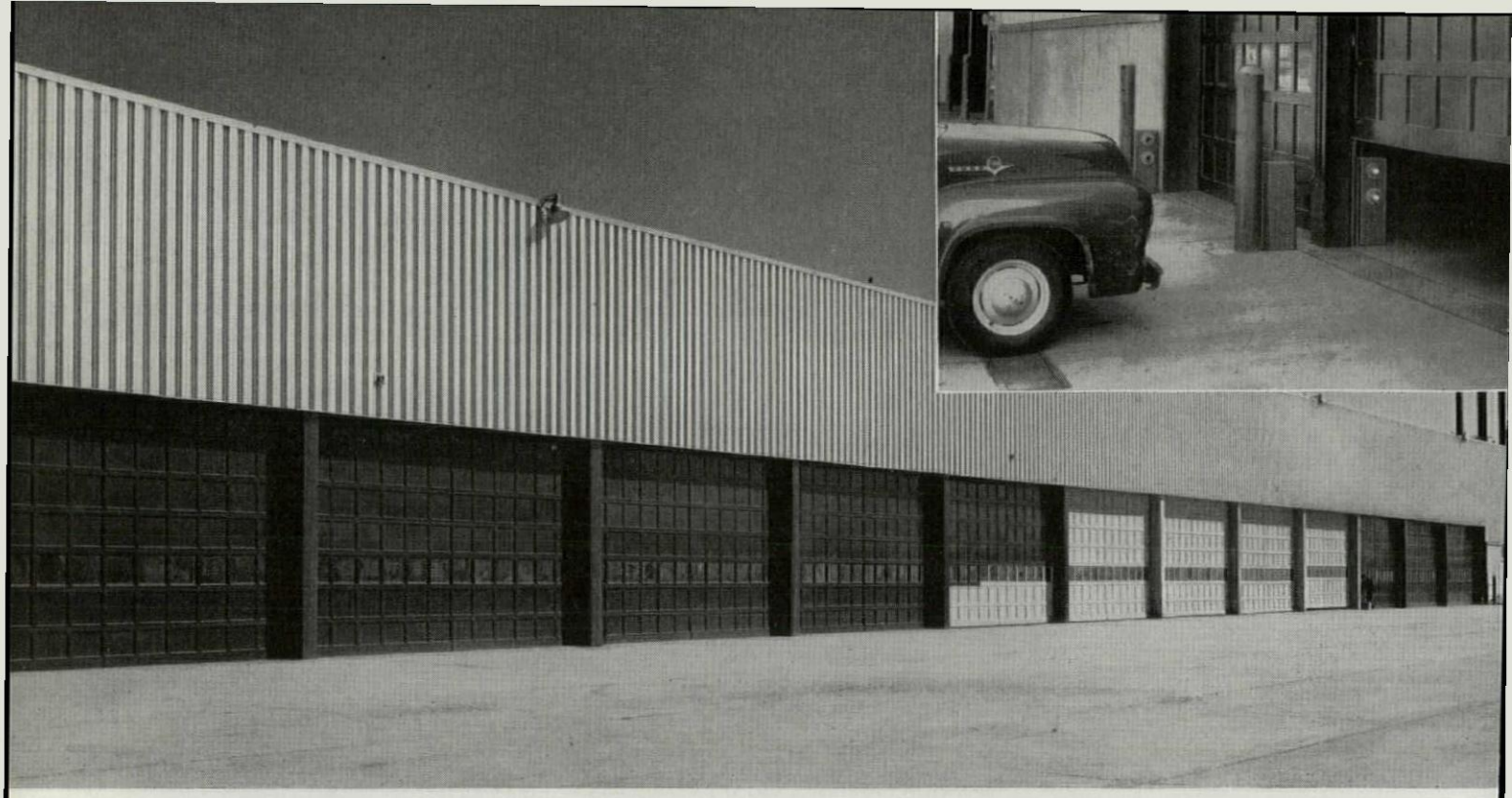
3. *Setting.* The application of adhesive and maximum areas to be covered in one operation shall be as recommended by the manufacturer of the adhesive, as shown on the container labels, described in his printed literature or in his specially written instructions for this project. Adhesive shall be allowed to set for 72 hours before grouting.

F. *GROUTING*

Moisten paper sheets on tile and remove paper and mounting glue. Fill joints completely by screeding and brushing over the tile a grout of neat waterproofed gray portland cement. After grouting is completed cover entire floor with waterproof paper lapped 4 inches at joints with laps sealed with tape for not less than 72 hours.

G. *RESISTANCE TEST*

The completed flooring shall be tested at the end of one month. When tested with an ohmmeter, in accordance with Section 6, "Reduction of Electrostatic Hazard," Paragraph 6-2 of current issue of NFPA Standard No. 56, the average resistance for protection against shock, arc, or spark shall be more than 25,000 ohms and less than 1,000,000 ohms.



FORD MOTOR COMPANY'S NEW LINCOLN ASSEMBLY PLANT USES 3 LARGE CRAWFORD MARVEL-LIFT INDUSTRIAL DOORS—with remot control or automatic control by the vehicles using them

JOB DATA
Client:
Lincoln Division,
Ford Motor Company

PROJECT
Lincoln Division Final Assembly,
Body Painting and Finishing Plant,
Novi, Michigan.

ARCHITECTS & ENGINEERS
Smith-Hinchman & Grylls, Inc.,
Detroit.

CONTRACTOR
W. E. Wood Company,
Detroit.

CRAWFORD DOORS
sold and installed by
Crawford Door Sales Company
of Detroit.
L. G. Stedman, Jr.,
Sales Manager

The new Lincoln Assembly Plant at Novi, Michigan covers appro mately 27 acres and has a maximum height of 60 feet. Constructio precast concrete panels and aluminum panels clipped to structu steel framing members. A total of 38 Crawford Marvel-Lift Industr Doors are used, all with quarter-inch clear wire glass in Sectio and with rubber astragal on the bottom rail. All doors are equip with operators. The twelve doors shown above are 24'0" x 14 and are on the loading dock which accommodates all incom truck-delivered materials. These are operated by remote contr

Sixteen other doors are automatically controlled by the vehi using them. Inbound vehicles pass over a rubber treadle in the c crete apron actuating an electric operator which opens the door; door remains full open while the vehicle breaks and then clears electric eye immediately inside the door opening; an adjustable t ing device then closes the door. A vehicle following immedia automatically causes the door to hold full open until it also cleared. Outbound vehicles reverse this process. Doors are equip for chain hoist operation in case of power failure.

If you have a door project or problem we'll welcome your inq and it will get quick, intelligent attention. Architects, write f complete file of Crawford literature. Crawford Door Comp 205-20263 Hoover Road, Detroit 5, Michigan.

Crawford Door Company has plants in 10 cities in the U warehouses in 110 cities; Sales and Service everywh In Canada, F. Fentiman & Sons, Ltd., Ottawa, Ontario.

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Indexed in Art Index, Architectural Index.

ABP

ABC AUDITED PAID CIRCULATION

REINHOLD

"veracious report"

My dear Editor: Thanks for the valuable testimony concerning the Larkin Building by Ada Louise Huxtable, you published March 1957.

Kindly convey to her my thanks for a veracious report upon that circumstance. I wish you might pursue her studies with equally faithful result.

FRANK LLOYD WRIGHT
Taliesin West, Ariz.

striking a balance

Dear Editor: May I, as an Englishman now resident in Canada, be allowed to comment upon the extraordinarily rude and thoughtless outburst of John E. Delense in VIEWS in your April issue? I realize, of course, that if he actually carries out his threat of a self-imposed censorship in terms of American literature, my thoughts will not reach him, but I should like to help restore the balance, nonetheless.

From time to time it would seem that emotionally overwrought individuals, such as Mr. Delense, feel it incumbent upon themselves to deliver sweeping—and all too often irrelevant—condemnations of other individuals, groups, societies or even, as in this case, whole nations.

Now it may well be that the Government of the United States did not support the Anglo-French combatants in their Suez venture (nor did the Canadian Government, incidentally) but why on earth should this have anything to do with subscribing to an architectural magazine? I have no sympathy with the regime in the Soviet Union, but that does not prevent me reading Soviet magazines of either a general or technical nature when the opportunity arises. How else am I to obtain a representative picture of their activities and attitudes unless I can strike some kind of balance for myself as between propaganda and anti-Soviet criticism?

It is to be hoped that Mr. Delense does not employ the same irrational and illogical line of argument in his professional endeavours!

In conclusion, I should like to congratulate the Editor and his Staff for producing an architectural journal of consistently high standard each month and for throwing light upon a virile and often exciting architectural panorama.

M. CHESWORTH
North Vancouver, B. C.

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Dear Editor: I trust that your readers will treat the letter from John E. Delense, ARIBA, Dip. TP, ARICS, AMPTI (published in April 1957 PROGRESSIVE ARCHITECTURE) with the contempt it deserves.

GERALD E. CRANE
MRP, ARIBA, AMTPI, Dip. TP
London, England

•

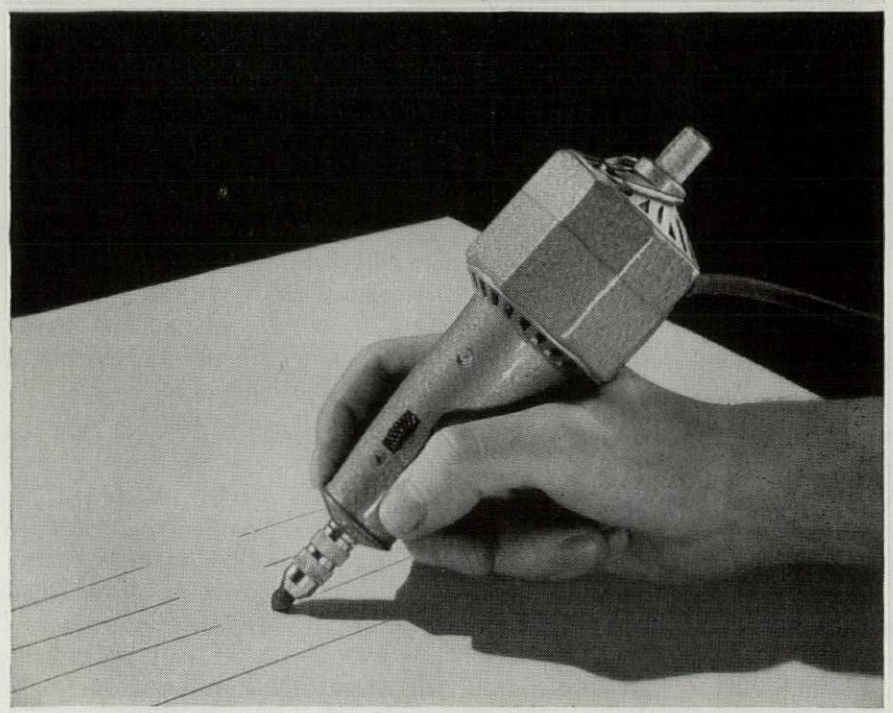
Dear Editor: Your correspondent in the April VIEWS, "plain speaking cousin," has revived Victorian scholarliness. In Mr. Delense's association with the Royal Institute of British Architects and the Town Planning Institute, it would be presumed that he would have had some intellectual forebearance.

It is to be regretted for Mr. Delense that he is to be denied the pleasure of reading American technical publications. Perhaps he considers himself an intellectual snob, a notion which by all account would seem to be based on nationalistic rather than mental issues. It is to be hoped that his efforts at enforcing an economic embargo, or as he puts it "dissuading his friends and colleagues from continuing subscriptions to American literature" will not be taken seriously. It is my earnest belief that other associates of the Royal Institute of British Architects and the Town Planning Institute will not be influenced by Mr. Delense's narrow view and will realize that his "waving of the flag" intellectual attitude is *passé*.

I hardly believe his crusade will prove successful since I write not as Mr. Delense's cousin, but as an associate in the Town Planning Institute as well as being a fellow British subject.

H. S. COBLENTZ
Albuquerque, N. Mex.

DRAFTING TRENDS



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Using a Sovereign is just as easy as reaching for an old fashioned eraser . . . and much more convenient. Curved to fit the hand, it incorporates many design features of special appeal to engineers and draftsmen. For example, the hollow armature shaft takes a full 7" core eraser which feeds through an instantly adjustable chuck. The extra long eraser eliminates those frequent, annoying changes often associated with ordinary erasing machines using short erasers. (When a change is finally made, the chuck cuts replacement time to *less than 10 seconds.*)

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notices

literature competition

In The 1957 Building Products Literature Competition, sponsored by AIA and The Producers' Council, Inc., the following CERTIFICATES OF EXCEPTIONAL MERIT, CERTIFICATES OF MERIT, and HONORABLE MENTIONS, were awarded by a Jury composed of: John R. Magney, Chairman, Grosvenor Chapman, Howard G. Hall, Norman J. Schlossman, and William B. Simboli. These Awards were presented last month during the Centennial Celebration of AIA in Washington, D. C.

class 1

Literature concerned primarily with basic technical information:

CERTIFICATE OF EXCEPTIONAL MERIT

Aluminum in Modern Architecture (2 Vols.)
Reynolds Metals Company

CERTIFICATES OF MERIT

Alloys and Mill Products
Aluminum Company of America

Reinforced-Concrete Floor Systems
Portland Cement Association

Metal Lath
Metal Lath Manufacturers Association

Wood Structural Design Book
National Lumber Manufactuers Association

Fir Plywood
Douglas Fir Plywood Association

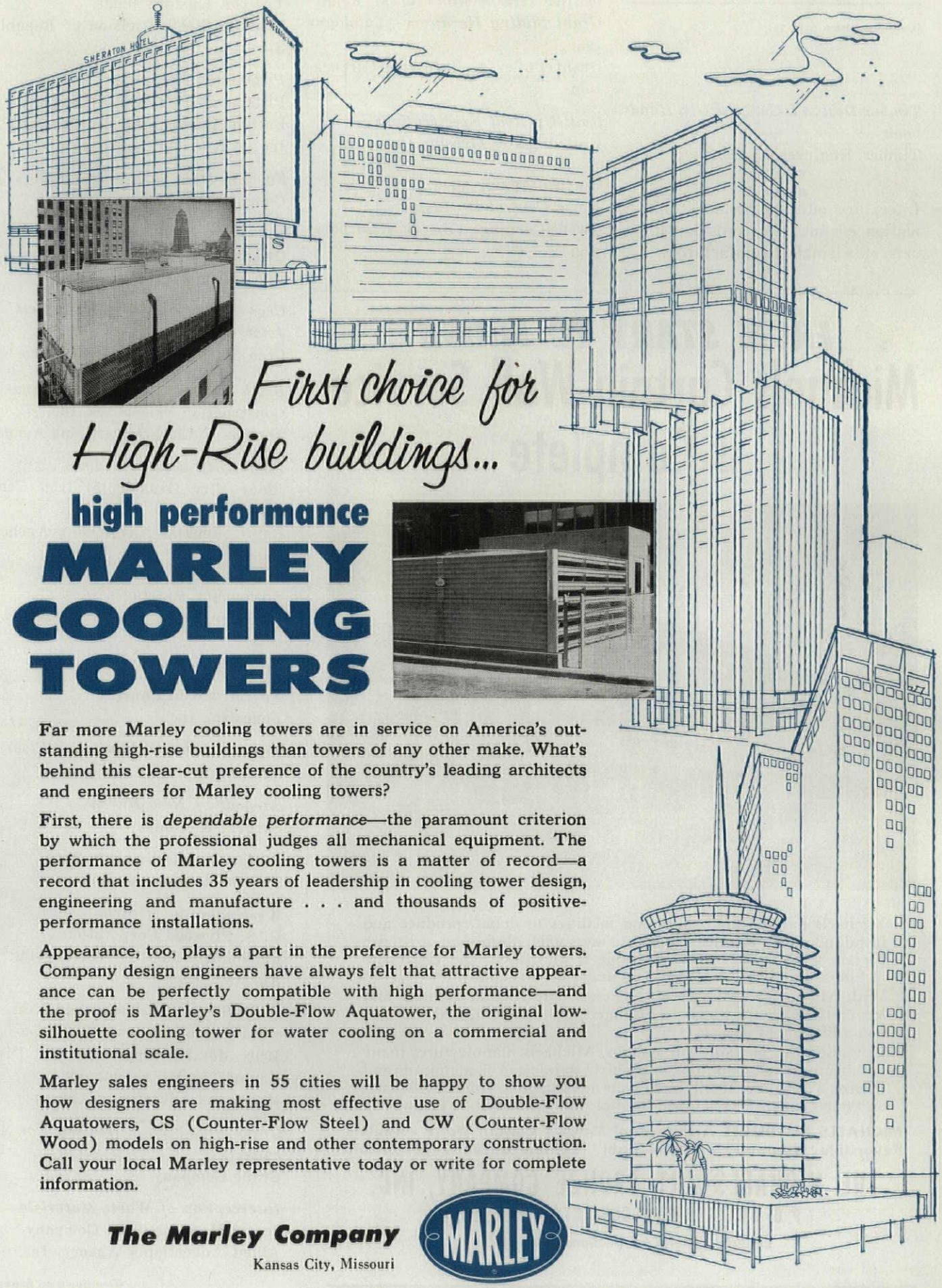
Woodwork Brochure Portfolio (A Series)
Architectural Woodwork Institute
James Arkin, AIA,
Editorial Consultant

HONORABLE MENTIONS

Sound-Absorption Coefficients of Architectural Accoustical Materials
Acoustical Materials Association

Technical Notes on Brick & Tile (A Series)
Structural Clay Products Institute

(Continued on page 16)



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Kansas City, Missouri

MARLEY

(Continued from page 14)

Timber Design & Construction Handbook
Timber Engineering Company

class 2

Literature offering technical information confined to particular products of a single manufacturer:

CERTIFICATES OF EXCEPTIONAL MERIT

Grant Sliding Hardware—Catalogue 1956
Grant Pulley & Hardware Corporation

Built-Up Roof Specifications
United States Gypsum Company

CERTIFICATES OF MERIT

Noise Control Products
Owens-Corning Fiberglas Corporation

Truscon Curtain Walls
Truscon Steel; Division of Republic Steel

Pittsburgh Doorways
Pittsburgh Plate Glass Company
Batten, Barton, Durstine & Osborn, Inc., Advertising Agency

Facts & Data on Resilient Floors
Congoleum-Nairn, Inc.

Industrial Insulation Manual
Owens-Corning Fiberglas Corporation

Ceco Shortspan Open-Web Steel Joists
Ceco Steel Products Corporation

Brick-Size Vents in Cast Aluminum
Construction Specialties, Inc.
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Flour City Metal Windows
Flour City Ornamental Iron Company
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Kawneer Architectural Metal Products
Kawneer Company

Fenestra Wall Panels
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Technical Data—Armstrong Floors
Armstrong Cork Company

Sargent of New Haven
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Josam Manufacturing Company
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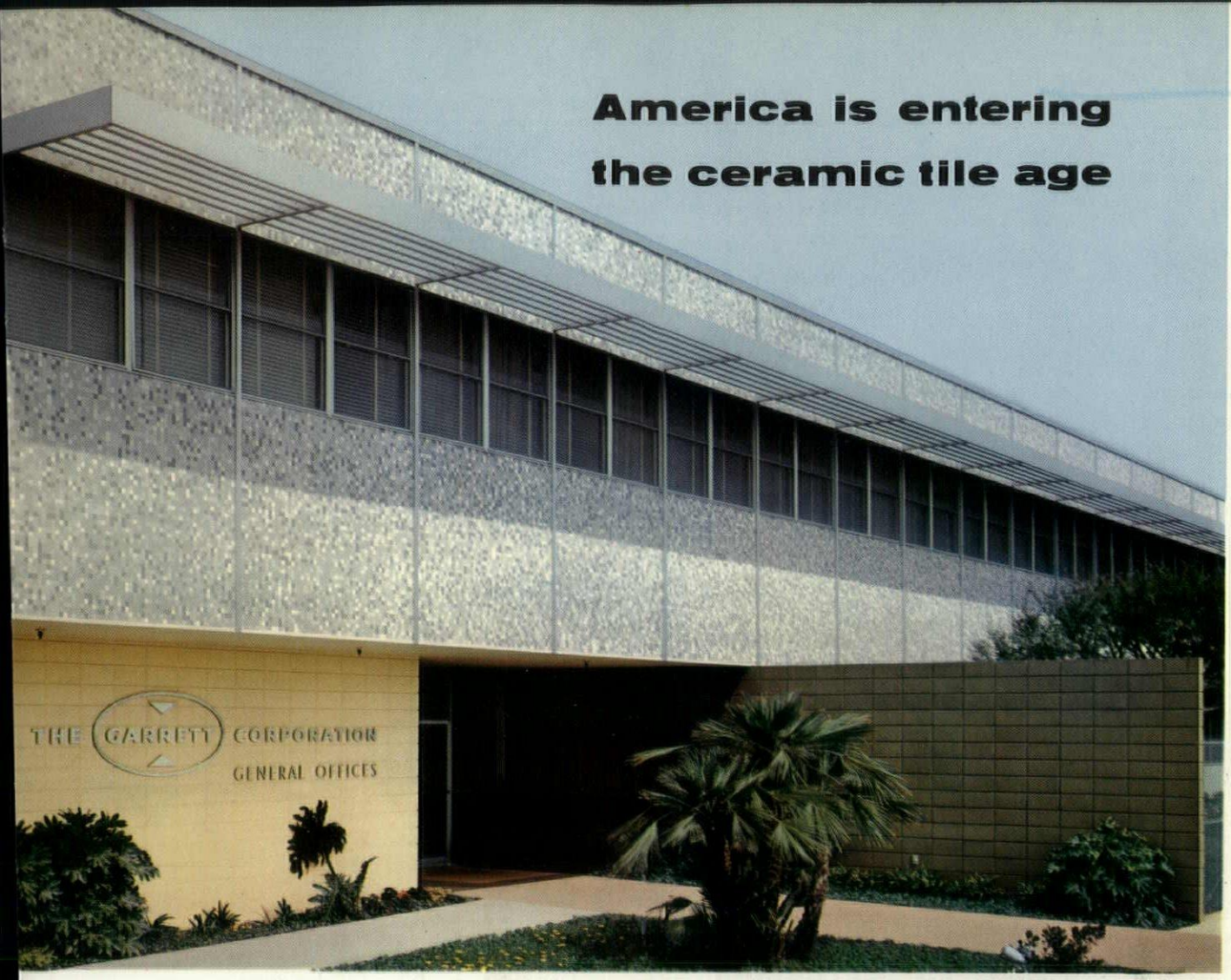
(Continued on page 20)

America is entering the ceramic tile age



Architect: Welton Becket and Associates. Tile Contr.: Bruner Marble and Tile Co. Plate No. 496.

Architect: Carl Maston. Tile Contr.: Selectile. Plate No. 487.

Architect: Howell Lewis Shay. Tile Contr.: Italian Marble and Mosaic Co. Plate No. 385.

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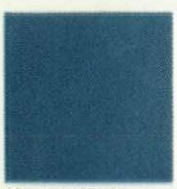
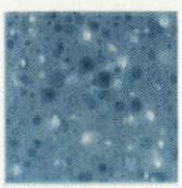
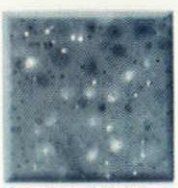


Harmonitone (square edge)



Velvetex (square edge)



Granitex (cushion or square edge)

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Harmonitone	Granitex
Velvetex	Electrically-Conductive
Everglaze	Faience

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Mosaic Medley Patterns, Form No. 211

Buildings of Today, Form No. 208

The Mosaic Tile Book of Beautiful Homes, Form No. 195

Mosaic Swimming Pool Catalog, Form No. 158

West Coast Color Catalog (West of Rockies), Form No. 165

Mosaic Impervious Electrically-Conductive Floor Tile Factbook, Form No. 196

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Member—Tile Council of America, Inc. and The Producers' Council, Inc.

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Showroom-Warehouses: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Corona, Cal., Dallas, Denver, Detroit, El Segundo, Cal., Fresno, Greensboro, E. Hartford, Hempstead, L.I., N.Y., Hollywood, Ironton, Ohio, Jackson, Miss., Little Rock, Matawan, N.J., Miami, Milford, Conn., Milwaukee, Minneapolis, New Orleans, New York (Showroom only), Philadelphia, Portland, Rosemead, Cal., Salt Lake City, San Antonio, San Diego, San Francisco, Santa Clara, Cal., Seattle, Tampa, Washington, D.C., Zanesville, Ohio.

Representatives: Birmingham, Cincinnati, Kansas City, Oklahoma City, Pittsburgh, St. Louis.

Factories: Zanesville and Ironton, Ohio; Matawan, N.J.; Little Rock, Ark.; Jackson, Miss.; Corona and El Segundo, Cal.

Atlanta where the *foremost* word for elevators is OTIS

The capital of Georgia, and principal headquarters of the Southeastern region, typifies the nation's confidence in quality elevators—*the world's safest transportation!* More than two-thirds of Atlanta's elevators are by OTIS who invented the first safe elevator in 1853. Since then, every important elevator safety feature has been pioneered by OTIS. As always, progress is expected of the leader. Outstanding quality has made OTIS the accepted word for elevator safety in the cities of the world.

Automatic Autotronic® or Attendant-Operated Passenger Elevators • Escalators • Trav-O-Lators
Freight Elevators • Dumbwaiters • Elevator Modernization and Maintenance • Electronic Systems
The Baker-Raulang Company, an Otis subsidiary, is the maker of Baker Gas and Electric Industrial Trucks*

Otis

OTIS ELEVATOR COMPANY

260 11th Avenue, New York 1, N. Y.
Offices in 501 cities around the world

* Baker® industrial trucks

(Continued from page 16)

USG Precast Gypsum Roof Decks
United States Gypsum Company

Milcor Ribform
Inland Steel Products Company

Tectum
Tectum Division; Peoples Research and Manufacturing Company
The Jay H. Maish Co., Advertising Agency

class 3
Literature of primarily promotional character:

CERTIFICATE OF EXCEPTIONAL MERIT
Fir Plywood Design Ideas
Douglas Fir Plywood Association

CERTIFICATES OF MERIT
Acme Brick In Colors
Acme Brick Company
Evand & Associates, Advertising Agency

Beautiful Walls with Concrete Masonry
Portland Cement Association

Tone (A Series)
Armstrong Cork Company

Ceco Metal Products (A Series)
Ceco Steel Products Corporation

For Modern Exteriors
Masonite Corporation

Palos Verdes Stone
Great Lakes Carbon Corporation

HONORABLE MENTIONS
Kilnoise Acoustic Plaster
Tiger Products Division, Basic Inc.

Architectural Achievements (A Series)
Aluminum Company of America

Brick & Tile
Structural Clay Products Institute

Fentile
Fenestra, Inc.

class 4
Space Advertising directed primarily to the Architect:

CERTIFICATE OF EXCEPTIONAL MERIT
Mineral Acoustical Tile
United States Gypsum Company

CERTIFICATES OF MERIT
Characteristics of Floor Tile (A Series)
Kentile, Inc.

Knoll Products (A Series)
Knoll Associates, Inc.

A Success Story (A Series)
Marble Institute of America
Moore & Company, Advertising Agency

Expanded Metal
United States Gypsum Company

HONORABLE MENTIONS
Max Spivak Designs (A Series)
The Cambridge Tile Manufacturing Co.
Wildrick & Miller Advertising Agency

Vital Statistics On Steel For Home (A Series)
Columbia-Geneva Steel Division
United States Steel Corporation
John O'Rourke Advertising Agency

sound condition in any color with custom-color acoustimetal

You pick the color...we match it

Your color choice for acoustical ceilings is *now* as wide as the spectrum *because you can specify any color you wish* in Gold Bond Acoustimetal.

Choose willow green, peach, oyster white, or any other color. Just give us the color sample — we match it and bake on your shade of semi-gloss enamel at the factory.

New custom-color Acoustimetal gives you all the sound features architects count on — Noise Reduction Coefficient in the .80-.90 range...incombustible, sound-absorbing mineral wool pads...12″ by 24″ metal panels that snap into Tee Runners and are instantly removed for access to overhead utilities. Easily cleaned...or can be repainted for a change of color without loss of acoustical efficiency.

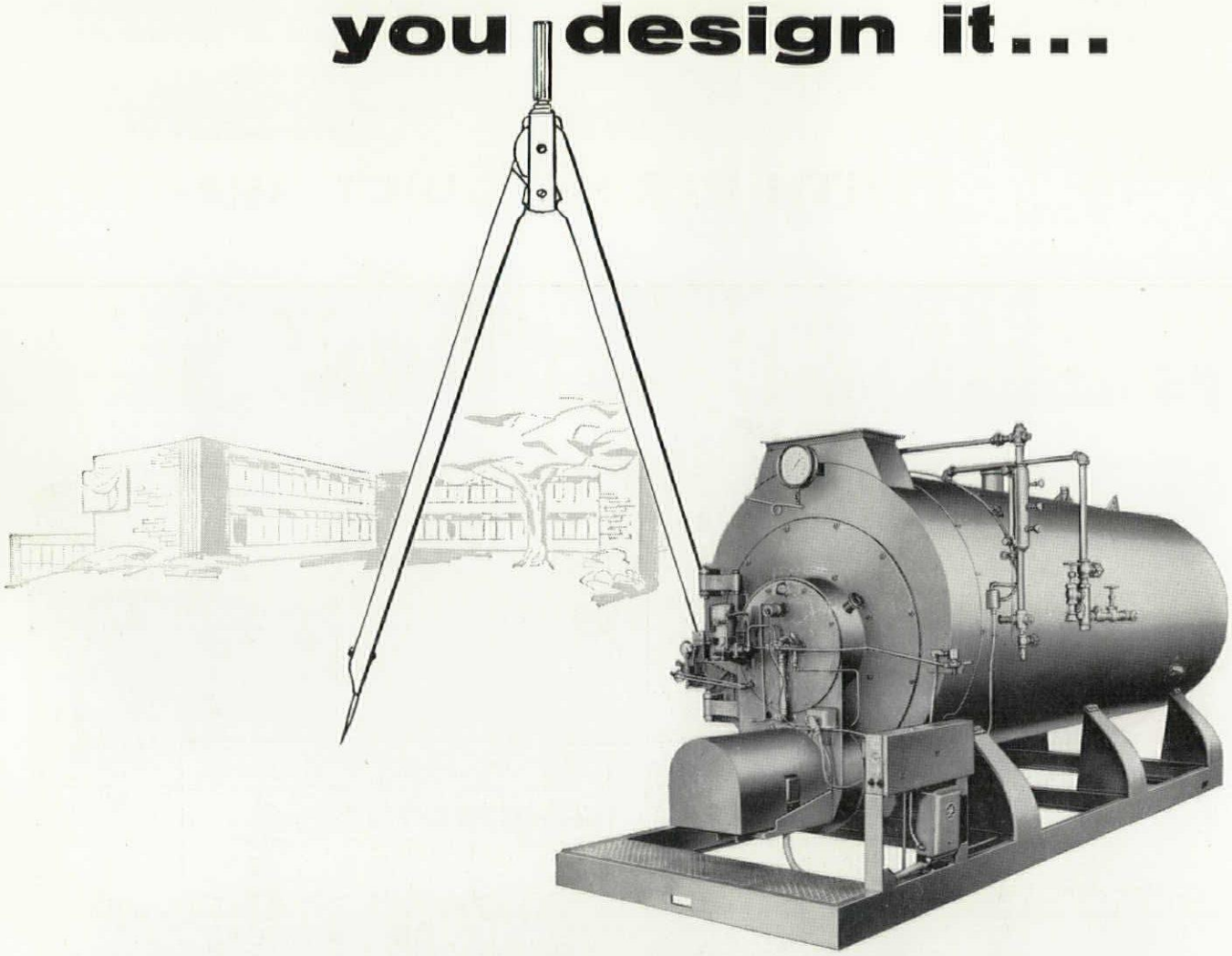
Ask your nearest Gold Bond® Acoustical Contractor about new custom-color Acoustimetal®—his name is in the Yellow Pages. Or write to Dept. PA-67, National Gypsum Co., Buffalo 2, N. Y.

ACOUSTICAL CEILINGS

NATIONAL GYPSUM COMPANY

Gold Bond
BUILDING PRODUCTS

you design it...



CYCLOTHERM will fit it!

Here's a steam and hot water generator that gives the architect full freedom in boiler-room design. It's Cyclotherm—the low-slung, ground-hugging boiler with its long axis parallel to the floor and very little headroom or lateral space needed. Saves one-third the space that even other package boilers may require. With Cyclotherm you can plan for the future by allowing space for an additional boiler when plant expansion calls for more power.

And there's no stack with Cyclotherm! You know how often an otherwise pleasing structure is defaced by an unsightly stack. Stacks cost thousands of dollars, too. But Cyclotherm operates with only a simple flue. It costs little to install a Cyclotherm—no special foundation, no excavation. Just set it on the floor and it's ready to go to work.

Guaranteeing at least 80% efficiency in only two passes, Cyclotherm brings substantial savings in both fuel and maintenance costs. It is fully automatic, completely safe and accords with ASME and Underwriters' Laboratories specifications. For full information, write Cyclotherm Division, National-U. S. Radiator Corp., today.

YEARS AHEAD
IN STEAM
GENERATION
CYCLOTHERM®
STEAM AND HOT WATER GENERATORS

Cyclotherm Division,
National-U. S. Radiator Corp.
33 E. First St., Oswego, N. Y.

Gentlemen. Please send me, without cost, your complete new Cyclotherm booklet: *Cyclotherm Cyclonic Combustion.*

Name.....

Address.....

City..... State.....

ALWAYS ON DUTY
WITH CLEAN, QUIET BEAUTY

Color shown: V-338, Kodiak

Vina-Lux® FLOORS
WITH *Micromatic Veining*

You can depend on Vina-Lux — a long-lasting vinyl asbestos tile with rugged resistance to wear, spilled food and medications. Its tightly textured surface keeps dirt and grease from grinding in — makes maintenance easy and economical.

Resilient, too, Vina-Lux softens foot and wheel noises — reduces fatigue — increases safety with its slip-resistant surface. And now, with the subtle styling of *Micromatic veining*, Vina-Lux in 21 modern colors gives you a big *plus* over other resilient floorings. Samples and color chart are yours on request.

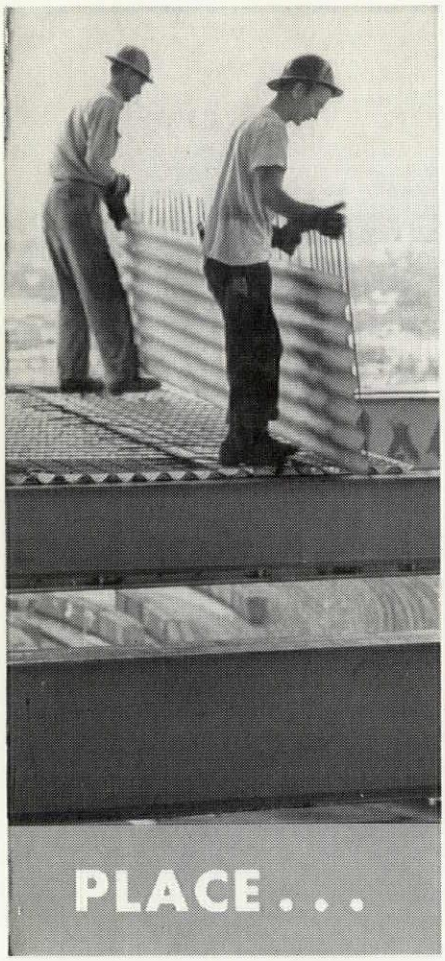
THE PRODUCERS' COUNCIL — AFFILIATED WITH THE AMERICAN INSTITUTE OF ARCHITECTS — MEMBER

AZROCK FLOOR PRODUCTS DIVISION

UVALDE ROCK ASPHALT COMPANY

523A Frost Bank Building • San Antonio, Texas

AZROCK FLOORING PRODUCTS

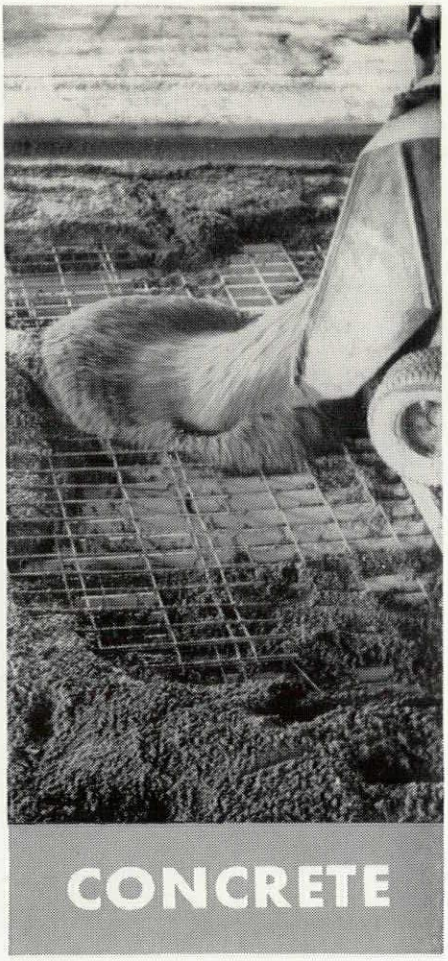


PLACE . . .

Cofar units weigh only 2 psf and cover up to 35 sq. ft. Units arrive at job site pre-cut to fit framing. No sorting. No fitting. Placing of units follows closely behind structural steel erection.

WELD . . .

Welded in place, Cofar provides a safe, solid work platform for trades. Concrete crews move in days sooner. Cofar welding gives designers flexibility to meet local codes for lateral forces.



CONCRETE

In monolithic slabs, Cofar offers composite action to resist concentrated loads and horizontal forces. For steel or concrete framing. Cofar underside may be painted for finished ceiling.

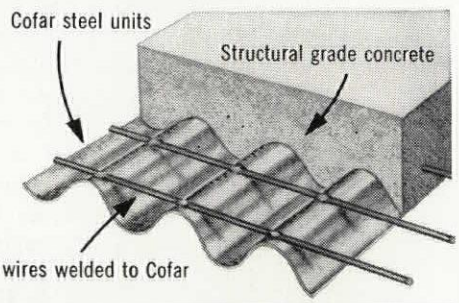
Cofar® combines concrete form and re-steel in one product. Saves time! Saves money!

Cofar units are deep-corrugated, high-strength galvanized steel sheets with "T" wires welded across the tops of corrugations. Cofar provides:

(1) tight concrete form
(2) safe work platform
(3) complete positive reinforcement

"T" wires furnish necessary temperature reinforcing and anchor concrete to steel.

Cofar units lap tightly, prevent concrete leakage and eliminate clean-up time below and are hot-dip galvanized for building-life permanence. When concrete sets, a fire-safe, high-strength reinforced concrete slab results. For more information about time, work and money-saving Cofar construction, contact Granco home or district office. ATTN: Dept. P-78.



GRANCO — SINCE GRANITE CITY STEEL 1878

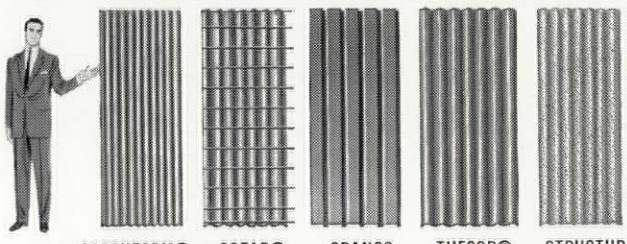
See our catalogs in Sweet's Architectural and Industrial Construction Files

GRANCO® STEEL PRODUCTS COMPANY
A subsidiary of GRANITE CITY STEEL COMPANY
6506 N. Broadway, St. Louis 15, Mo. Executive Offices: Granite City, Ill.

DISTRICT OFFICES: St. Louis • Kansas City • Cincinnati • Dallas • Houston
Chicago • Minneapolis • Atlanta • San Francisco

Distributors in 80 principal cities

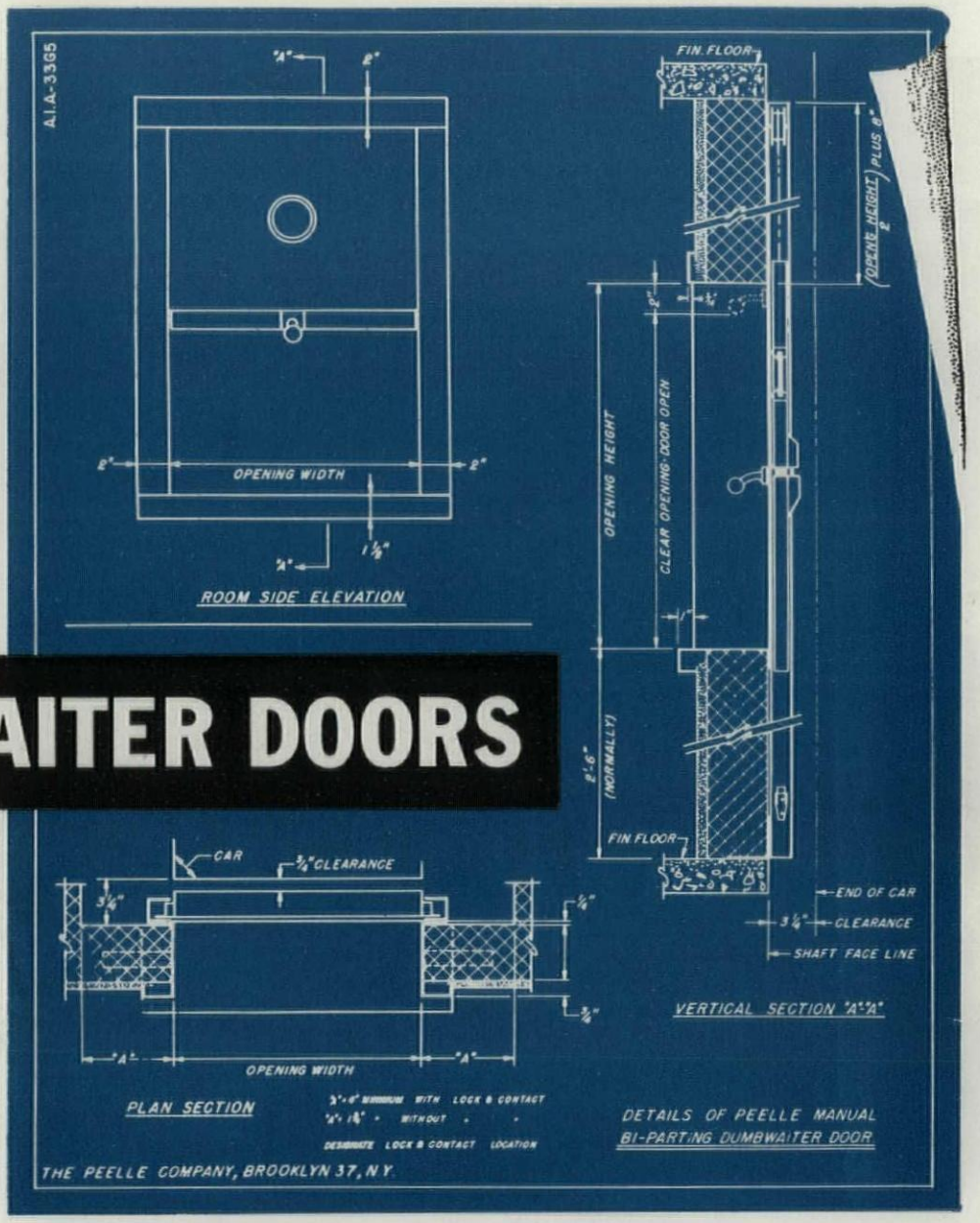
Granco Products for any type of framing you specify



CORRUFORM® COFAR® GRANCO ROOF DECK TUFCOR® STRUCTUR-ACOUSTIC

Specify Stainless Steel Sills for

DUMBWAITER DOORS



1. To eliminate repainting costs due to scratched and worn finish on painted dumbwaiter door sills.

2. To assure permanent attractive finish providing cleanliness and preventing corrosion.

The following short specification will help you solve dumbwaiter sill problems.

SPECIFICATIONS

Furnish only, installation by others, bi-parting dumbwaiter door units as manufactured by The Peelle Company, 47 Stewart Avenue, Brooklyn 37, New York and bearing the label of the Underwriters Laboratories. Each unit shall consist of 16 gauge plain steel head, jamb, and 14 gauge stainless steel sill. Door panels of hollow metal construction filled with fireproof acoustical filler. Each upper panel shall be equipped with a 3" diameter vision panel. The top edge of the lower panel shall be constructed with stainless steel extended sill to close the space between the car platform and door panel. (Car clearance between shaft wall and dumbwaiter car to be 3¼").

Each dumbwaiter door unit shall be equipped with either a lock and contact operated by a stationary cam, or interlock operated by a retiring cam.

Provisions will be made for mounting lock and contact or interlock on dumbwaiter door rail. All wire, wiring and mounting of lock and contact or interlock to be by dumbwaiter car manufacturer.

The assembled units, shall have one prime coat of shop paint before shipment. Finish painting by others.

The doors shall be guaranteed for one year against defects in workmanship and materials by the manufacturer.

Alternate: If complete stainless steel unit is required, frames shall consist of 16 gauge stainless steel jambs and head, and 14 gauge stainless steel sill. Room side face of panels to be 16 gauge stainless steel and shaft side plain steel.

PEELLE FOR DOORS

FREIGHT ELEVATOR DOORS • DUMBWAITER DOORS • INDUSTRIAL DOORS

THE PEELLE COMPANY 47 Stewart Avenue, Brooklyn 37, N.Y.
OFFICES IN PRINCIPAL CITIES

PUBLIC LIBRARY .

DURABILITY

In Southwestern Bell's new Oak Cliff Office Building in Dallas, arranging phone installations, answering inquiries, billing accounts, and a hundred other matters keep employees constantly on the go. Needing a really tough floor that would stay handsome despite years of constant foot traffic, the Southwestern Bell Telephone Company used Textelle Linoleum. This flooring has provided high resistance to indentation and excellent underfoot comfort for this and other Bell Telephone business offices across the country.

Southwestern Bell Telephone Co., Oak Cliff Office Building, Dallas, Texas
Architect: Architectural and Engineering Department, Southwestern Bell Telephone Co.

LEPHONE EXCHANGE . . . HOTEL CAFÉ

the flooring spec: Armstrong Textelle Linoleum

EASE OF MAINTENANCE

Wanting an attractive floor that was low in both initial cost and operating expenses, the architects of this handsome new wing of the Kirkwood (Mo.) Library chose Armstrong Textelle® Linoleum. They recognized that Textelle, basically an economy floor, continues to save money because of its durability and its ease of maintenance. They were convinced that despite the economy of a floor of Textelle Linoleum, there is no sacrifice in appearance. Textelle stays attractive for years with minimum maintenance.

Kirkwood Public Library, Kirkwood, Missouri
Associated Architects: Raymond X. Grueninger, A.I.A., Clayton, Mo.
Frank L. Thompson, Clayton, Mo.

STRIKING EFFECT

To create the appearance of an Old World street for this "sidewalk café," the designers specified Textelle Linoleum. Specially cut sections of Textelle, in contrasting colors, added a bright, gay touch to the floor of La Rue du Ville in Harrisburg's Penn Harris Hotel. Textelle's distinctive bold graining made it easy to create a flagstone paving effect. Another feature which led to Textelle's specification was its ease of maintenance—spilled food and tracked-in dirt are no problem with this modern flooring.

La Rue du Ville, Penn Harris Hotel, Harrisburg, Pa.
Interior: Walter M. Ballard Corp., New York City

Armstrong Textelle Linoleum is a heavy (⅛") gauge, burlap-backed floor, designed especially for use in commercial interiors. Available in a wide range of tone-on-tone colors, it is a handsome asset to any interior. Although Textelle is dense and highly resistant to abrasion and indentation, it is resilient and comfortable underfoot. Textelle's exceptional durability and its ease and economy of maintenance make it ideal for heavy-traffic areas where a smart appearance is essential at all times. Because it is greaseproof, it is also an excellent floor for food-service areas. It should be installed on suspended subfloors only.

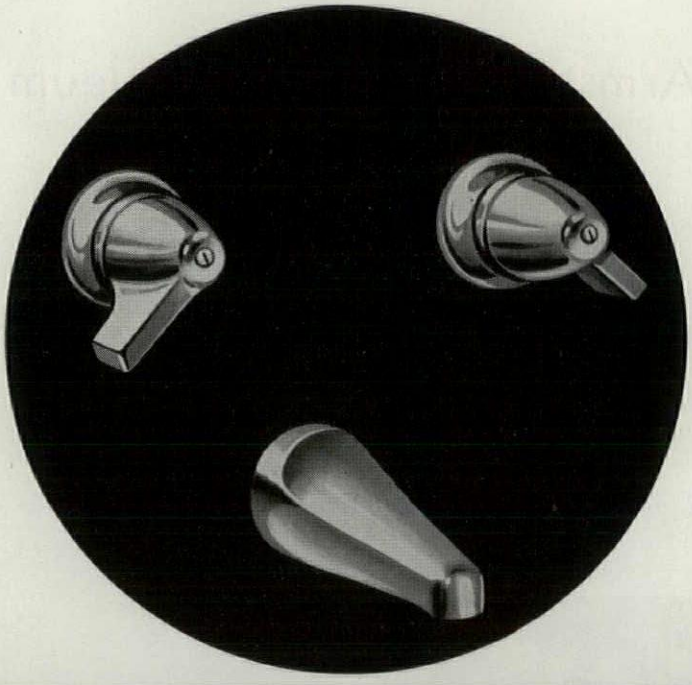
Because Armstrong makes all types of resilient floors, unbiased recommendations can be offered for every flooring need. For information, samples, complete specifications, design and color scheme assistance, call the Architectural-Builder Consultant in your nearest Armstrong District office or write direct to Armstrong Cork Company, Floor Division, 106 Watson St., Lancaster, Pennsylvania.

Armstrong FLOORS

Approximate Installed Prices per Sq. Ft. (Over concrete, minimum area 1000 sq. ft.)

Decoray® Linoleum Tile Asphalt Tile, ⅛" (A, B, C, D) Linoleum, light gauge Asphalt Tile, 3/16" (A, B)	35¢ to 45¢	Linoleum, standard gauge Asphalt Tile, 3/16" (C, D) Linoleum, ⅛" ("Battleship") Greaseproof Asphalt Tile	45¢ to 60¢	Corlon® (Sheet Vinyl) Linoleum, ⅛" Cork Tile, ⅛" Excelon® Tile (Vinyl-Asbestos) ⅛"	60¢ to 70¢	Rubber Tile, ⅛" Cork Tile, 3/16" Linotile® Corlon (Hydrocord* Back) Linoleum (Cushion-Eze* Back**)	70¢ to 90¢	Custom Corlon Tile (Homogeneous Vinyl) 3/32", ⅛" Cork Tile, 5/16" Rubber Tile, 3/16" Corlon (Cushion-Eze Back)	95¢ to $1.30	Custom Vinyl Cork Tile Imperial Custom Corlon Tile

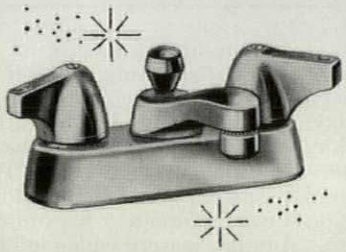
*TRADE-MARK
**PATENT PENDING



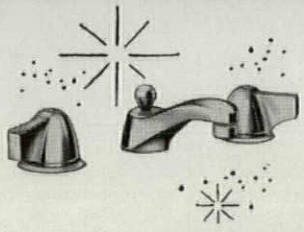
Immediate success!

Eljer's new high-style line of quality brass fittings!

Quality Plumbing Fixtures Deserve Quality Fittings! From the moment they were introduced, early this year, Eljer's new line of brass fittings have won overwhelming acceptance. These fittings have brought a completely new styling concept to the plumbing industry. And they can add unique beauty to fixtures in the projects you plan. Here's what they offer:

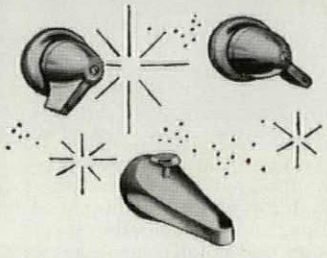


New Eljer center-set lavatory fitting.

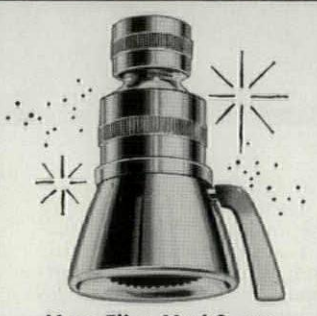


New Eljer combination lavatory fitting.

New Eljer deck-type sink fitting.



New Eljer combination shower and over-rim bath filler with diverter spout.



New Eljer Vari-Spray ball-joint shower head.

- Sleek, sculptured styling!
- Compact, functional design; easy to clean!
- Completely renewable for easy maintenance!
- Traditional Eljer quality!
- Thoroughly tested mechanical efficiency!
- Heavy, long-lasting chrome plating!
- Made in modern plant devoted solely to brass!

An Eljer representative will gladly give you the facts on new Eljer fittings, fixtures and all-steel kitchens. Write Eljer Division of The Murray Corporation of America, Three Gateway Center, Pittsburgh 22, Pa.

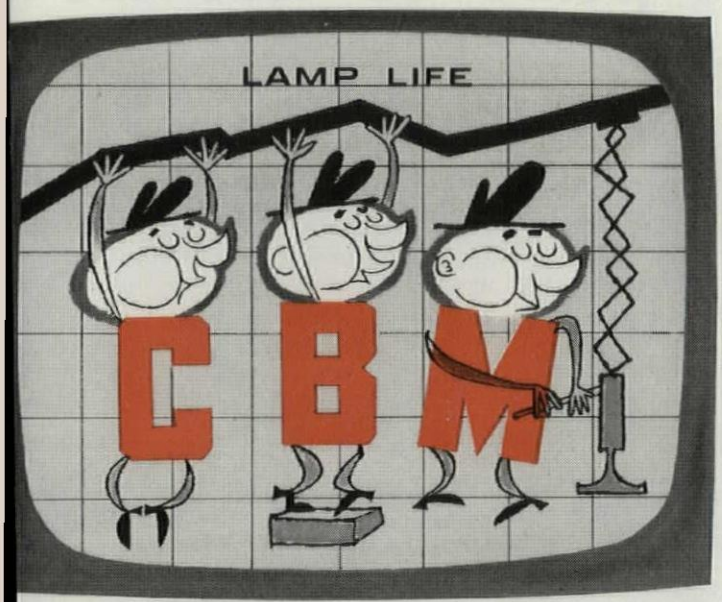
New Brass Line Backed by Eljer's Colorful National Advertising! This striking new brass line is featured in Eljer's national advertising and is gaining widespread acceptance among millions of users.

ELJER*

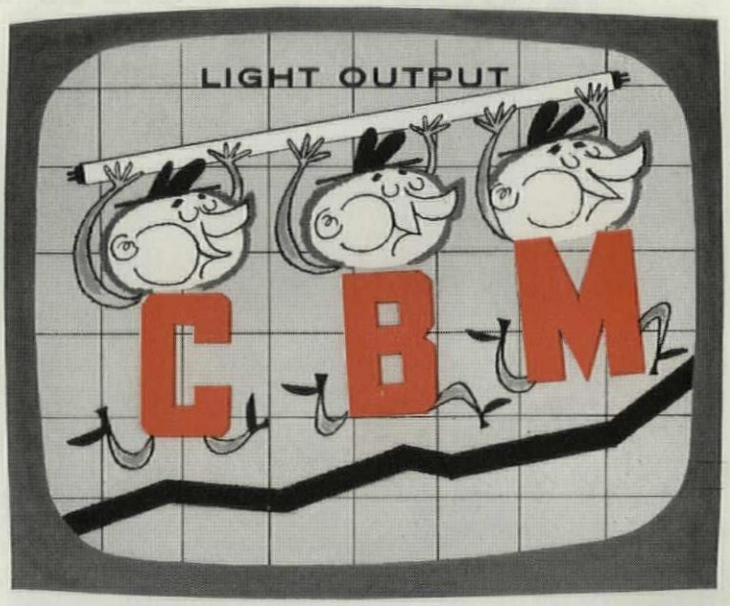
DIVISION OF THE MURRAY CORPORATION OF AMERICA

*ELJER - the only name you need to know in plumbing fixtures

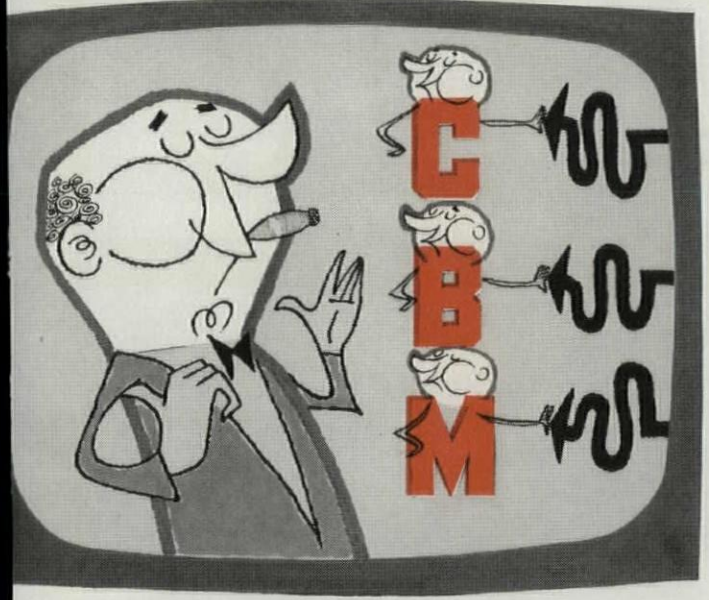
Why CERTIFIED CBM BALLASTS mean fluorescent lighting that really measures up!



YOU GET PEAK LIGHTING PERFORMANCE with CERTIFIED CBM BALLASTS in fluorescent fixtures. And you assure customer satisfaction just as you planned because . . .



CERTIFIED CBM BALLASTS are built to exacting "specs" to give quiet operation and High Power Factor along with assured ballast life, optimum light output, and rated lamp life. And they *all* carry the UL label.



THEY PROTECT YOUR CUSTOMERS . . . help you, too. Says one lamp manufacturer, "This certification (CBM) assures without individual testing that lamps will operate at values close to ratings."

"CBM . . . INEXPENSIVE INSURANCE", says another tube maker. Be sure to specify fixtures equipped with CERTIFIED CBM BALLASTS and write for "Why it pays . . ." booklet today!

Not *all* ballasts are the same . . . Certified CBM ballasts are "tailored to the tube". Insist on CBM ballasts, *certified by ETL*, in the fixtures you choose.

CBM CERTIFIED by ETL

Seven leading manufacturers now make up

CERTIFIED BALLAST MANUFACTURERS

2116 KEITH BUILDING • CLEVELAND 15, OHIO

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

Fesco Board® is part of the new

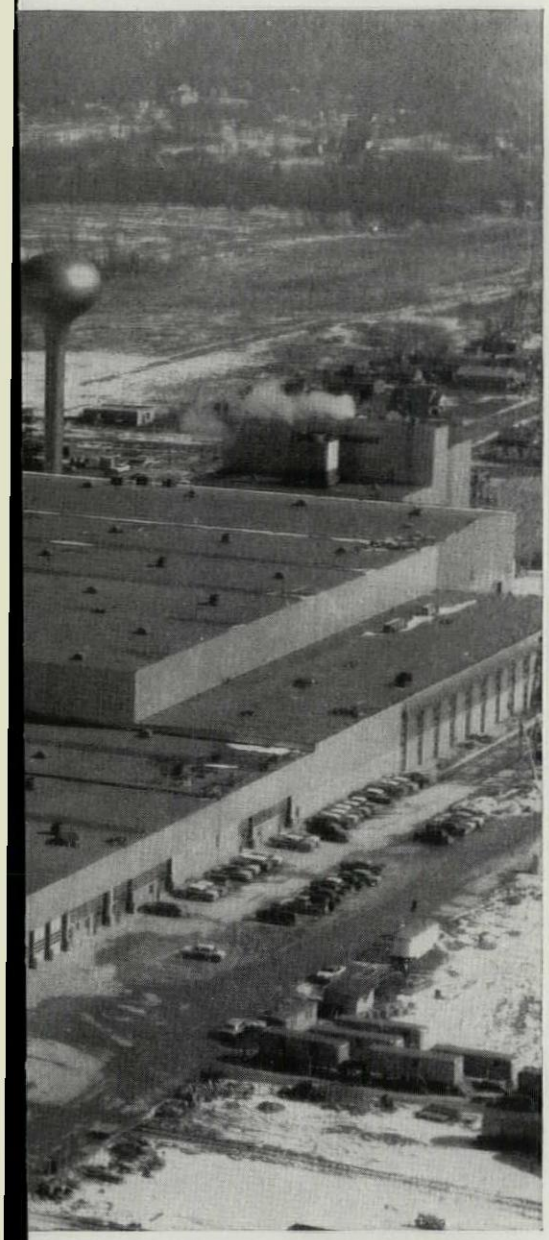
For Fire Resistance: New Materials with a "Forward Look"

This new 34-acre Chrysler roof deck brings together the most modern materials to establish a new level of fire-resistance and fire-containment. Specifications: Walcon steel deck, Koroseal vapor barrier and non-flammable Lexsuco cold adhesive R907T—(manufactured for Lexsuco, Inc., Cleveland, by B. F. Goodrich), Schundler's Fesco Board Roof Deck Insulation, and Koppers 4-ply tar and gravel built-up roof.

ARCHITECT and ENGINEER: F. A. Fairbrother and George H. Miehls with Albert Kahn ASSOCIATED ARCHITECTS and ENGINEERS, CONSULTANTS, Detroit. GENERAL CONTRACTOR: Hunkin-Conkey Construction Company, Cleveland. ROOFING CONTRACTOR: Industrial Roofing and Sheet Metal, Inc., Cleveland. LEXSUCO ROOF construction engineered and distributed by Lexsuco, Inc., Cleveland.

**Non-flammable Lexsuco adhesive R907T
*TM B. F. Goodrich Co.

"Forward Look" in roof design



In every way, Fesco Board lent itself to a new concept in fire retardant roof design employed on the 34 acre roof of Chrysler's Twinsburg, Ohio body stamping plant. Teamed up with Lexsuco's non-flammable adhesive, and the modern vapor barrier, Koroseal*, Fesco Board contributed these important properties:

Incombustibility — Fesco Board is rated incombustible, with a flame spread of only 20.5, and a smoke contribution factor of 0.

Moisture Resistance — Fesco Board absorbs only 1.5% moisture by volume on 24 hours total immersion.

Permanence — Fesco Board is not subject to rot, fungus or decay.

Mechanization — With a compression factor of 174.8, rigid Fesco Board holds up under heavy traffic, is packaged for mechanized handling.

Workmanship — Light, only 9 oz. PBF, and 24" x 36" sized, Fesco Board handles fast. Protective packaging, true-square corners, and dimensional stability assure good craftsmanship.

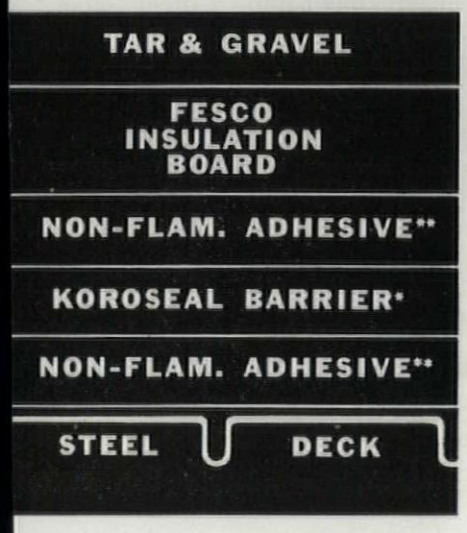
Designing for greater fire-resistance? You'll find Fesco Board at home with the newest materials, the newest highspeed application techniques, the newest concepts of fire-control. Write for engineering data.

F. E. SCHUNDLER & COMPANY, INC.

504 RAILROAD STREET • JOLIET, ILLINOIS

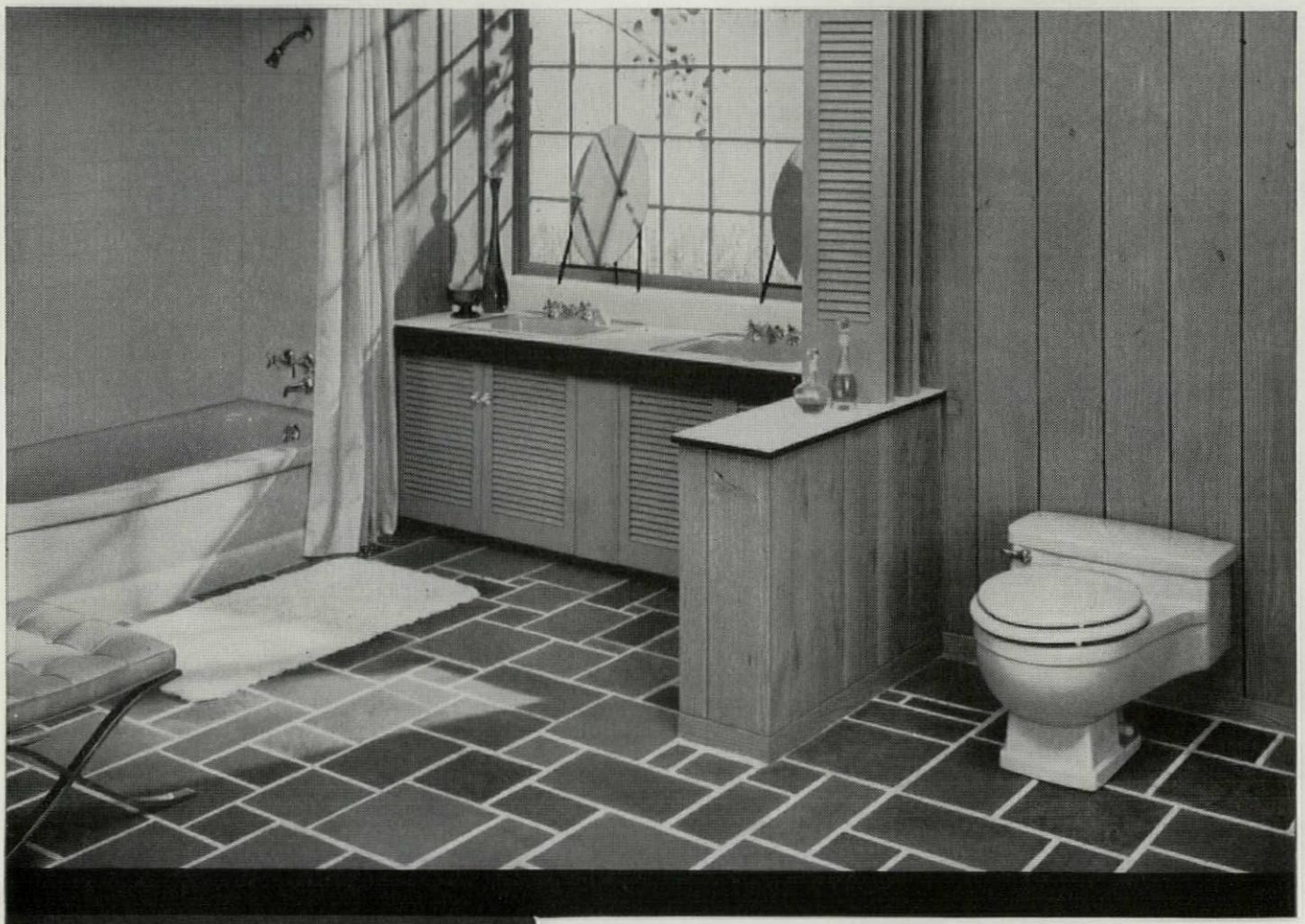
RATED FIREPROOF MATERIALS, ACOUSTICAL & INSULATING

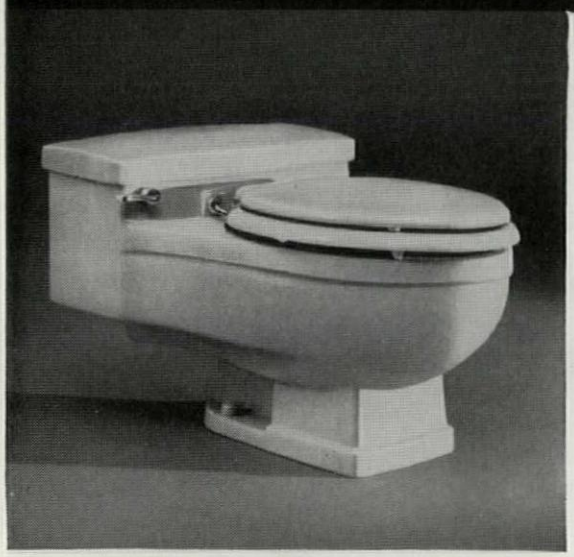
Developers and producers of incombustible mineral products including Ebbtone Acoustical Tile, Fesco Insulation Board, Coralux Acoustical Plaster, Coralux Perlite Aggregates, Mica Pellet Vermiculite, High Temperature Insulating Blocks and Insulating Cement.



Distinctive design by Briggs Beautyware

provides low-cost luxury for unmatched sales appeal!





THE EMPEROR
Distinctive, low, one-piece design and very quiet operation make it the ultimate in luxury and utility.

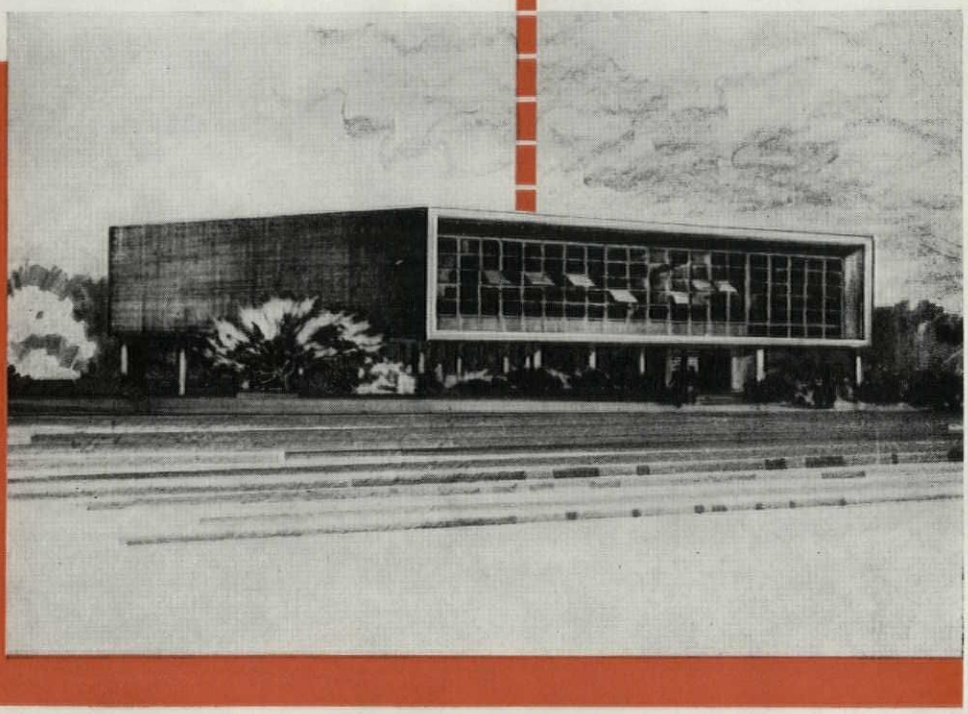
And Beautyware adds the privacy of silence!

Design *so* distinctive it enhances any bathroom décor you or your home buyers select. Add the choice of five Briggs compatible colors . . . Sky Blue, Coral, Sea Green, Sandstone, Pearl Gray . . . and your bathrooms become sales features second to none. And, of course, Briggs famous quality plus such important extras as quiet operation allows you to provide luxury plumbing fixtures at moderate cost. Specify dependability and leadership! Specify Briggs!

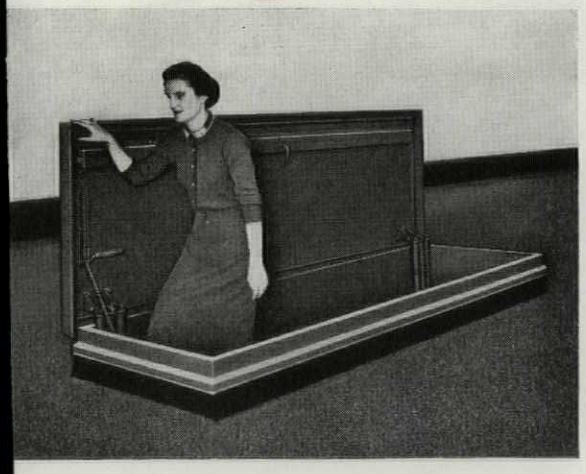
BRIGGS MANUFACTURING COMPANY • DETROIT, MICHIGAN

BRIGGS

B E A U T Y W A R E



Out of Sight-Line...



BILCO Type L Roof Scuttle
for normal stairs to the roof

and at a 75% saving of the average penthouse cost!

The standard BILCO Type L roof scuttle, illustrated, has a clear opening of 2'6" x 8'0" . . . special sizes are available . . . always specify BILCO for life-long, trouble-free, service, plus the safety and convenience of *built-in springs for effortless operation.*

See our catalog in Sweet's
or write for catalog A.I.A. File 12P

THE BILCO COMPANY
DEPT. 747A, NEW HAVEN, CONN.

Only the Best is stamped

Bilco®

oldest and largest manufacturers of doors for special services

Architect: Morris Lapidus, New York, N. Y. Gen. Contractor: Taylor Construction Co., Miami, Fla. Plastering Contractor: Thompson Plastering Co., Miami, Fla. Owned & Operated by Tisch Hotel

The dramatic new **AMERICANA HOTEL**, Bal Harbor, Miami Beach, Fla., is the latest in vacationland luxury. A cosmopolitan city within itself, this $17 million hostelry features the finest in spacious living.

Contributing to the structural quality of this hotel is **LEHIGH MORTAR CEMENT.** It was used in the masonry walls which required over 100,000 concrete blocks—and in the exterior stucco.

LEHIGH PORTLAND CEMENT COMPANY ALLENTOWN, PA.

ἄριστον*

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*"THE MOST"
that's my word for the

Guth brascolite
LINE OF INCANDESCENT LIGHTING FIXTURES

PLEASE HELP ME— I NEED A NAME!

I'm your new LUMEN-ATIONS friend, from the sunny shores of far-away and long-ago Greece, and I'm a direct descendant of the famous old Diogenes.

After looking *everywhere* for the world's finest incandescent lighting line, I finally found it—at Guth. So I've gone to work as a silent salesman for Guth, and you'll be seeing a lot of me—in national ads, literature, premiums, point of sale material, conventions, in all sales promotion and merchandising campaigns, pointing out the features and qualities of the Guth Brascolite incandescent line.

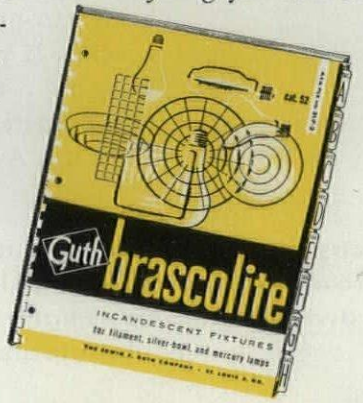
There's just one thing wrong—I don't have a name! Will you help name me, please? Just send in your suggestions—as many as you wish—to the Guth address below. The senders of the five best names will each receive . . .

φιάλην τοῦ οἴνου

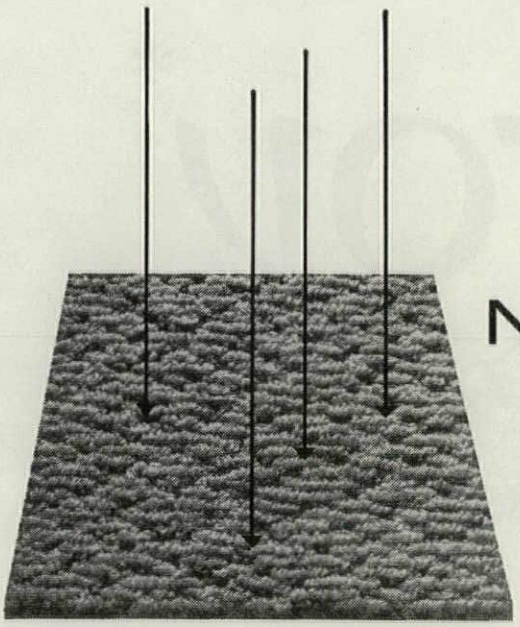
(a bottle of Metaxa, an excellent Greek brandy)

Quality is the word for this new Guth Brascolite incandescent fixture line with Alzak aluminum reflectors. Stylish design, sound engineering, efficient function . . . a real boon to the architect, electrical engineer and all who specify lighting.

And here's another terrific working tool—the new Brascolite catalog. Contains *everything* you need to figure any incandescent lighting job. Write today on your letterhead for your complimentary copy.



The EDWIN F. GUTH COMPANY • 2615 Washington Blvd., St. Louis 3, Mo.



New studies prove carpet highly effective in sound control

Tests performed at a nationally-known acoustics laboratory prove — beyond doubt — carpet's ability to control sound:

1 Carpet absorbs air-borne noise as well as many materials used solely for sound control.

2 Carpet virtually eliminates floor impact noises in the room and in rooms below.

3 Carpet absorbs 10 times as much noise as other types of floors and floor coverings.

When you specify carpeted floors, you're providing your clients with a high degree of sound control in addition to exceptional savings on maintenance. For, in heavy traffic areas, where sound control is usually most needed, carpet cuts floor maintenance costs over 50%.

In addition, of course, carpeted floors offer all the prestige, beauty, comfort, and safe footing for which they've always been preferred.

Send today for your file copies of "Sound Conditioning With Carpet," the complete study of carpet's ability to control airborne and impact noises. You'll discover that, in addition to the beauty, dignity and safe footing carpet brings to any area, it is the most economical sound control you can specify. If you don't already have your copy of "Cutting Costs With Carpet," a comparative study of the maintenance costs of carpeted and non-carpeted floors, ask for that, too. Write Dept. A-2, Carpet Institute, Inc., 350 Fifth Avenue, New York 1, New York.

Specify carpet designed and made for the American way of life by these American manufacturers:
Artloom · Beattie · Bigelow · Cabin Crafts-Needletuft · Downs · Firth · Gulistan
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Philadelphia Carpet · Roxbury · Sanford · Alexander Smith

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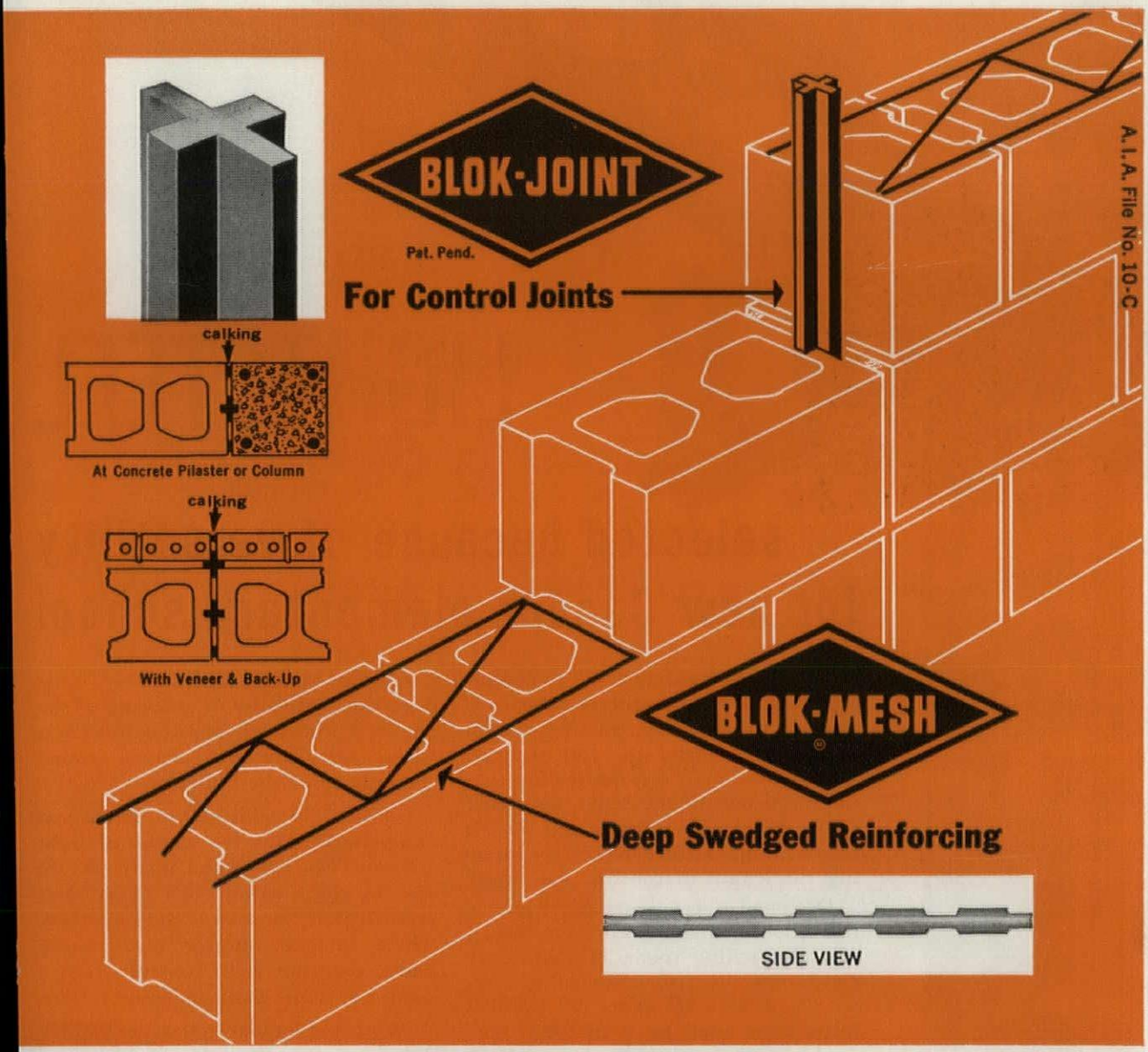

It Takes Both For
MORE STRENGTH & PROTECTION IN MASONRY WALLS

lok-Joint is a cross-shaped rubber extrusion used o make control joints in masonry walls. No special locks are required—no building paper and mortar ll is necessary. No cutting or sawing to be done. lok-Joint is used with any standard metal window ash block.

he secure interlock provided by Blok-Joint adds the lateral stability of the wall. It allows for ontraction *and* expansion while maintaining a firm int.

ok-Joint is effective in single block walls, with rick and block backup and at pilasters and lumns.

e big advantage you get with Blok-Mesh is the clusive "Deep-Grip" swedging. It allows the mor- r to get a real bite on the reinforcing yet requires no more area in joint than other types of superficial deforming.

Blok-Mesh is designed to eliminate cracks above lintels and below sills. It minimizes ordinary shrinkage cracks. Notice in the illustration how the "Deep-Grip" swedging of Blok-Mesh is large, deep and well-defined to form effective dovetailing.

For Further Information

Write for FREE Blok-Joint sample

and literature on Carter-Waters 2-point better masonry wall design.

For Further Information See

SEE OUR CATALOG IN SWEET'S OR WRITE FOR COPY

2-c Car

Architectural or Industrial Construction File

CONSTRUCTION MATERIALS
CARTER-WATERS
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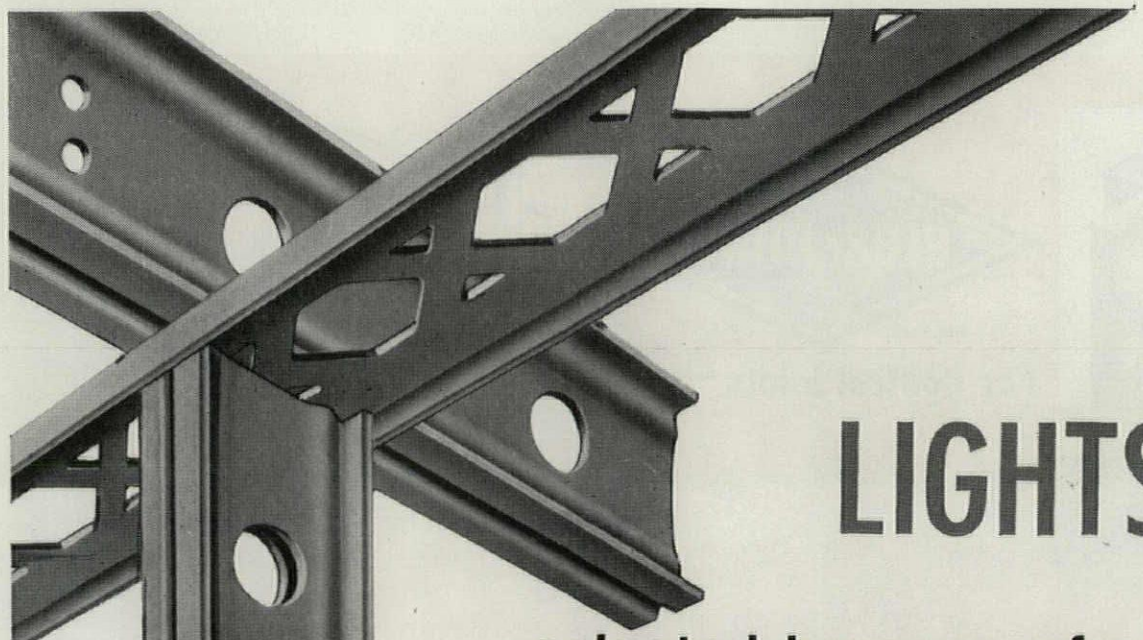

LIGHTSTEEL

selected because of versatility for new Candor elementary school

According to the architects, "In designing the Candor Elementary School we selected the LIGHTSTEEL framing system because of its versatility and its speed of construction. It was our feeling that the simpleness of the design lent itself to the wall-bearing system and we felt that we might reduce the cost by reducing the length of construction time."

Designed to accommodate 420 pupils, the school contains 3 kindergartens, 1 special teaching room, 11 elementary classrooms, library, office suite, cafeteria and 36′ x 52′ gym. 10″ LIGHTSTEEL joists were used for roofs and 3⅝″ double studs for load-bearing walls.

Exterior is brick and stucco. To reduce the possibility of cracking of the stucco, Penmetal Expansion Joint was placed vertically on 4′ centers around the outside of the building.

LIGHTSTEEL, in addition to serving as complete framing for schools of light construction, has found many specific uses in conjunction with heavy steel framing or masonry construction. These include interior load-bearing walls, exterior walls, corridor joists, canopies, floor joists and roof rafters.

Write for details of versatile LIGHTSTEEL. Ask for a copy of catalog SS-14.

Sargent-Webster-Crenshaw & Folley Architects A.I.A.

PENN METAL COMPANY, INC.
***General Sales Office:* 40 Central Street, Boston 9, Mass.**
Plant: Parkersburg, W. Va.
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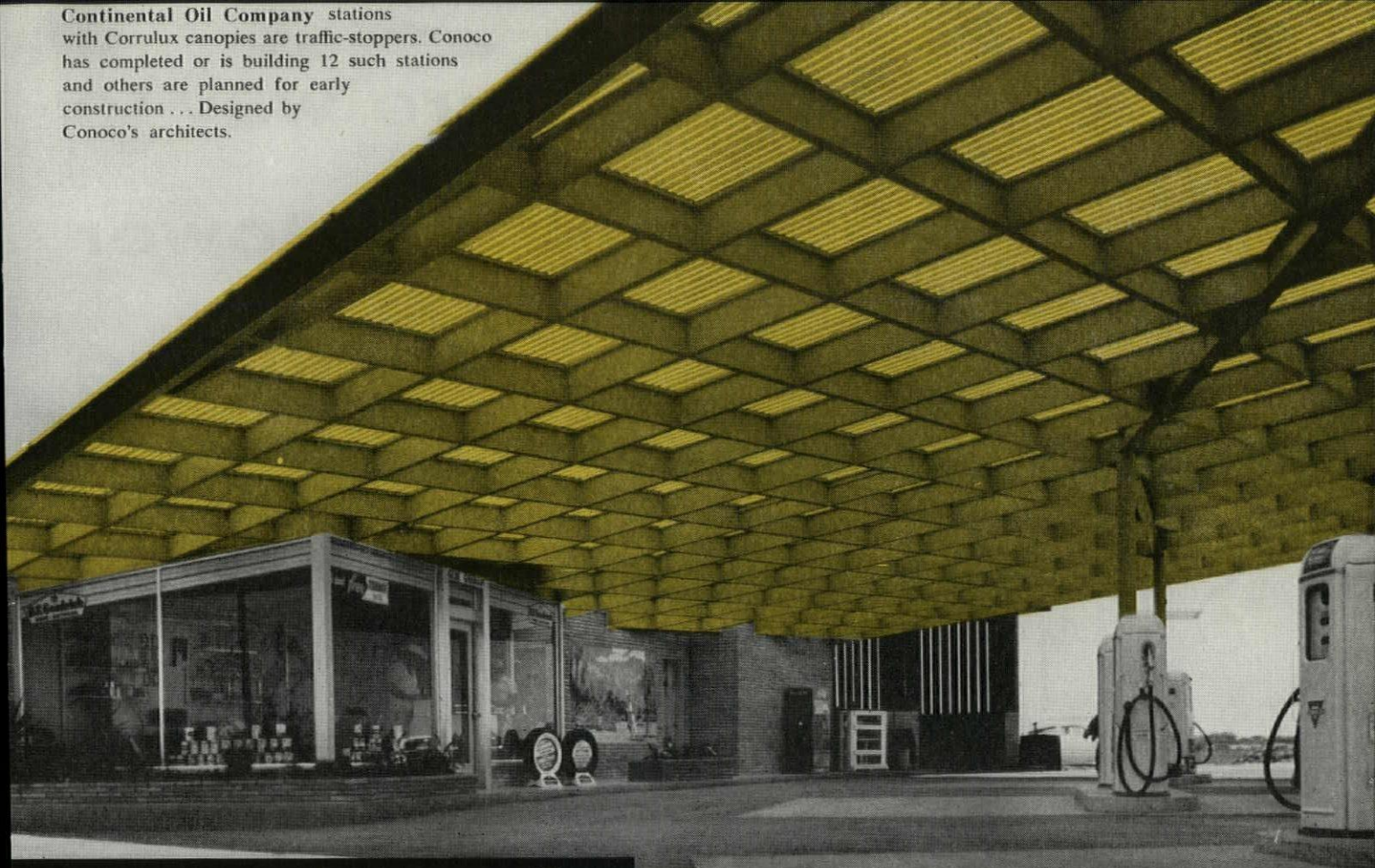
Penmetal 1869 METAL MARK OF QUALITY

PM-145

Continental Oil Company stations with Corrulux canopies are traffic-stoppers. Conoco has completed or is building 12 such stations and others are planned for early construction . . . Designed by Conoco's architects.



onoco & Corrulux® reate a roof that ransmits light . . .

ve Thru Markets get double-duty, too, with Corrulux opies to protect their "stay-in-the-car" customers while smitting flattering light to all food display racks. . . . igned by W. G. Horn, Mecca Engineering Company.

. . . and protects from weather, too

Employees and customers alike appreciate Corrulux canopies — to shelter and shade — while transmitting soft shades of diffused light. These glass fiber reinforced plastic panels are amazingly strong—yet light in weight.

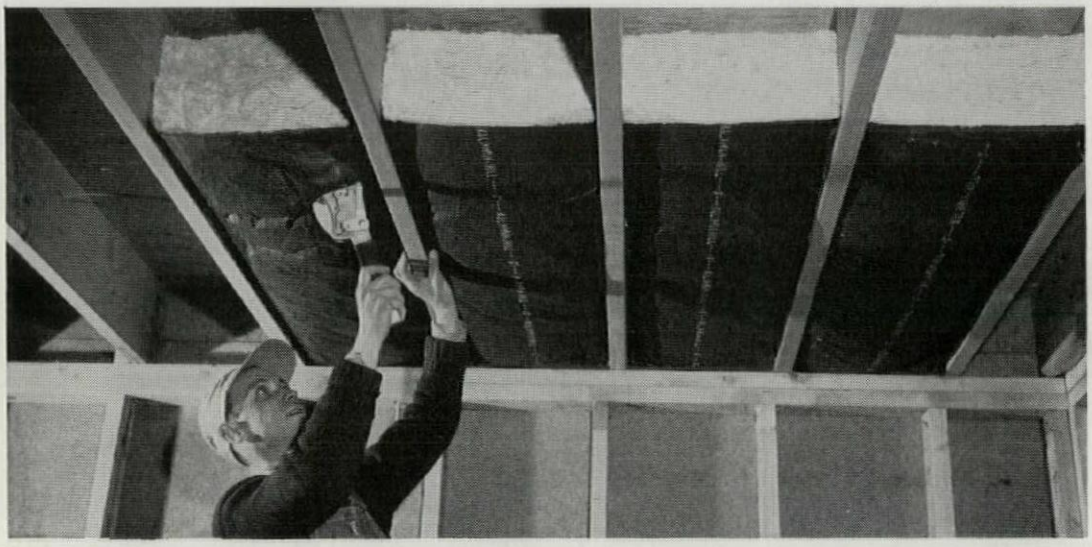
Corrulux has a place in your plans — for skylighting, partitions, paneling, curtain walls. Varied corrugations — Wide color range. Complete specifications on request or see your Sweet's File. Fire-retardant Corrulux is available with Underwriter's Label and Factory Mutual Approval.

L·O·F GLASS FIBERS Corrulux® Corrulux®

Corrulux Division, L·O·F Glass Fibers Co.
P. O. Box 20026, Houston, Texas

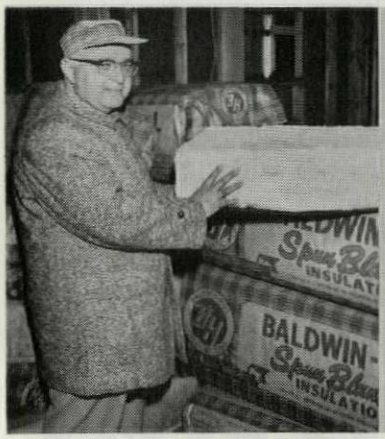
NOW... here's a sure way to lower Air Conditioning costs

Specify BALDWIN-HILL



B-H Big Six batts installed in lower-floor ceilings to eliminate the "tramp, tramp" and other noise from the upstairs tenants.

ARCHITECTS: Silberstein & Silberstein, Newark, N. J.
CONTRACTOR: A. Wakefield Co., Lakewood, N. J.
B-H DISTRIBUTOR: Wholesale Building Supply Co., Manasquan, N. J.



Let us quote Mr. A. Wakefield, owner and contractor: "Since I am building — and going to operate — these apartment houses, I want minimum building and operating costs. Strange as it may seem, I found that the cost of extra insulation is more than repaid by savings in original heating and air conditioning equipment, with fuel and power savings an added bonus."

B-H Big Six batts are packed under compression to save builders' storage space — but see how they expand to the full six-inch thickness when the package is opened. This resilience is permanent! It is "built-in" by Baldwin-Hill's process of spinning molten minerals into long, fine, interlocking fibers that never settle into a compact mass.

B-H Big Six batts installed quickly in 2nd-floor ceilings. Their lightweight and resilience makes them surprisingly easy to handle.

BIG SIX BATTS

"Tests have shown that the economy provided by ample insulation greatly offsets any slight additional cost at the time of construction." Explained Mr. A. Silberstein, Architect and designer of the new luxurious Wakefield Apartments in Lakewood, N. J. "But an additional reason we used these new B-H six inch batts was to deaden sound. We specified them in the first floor ceiling between apartments, as well as in the ceiling of the second floor. To give ample ventilation we built a hip roof thus guaranteeing the maximum effectiveness of the insulation in summer.

"In exterior walls and interior walls between apartments and stairwells we specified B-H semi-thick blankets. This assured that each apartment would not only be a heating and cooling unit independent of its neighbors, with separate controls, but assured each tenant that he would neither be heard nor hear noises made by his neighbor. In effect, each apartment is like a separate home with its own control of air conditioning and heating.

Since these three two-story apartments are to be owned and operated by the contractor building them, we met no resistance in specifying ample insulation. Mr. Wakefield's own experience has convinced him only ample insulation is sound economy."

One of the most important advantages an architect offers in designing buildings is that with his up-to-date knowledge of new construction methods and new products he can perform countless economies for both contractor and owner. The specification of ample insulation in the form of the Baldwin-Hill Big Six is a typical example.

Recent research has proven that six inches of mineral wool insulation in ceilings with full-thick insulation in walls saves as much as 50% in size of air conditioning equipment and its day-to-day operation. With 100% increase in the cost of fuel oil in the past ten years and the high cost of electric heat, this heat containment assumes even more importance.

Baldwin-Hill Mineral Wool is made by a special spinning process that provides long fine fibers that are extremely resilient, will not settle, and contain nothing that can deteriorate or lose effectiveness. To maintain a reputation for sound architectural recommendations, specify *Baldwin-Hill* . . . a leader in producing better, permanently dependable insulations.

"U" VALUES of the Baldwin-Hill Big Six clearly demonstrate its value as effective insulation in ceilings. With either ⅜" Gypsum Board or ¾" Plaster on Metal Lath, the heat flow up (for winter) is .042 and the heat flow down (for summer) is .041. (Calculated in accordance with procedure recommended in FHA Technical Circular No. 7 as revised April 1956.)

For specifications and more complete information, write for our catalog or see it in your Sweet's File. Samples will be sent on request.

Baldwin-Hill manufactures a complete line of insulations including B-H Perimsul perimeter insulation and B-H Duct insulation. Write for brochures.

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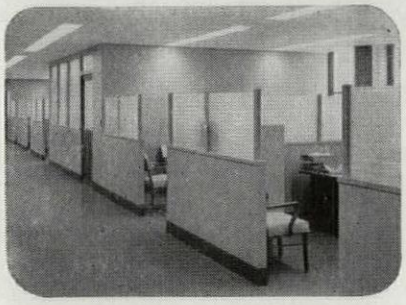
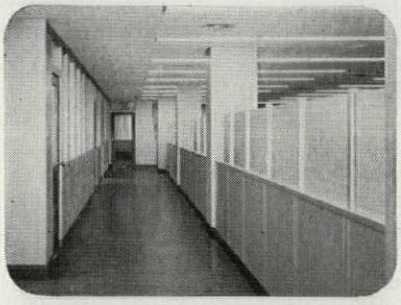
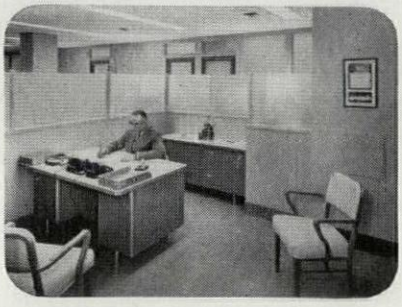
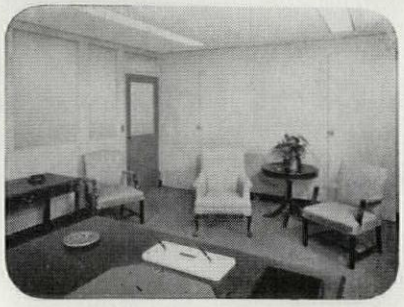
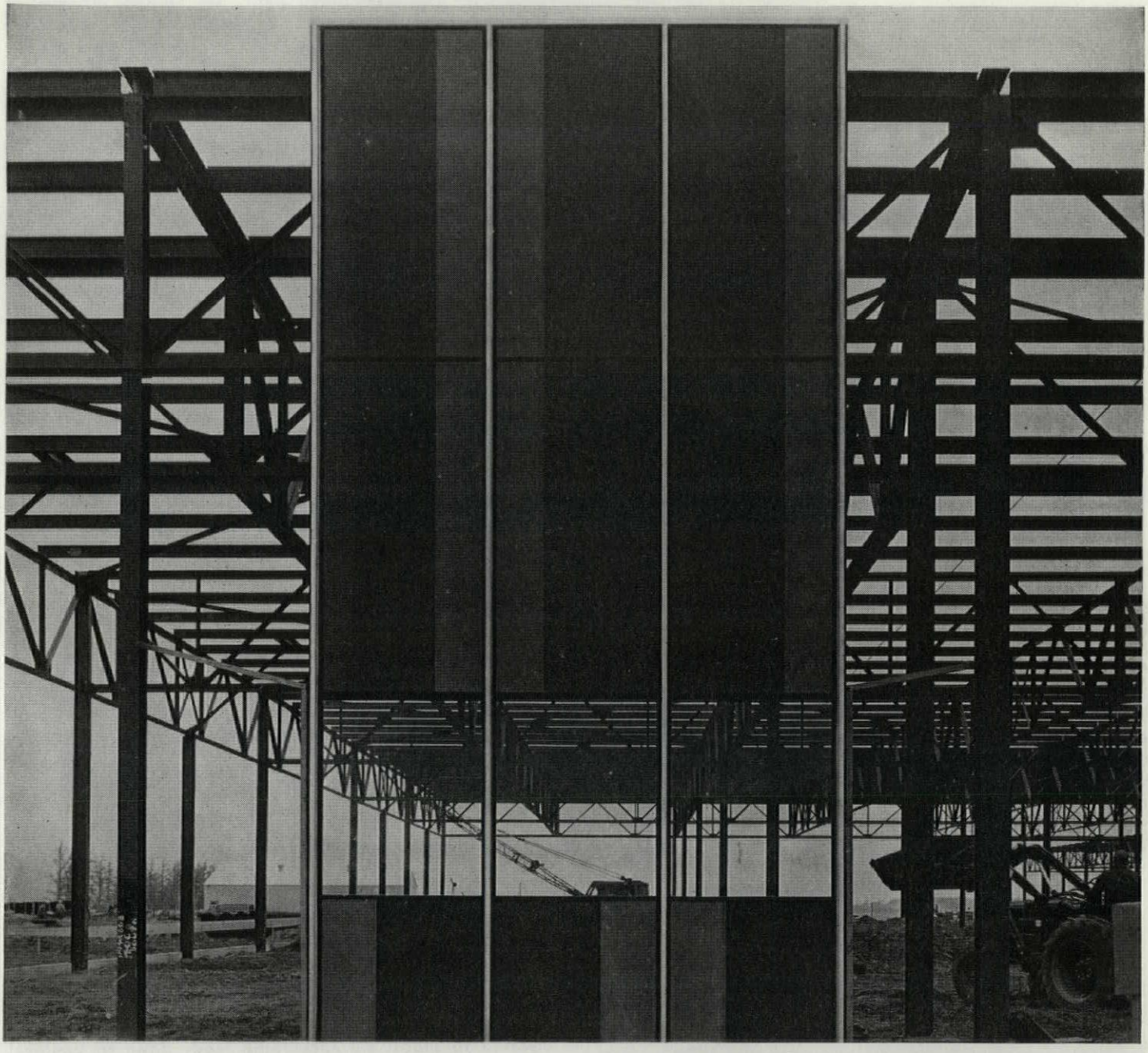








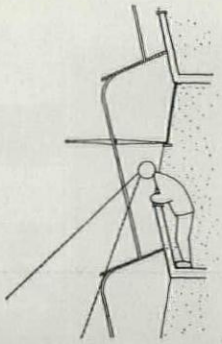
The National Biscuit Company has selected MILLS MOVABLE PARTITIONS for its new General Office at 425 Park Avenue, New York. Occupying six stories, these offices contain 6000 lineal feet of MILLS MOVABLE PARTITIONS. At the left are photographs of the offices showing the versatility and adaptability of the partitions. Write for catalog: The Mills Company 953 Wayside Road Cleveland 10, Ohio.

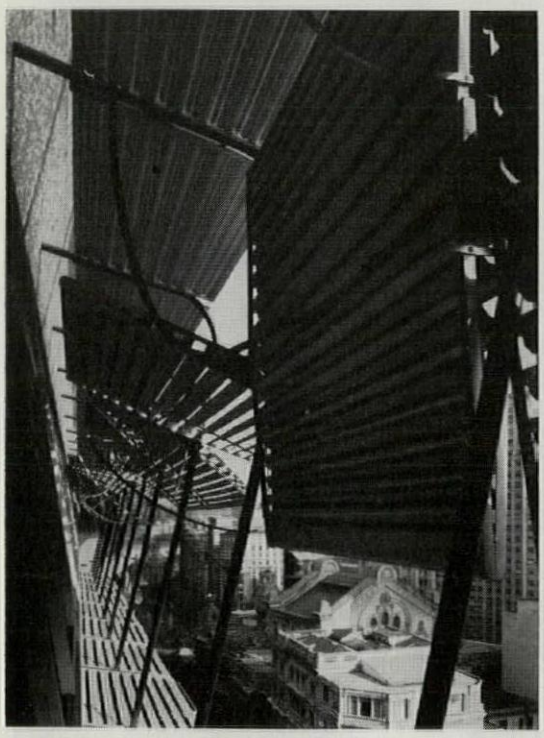


SAARINEN USES CURTAIN WALL 5/16" THICK

"This is a curtain wall where every component, including the weatherstripping, is used to maximum structural efficiency," says Partner John Dinkeloo, of Eero Saarinen & Associates. He is referring to the amazing 5/16"-thick envelope being used on the new Saarinen-designed factory, educational facility, and office building for International Business Machines that is now under construction in Rochester, Minnesota.

The laminated panels have a U Factor of .241 and they consist of porcelain enamel on aluminum, on both faces, with a special cement-asbestos core. The panels, largest of which is 4'x8', are integrally locked with a neoprene gasket into the slender aluminum, vertical mullions; there are no horizontal aluminum grid members; only the gasketing separates them vertically. On the IBM plant, developed on a 4-ft module, the panels are patterned vertically in two hues of blue. Cost of this remarkable curtain-wall material is $4 per sq ft of wall surface, the price including not only the panels themselves, but also the glass and the neoprene gasketing, all installed and completely finished on both exterior and interior faces. The photograph of a full-scale mock-up of the curtain wall was taken recently at the site. When the job is completed, P/A will present it fully in the magazine.





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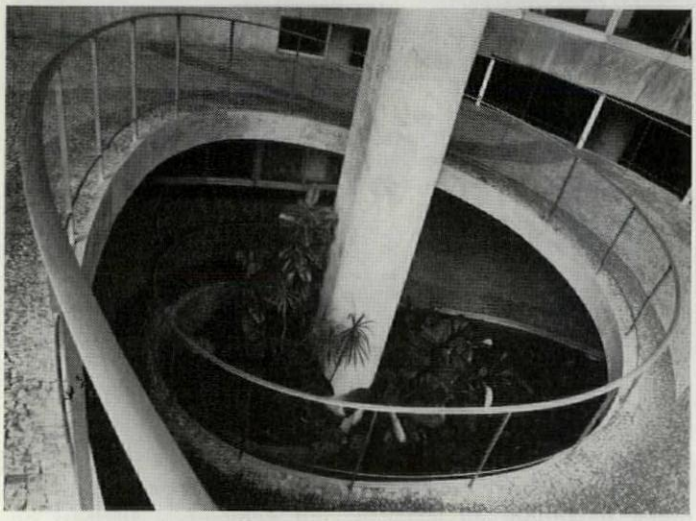
OFFICE BUILDINGS RISING HIGH



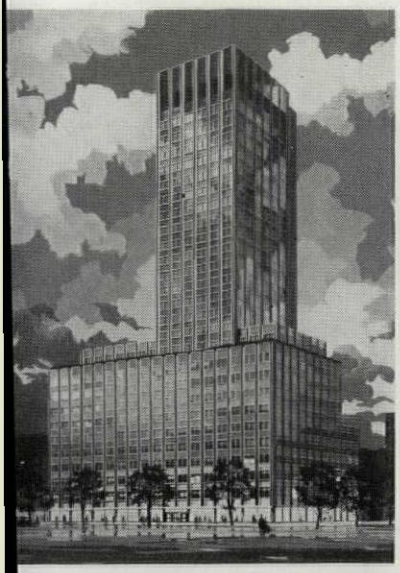
1 Rio de Janeiro, Brazil: 23-story reinforced-concrete office building. Façade subtly curved in attempt to modify large mass. Special sun-screening devices, applied for first time by architects, further assist in avoiding monotony. Pivoted louvers may be individually adjusted. Street level devoted to shops: entrance ramp leads down to sub-level where main lobby and more shops are located. M. M. M. Roberto, Architects.

2 New York, N. Y.: 27-story office building by Central Third Corporation. Piers faced with gray glazed brick; aluminum-framed pivoted sash; colored ceramic-coated glass. Carson & Lundin, Architects.

3 New York, N. Y.: 34-story office center for textile industry for General Realty & Utilities Corp. Windows on four sides of rectangular building for natural light in showrooms and sales offices. Lower and middle stories designed for full-floor occupancy. Elevators at rear. Sydney Goldstone and Kahn & Jacobs, Architects.

4 New York, N. Y.: 34-story air-conditioned office building by Sam Minskoff & Sons, Inc. Golden anodized-aluminum sheathing. Sylvan & Robert Bien, Architects.

5 Buffalo, N. Y.: 20-story air-conditioned office building for Tishman Realty & Construction Co., Inc. Glass cur-



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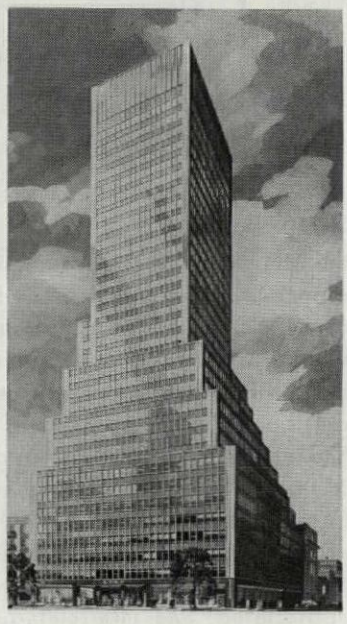

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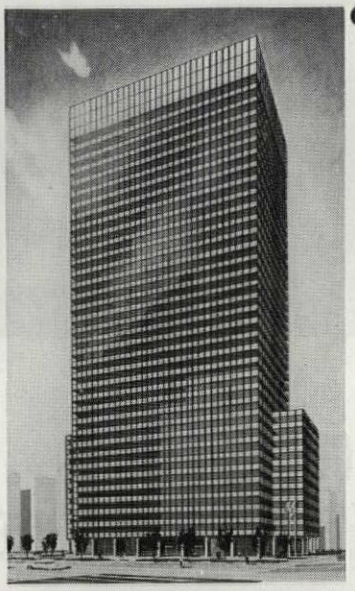

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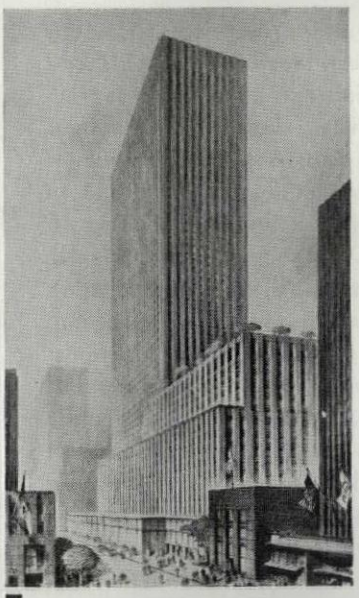

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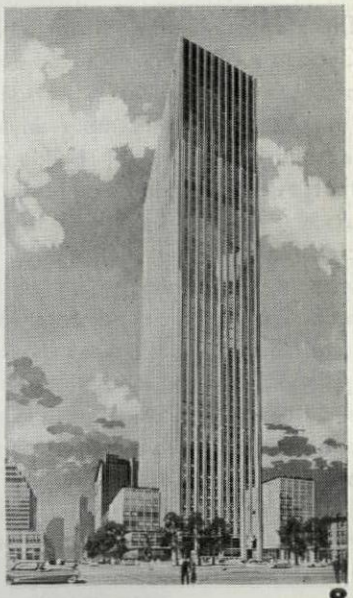


8

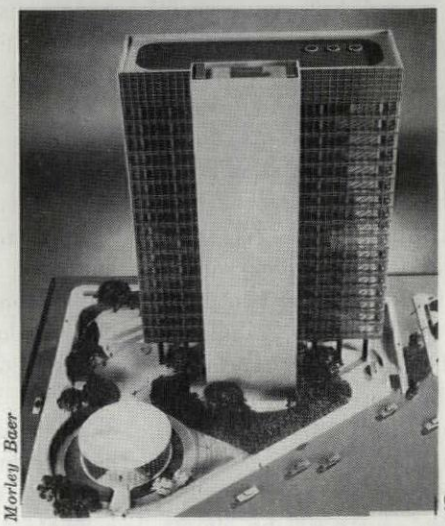
tain wall, dark blue-green spandrels, gray-tinted glare-reducing glass. Emery Roth & Sons, Architects.

6 Chicago, Ill.: 39-story office building for National Properties, Inc. Twenty-ft set-back from property line and plaza with planting, reflecting pool or fountain. A. Epstein & Sons, Inc., Architects-Engineers.

7 New York, N. Y.: 60-story stainless-faced office structure for Galbreath-Ruffin Corporation. Plaza "forecourt." Escalators to connect with concourse level. Off-street loading. Harrison & Abramovitz, Architects.

8 New York, N. Y.: 47-story single-shaft office tower for Rockefeller Center, Inc., and Time, Inc. Sixteenth building in Rockefeller Center group. Landscaped plaza, reception center, gallery. Harrison & Abramovitz, Architects.

9 San Francisco, Calif.: 20-story steel-and-glass headquarters office building for Crown Zellerbach Corporation. Only a third of site covered by building. Landscaped gardens, reflecting pool open to public. Office floors free of interior columns. Hertzka & Knowles, Architects; Skidmore, Owings & Merrill, Associated Architects.



Morley Baer

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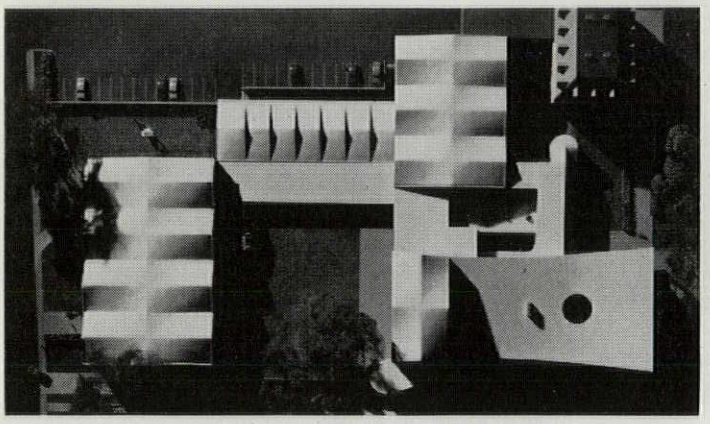
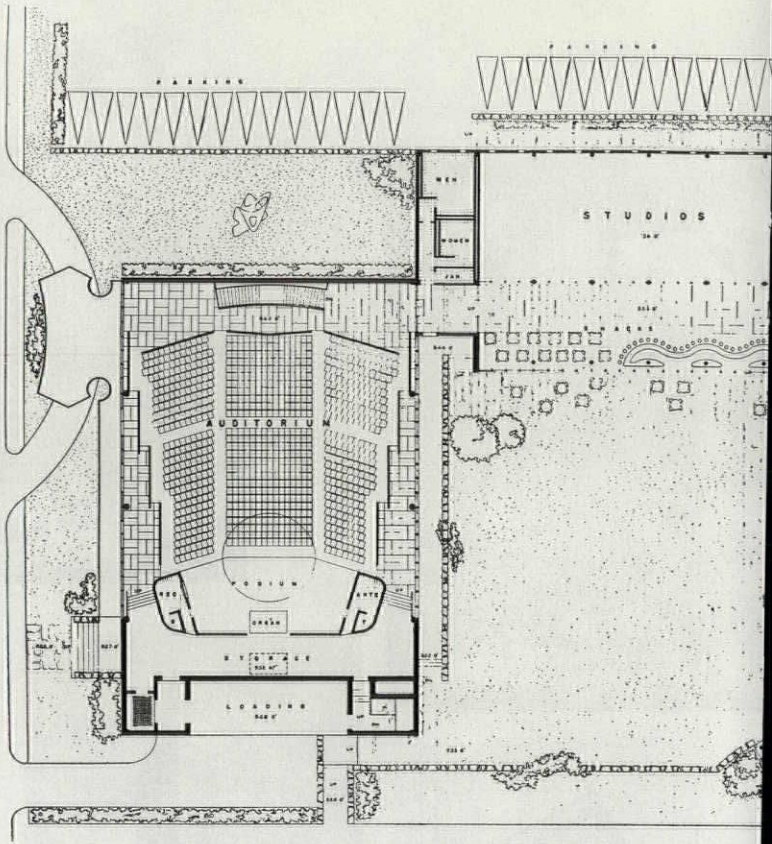




DARTMOUTH LAUNCHES CULTURAL / FELLOWSHIP CENTER

The Hopkins Center, to be built as a tribute to Dartmouth College's President-Emeritus Ernest Martin Hopkins, is one of the most remarkable instructional-creative-social centers to appear on any campus anywhere. Basic to the concept (and furthered by the building plan) is the determination that every Dartmouth student will at least be exposed to every phase of the arts and—it is hoped—be spurred to creative activities of his own. Designed in an irregular U scheme, the Center, which will occupy a prominent location on the campus immediately adjacent to the Hanover Inn, is to consist of a 450-seat theater for dramatic productions; galleries; studios and workshops for painting, sculpture, architecture, music, print-making, woodworking, the craft and theater arts; an auditorium-concert hall to seat 900; and various lounges and social facilities that will serve both as an informal meeting place and for various functions. A huge, room-height window wall in this area will overlook the Dartmouth campus. On the floors not shown are banquet rooms, an alumni hall, music-practice rooms, experimental theater, etc. Harrison & Abramovitz are Architects for the Center, with Wallace K. Harrison in charge.

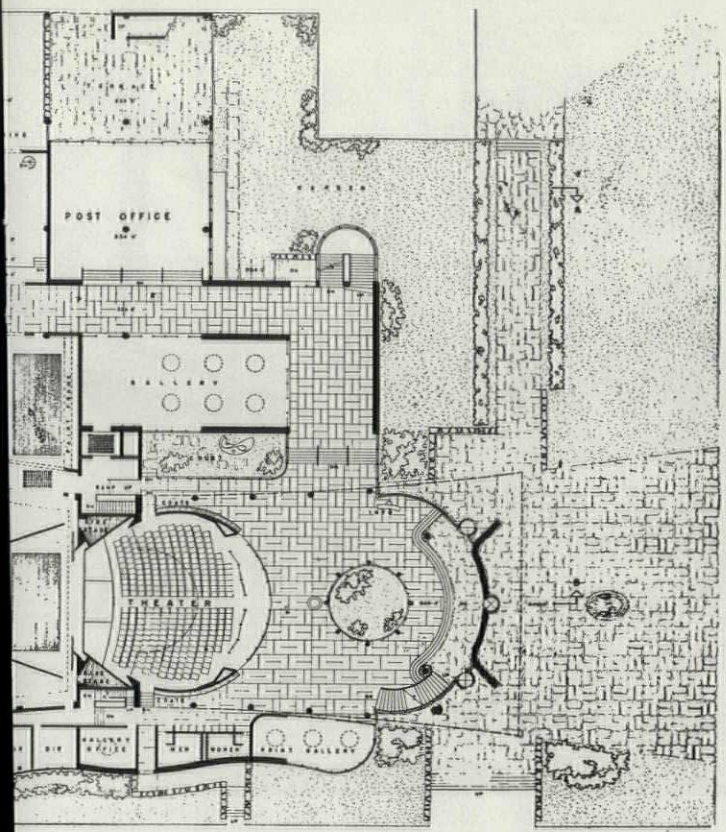
Methods by which the entire student body will be either required to visit this lively place or lured to it are most resourceful. At Dartmouth, there is one required lecture course that all freshmen must take. This will be conducted in the Center's auditorium. All seniors must attend a course on "Great Issues," which will be held in the main theater. Thus, at least in these two years, every student will be exposed to the galleries, exhibits, people working in studios, etc. But perhaps the real clincher is inclusion of the College post office in the Center. As Pres. John Sloan Dickey points out, it is hardly imaginable that there will be any students who never receive mail! The corridors of the building are wide, and changing exhibits will line them. Thus, it is assumed, there will be almost daily contact with the arts on the part of every student. And—an exceptional aspect of the plan—all activities involved in the creation of art will be on display, through the device of glass corridor partitioning. Those visiting the Center can watch rehearsals in progress; scenery being built; sculptors, painters, draftsmen, and craftsmen at work; musicians practicing. End educational result desired is that continual exposure to the excitement of creative activities will prove contagious to many. Furthermore, it is felt that this physical proximity of all of the arts will produce a beneficial "cross fertilization" between them, and each will be the better understood, appreciated, and interrelated.

Details of structure have yet to be decided, though the model does indicate roofs over several major areas made up of a series of concrete, double-curved surfaces.

NEWS BULLETINS

• Industrial Decorative Designers Guild of New York elected following officers for 1957-58: Dan Cooper, President; Wallace Lanz & Ruth Chargar, Vice-Presidents; Estelle Heller, Secretary; Rudolph Gerz, Treasurer. . . . American exhibits at Brussels Universal Exhibition will be designed by firm of Peter G. Harnden, exposition planners selected by Howard S. Cullman, U.S. Commissioner General to Brussels 1958 World's Fair. Theme will be "A New Humanism." . . . Architect Francis Keally has been elected President of Fine Arts Federation of New York.

• Cooper Union Museum for Arts of Decoration, New York City, celebrated 60th birthday May 23 by opening three-month exhibition of prints, textiles, wallpaper, ceramics, furniture, and other objects—selected from extensive collec-



tion of industrial-decorative art. . . . "One Hundred Years of Federal Architecture" — photographic exhibition illustrating development of public buildings—will be on display at The Octagon, AIA headquarters in Washington, D.C., throughout the summer.

• Architects and engineers are invited to join professionally conducted tour to Europe, on occasion of Interbau-International Building Exhibition, Berlin, Germany—and Triennale—International Exhibition of Architecture and Design, Milan, Italy. Tour will extend from Aug. 25 to Sept. 23. For data, write: Globe Travel Service, 127 N. Dearborn St., Chicago 2, Ill. . . . Twentieth International Conference on Public Education will be held July 8-17, Geneva, Switzerland, in conjunction with exhibit of contemporary American school buildings.

• Top winners in student architectural competition of International Home Exposition, held May 4-12 in New York Coliseum, were selected by AIA. First prize of $1000 went to Arnold Feinsilber and Martin Blumberg of Cornell University, for beach house design; $250 award for a suburban house design went to Allen Davis of Pratt Institute; Michael Rubinstein and Marcia L. Dale received Honorable Mention for a house for the Negev.

• Sir Patrick Abercrombie, noted British town planner—credited with enlarging scope of planning field from bit development to citywide scale—died at his Aston Tirrold, Berkshire, home, Mar. 23.

• Dr. David B. Steinman, New York City bridge engineer, was recently awarded J. Lloyd Kimbrough Medal by AISC for outstanding contributions toward advancement of steel-bridge design and construction. . . . Architect Kent J.

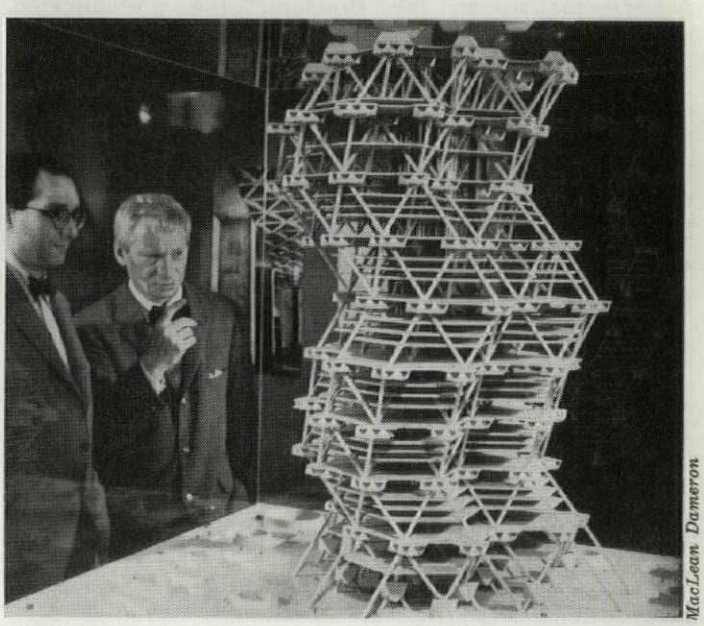
p/a news survey

Attridge, Beverly Hills, Calif., was elected to membership in Acoustical Society of America—in recognition of his "substantial contribution to advancement of acoustical science" applied to architecture. . . . John Carl Warnecke, California architect, received $1000 Arnold W. Brunner Prize in Architecture—awarded by National Institute of Arts and Letters—for outstanding architectural design. . . . Percy Uris, builder and partner of Uris Brothers, will serve as Executive Assistant to President Grayson Kirk of Columbia—who asked his aid in supervision of new construction on Columbia's campus.

• International Council of Shopping Centers, Inc.—group of builders and shopping-center operators aiming to promote retailing importance of centers and deal with operational problems—recently established temporary headquarters at 6 N. Michigan Ave., Chicago, Ill. Council is expected to be major source of data on centers.

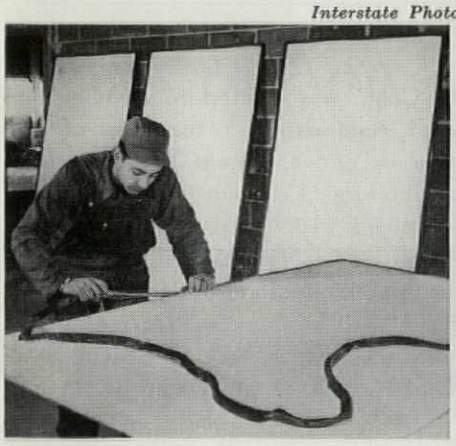
• "Main Street, 1969" is theme for 1957 National Citizens Conference of American Planning & Civic Association—which will feature as speakers, Victor Gruen and William Zeckendorf. Conference—to explore impact of new shopping center concepts, regional planning, and interregional highways—will be held in Little Rock, Arkansas, June 9-12.

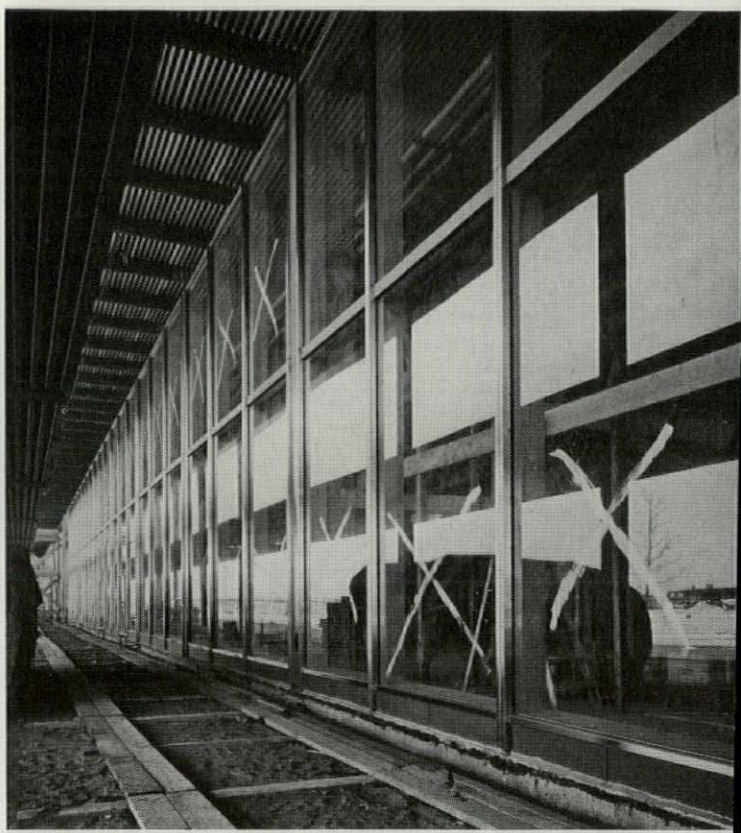
• In anticipation of future design idiom, Louis Kahn (below right) Philadelphia architect and city planner, conceived municipal office-building design—utilizing triangular frames of precast, prestressed concrete; hollow-concrete sections contain piping and other service lines while central core consolidates elevators and stairways. Project, sponsored by Universal Atlas Cement Company, is on view at Cornell University's White Art Museum—in exhibition of Kahn's work. Looking on (below left) is Museum Director Alan R. Solomon.



MacLean Dameron

Interstate Photographers

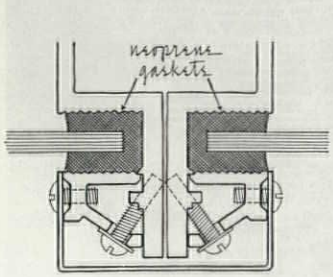




Gottscho-Schleisner

NEOPRENE GASKET SEALS IDLEWILD'S WINDOW WALLS

Idlewild Air Terminal, N.Y., May 15—The all-glass curtain walls for the new Idlewild Arrivals Building—rapidly nearing completion with a target opening date pegged for sometime in July—is one of the largest, single glass contract in the history of the industry. This long-awaited three-story building, 1760 ft long and 415 ft deep with two double-deck 240 ft fingers, is completely enclosed by thousands of glass panels of various kinds and sizes. Such a vast area of enclosing skins required that extremely detailed consideration be given to the use of sealants and, for this purpose, the concept of bringing pressure on glass through a rubber-like gasket was used to seal a building. A special neoprene gasket was developed jointly by E. I. du Pont de Nemours & Co.; Pawling Rubber Co.; Skidmore, Owings & Merrill, architects for the Arrivals Building; and several glass companies — for sealing the structure. The prefabricated gasket fits snugly around all four edges of the glass panel and can be easily placed in position by one man (see illustrations above). An aluminum pressure stop brings pressure on the glass through the gasket, sealing the glass at three places (note detail below). With this method, no caulking material is necessary and many man hours can be saved. Since the neoprene gasket is resilient enough to allow the glass panels to bend under heavy wind pressure, breakage possibilities are greatly reduced. Even if the glass should break, the same rubber gasket and aluminum frame can be reused to replace the light. Each gasket will expand or contract as necessary to accommodate movement of the glass skins, and long life is assured since neoprene has a proven resistance of 25 years to weather and chemicals. Cost is said to be approximately one-half that of other top-quality sealing methods. A mock-up section has successfully passed a weather test conducted by the General Bronze Corp.



FINANCIAL NEWS

by William Hurd Hillyer

Residential real-estate markets are prime agenda for consideration by the Board of Governors of the Federal Reserve System, as reflected in that body's current bulletin. Graphically portrayed at the outset, by means of a chart based on data supplied the U. S. Departments of Commerce and Labor, are the contrasting trends in construction outlays in 1953-'56, and part of 1957. Private business construction shows a fairly steady rise for the four-year-plus period from $8 billions to $12 billions, while public construction rose from $12 billions to around $14 billions. Private residential erection, however, starting even with public undertakings and spurting to some $18 billions in '55, has since taken a 30% dive, to about $13 billions.

An element in this decline, says Federal Reserve, has been the unattractiveness of Government-underwritten mortgages when yields on competitive investment have been rising and house buyers have become more selective. Were it not for the availability of "conventional" (non-Federal) mortgage financing, and the willingness of borrowers to use it, the plight of the residential market would have been sad indeed. Junior liens were likewise effective in cushioning the slide.

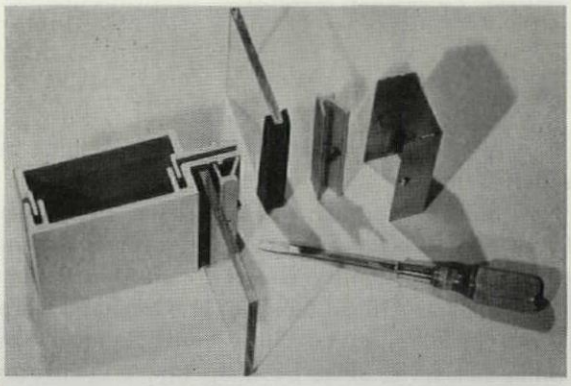


Photo Associates

Gottscho-Schleisner

"Fanny May" (Federal National Mortgage Association) whose task is to "make a market" for FHA and TV mortgages, is now carrying the largest loan portfolio in her history—96,000 mortgages worth more than a billion dollars and mounting at the rate of nearly $300 millions quarterly. This year's first-quarter purchases were about 440% more than in the initial three months of 1956. Fanny May's Pres. J. Stanley Baughman regards the last quarter of '56 as the peak, and reports offerings as down 37% from that period. He predicts an "easing" of tight supply in the residential-mortgage field. The consensus of informed opinion (in which this page joins) is that relief in the residential-loan situation will come from an augmented supply of private capital in the hands of lenders who do not insist on Government guarantee. Already the net increase of "conventional" mortgages has risen from $2 billions below the FHA-VA type in mid-'55 to a like sum above that category in 1956. Last year, the conventionals increased $6.2 billions.

In this connection, architects and builders will be intrigued by the systematic endeavor of the American Bankers Association to encourage a free interstate mortgage fund flow. That body's efforts are presently concentrated on the passage of uniform laws by 48 States to facilitate investment in building, general as well as residential. Declares John R. Redfield of Cadwalader, Wickersham & Taft: "Restrictive state laws obstruct a healthy building industry."

• Conceding that private housing starts are currently below a one-million annual rate for the first time since 1951, the Federal Reserve Bank of Chicago believes that the current trend of business compares favorably with early 1956.

p/a news survey

Despite signs of leveling, recent evidence suggests that economic activity is continuing strong, relative to a year ago. Ordinarily the flattening curve of bank loans to business enterprises would be cited as evidence of a general slowdown, but alternative sources of funds are being tapped today, in the shape of stocks and bonds. New capital for 1957's first quarter amounted to $3.3 billions, 60% ahead of last year.

• Capital replacement, vitally important to architects with a proportion of non-residential practice, is deemed "a dilemma of inflation," in the language of the Guaranty Trust Company, New York. Deficiency in such replacement by industrial concerns which require new factories has become "an extremely serious matter" now that costs are steadily going up. Some industrial managements are reported as in a "quandary" as a result. The Guaranty joins in a call on Government to reexamine the depreciation-and-profit concepts of revenue laws.

Another large New York trust company, the Bankers, sees capital needs running ahead of savings. Inflow of funds to major reservoirs is expected to diminish this year as compared with '56, but "no let-down" is in sight for corporate financing, declares the Bankers' economist.

• Architectural practice tends to be broadened by the relatively strong position of lower-bracket industrials. Such concerns "averaged out with slightly higher profit margins" last year than in '55, SEC states. Contrary to general expectations, these companies made a better profit-showing, percentagewise, than did their oversize competitors. Firms with less than $5 millions assets netted 2.7% on sales after taxes in 1956, compared with 2.4% the year before. Meanwhile, the $100-millions groups suffered a decline from 7.4% to 6.9%.

• Inadequacy of school facilities is seen as a rapidly growing problem by the Federal Reserve Bank of Richmond. It is estimated that elementary-school enrollments will increase 22% during the latter half of this decade and another 10% during 1960-'65, with high-school enrollments gaining 20% to 32%. Many officials are already striving to prepare, physically and financially, for the "vast" prospective increases in student enrollment. At least one municipality has solved the school-money problem. Columbus, Indiana, a community of 22,000, needed a new high-school gym and raised $1 million by local donations in a drive.

• Municipal bonds are mobilizing capital at an improved pace for schools and other public construction. Thirteen new issues totaling $161 millions were added to the daily "Bond Buyer's" List of Major Accounts in the last reported week as we go to print. Of these 96% were sold. Prices moved nine basic points higher. Although the inflow of funds to major reservoirs is expected to diminish this year, no fall-off is sighted for bond financing.

p/a Washington report

by Frederick Gutheim

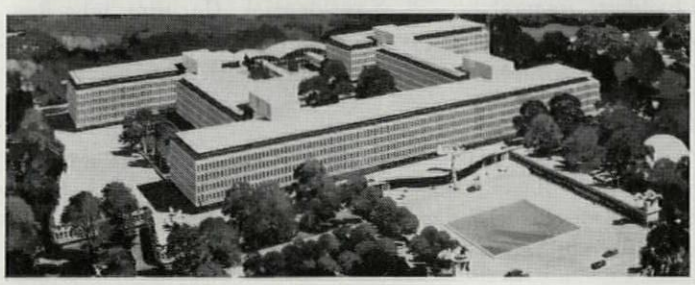
A turn for the better in Government architecture is suggested by the design for the Central Intelligence Agency's building (below) on an outlying site near Washington. Harrison & Abramovitz are the architects. The design was first shown in an exhibit of "One Hundred Years of Federal Architecture" that continues on view in the Gallery of The Octagon here during the summer. A single-story "platform" extends far beyond the area occupied by the four-story-and-penthouse office building itself. The building is broken into five main sections, and while compact, maintains much of the beauty of a splendid open site near Langley, Va. Not only is the huge structure's impact minimized—it is about one-third the size of the Pentagon!—but most of the offices will have exceptionally attractive views. Few details of the building have been given, for obvious security reasons, but it will be fully self-contained, with an auditorium, lounge, and restaurant facilities. While a more official-looking structure than one might have surmised from the description initially given by the architects and CIA Administrator Allen Dulles, it is a good step ahead of any other recent buildings here.

Put forward by the Public Buildings Service as one of four public buildings that "look to the future," the initial question is: "Does it?" The second, and closely related question, is whether this building really belongs in the category of PBS structures, or in a category with the Atomic Energy Commission that makes it exempt from the usual stultifying influences of PBS design. From my own point of view, the CIA building is far from the last word in Government-office building, and I hope it will not be taken as a model for future public architecture. It is still far too big for a single building, and would be greatly improved if a more decentralized "campus" plan had been employed, and a greater effort made to integrate parking areas with the structures themselves. It would not be necessary to go to the extreme of, let us say, the General Motors Technical Center, to effect a great improvement in the humanization of working conditions. The uniform height of all structures makes a great contribution to the institutional character of this building, and I know of no good functional reason for it. More low buildings and a few towers would have yielded a structure that looked less like a formula. The architects have a good record in employing sculpture in their work, but the four monumental pieces shown in the rendering need the support of a more forthright PBS policy in this field before one can be sure they will be parts of the finished building. The same might be said of the landscaped courts and other features. I am not attempting to criticize the building on the basis of the typical Schwartz rendering, but these all seem valid points to raise at this stage. They support the contention that this is not the last word in public architecture for dispersed sites. Perhaps even more, it is not a building PBS is likely to realize, or equal, in future work.

The CIA building is far superior to the other three buildings that it is claimed "look to the future." These are the New State Department building here; the Bureau of Old-Age and Survivors Insurance (of the Department of Health, Education and Welfare) located in Baltimore; and the Federal Office Building in Omaha, Nebraska. The OAS building, to take one example, looks like all the other dull, state, office buildings I have seen recently. That is to say, when good they look like the Ethicon Suture factory, and when bad like a ramp garage. Granted the OAS building is really a factory (even more than an insurance company is) where the clerical work is highly mechanized, I find it hard to believe the so-called block-type building is the best solution. It harks back to the theory that the 20-year-old General Accounting Office building in Washington, with its total flexibility, is the ideal. This is a building in which the maintenance man—not the architect, and still less the employe, or the administrator—has had the loudest voice.

The buildings, as a whole, do not overcome that need for a fresh architectural approach specified in a recent amendment to the public works bill by Representatives Thompson (N. J.) and Reuss (Wis.). The proposers frankly state that the best current Government building effort is that of the Foreign Buildings Office of the State Department. They trace the excellence of that program to its selection of good architects. They propose an independent architectural advisory board in the Public Buildings Service to assist it in this direction. While one may quibble with the details of this bill, the direction in which it points seems to me one that will be approved by the overwhelming majority of architects. It aims at recovering a leadership in architecture that is essential if public-building design is to be centralized in a single agency. And the PBS exhibit shows the need for such a reform—not, as I suspect it had hoped to show, that PBS can do very well as it now stands.

Perhaps one further word on the exhibit itself, the greater part of which is organized along historical lines. Limited to the past century, it necessarily skips the impressive legacy of the Federal period. Concerned with a rather formal definition of architecture, it omits reference to the public engineering works of the 19th Century. The impression clings that public building has steadily lagged behind the best private building of the time, and that in periods of architectural change it has tended toward timidity and compromise. Are these inevitable characteristics of public building?



COMPONENTS FOR CURTAIN-WALL CONSTRUCTION...

This issue of PROGRESSIVE ARCHITECTURE is almost wholly dedicated to the pleasant task of reporting recent examples of architecturally designed buildings featuring curtain wall systems and products and a definitive 16-page discussion of "Panel Curtain-Wall Construction" by Harold R. Sleeper, F.A.I.A. (See pages 209-224)

Supplementing this editorial report, and related articles on the relatively new and complex subject, is the solid section of ninety-one pages which follows this index. In these pages the manufacturers of curtain-wall materials and products—and fabricators of components—present for your consideration the answers to virtually all design and engineering problems arising in this field.

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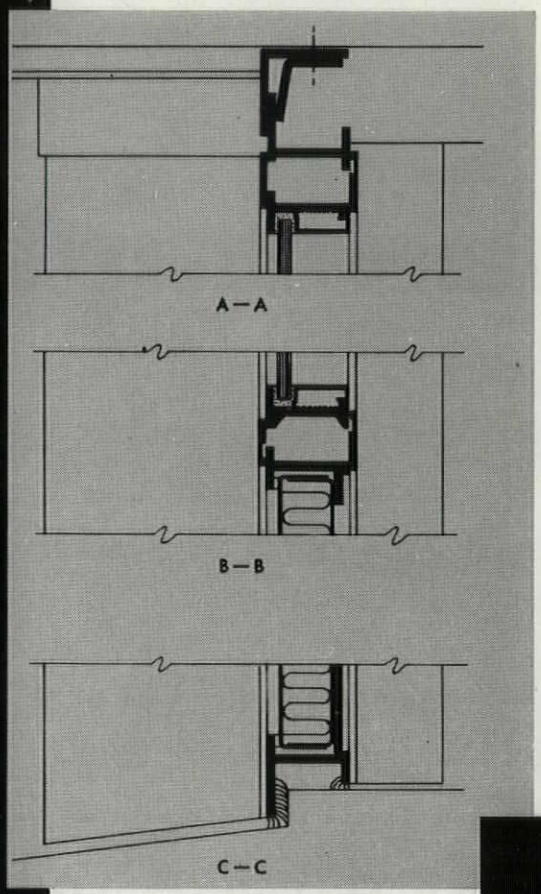
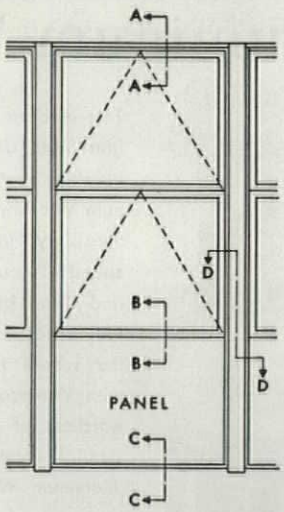
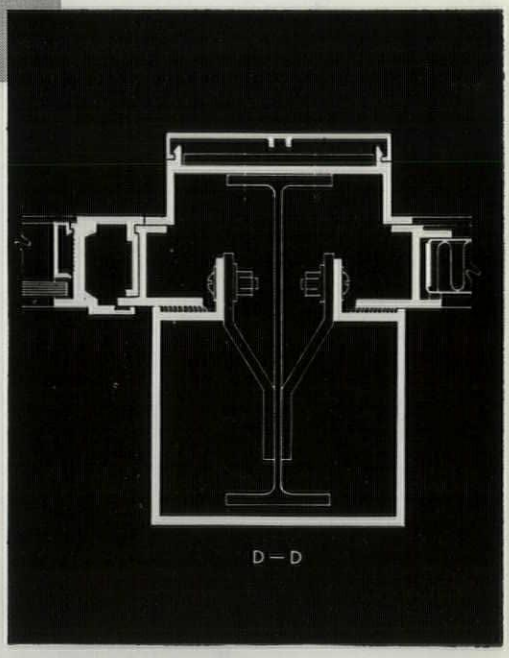


Reynolds Aluminum Windows, Series 500 Intermediate Projected, are used throughout this building. At left and below are detailed sections of head, sill and jamb.





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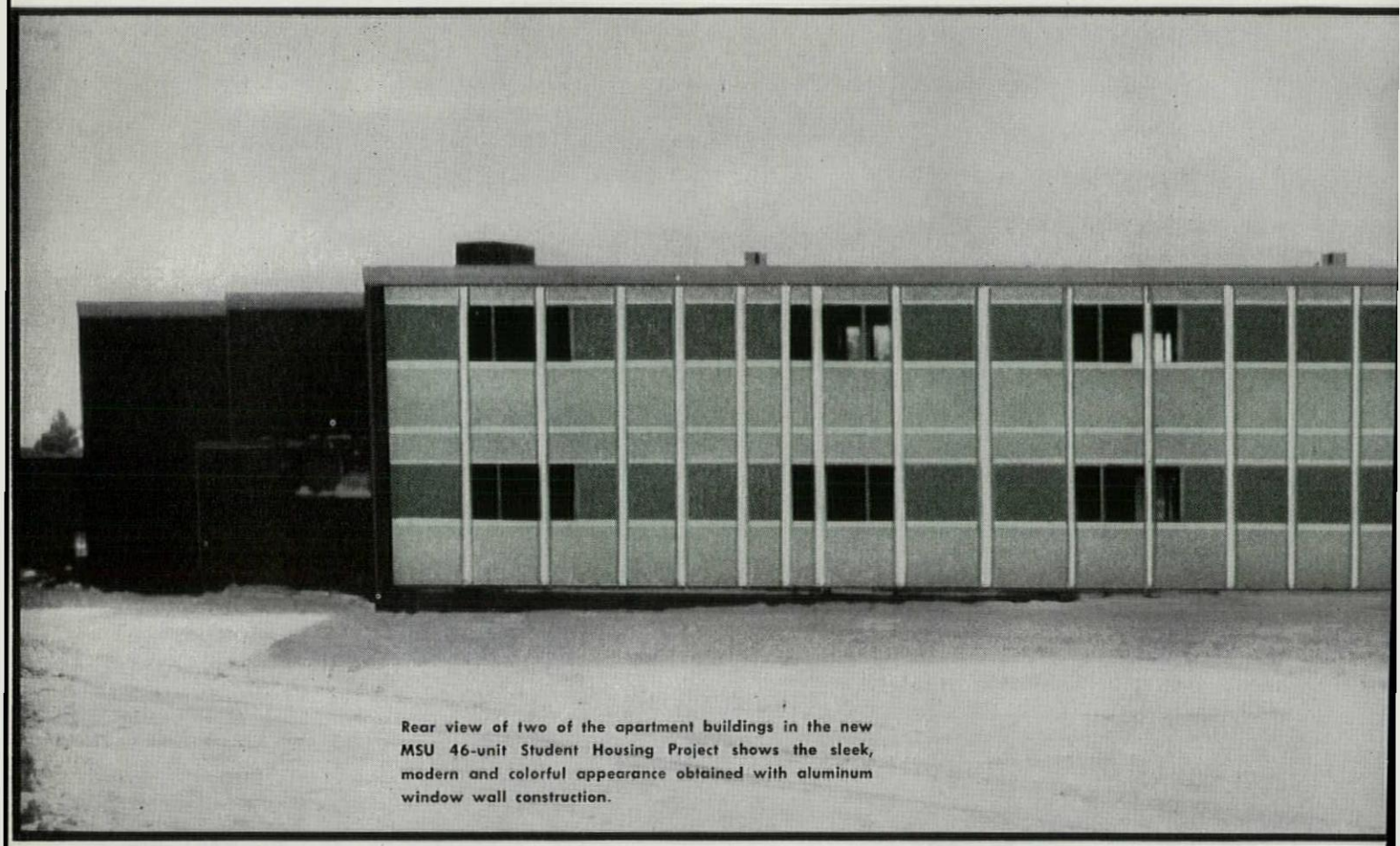

Rear view of two of the apartment buildings in the new MSU 46-unit Student Housing Project shows the sleek, modern and colorful appearance obtained with aluminum window wall construction.

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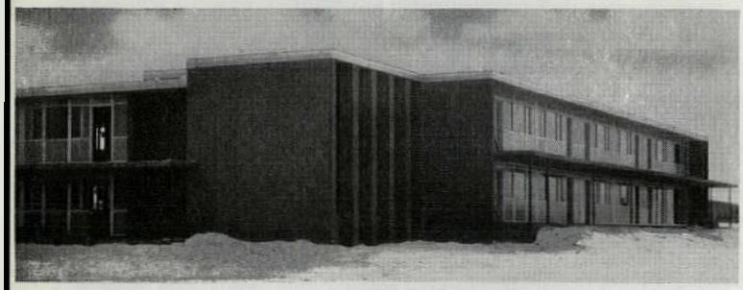
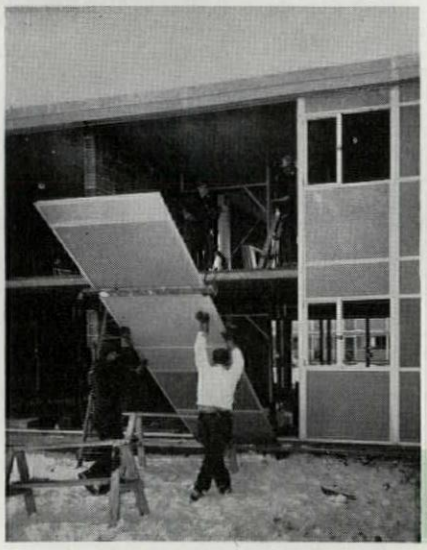


Front view under-construction photograph of 2 MSU apartment buildings shows their attractive front window wall design.



Workmen install 16-foot-high, 2-story aluminum window wall panel in new MSU Housing Project. It can be interlocked to the adjoining panel in a matter of minutes. 4-man crew can install entire rear wall in one day.

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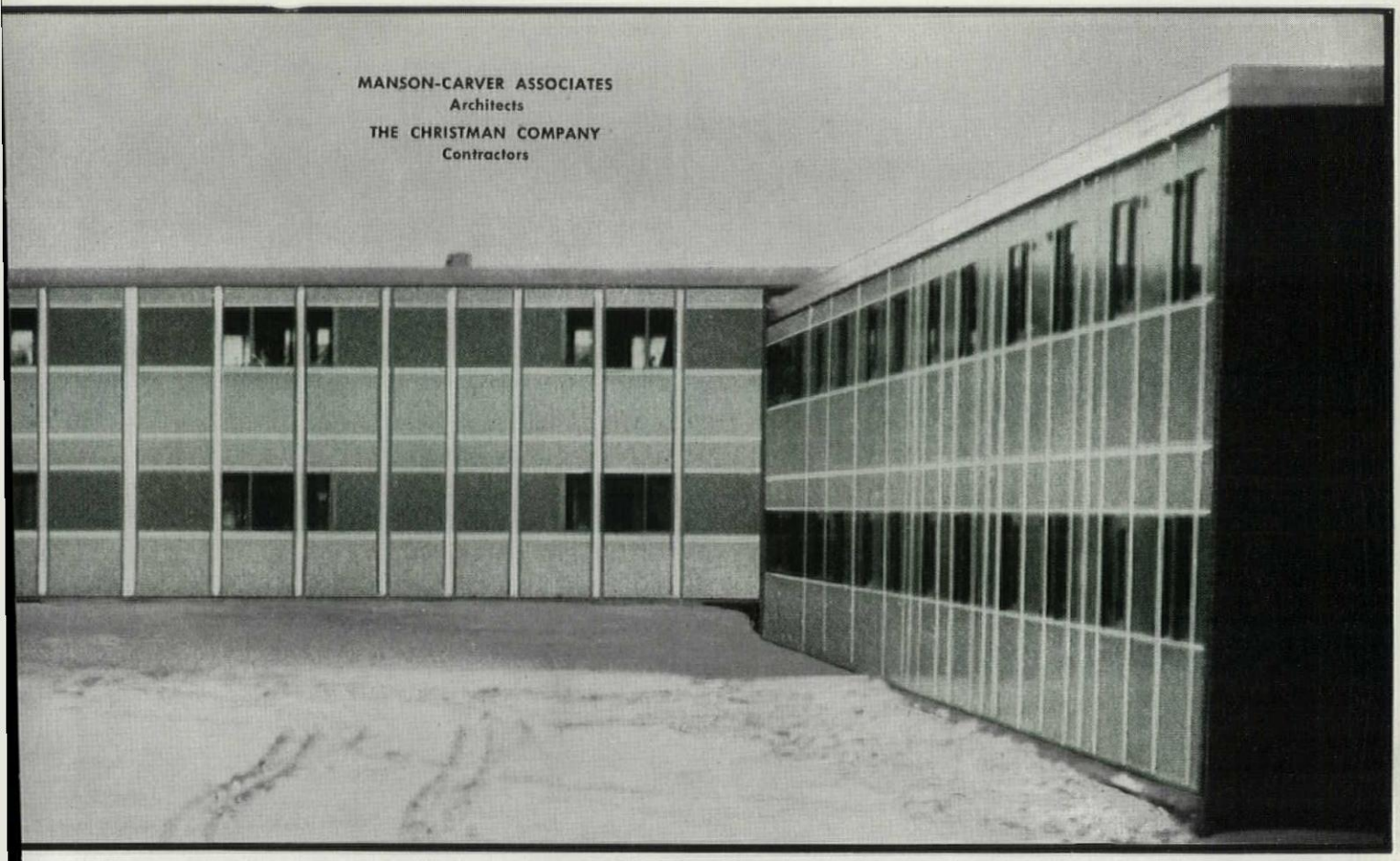

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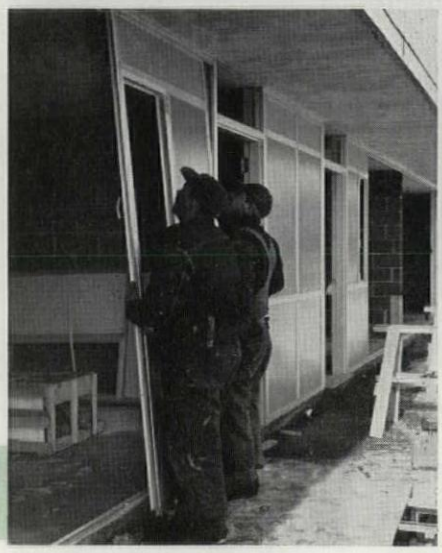

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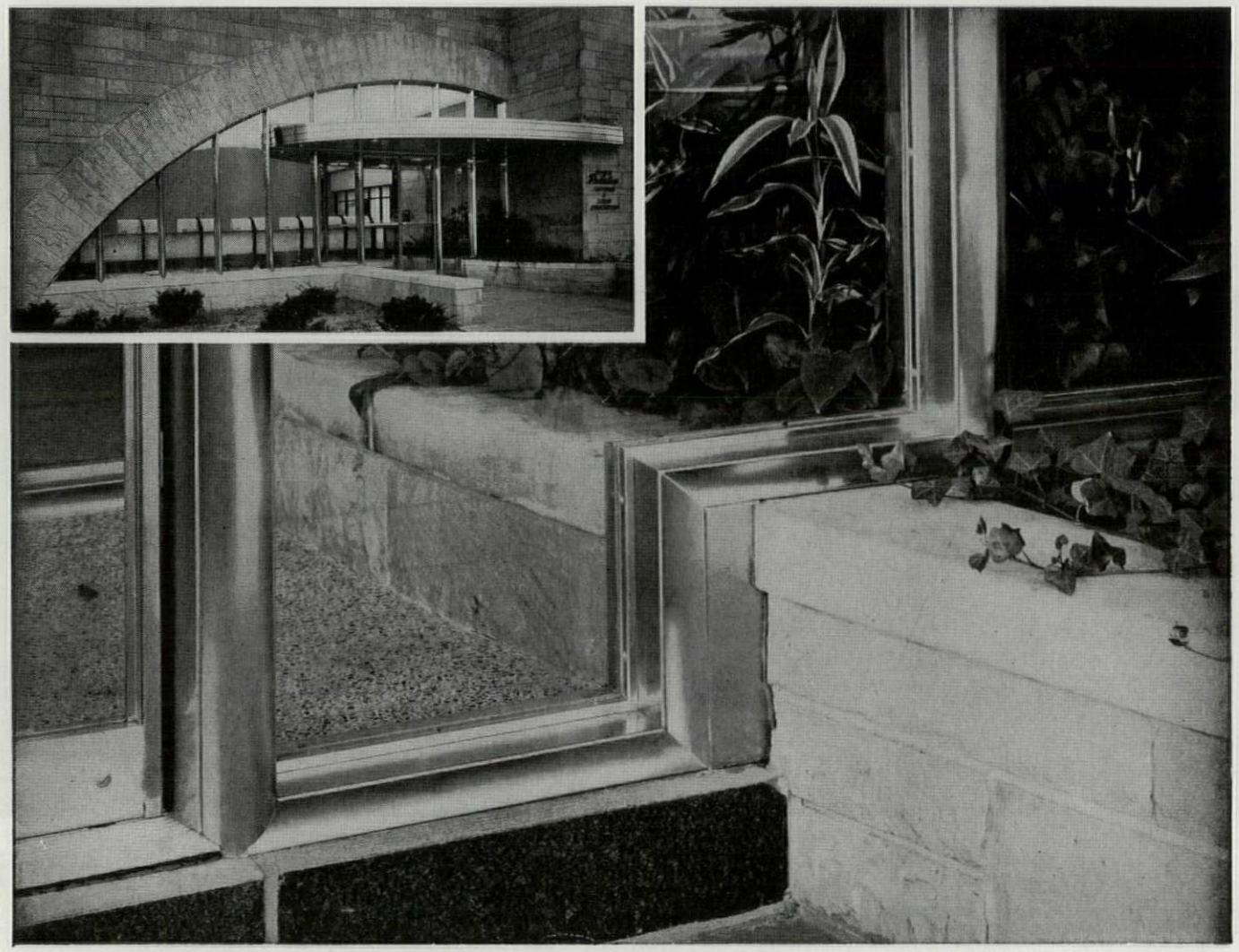

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Very truly yours,

A. M. Ferst

A. M. Ferst
Supt. of Planning
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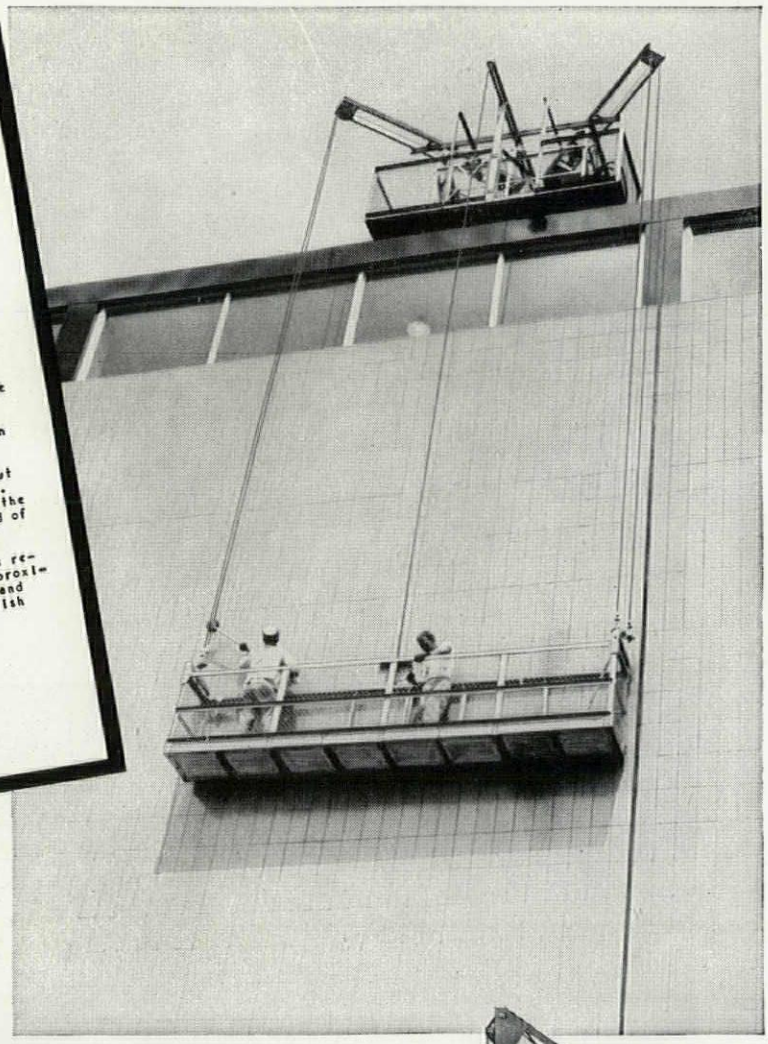

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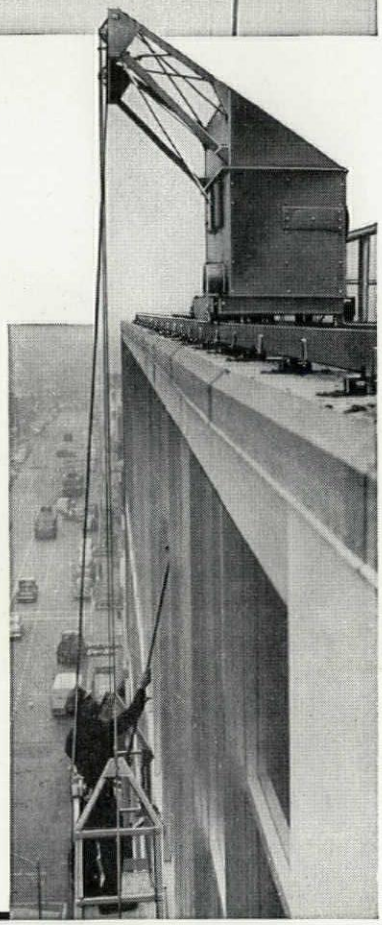
The architect can now exercise complete freedom in the design of building exteriors, unrestricted by the necessity of specifying movable glass for window washing.

The Wind-O-Washer is electrically operated from the working platform by push button controls for both up and down and horizontal movements. The machine travels on a track, and when not in use, is backed out of sight by means of a turntable or transfer car.

Economy representatives, located in all principal cities, can give personal engineering service on your problems and make recommendations with estimates. Each installation is individually engineered.



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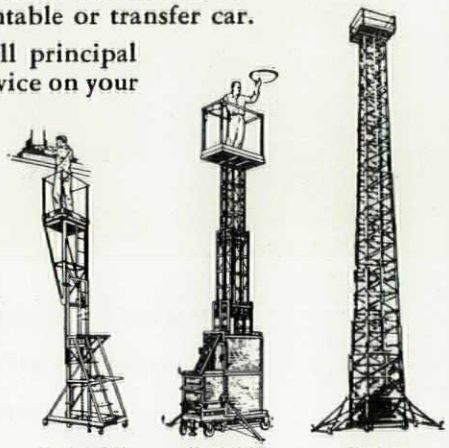
For interior maintenance. *Economy Hi-Reach Telescopers are the answer to the problem of servicing overhead lighting and hard-to-reach interior maintenance work. For many years these Hi-Reach Telescopers have been widely used throughout industry and by institutions.*



Model PUL 10'9" to 15' | Model LB 20' to 35' | Custom up to 100'

ECONOMY ENGINEERING CO.
4538 W. Lake St., Chicago 24, Ill.
New York Office: 342 Madison Ave., New York 17, New York

CURTAIN WALLS OF

SEAPORCLAD

INSULATED-LAMINATED PORCELAIN PANELS

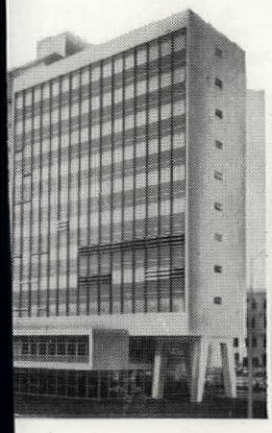
OWN HOSPITAL, Pottstown, Pa. ARCHITECTS: Vincent G. Kling, Frederick G Roth

Dramatic effects of beauty, design, color and texture are achieved with SEAPORCLAD porcelain enamel Curtain Wall Panels.

ying SEAPORCLAD results in fast, easy and efficient construction methods; assures economy of maintenance and lasting beauty. Curtain Walls of this type can vary from ½" to 3" in thickness thus replace brick or masonry walls from 8" to 14" in depth. This adds thousands of usable square feet to building interiors.

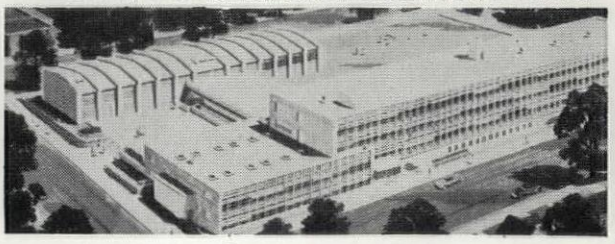
SEAPORCLAD Curtain Walls are light in weight, extremely tough, weather and fire resistant. actors can be developed to meet almost any required conditions. These are but a few reasons e growing acceptance of SEAPORCLAD for new buildings and modernization projects everywhere.

FIRST SECURITY BANK BUILDING, Salt Lake City, Utah
Associate Architects: Bank Building and Equipment Corp., of America, St. Louis, Mo. W. Sarmiento, St. Louis, Mo. Harry S. Mayer, San Francisco, Calif. Slack W. Winburn, Salt Lake City, Utah



LEGISLATIVE PALACE, City of Panama, Republic of Panama
Architect: Ernesto de LaGuardia III, Panama

JUNIOR HIGH SCHOOL 189, Queens, New York City Architect: Michael L. Radoslovich, Chief Architect, Board of Education, City of New York



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Porcelain Enamel Institute. A. F. of L. Metal Fabricating and Enameling Plant.

a: Seaporcel is Manufactured by General Steel Wares, Ltd., London & Toronto, Ontario.
countries: inquire for name and address.
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Seaporcel

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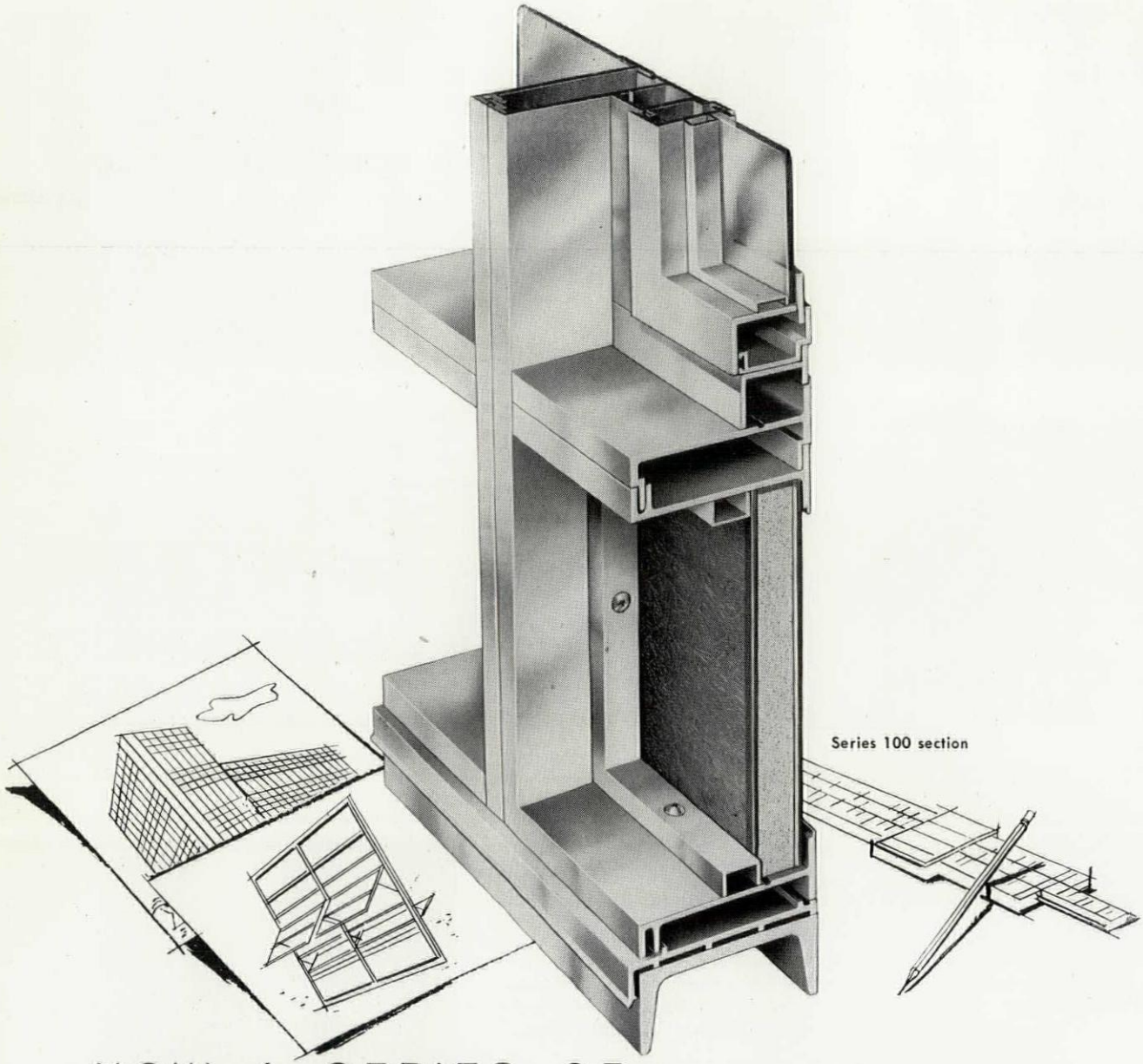

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ENGINEERED FOR YOUR NEEDS

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- Series 100 and 150 4″ for one and two floor heights.
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- Series 300 4½″ Customwall for monumental multi-story construction.

Interlocking mullions on the 100, 150 and 300 series (caulking and weatherstrip rabbet on the 200 Series), eliminating leakage points, expansion and contraction taken up by unit, inside or outside bead glazing, wide variation of panel material and venting arrangement are only a few of the many features. Why not send us the requirements for your next job, *today?* Write Dept. PA-6.

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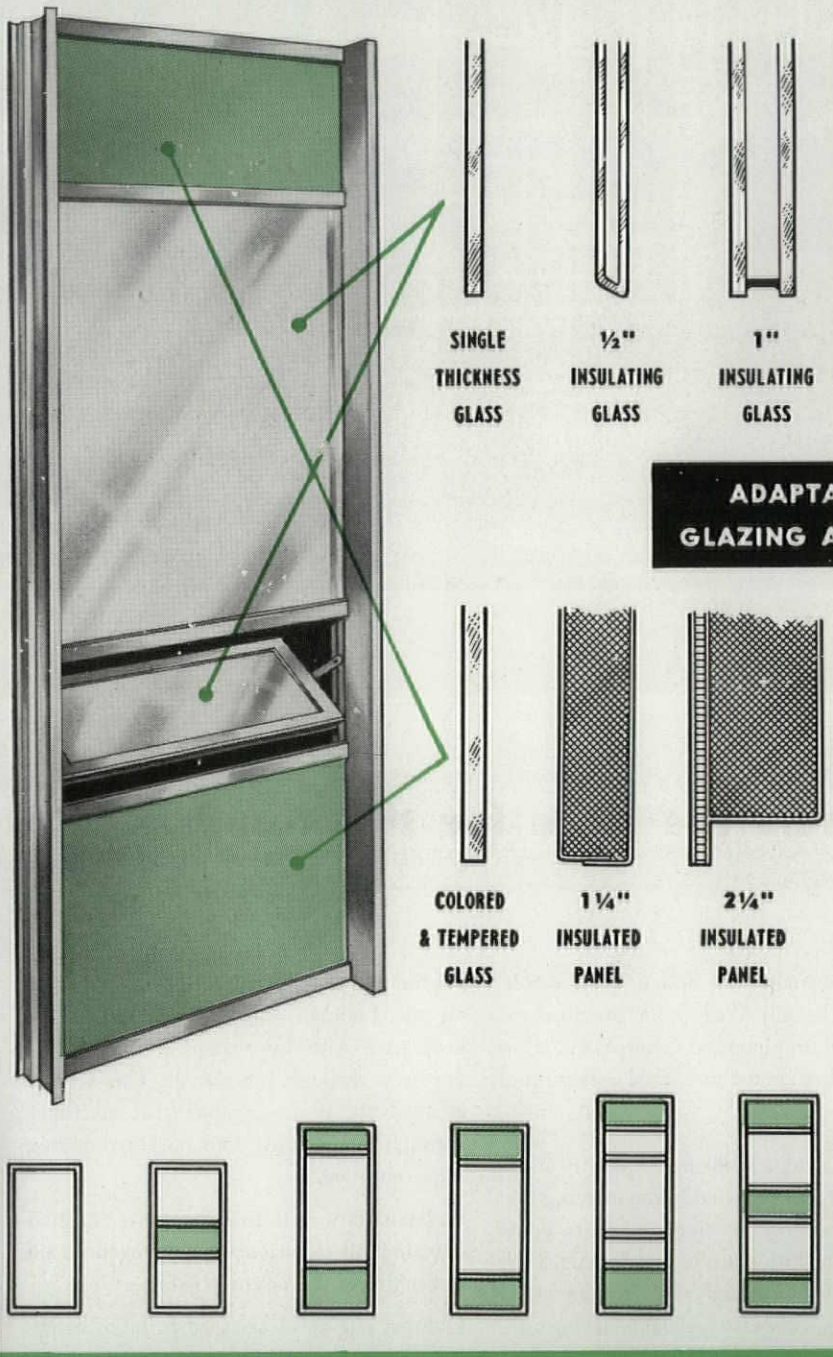
STOCK SIZE MODULAR ALUMINUM UNITS



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- Complete units are factory fabricated, delivered ready for glazing.
- Installed and glazed entirely from the *inside*.
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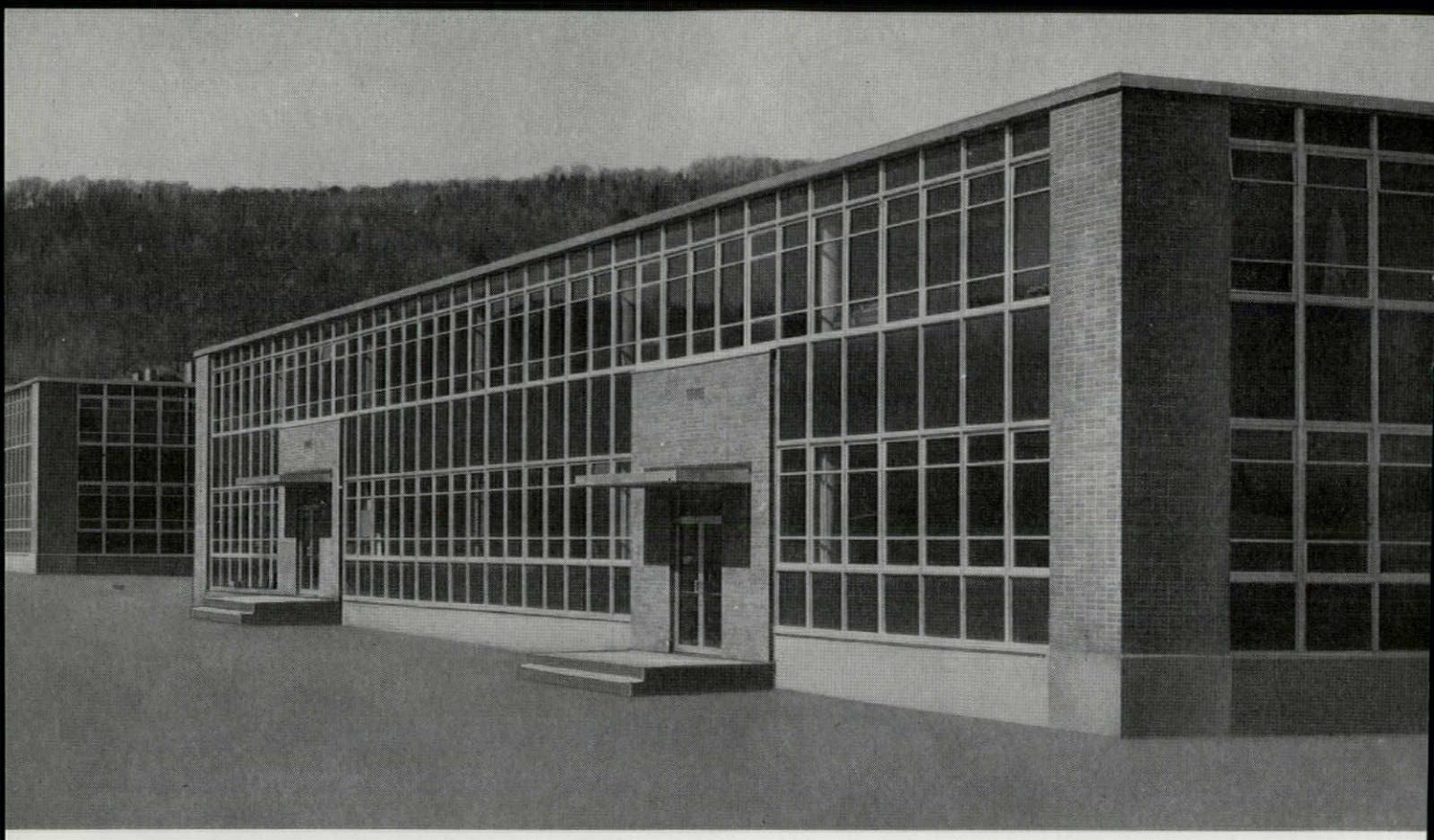


BROOME COUNTY TECHNICAL INSTITUTE
Binghamton, New York
Curtain Wall with Projected Windows

Architect: A. T. Lacey & Sons, Binghamton, N.Y.
Contractor: Nikula Construction Co., Inc., Binghamton, N.Y.

the architect's vision sets the pace for the future . . .

by Lawrence Field

The plans an architect draws today may well determine the architecture of the future.

When an architect does project the future in his plans, he must find the materials with which to implement that vision.

For example, within very recent years, curtain walls have introduced new dimensions of freedom in design and given the architect a new fluidity of line, and a cleanness of structural concept and mobility.

Eminently practical, ingeniously adaptable, curtain walls have enlarged the architect's horizon and, at the same time, achieved a valuable saving in construction time and costs.

The Ludman Corporation was one of the first to pioneer in the engineering development and successful installation of curtain wall in hundreds of buildings of every kind. Its engineers are constantly formulating new methods of treatment, new ways of handling curtain wall design. As a result, Ludman Curtain Walls offer practical expression of architectural concepts . . . allow the architect almost unlimited extension of his ideas.

Ludman Curtain Walls match architectural vision with superb window engineering that reduces construction time and costs, yet is always beautiful, efficient and flexible. They combine window and wall in one easily handled, quickly fastened, labor saving unit. Maintenance is virtually nil.

Ludman Curtain Walls are easily adaptable to any wall treatment desired, offering a wide range of materials, color and texture for interior and exterior walls.

Patented Auto-Lok aluminum awning windows, intermediate projected windows, or other Ludman windows, co-ordinate with curtain wall treatment to increase the grace and effectiveness of the proposed structure.

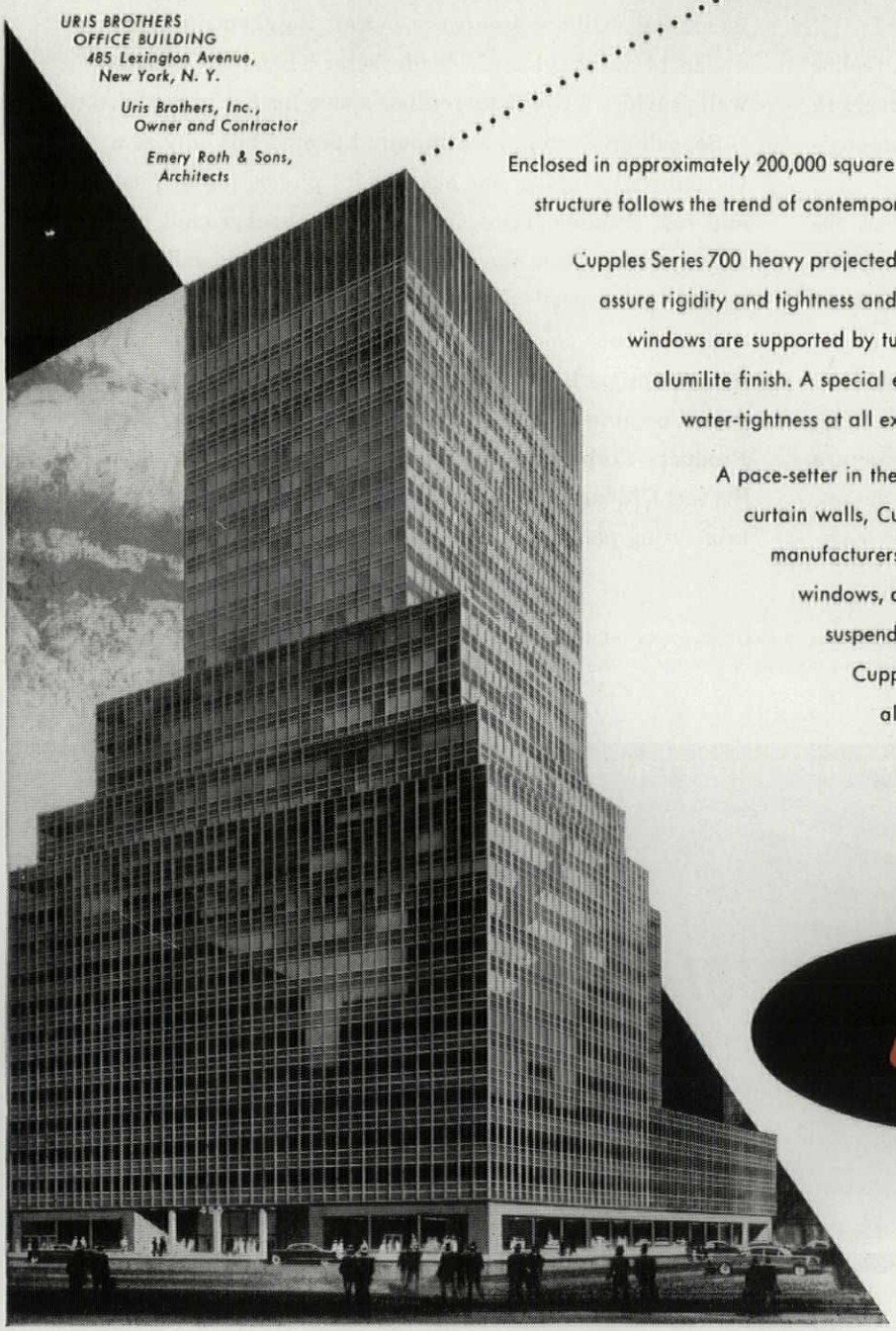
Furthermore, an architect can always rely on the Ludman Engineering Division to keep pace with his vision, from proposal drawings through completion. This service is available to the architect at all times through his nearest Ludman Engineering representative.

Ludman know-how, based on years of actual curtain wall experience, has proved of aid to architects the country over.

Ludman engineers are glad to be of assistance at any stage of planning or construction, or to help solve structural problems connected with curtain walls or window treatment. Ludman is on the job throughout the actual installation.

In Ludman Curtain Walls lie the means by which the architect may well set the pace for the future. Write to us for full, detailed information on our curtain wall system. The Ludman Corporation • Founded 1936 • Miami, Florida.

ANOTHER CUPPLES ALUMINUM CURTAIN WALL FOR MANHATTAN



URIS BROTHERS
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485 Lexington Avenue,
New York, N. Y.

Uris Brothers, Inc.,
Owner and Contractor

Emery Roth & Sons,
Architects

Enclosed in approximately 200,000 square feet of Cupples Curtain Wall, this 30-story structure follows the trend of contemporary office building design in the New York area.

Cupples Series 700 heavy projected windows, integrally bead glazed and welded, assure rigidity and tightness and provide easy inside cleaning. Spandrels and windows are supported by tubular extruded mullions with contrasting alumilite finish. A special extruded aluminum flashing insures water-tightness at all expansion joints.

A pace-setter in the engineering and fabrication of aluminum curtain walls, Cupples also is one of the nation's largest manufacturers of commercial and residential aluminum windows, doors, Alumi-Coustic grid systems for suspended ceilings and special ornamental products. Cupples' high standards of design and manufacture always meet or exceed the most rigid requirements without premium costs. Our catalogs are filed in Sweet's.

Cupples

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For Another Example of Cupples Curtain Wall Construction See Page 107

FOUR FREEDOMS

Ceco Curtainwall Construction Gives You Freedom of Originality ... Flexibility ... Versatility ... Utility

Every architect wants to design a structure that bears the unmistakable stamp of his creative ability.

There's an unbeatable team that can help you realize that ambition: *Curtainwall* . . . the modern miracle in building—and *Ceco*, for 45 years a leader in the engineered building-products-and-service industry.

Curtainwall by Ceco offers architects the greatest opportunity for unlimited use of color and pattern. The reason is simple. Ceco offers you *either* aluminum or steel sections. Couple that with your choice of panels in stone, marble, glass or coated metals . . . and you find you have the widest possible range to stimulate your creative urge.

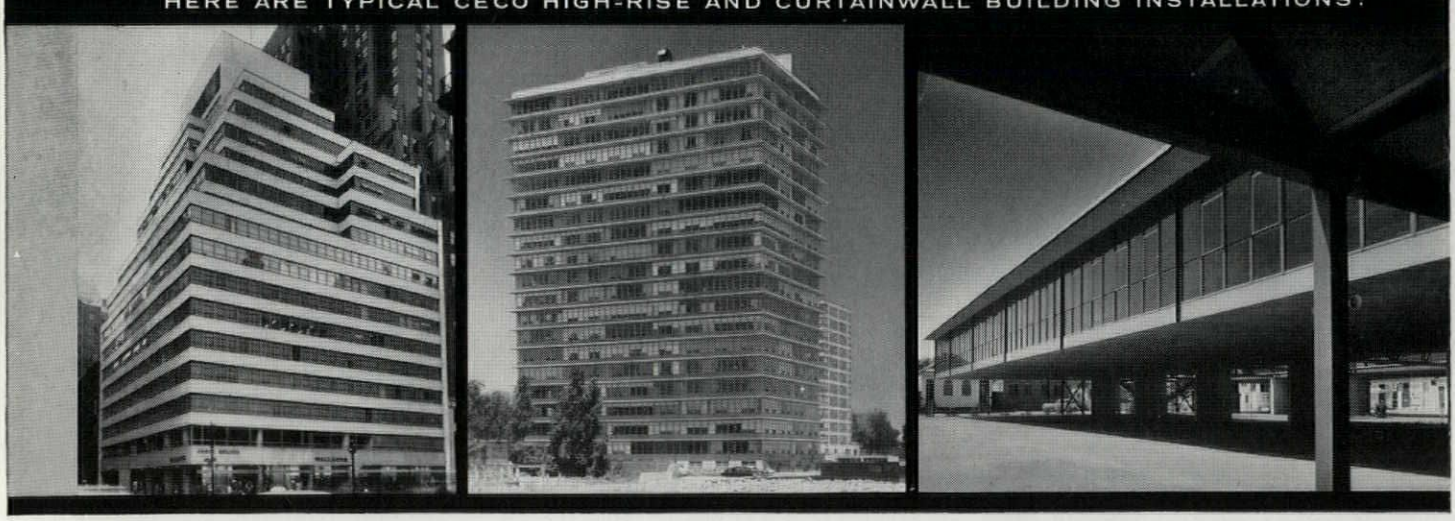
With Curtainwall the exterior surface of the structure is precision built in the factory... tailored to your design. And Ceco Curtainwall is tailored to your budget, engineered to save materials and construction time. All this means early building occupancy, permitting client-invested dollars to start paying dividends faster. Then too, Curtainwall provides 4 to 6% more floor space for use or rental.

So, call on Ceco . . . a company honored not only as a Curtainwall supplier but also for its pioneering in floor and roof framing. Here Ceco's unique background will assist you to obtain the best structural Curtainwall. For among Curtainwall suppliers only Ceco has experience in floor and roof construction—to which all Curtainwalls must be properly anchored. So Ceco can best coordinate your Curtainwall with your structural plans. Ceco Steel Products Corporation—general offices: 5601 West 26th Street, Chicago 50, Illinois—offices, warehouses and fabricating plants in principal cities.

IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

Windows, Screens and Doors / Ceco-Meyer Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck / Metal Lath

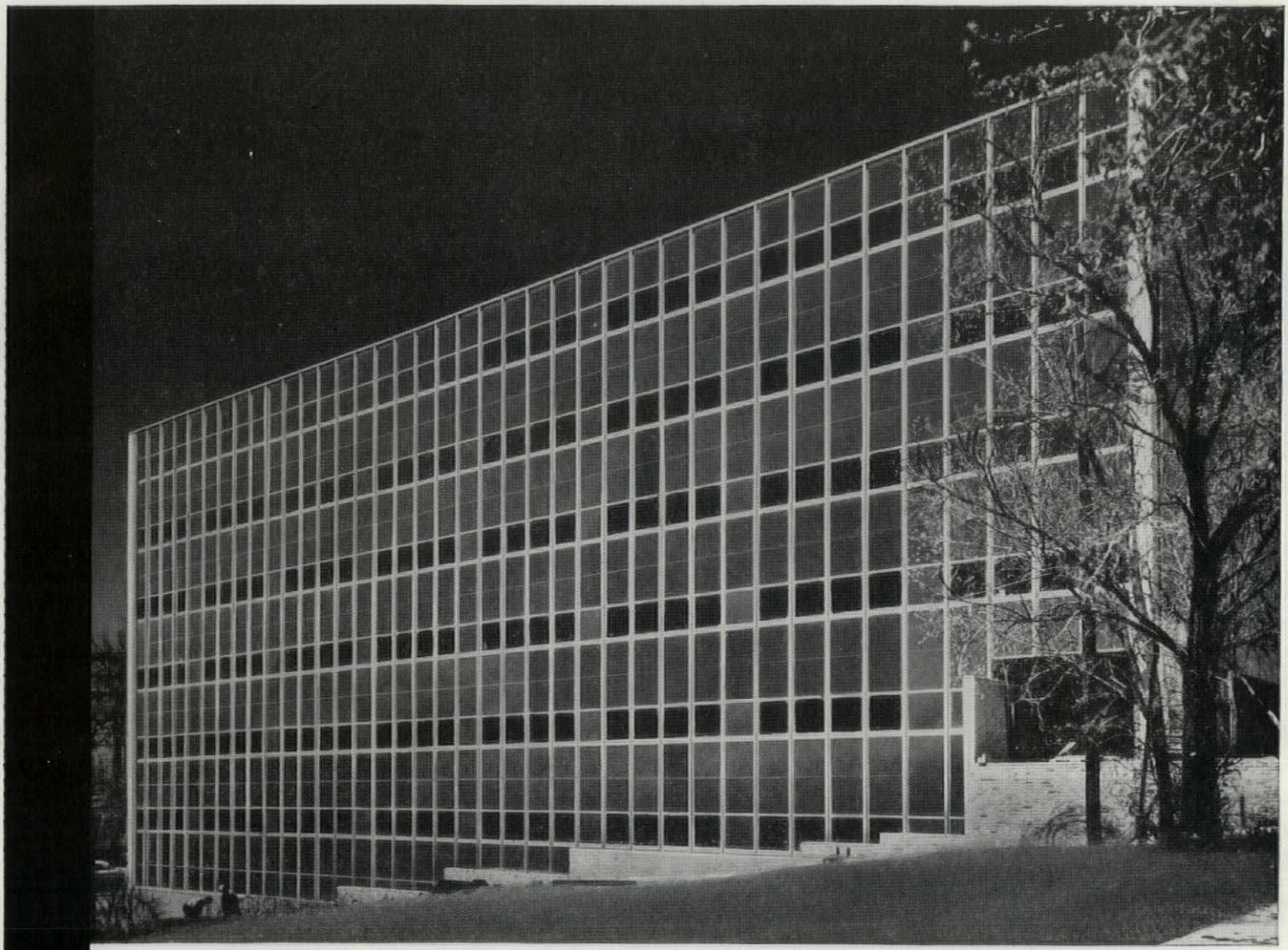
HERE ARE TYPICAL CECO HIGH-RISE AND CURTAINWALL BUILDING INSTALLATIONS:



Amoco Building, New York, New York
Emery Roth & Sons, Inc., Architects.

Harbor View Apartments, Chicago, Illinois
Irwin G. Fredrick, Architect.

Phillis Wheatley Elementary School, New Orleans, Louisiana
Charles R. Colbert, Architect.



A monument to the beauty and functional design achieved with Ceco Curtainwall is the Meramec Building, Clayton, Missouri. Architects Benjamin Shapiro and Robert Tisdale and Contractor Manuel Lasky obtained this effect with Ceco Aluminum Projected Windows and porcelain panels.

CECO STEEL ®

Palms Shopping Center, Houston, Texas
Irving L. Klein, Architect.

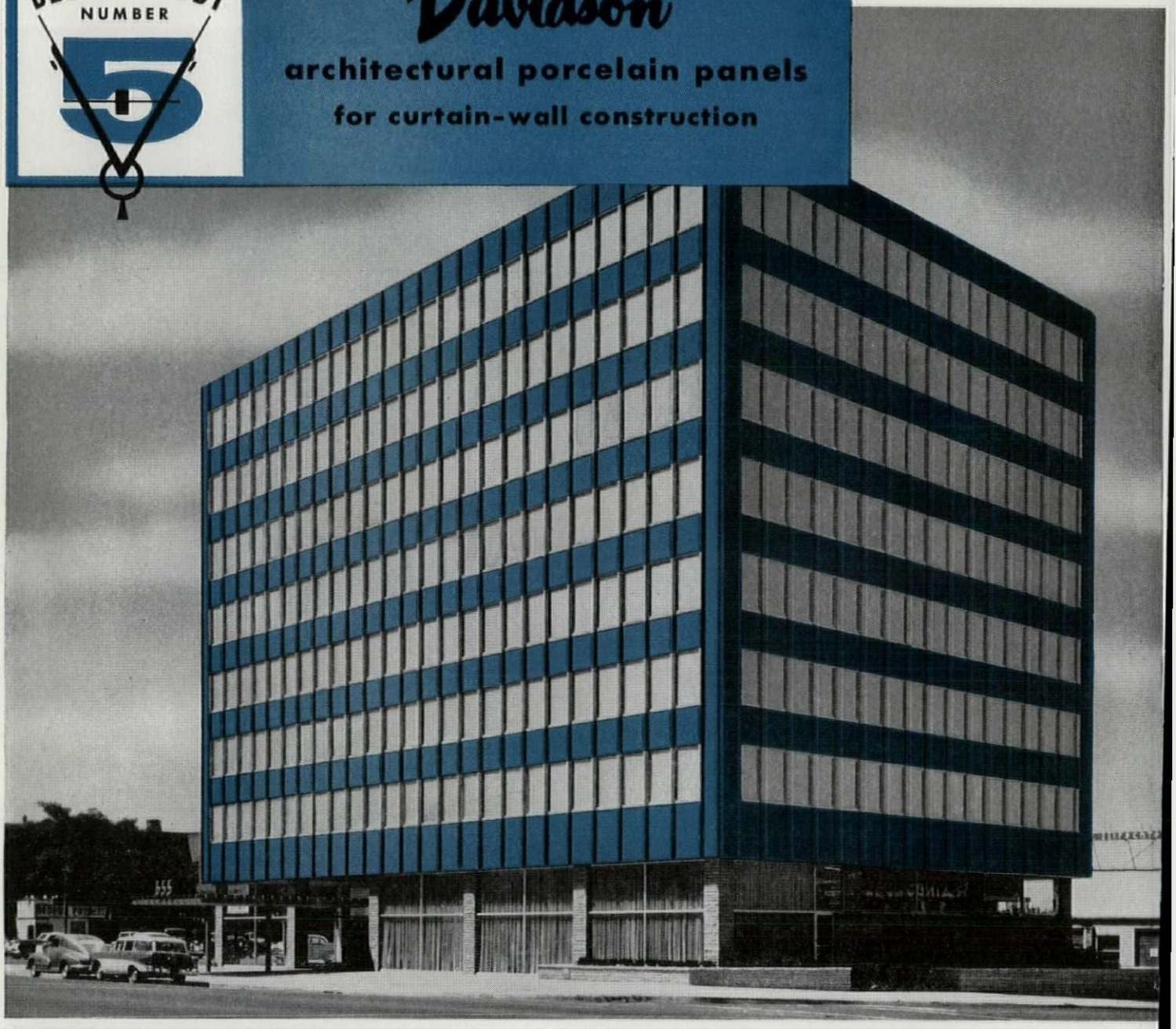
What to look for and look out for in Curtainwall construction: It is especially important to make proper allowance for expansion and contraction of metals. Windows and caulking must move together with expansion and contraction to ensure a tight seal. Part of the solution is in engineering know-how and part in the right choice of caulking materials. There must be proper structural design of window-wall mullions to meet varying wind load conditions. There must be adequate anchorage of the wall to the skeleton of the structure. Panel installations must be weather-tight.

A.I.A. FILE NO. 15-M-1

DESIGN STUDY NUMBER 5

Davidson

architectural porcelain panels for curtain-wall construction



655 BROADWAY BUILDING — DENVER, COLORADO

Architect: T. J. Moore, Jr., Denver, Colorado
Contractor: J. W. Stalder, Denver, Colorado
DAVIDSON PORCELAIN PANELS DISTRIBUTED BY
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DAVIDSON ARCHITECTURAL PORCELAIN

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Whatever your next building project — whether it b curtain-wall or some other method of constructio — you will find that the application of Davidso Architectural Porcelain Panels will be well wort considering.

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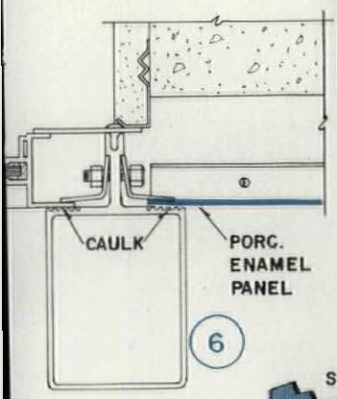
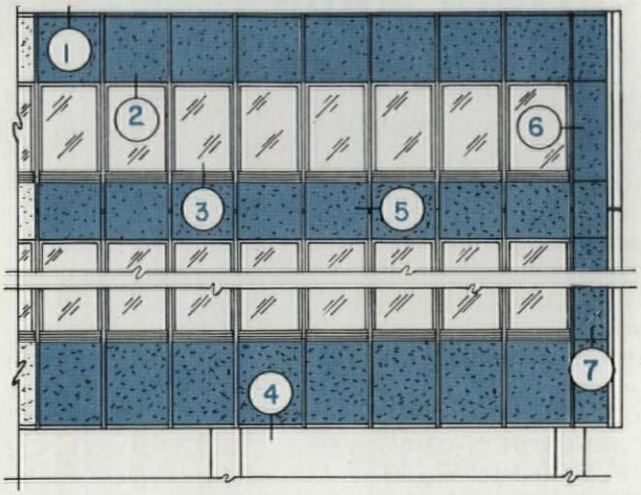
Davidson

architectural porcelain panels

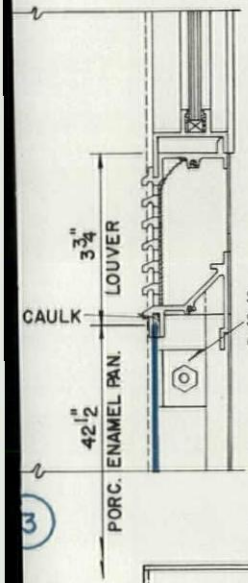
for curtain-wall construction

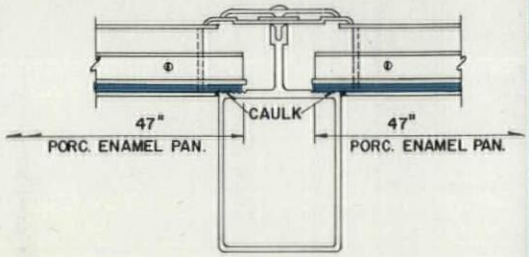
DESIGN STUDY NUMBER 5

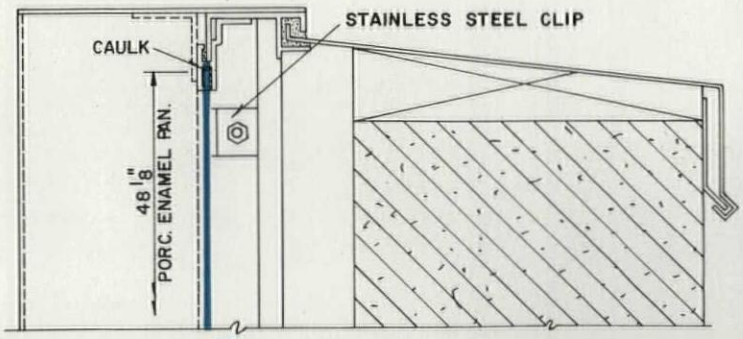


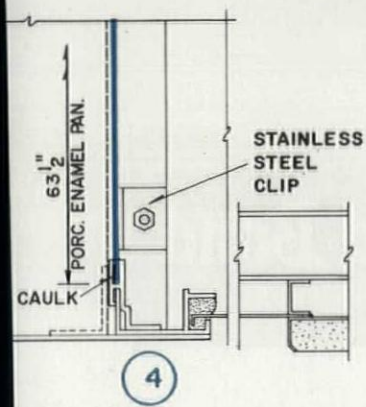


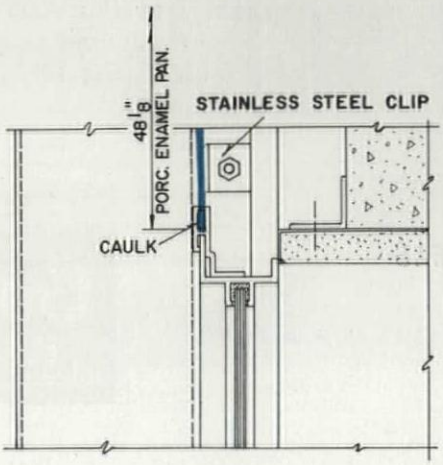
ELEVATION











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DESIGN STUDY 5

DAVIDSON ARCHITECTURAL PORCELAIN

655 Broadway Building — Denver, Colorado

For further information on the application of Davidson Architectural Porcelain, check and send to: DAVIDSON ENAMEL PRODUCTS, INC., 1124 E. Kibby St., Lima, Ohio

- ☐ Full scale drawings showing the application of Architectural Porcelain for 655 Broadway Building, Denver, Colorado.
- ☐ Detailed, 20-page Sweet's Architectural Catalog, 1957 Edition.
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CITY & STATE

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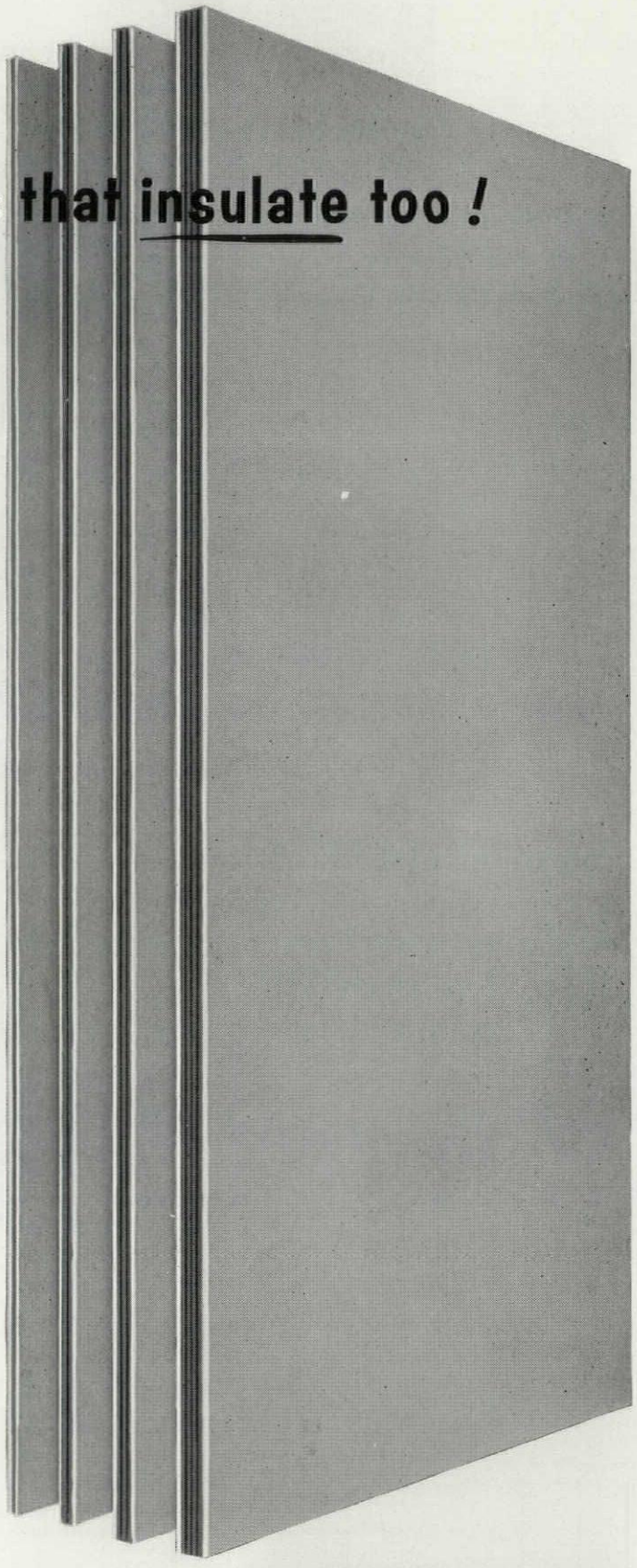
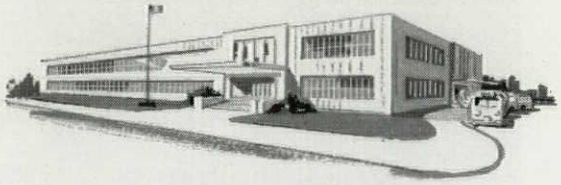
versatile curtain walls that insulate too!

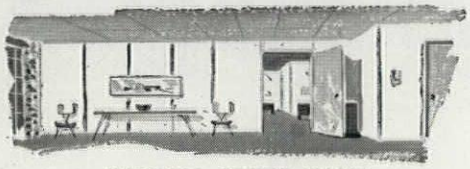


Gold Bond ASBESTONE PANELS bring to the building industry one of the simplest, most economical curtain wall methods ever introduced. In addition to easy handling, ASBESTONE PANELS provide the durability and permanency of ageless stone.

ASBESTONE PANELS are made of 2 Asbestos-Cement sheets, laminated to both sides of an asphalt-impregnated, chemically-treated insulation core. This process provides the added advantages of resistance to weather, moisture and fire, plus built-in insulation. Four feet wide, ASBESTONE PANELS are available in 6′, 7′, 8′, 9′, 10′ and 12′ lengths in four thicknesses. There's a size for every building recommendation.



EXTERIOR CURTAIN WALLS



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Whether you're planning panelized curtain walls for factories, schools, hospitals; for inside or outside use; Gold Bond ASBESTONE PANELS offer you maximum flexibility, strength and economy.

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BUILDING PRODUCTS

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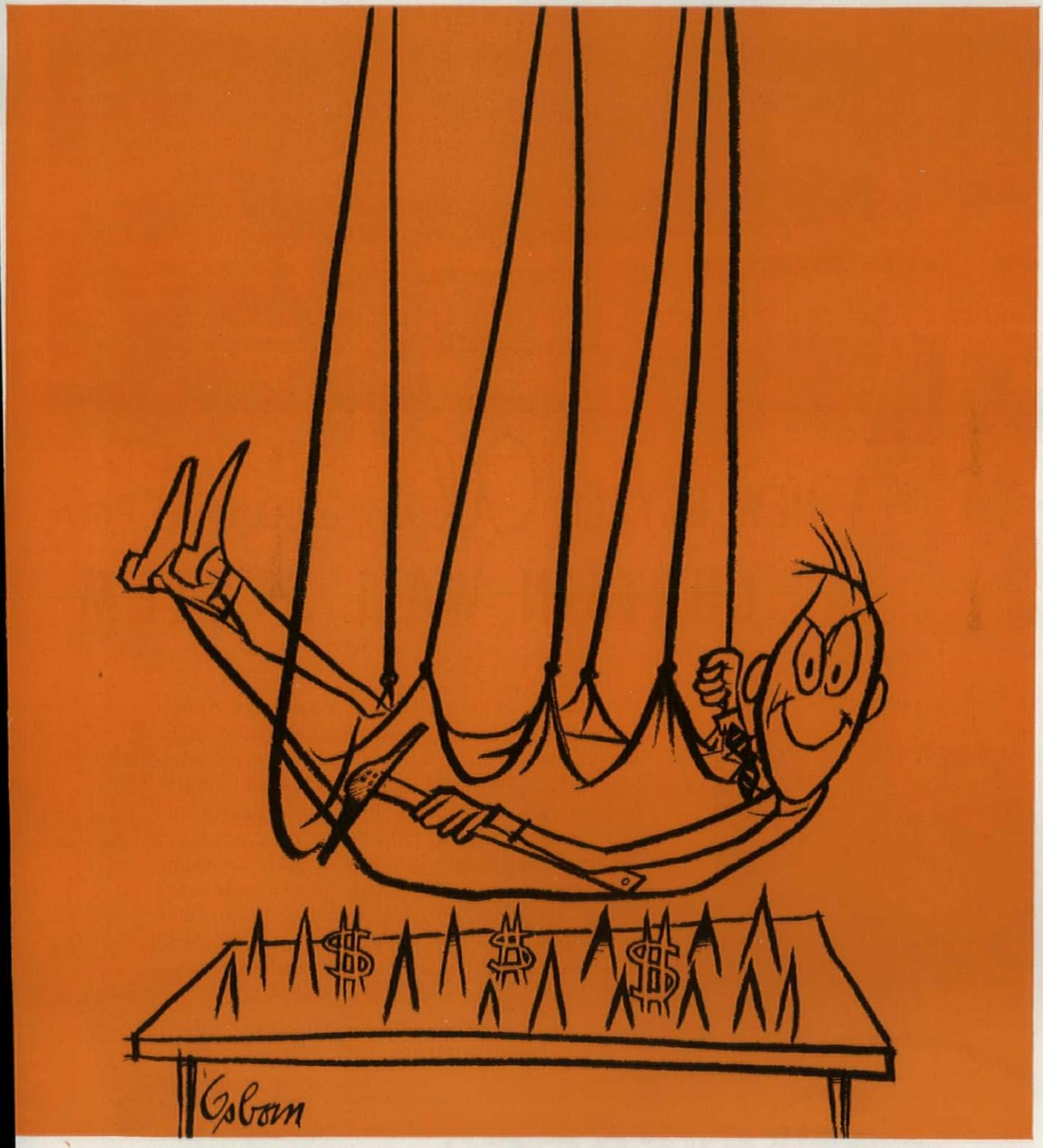

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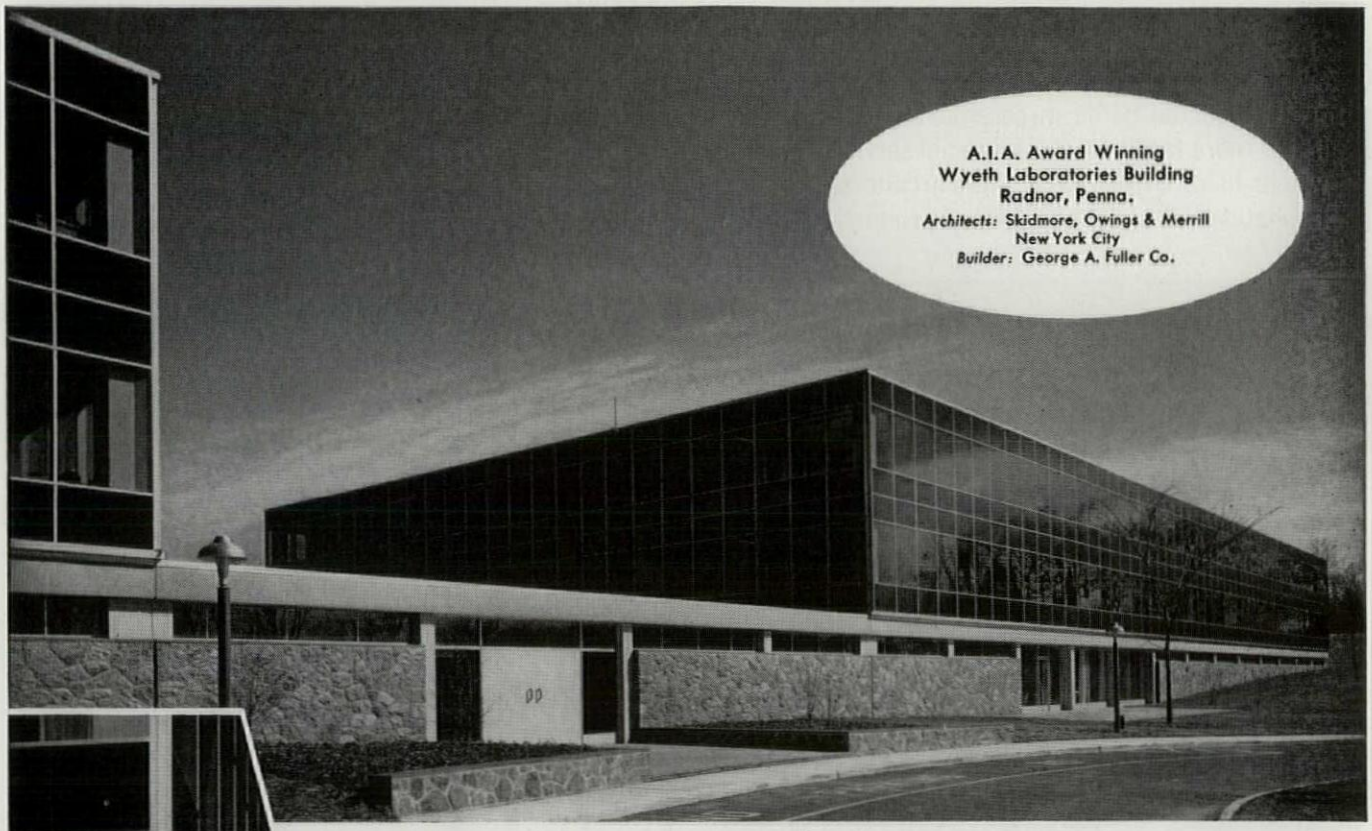
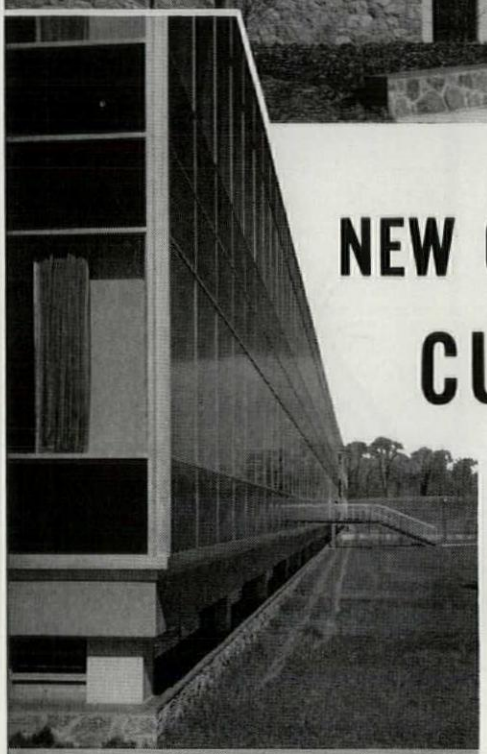
hilippine Islands/Vitreous Enameling Corporation (PTY.) Ltd., Capetown, South Africa/Emailleries & Toleries Reunies S. A., Auxi-le-Chateau, France.



A.I.A. Award Winning
Wyeth Laboratories Building
Radnor, Penna.
Architects: Skidmore, Owings & Merrill
New York City
Builder: George A. Fuller Co.

NEW GEYSER *Aluminum Bar* CURTAIN WALL SYSTEM



SMOOTH **is the exterior without bulky, projecting mullions. The interior finishes flush, too.**

Even before its announcement, the Geyser Aluminum Bar Curtain Wall System has been *proved* in the construction of the new Wyeth Laboratories building, Radnor, Pa., and others. This is a mullion-free framing system that trims flush both interior and exterior, accepts glass, panels or ventilators, interchangeably anywhere in the grid, gives the clean, continuous sight lines so vital to good contemporary design. No joints, no exposed fasteners, no bulky projections. Price-wise, too, the Geyser Curtain Wall System reduces building costs substantially.

Write for the new Geyser Curtain Wall specifications and details today.

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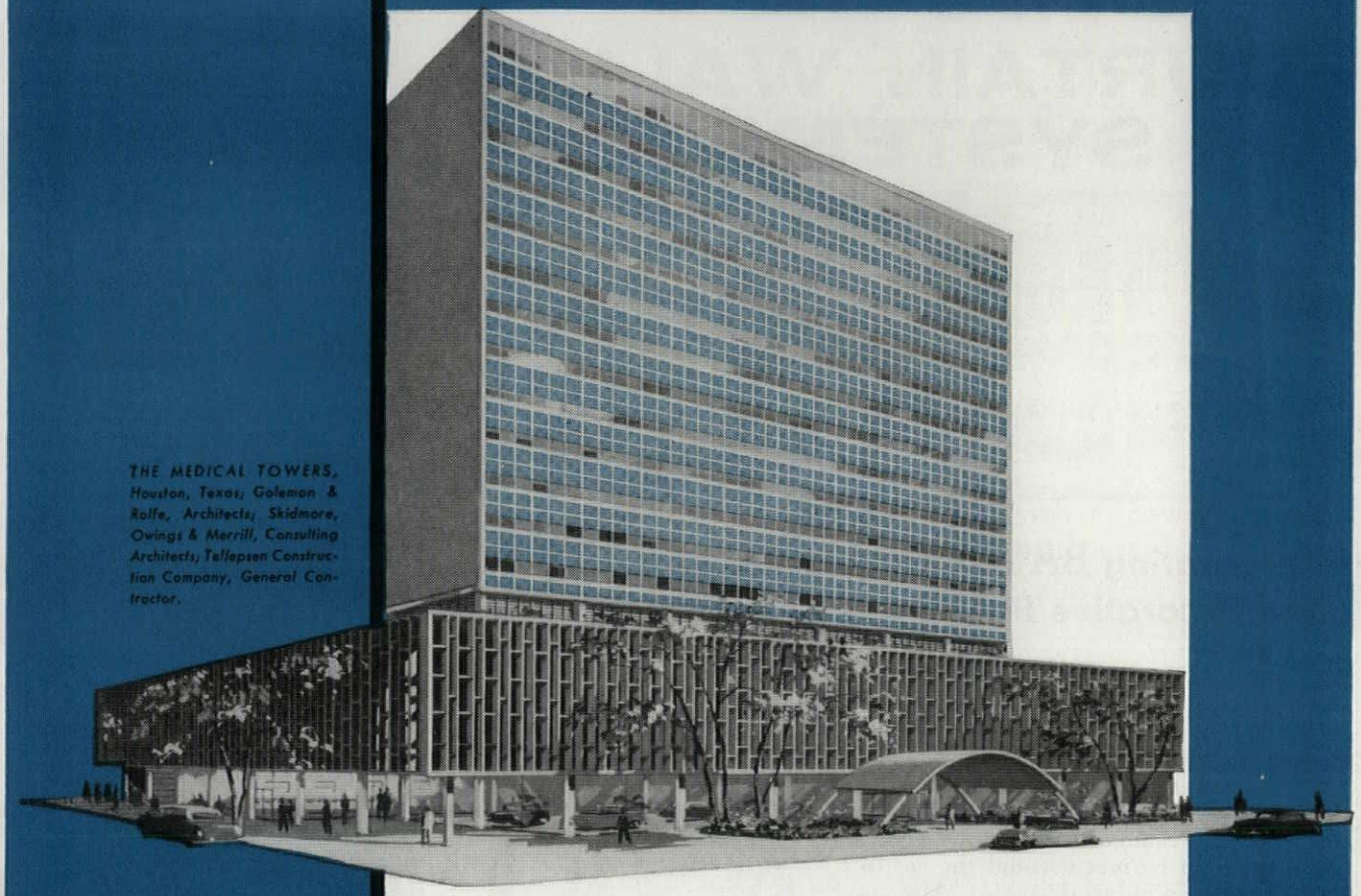
CUPPLES ALUMINUM CURTAIN WALLS

SPECIFIED FOR AWARD-WINNING BUILDING



THE MEDICAL TOWERS, Houston, Texas; Golemon & Rolfe, Architects; Skidmore, Owings & Merrill, Consulting Architects; Tellepsen Construction Company, General Contractor.

A winner in "Progressive Architecture Design Program—1954," this pale blue panelled building combines inspired design with sound, economical construction.

High on the list of outstanding features are its Cupples aluminum curtain walls, composed of a series of horizontal and vertical tubular mullions and double weather-stripped projected windows which clean from the inside. Open aluminum grill work on lower level, also by Cupples. Entire grill and curtain wall in alumilite finish.

A pace-setter in the curtain wall field, Cupples also is one of the nation's largest manufacturers of commercial and residential aluminum windows, doors, and Alumi-Coustic grid systems for suspended ceilings. Cupples' products always meet or exceed the most rigid requirements without premium costs. Our catalogs are filed in Sweet's.

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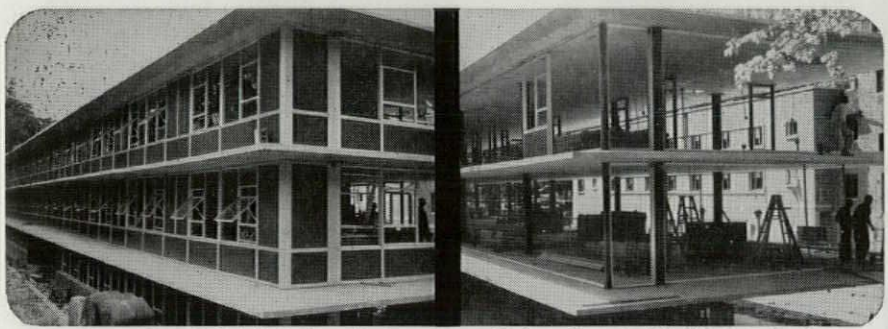
For Another Example of Cupples Curtain Wall Construction See Page 99

How to simplify and cut costs of Your wall construction with

BAYLEY

CURTAIN WALL SYSTEMS



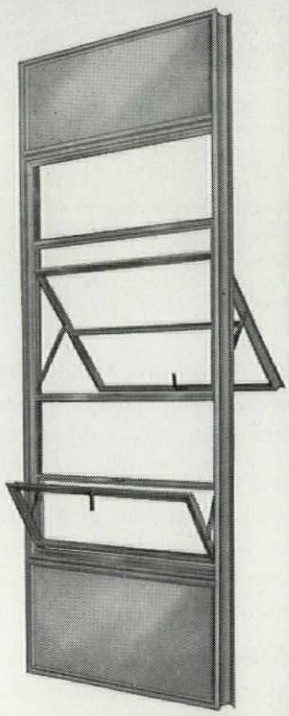
After Curtain-Wall is installed. Before Curtain-Wall is installed.

—incorporating BAYLEY Projected Windows and Decorative Panels

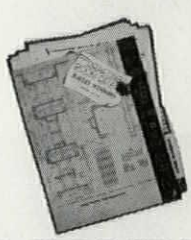
Bayley Curtain Wall Systems—in either aluminum or steel—offer you the maximum economies to be realized from modern curtain-wall construction. Incorporating standard time-proved Bayley Projected Window Units, and a Bayley system of sub-frame assembly, a designer's preference can be met without the costliness of special window designing. Also, as illustrated, installation is reduced to the simplest procedure. Other advantages accruing are:

- ✓ **Permits a choice of decorative panels and individualized arrangements**
- ✓ **Provides an insulated wall treatment to suit the building's appropriation**
- ✓ **Designed to accommodate a building's movement — expansion and contraction**
- ✓ **Provision against condensation annoyance or damage**
- ✓ **A wall with any desired degree of air, light or vision**
- ✓ **Centralized responsibility for the complete wall system — including sub-frames, windows and panels**

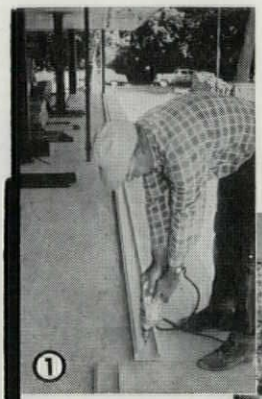
For further information write; or call your local Bayley Representative; or see Sweets.



The Bayley Series A-450 Aluminum Curtain-Wall Unit.

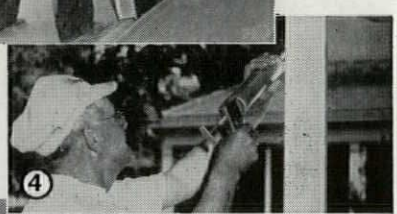


Write Today for this Curtain-Wall Idea File.

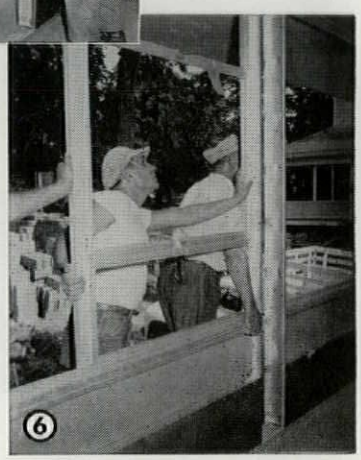


1. Bolting sill and header plate into position.
2. Bolting jamb plate to load-bearing column.

3. Interlocking window-panel into position.



4. Caulking interlock grooves before positioning mullion.
5. Positioning Bayley adjustable-width mullion.
6. Positioning window-panel — using interlock groove as slide.

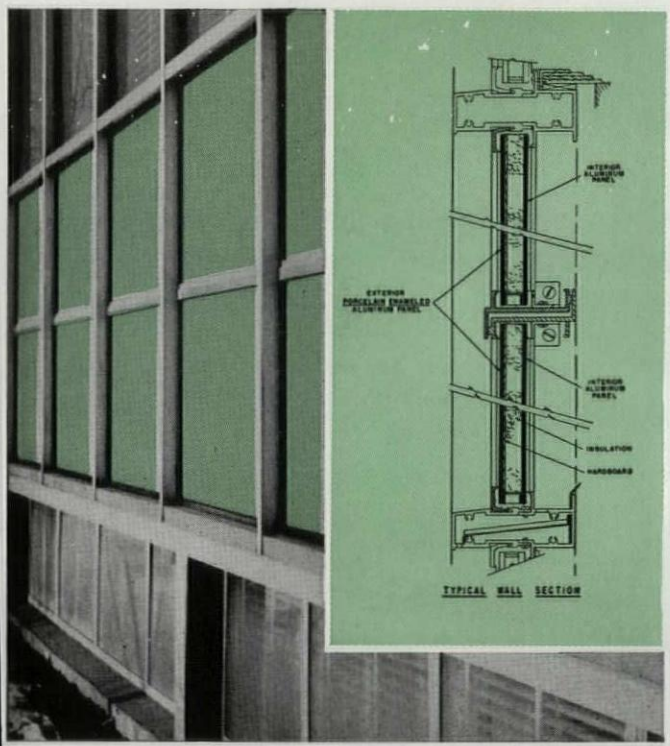


THE WILLIAM BAYLEY COMPANY

Springfield, Ohio

District Sales Offices: Springfield Chicago 2 New York 17 Washington 16

Imperial Oil Engineering Building uses 5,880 square feet of colorful, durable Porcelain-Enameled Aluminum



ARCHITECT: John B. Parkin Associates
Toronto, Ontario, Canada
ENAMELER: Kawneer Company
Niles, Michigan

Shown here is Imperial Oil's smart new Engineering Building at Sarnia, Ontario. In addition to the extensive use of glass, 588 aluminum-faced 5′ x 2′ spandrel panels were used. This allowed plastic foam insulation and exterior wall, finished in Du Pont porcelain enamel, to be installed as a unit. On the interior, an air space was created by the use of 4″ precast lightweight concrete slab backup.

According to the architect, "The following considerations dictated the selection of porcelain-enameled aluminum spandrel panels: light weight, high insulation, lowest possible maintenance and deterioration, free choice of color and shiny, clean crisp finish. The panel used was the best answer."

Du Pont porcelain enamels for aluminum are available in an unlimited range of highly stable colors and surface textures. Because they can endure a good deal of punishment without spalling or exposure of metal, they readily lend themselves to a wide variety of architectural applications—both in prefabricated units and where some on-site work is required.

May we send you detailed literature describing these Du Pont porcelain enamels for aluminum? If you wish we can also put you in touch with an experienced enameler who can serve your needs. The coupon below will bring a prompt reply.

DU PONT PORCELAIN ENAMELS
for aluminum

DU PONT
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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept. PA-6, Wilmington 98, Delaware

☐ **Please send me Technical Bulletin CP 4-454 and illustrated folder on Porcelain Enamel for Aluminum.**
☐ **Have your technical representative call with further details.**

*Name*_____ *Position*_____
*Firm*_____
*City*_____ *State*_____

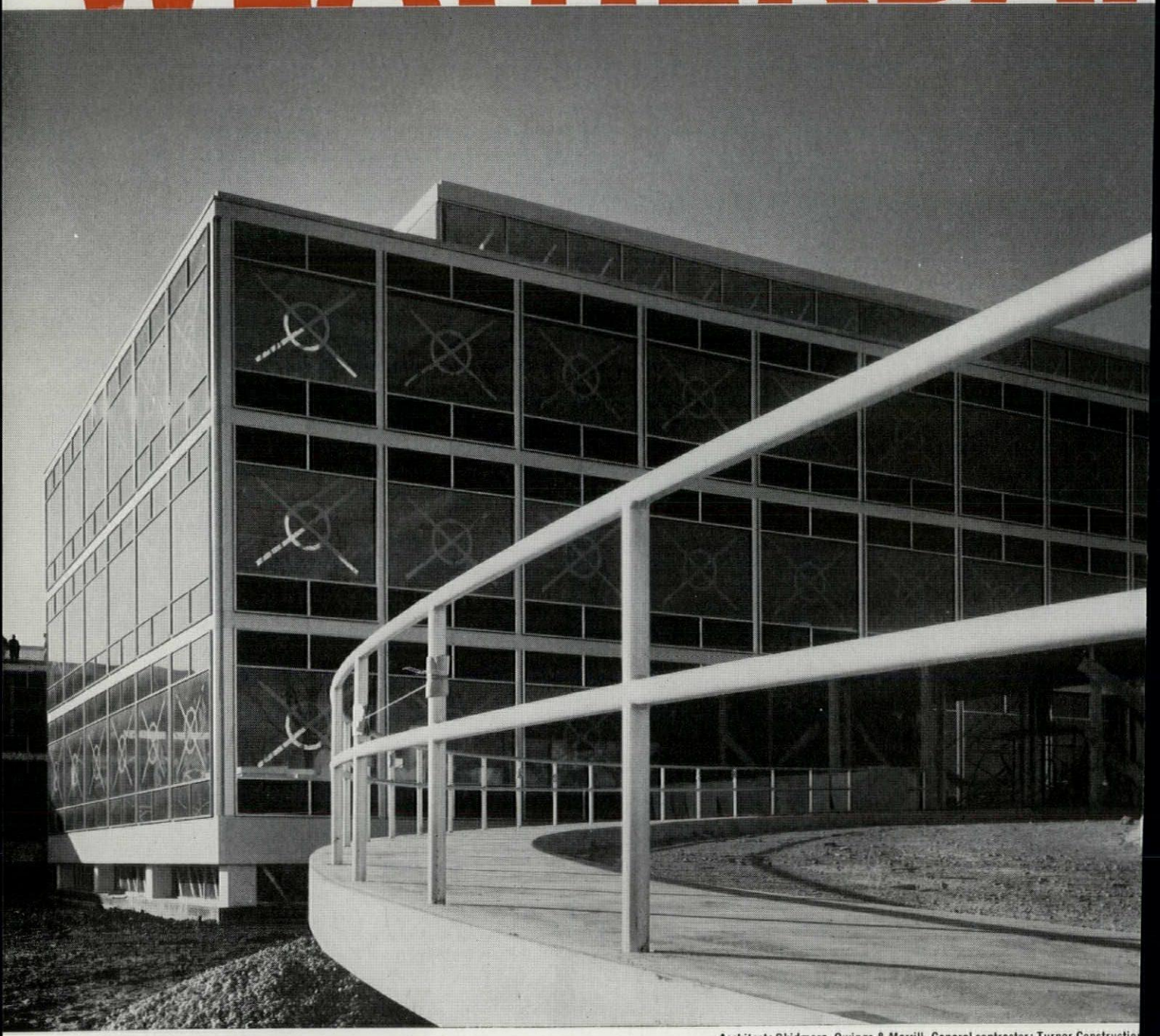
LOCKS WEATHER OUT OF 600,000-SQ.-F

CURTAIN WALL BUILDING

Announcing ***new***

WEATHERBAN

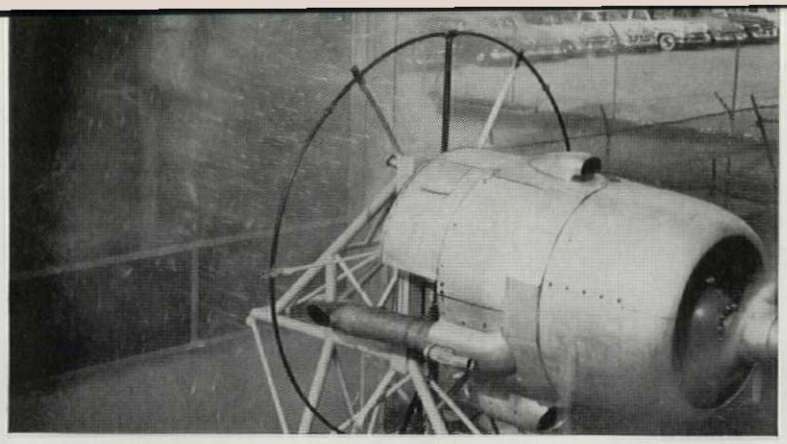
BRAND CURTAIN WALL SEAL



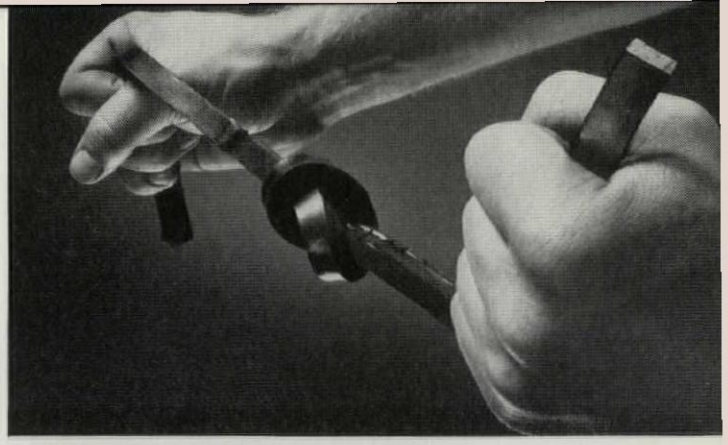
Architect: Skidmore, Owings & Merrill. General contractor: Turner Construction

CHOSEN FOR CONNECTICUT GENERAL LIFE BUILDING

WEATHERBAN Brand Curtain Wall Sealer seals curtain walls of the giant, new Connecticut General Life Insurance Company Building in suburban Hartford, Conn. More than 80% of the wall area is glass. 900 heat-absorbent glass panes (the biggest used) measure 8 by 11 feet. Weatherban Sealer seals glass to aluminum chann



RESISTS WEATHER This WEATHERBAN-sealed test wall withstands hurricane fury without leaking . . . simulated 12-inch-per-hour rainfall driven by 130-m.p.h. wind. Building uses prove that WEATHERBAN Sealer can endure sunlight, atmosphere, temperature extremes, too, for years.



FLEXES LIKE RUBBER WEATHERBAN Sealer is a two-part polysulphide rubber-based compound. It bends, stretches, compresses with wall movement, doesn't flow out of seam, keeps a solid seal. What's more, it cushions glass and metal, guards them from breaking and cracking under buffeting winds.

seals curtain walls
more securely four ways!

WEATHERBAN

BRAND CURTAIN WALL SEALER

Here's a dramatically new sealer that offers you four-way greater dependability in curtain wall sealing . . .

It's WEATHERBAN Brand Curtain Wall Sealer, made by 3M, based on synthetic rubber, specially designed for curtain walls.

Workmen apply WEATHERBAN Sealer by pressure or flow gun. Yet WEATHERBAN Sealer is practically 100% solids. It cures *chemically* into a durable, elastic, solid rubber seal. And it cures without shrinkage.

You get a seal that can resist deterioration, adhere, flex and endure through years of exposure . . . where conventional caulking compounds often fail.

As the result of 13 years of experience with aircraft sealers, 3M has produced in WEATHERBAN a sealer of exceptionally long service life. It endures vibration, sunlight, atmosphere, oils, solvents or gases, still seals tightly.

What's more, WEATHERBAN Sealer prevents wall materials from contacting one another, minimizes galvanic corrosion. Three pleasing colors (aluminum, black, tan) blend with buildings.

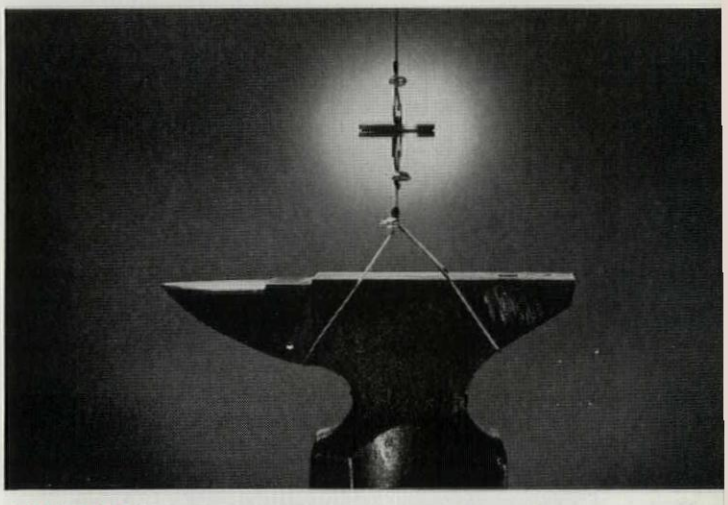
Let the 3M technical staff work out test application or actual application procedures with you.

SEND FOR FREE LITERATURE

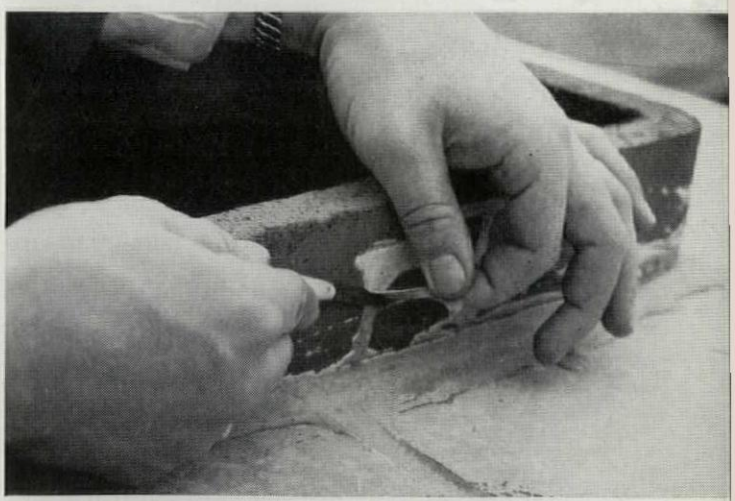
Learn the full facts about WEATHERBAN Sealer now! Send for free booklet: *Performance Facts About WEATHERBAN Brand Curtain Wall Sealer.* Fill out and mail the handy coupon below today. Or write on your business letterhead to:

MINNESOTA MINING AND MANUFACTURING COMPANY
ADHESIVES AND COATINGS DIVISION
Dept. 32, 417 Piquette Ave., Detroit 2, Mich. General Sales Offices: St. Paul 6, Minnesota
Export: 99 Park Ave., N. Y. 16, N. Y. Canada: P. O. Box 757, London, Ont.

PRODUCT OF 3M COMPANY RESEARCH



ADHERES WEATHERBAN Sealer bonds these metal discs, doesn't lose adhesion even when a 125-pound anvil is supported from them. Such positive, lasting adhesion means watertight, dependable sealing. Test WEATHERBAN Sealer yourself on stainless steel, aluminum, glass, stone or concrete.



SEALS FOR YEARS You enjoy minimum upkeep. Still elastic after seven years, WEATHERBAN Sealer sticks tight to glazed parapet caps on this San Francisco rooftop. This is why building owners are picking WEATHERBAN Sealer to repair leaks in curtain walls originally sealed with conventional sealers.

Minnesota Mining and Manufacturing Company
Adhesives and Coatings Division, Dept. 36
417 Piquette Ave., Detroit 2, Michigan

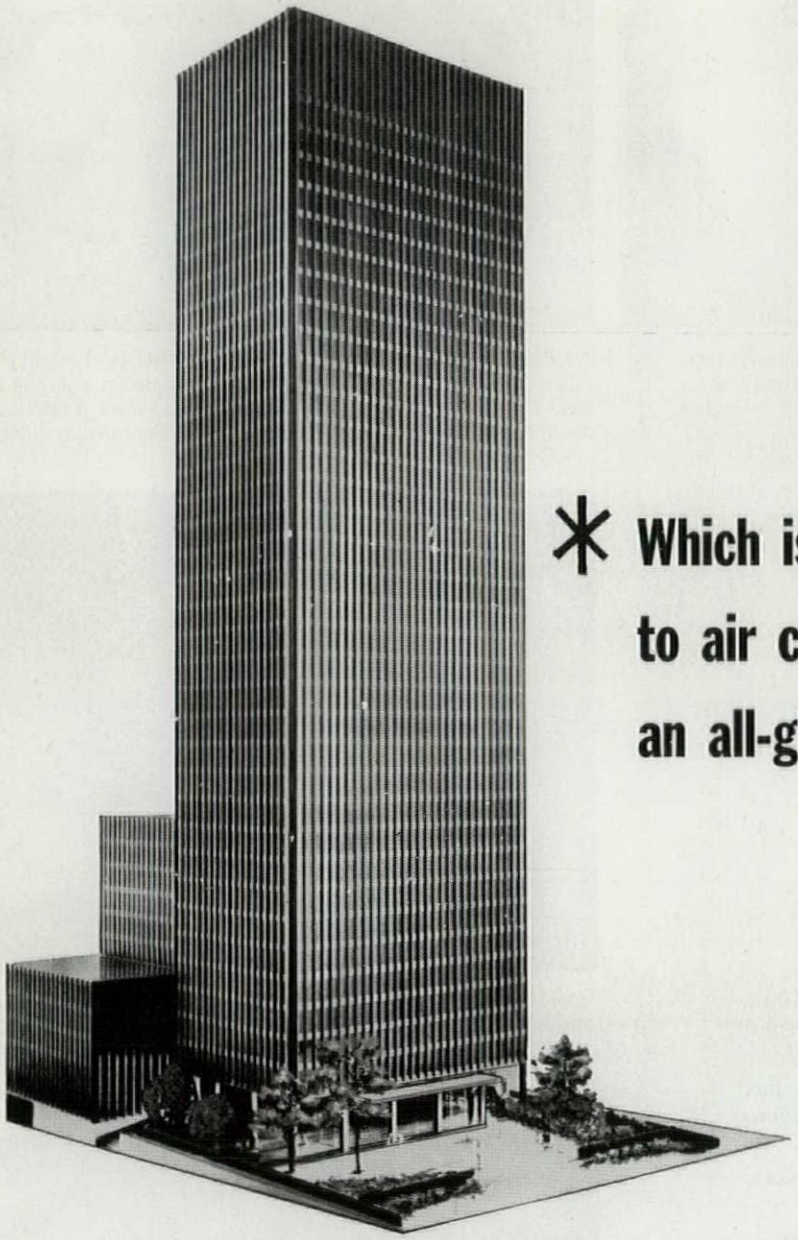
Send me free literature on WEATHERBAN Brand Curtain Wall Sealer. Please (do) (do not) have a 3M Field Engineer contact me at this time.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____



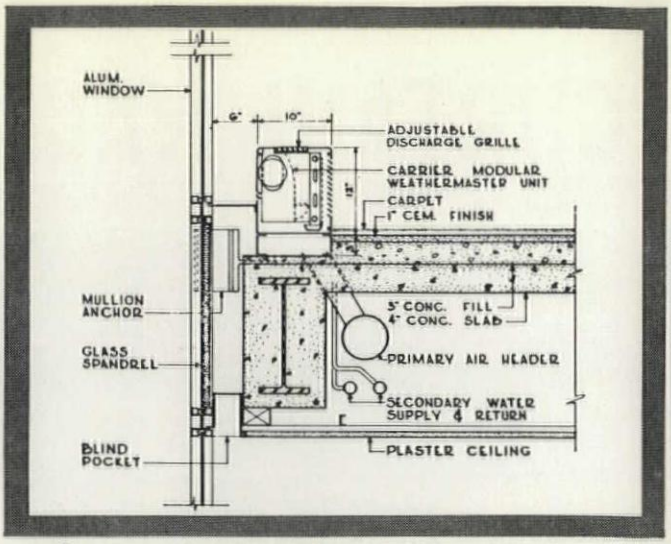
* Which is the best way to air condition an all-glass building?

That depends on the building. For example, its fenestration and construction are important factors in selecting individual air conditioning units. Carrier meets every variation of these factors with its flexible new Modular Weathermaster* Units. Based on the "building block" principle, they adapt attractively and efficiently to all conditions, provide individual climate control in each room. Only Carrier makes modular units to fit any all-glass building problem. Here are six different modular arrangements—there are many more. For complete information about them, call your nearest Carrier office.

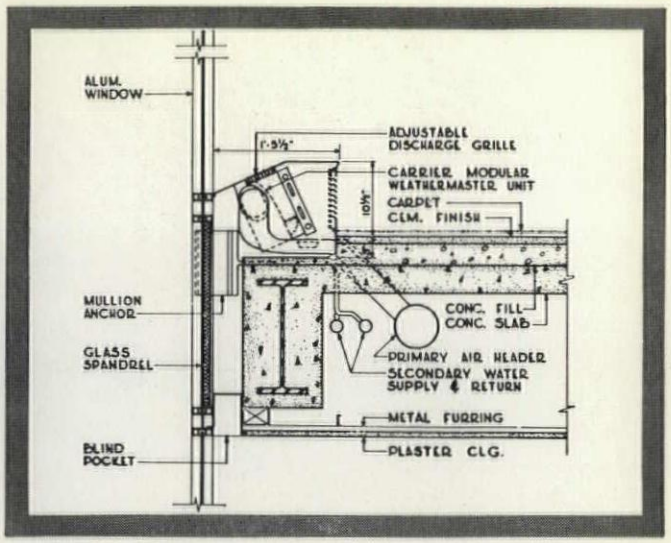
Carrier

*Reg. U.S. Pat. Off.

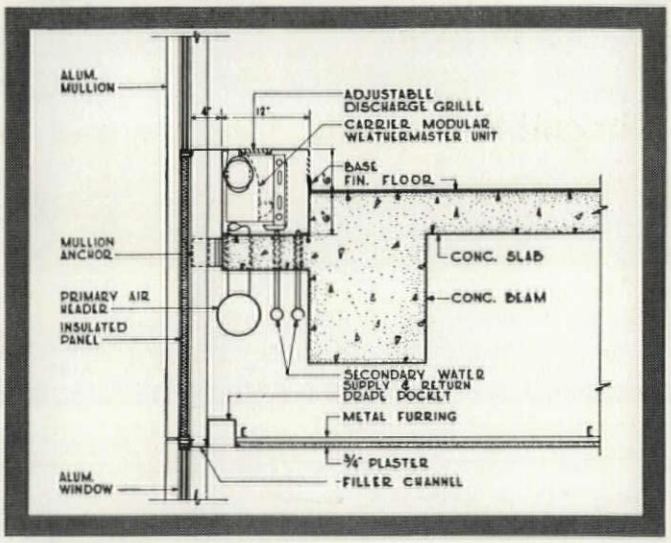
For free booklet describing Carrier Modular Weathermaster Units, ask your nearest Carrier office for 36N-64. Or write Carrier Corporation, Syracuse, New York.



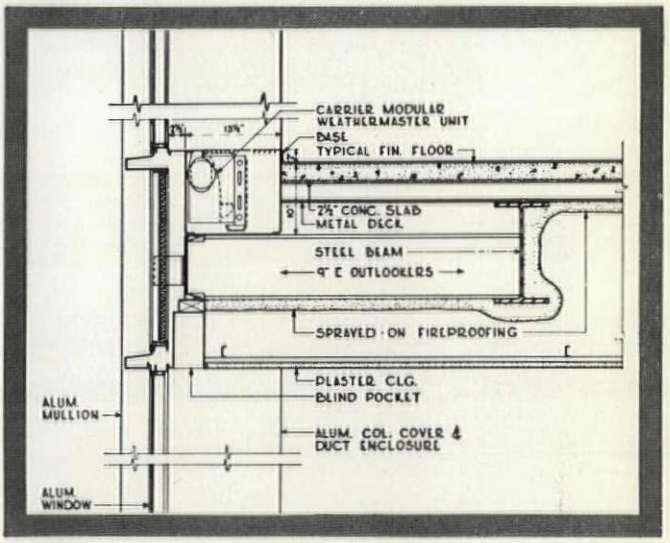
TYPICAL INSTALLATION WITH STOOL POCKET



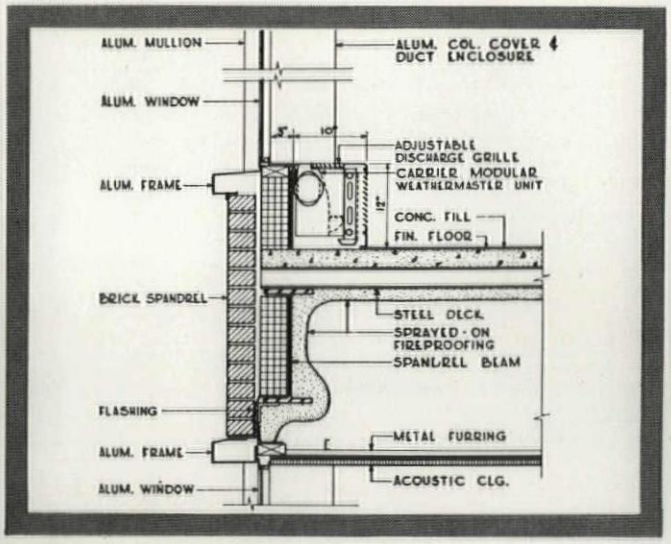
TYPICAL INSTALLATION WITH SLOPING STOOL



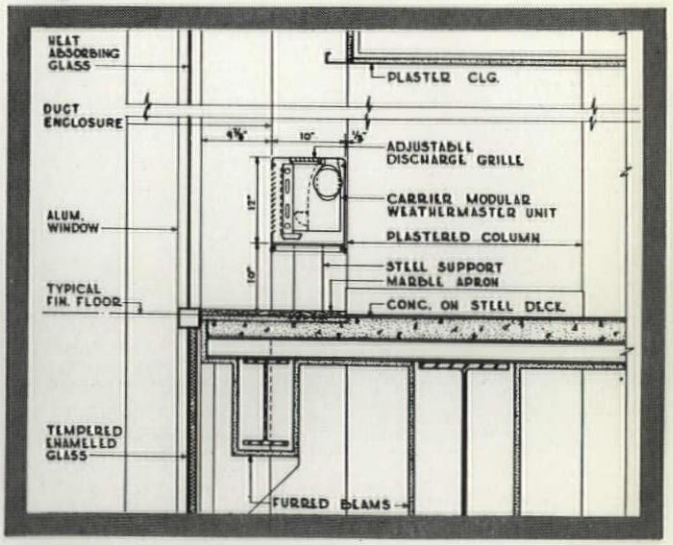
TYPICAL SEMI-RECESSED INSTALLATION



TYPICAL RECESSED INSTALLATION



TYPICAL SURFACE INSTALLATION



TYPICAL RAISED INSTALLATION

Air and water services to individual Carrier Modular Weathermaster Units may be run horizontally from vertical risers, or they can be fed vertically from sources running horizontally in the ceiling below.

NOW . . . A COMPLETE *Glass-clad* CURTAIN-WALL

THE COMPLETE Pittsburgh system of curtain-wall construction is shown in this new building housing the National Carbon Company's Research Laboratory at Parma, Ohio. This system effectively utilized SPANDRELITE and PITTCO 82-X with Pittsburgh's SOLEX® Heat-Absorbing, Glare-Reducing Plate Glass. Architects: Skidmore, Owings & Merrill, New York City; Contractor: Gilmore-Olsen Company, Cleveland.

THE COLOR and distinctive qualities of SPANDRELITE may also be part of any architectural scheme involving other types of framing. This view of the Northeast Junior High School in Minneapolis, Minn., fully demonstrates the value of SPANDRELITE in such architectural plans. Architects: Thorshov and Cerny, Inc., Minneapolis, Minn.; Contractor: Watson Construction Co., Minneapolis, Minn.

SYSTEM FROM ONE SOURCE!

PITTSBURGH PLATE GLASS COMPANY is proud to announce the availability, for the first time, of a *complete* system of glass-clad curtain-wall construction through the combination of its recently developed PITTCO® 82-X metal framing and colorful SPANDRELITE®—the heat-strengthened glass with ceramic color fused to the back.

PITTCO 82-X offers an integrated system of curtain-wall framing. Originally designed to meet the requirements of the National Carbon Company's Research Laboratory in Parma, Ohio, it has since been successfully used on other structures—both large and small.

SPANDRELITE has met with widespread approval on the part of architects all over the country. For it helps to give added character to their creative designs. It is *strong*, withstanding impact and wide temperature variations. It is *durable*, providing the timeless properties of glass, with color that is both uniform and non-fading. It resists weathering and corrosion, is non-porous, non-absorbent. And SPANDRELITE is exceptionally economical . . . may be installed in the same manner as ordinary glass and is easily cleaned.

Architects have a selection of two finishes—Twill and Polished—and 16 standard colors, as well as a wide range of custom colors—from pastels to chartones. SPANDRELITE is available in sizes up to 72″ x 144″.

For complete information on Pittsburgh's glass-clad curtain-wall systems, fill in and return the coupon. Moreover, our Architectural Representatives in your locality are anxious to help you in every way possible with any problems of curtain-wall construction. Consult with them at any time.

Other notable buildings using Spandrelite and Pittco 82-X bar framing members . . . now under construction or recently completed

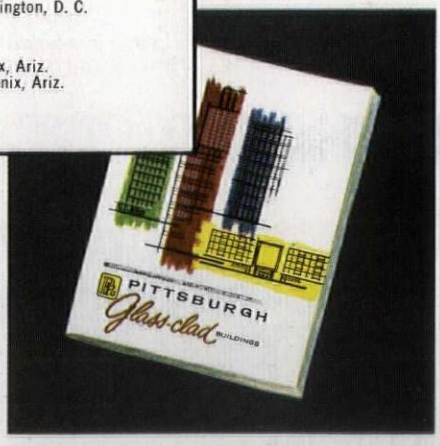
New Orleans Public Library
New Orleans, La.
Architects: Curtis and Davis, New Orleans, La.
Contractor: R. P. Farnsworth & Co., New Orleans, La.

Louisiana State Library
Baton Rouge, La.
Architects: Desmond and Davis, Hammond, La.
Associates: Burk, Lebreton and Lamantia, New Orleans, La.
Contractor: George Caldwell Company, Inc., Baton Rouge, La.

D. J. Kaufman, Inc., Men's Furnishings
Washington, D. C.
Architect: David Baker, Washington, D. C.
Contractor: William P. Lipscomb Co., Inc., Washington, D. C.

Motorola Electronics Facilities
Phoenix, Ariz.
Architects: E. L. Varney and Associates, Phoenix, Ariz.
Contractor: T. G. K. Construction Co., Inc., Phoenix, Ariz.

Write today for our FREE full-color book



Pittsburgh Plate Glass Company
Room 7250, 632 Fort Duquesne Blvd.
Pittsburgh 22, Pa.

Without obligation, please send me a copy of your full-color book entitled "Pittsburgh Glass-Clad Buildings."

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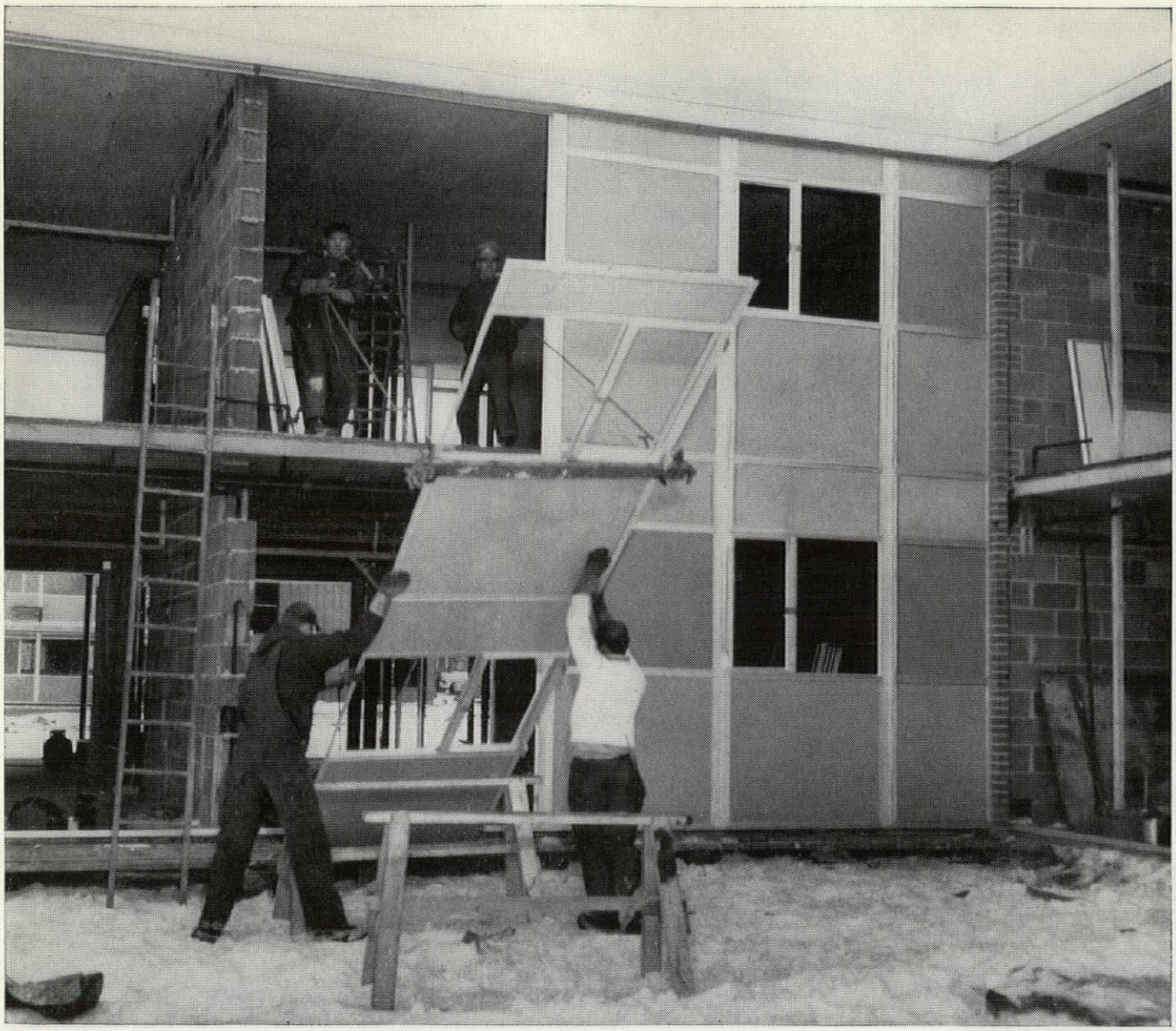
Glass-clad **CURTAIN-WALL SYSTEMS**

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

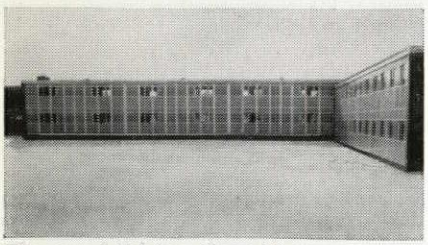


Workmen installing window walls made with Hasko-Struct† plastic laminated sandwich panels. Architect is Manson & Carver Associates, General Contractor is Christman Company.

STYROFOAM*
FIRST IN PLASTIC FOAM INSULATION
*Styrofoam is a registered trademark of The Dow Chemical Company

Styrofoam* insulation chosen for housing project at Michigan State University

Class of '58 or '88—students will be assured of warm, dry rooms in this large, married students' housing project in East Lansing, Michigan. It's insulated with Styrofoam, a Dow plastic foam.



The new Michigan State University Married Students' Housing Project. There are 46 complete units housing 508 families.

Styrofoam was specified for the Hasko-Struct building panels and as the perimeter insulation by the architectural firm of Manson and Carver Associates. It has a low K factor that *stays low* because Styrofoam won't absorb water. It doesn't rot, mold, deteriorate or warp. In addition, Styrofoam is a rigid insulation with high compressive strength. It makes panels stronger and won't pack down. Yet it's very light in weight.

If you need an outstanding insulation for curtain wall construction, perimeter or plaster base installations, cavity walls or low-temperature work—investigate Styrofoam. Contact your nearest Dow sales office today. THE DOW CHEMICAL COMPANY, Midland, Mich.

†*Registered Trademark of Haskelite Manufacturing Corp. of Grand Rapids, Mich.*

YOU CAN DEPEND ON DOW

Three installations that show the trend to

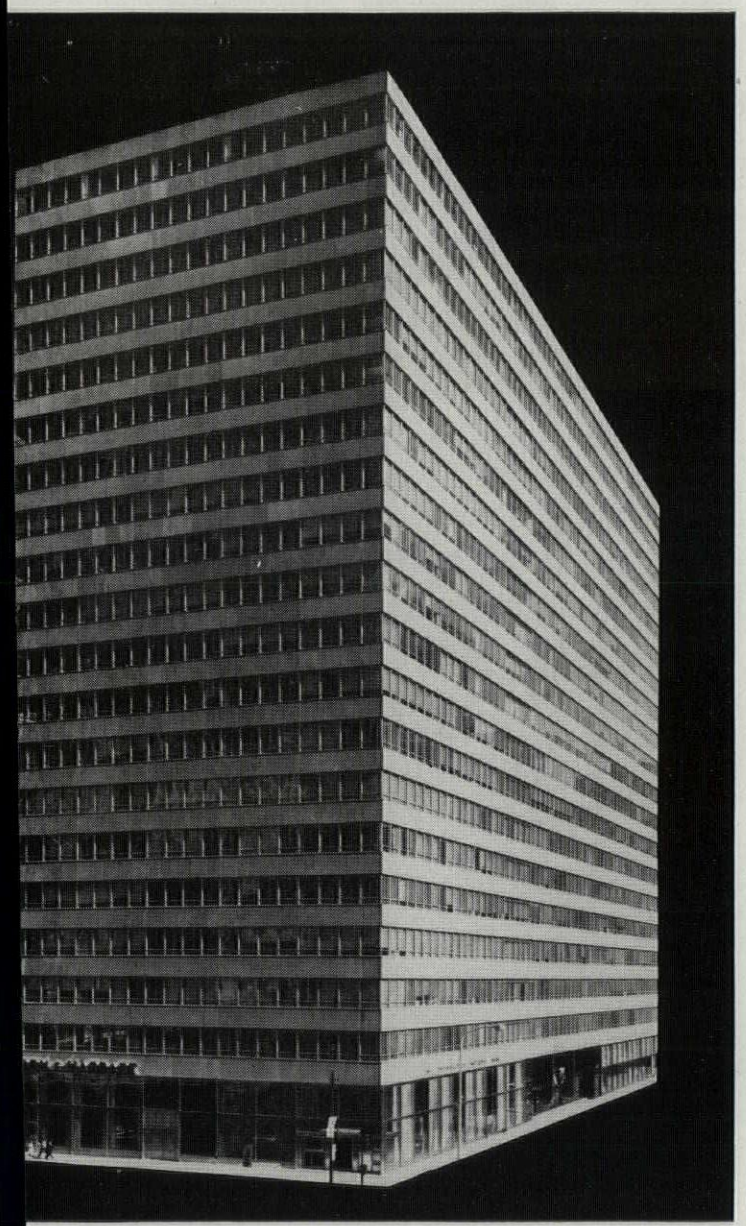
LUPTON Aluminum

COLGATE-PALMOLIVE BUILDING, New York City. Architects: Emery Roth & Sons. Contractors: Uris Brothers. Lupton Aluminum Curtain Wall, Type "H", with 4'5" width module.

MALL BUILDING, Philadelphia, Pa. Architect: Charles R. Colbert. Contractors: Shelby Construction Co., Inc. Lupton Aluminum Curtain Wall, Type "H", with 5' width module.

Curtain Walls

nd Windows



3 PENN CENTER, Philadelphia, Pa. Architects: Emery Roth & Sons. Contractors: Caldwell-Wingate Construction Co. Combination fixed and ventilator windows adapted from a standard Lupton design.

These three new high-rise buildings exemplify modern planning and construction. All three were designed with famous LUPTON components. Indeed, LUPTON has always been in the forefront of the curtain-wall movement . . . and for good reason:

The characteristics of LUPTON Aluminum Curtain Walls and Windows result in unusual planning flexibility with either stock or custom units. The wide range of LUPTON styles, in both metal windows and curtain walls, frees you for truly creative planning with utterly reliable materials. *You* design LUPTON-made installations; LUPTON executes your wishes, in manufacture and frequently even in erection. LUPTON's undivided responsibility for the job assures you exact compliance with your instructions, and effects multiple savings for your clients.

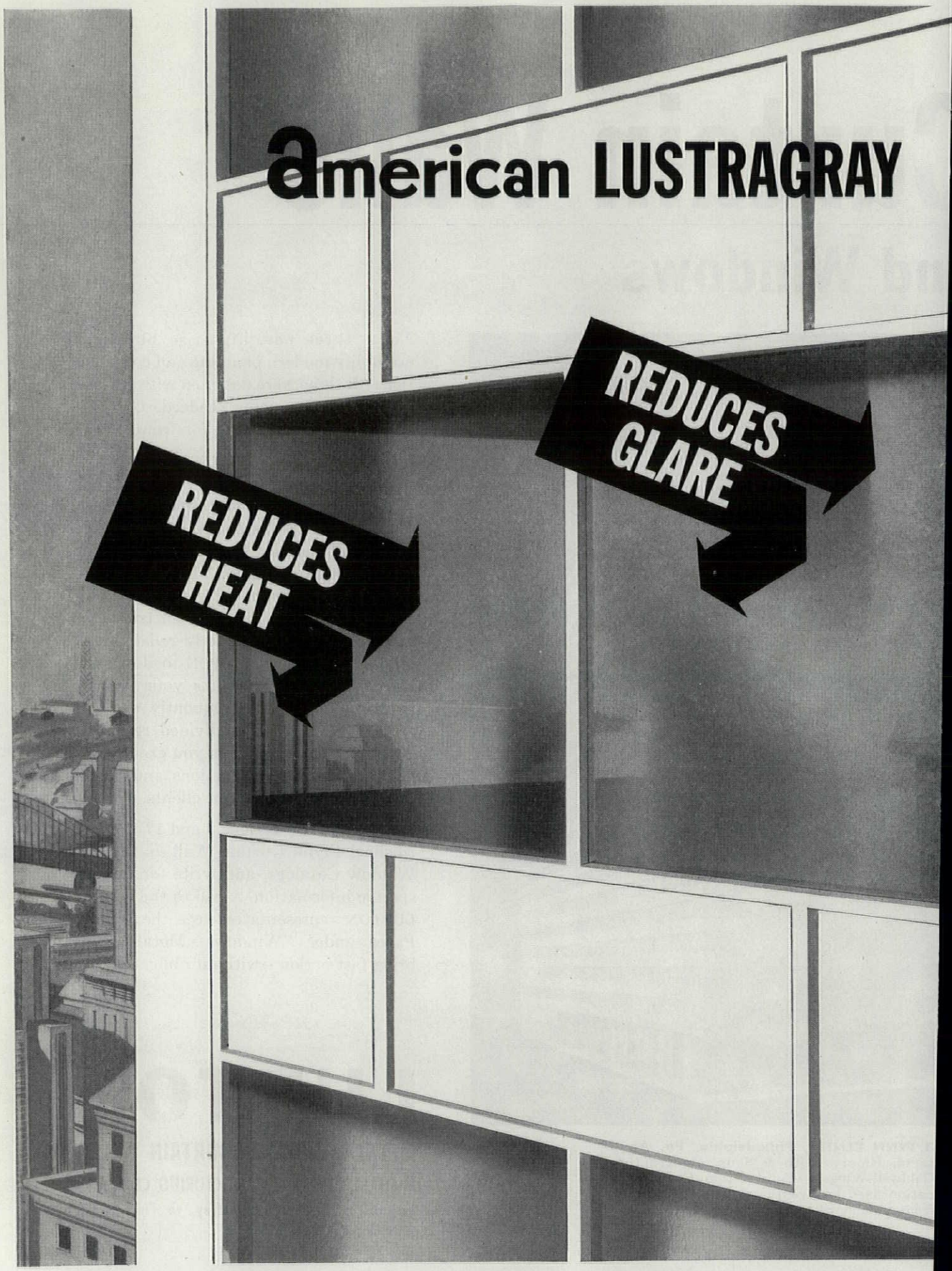
SEE SWEET'S (Sections 3 and 17) for the Michael Flynn Curtain Wall and Metal Window Catalogs, and write for further specific information. A call to the nearest LUPTON representative (see the Yellow Pages under "Windows—Metal") will bring fast action—without obligation.

LUPTON

METAL WINDOWS • CURTAIN WALLS

MICHAEL FLYNN MANUFACTURING COMPANY

Main Office & Plant: 700 E. Godfrey Ave., Phila. 24, Pa.

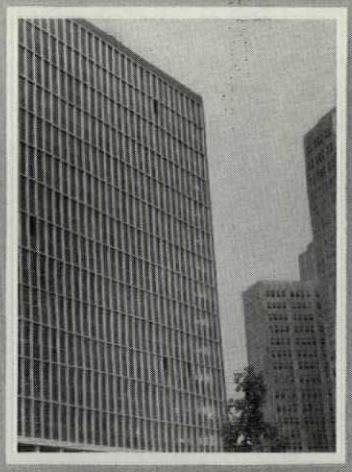

american LUSTRAGRAY
REDUCES GLARE
REDUCES HEAT

Sheet Glass

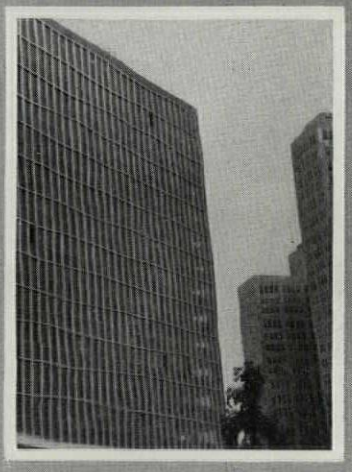
Features

- Reduces glare approximately 50%
- Provides an effective reduction in transmission of solar energy
- Neutral gray tint blends with all colors used in or on buildings
- No special installation handling
- Non-fading
- Economical

For additional information contained in an eight-page Catalog, write to our Architectural Promotion Department today.



Reflection #1: AMERICAN'S Sheet Glass



Reflection #2: Competitive Sheet Glass

Reflection tests show that AMERICAN'S sheet glass has the least distortion and provides the most attractive appearance. It can be used in place of plate glass—resulting in substantial savings.

SOLAR ENERGY TRANSMISSION*

AMERICAN LUSTRAGRAY	3/16"	7/32"	1/4"
Total Visible Light	61.8%	58.8%	55.0%
Ultraviolet	63.7%	63.0%	61.0%
Infrared	73.4%	71.7%	68.5%
Total Solar Radiation	68.3%	66.3%	62.6%

*Average radiant energy at normal incidence, with energy distribution equivalent to air mass equal 2.

• Maximum Size: 6' x 10'

MODERN GLASS *Best at a Glance*

WSW 6643

american

WINDOW *Glass* COMPANY

PITTSBURGH, PA.

PLANTS: ARNOLD, PA. • ELLWOOD CITY, PA. JEANNETTE, PA. • OKMULGEE, OKLA.

1947 . . . IN ALUMINUM
Alcoa Administration Bldg.
Davenport, Iowa
Architect: Harrison & Abramovitz

Pioneers in

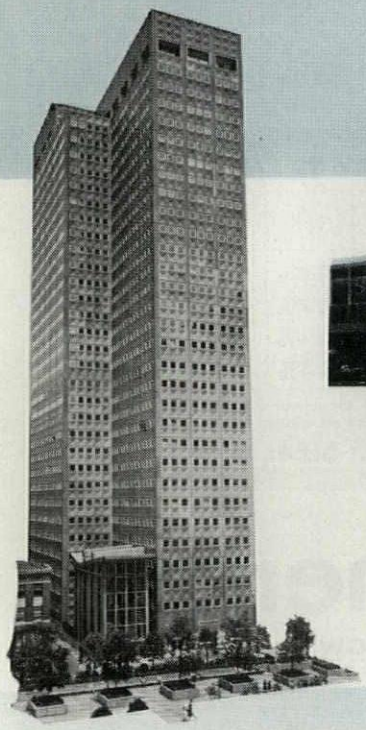
ALUMINUM, BRONZE

GENERAL BRONZE offers 10 years experience in designing, fabricating and erecting curtain wall systems.

1954 . . . IN ALUMINUM
Bank of the Southwest, Houston, Texas
Architects: Kenneth Franzheim

1950 . . . IN STAINLESS STEEL
Lever House, New York, N. Y.
Architects: Skidmore, Owings & Merrill

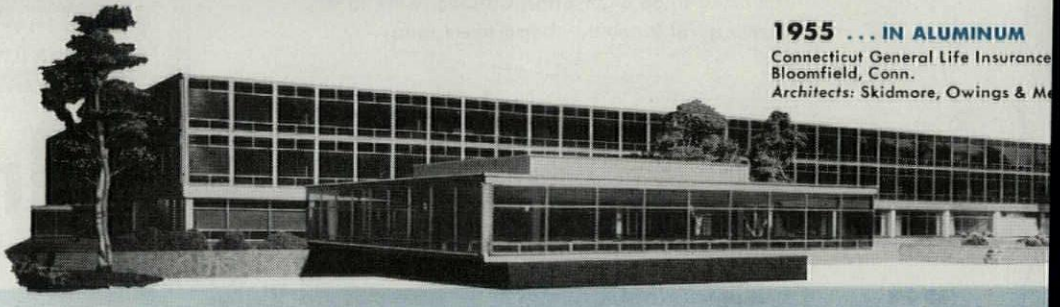
1950 . . . IN ALUMINUM
Alcoa Bldg., Pittsburgh, Pa.
Architects: Harrison & Abramovitz



If you are thinking of curtain walls, in terms of aluminum, bronze or stainless steel, either complete skin or grid and panel system, GENERAL BRONZE offers you the benefit of their ten years of practical experience working with all types of buildings, all types of materials. This experience can help eliminate many headaches for you and save both time and money for your clients.

As a result of our pioneering efforts in the field of curtain wall and our experience on more than 40 individual jobs-including those shown here—we know the answers to those many intricate problems that are bound to arise; i.e. how to take care of expansion and contraction, – how to keep the building weathertight at all times, – when and where to use flashing, – how to design for trouble-free horizontal and vertical joints.

Before you get too far along on your next curtain wall job, call in the General Bronze representative. He is anxious to serve you. Our catalogs are filed in Sweet's.



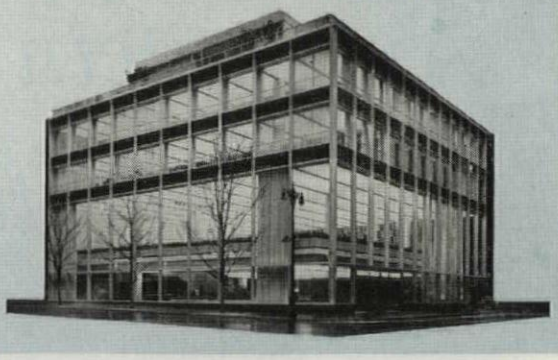
1955 . . . IN ALUMINUM
Connecticut General Life Insurance
Bloomfield, Conn.
Architects: Skidmore, Owings & Me

GENERAL BRONZE CORPORATION

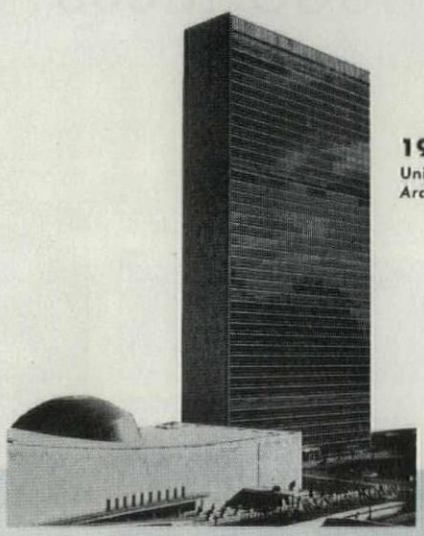
GENERAL BRONZ

Curtain Walls

and STAINLESS STEEL



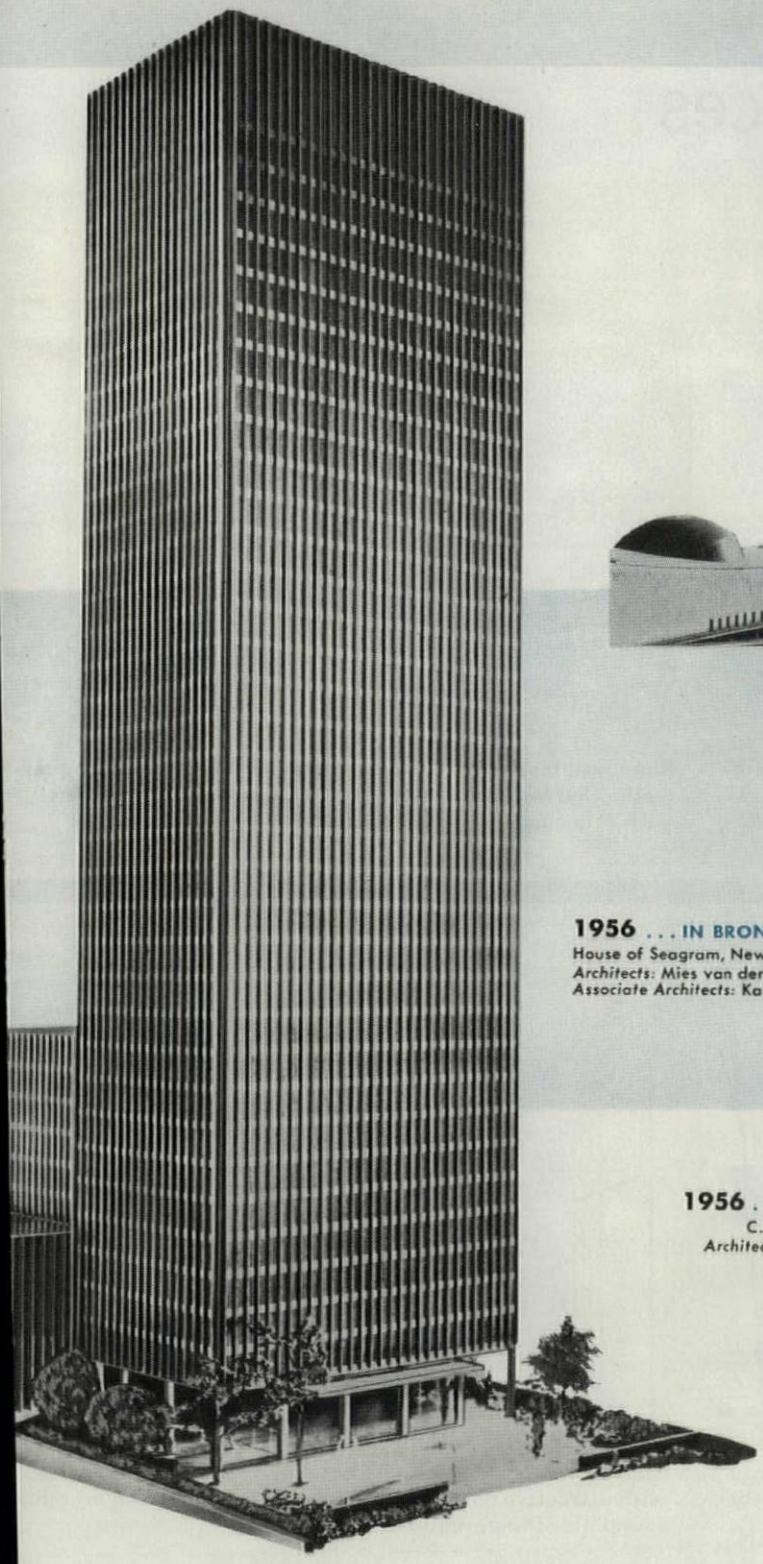
1953 . . . IN ALUMINUM
Manufacturers Trust Co., New York, N. Y.
Architects: Skidmore, Owings & Merrill



1949 . . . IN ALUMINUM
United Nations Secretariat Bldg., New York, N. Y.
Architects: U.N. Board of Design Consultants,
Wallace K. Harrison, Director

1952 . . . IN ALUMINUM
99 Park Avenue Bldg.
New York, N. Y.
Architect: Emery Roth & Sons

1956 . . . IN BRONZE
House of Seagram, New York, N. Y.
Architects: Mies van der Rohe and Philip Johnson
Associate Architects: Kahn & Jacobs



1956 . . . IN STAINLESS STEEL
C.I.T. Bldg., New York, N. Y.
Architects: Harrison & Abramovitz

CORPORATION

Executive Offices and Main Plant: **Garden City, N. Y.**
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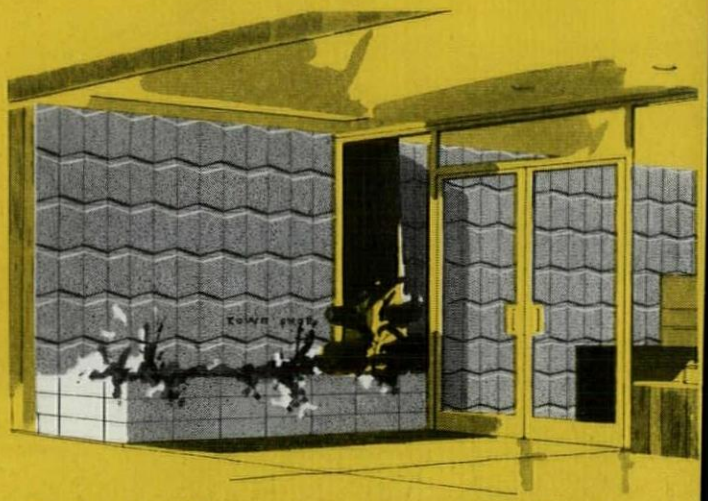
Announcing shadowal TRADEMARK

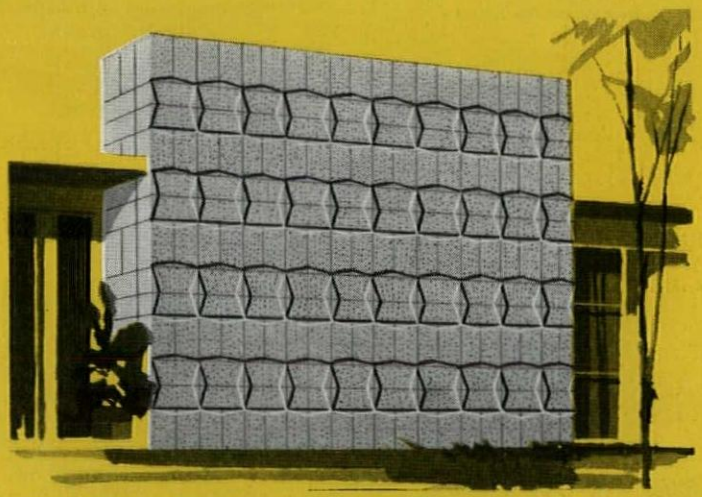
concrete masonry

the block with 1000 faces

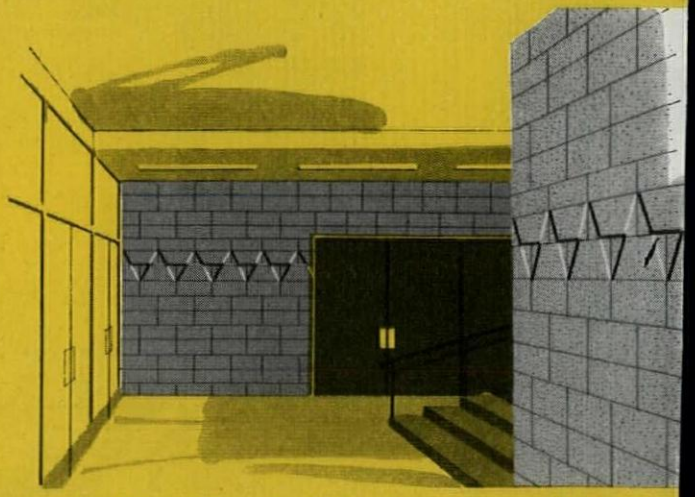
Shadowal block for the home adds new dimension and character to a room. The standard modular 8″ x 16″ face makes it easy to lay-up in the wall.



Shadowal block for the smart shop can be used with equal distinction for interior and exterior walls—blends perfectly with other building materials.



Shadowal block for the exterior of industrial buildings gives the effect of expensive special shapes at only slightly more than the 8″ x 8″ x 16″ units.



Shadowal block for schools breaks up large wall expanses with attractive patterns. Shadowal masonry is also firesafe, sound absorbing, requires no finishing.

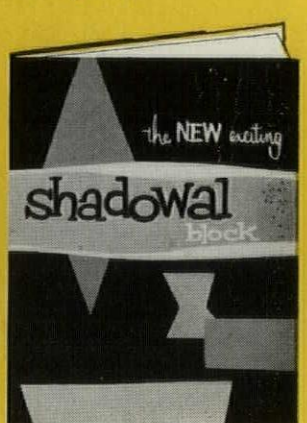
Shadowal block available from NCMA *members*

National Concrete Masonry Association · 38 South Dearborn · Chicago

Here it is—the biggest news in the building industry in years! Now from NCMA's extensive research comes a standard modular concrete block with a pattern built into the face. You see on these pages just a few of the beautiful wall patterns possible with Shadowal block. These patterns were made with just one *Shadowal masonry unit. The variety of intricate patterns is limited only by the imagination of the user. You can save expensive wall finishing costs and still build new beauty into all types of structures at little extra cost.*

Call your local NCMA member—Shadowal block is available exclusively from Association members—ask him to show you samples of versatile Shadowal units.

See for yourself the big news about the building industry's most versatile material, beautiful Shadowal concrete masonry—the block with 1000 faces.



Shadowal Block Portfolio

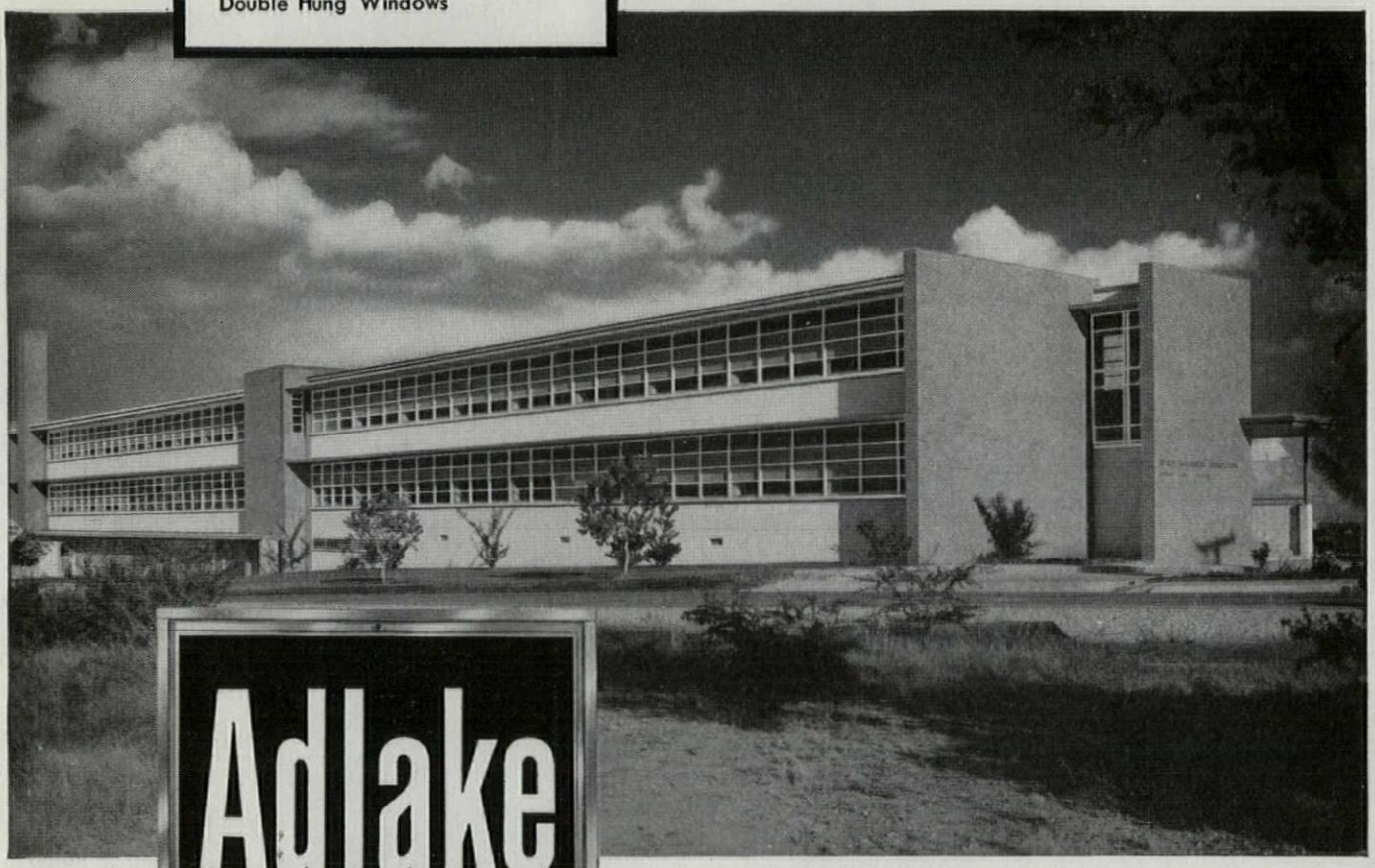
Get the complete story about Shadowal block from your nearest NCMA member. Contains many brand new wall patterns, the story of Shadowal block and a host of other new building ideas.

BUILDING—Longfellow Junior High School, San Antonio, Texas

ARCHITECT—Phelps, Dewees, & Simmons

CONTRACTOR—J. C. Worchester

TYPE OF WINDOW—Adlake Double Hung Windows



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America's Finest Aluminum Windows

...chosen again!

Only Adlake gives these 6 basic advantages:

- No warp or rot
- Minimum air infiltration
- No painting or maintenance
- Finger tip control
- No rattle, stick or swell
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Also, Double-Hung Windows With Patented Serrated Guides

The Adams & Westlake Company

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Established 1857

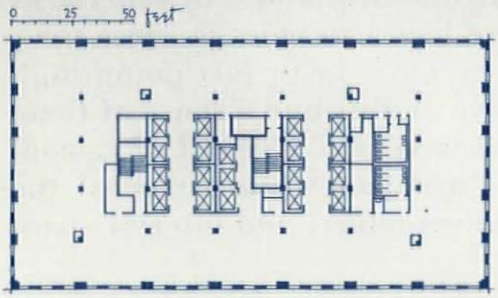
Fairchild Aerial Surveys

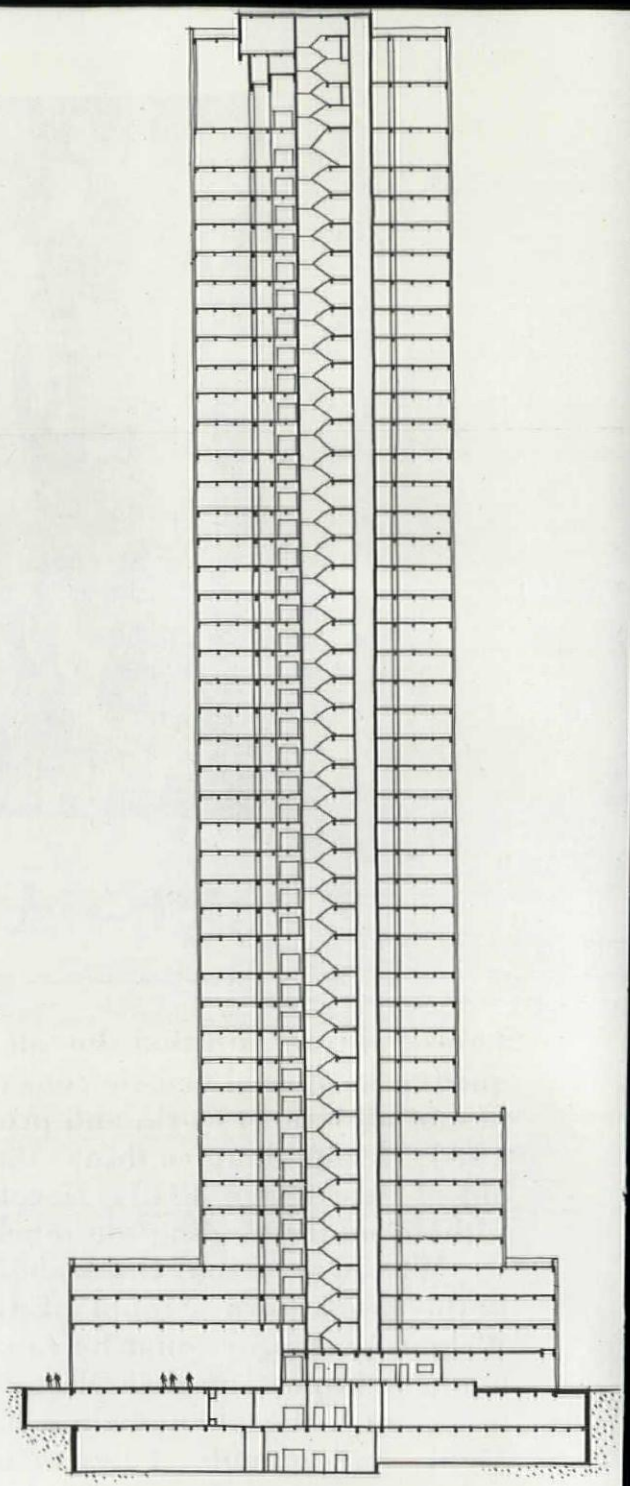
high-rise office buildings

Louis Sullivan said that the tall office building was a product of our time requiring its special artistic consideration (page 204). Richard Roth says that first of all it must work, and provide a return on someone's investment (page 196). Irving Shapiro thinks that our present high-rise buildings will soon be out of date (page 201). Harold Sleeper fears we are building curtain walls without understanding too much about them (page 209).

Whatever we may think about it, the high-rise office building of the 1950's is the best-known symbol of U. S. architecture today. Even Frank Lloyd Wright must prove that he can rise better and higher. As a "market," this boom is important—to architects as well as manufacturers. As a display of technology, the phenomenon has never been rivaled. As urban design it is highly questionable: bows to urbanism are at the most proprietary plazas quickly smothered or countered by competitive neighbors; pretensions of design, in most cases, ignore even the elementary formalisms of scale, unity, clarity. As manipulation of space, the program remains one of providing slices of horizontality piled vertically, with distinction only in the conditioning of air, light, and sound.

Yet out of this background of rentable-to-gross-area ratios, floor heights, and land coverage (pages 160 to 171); out of the down-to-earth criteria of office modules and elevator requirements, there begin to emerge some new, promising attitudes—walls that have character in addition to just going high into the air (page 181); unified designs that have dignity and a sense of form richer than a straining at the zoning-ordinance envelope (page 172); consideration of the automobile as a factor in the occupancy and shape of the building (page 192). Here architecture enters the picture, and interior space begins to count in the design.





comparative data

Socony Mobil Building, New York, New York. Harrison & Abramovitz and John B. Peterkin, Associated Architects; A. P. Brooks, Project Manager
Area of site: 82,882 sq ft
Gross floor area: 1,650,000 sq ft
Office-use: 1,255,000 sq ft—76% of total
Number of floors: 45
Floor-to-floor height: 11'-9"
Over-all height: 547'-6"
Mullion spacing: 9'-8" nominal
Materials & Methods: steel frame; stainless-steel wall panels; plate glass; vertically pivoted sash, revolving 360 degrees; high-velocity, split, air-conditioning system
Ground-floor use: rental; lobbies
Provision for car parking: none

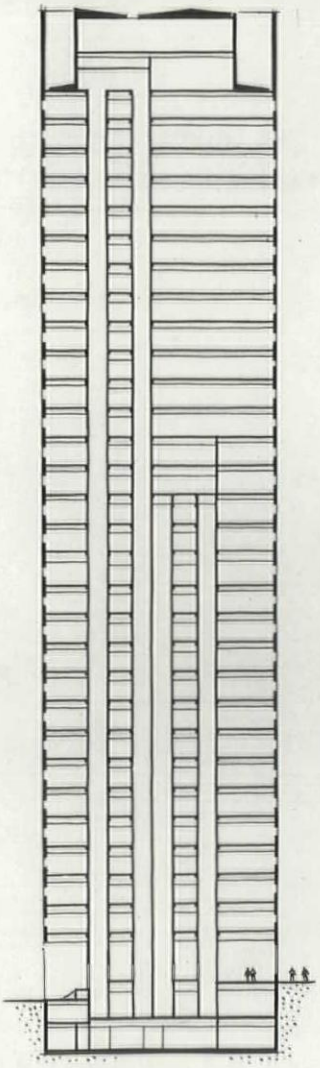
Photos: Gottscho-Schleisner

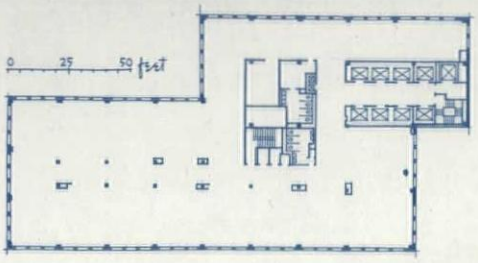
comparative data

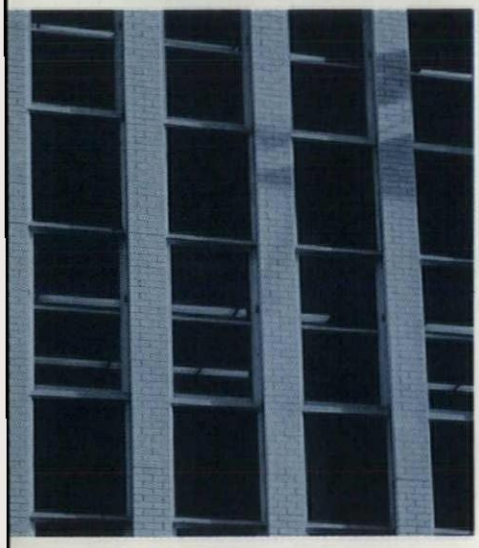
Aluminum Company of America office building, **Pittsburgh, Pennsylvania.** Harrison & Abramovitz, Architects; Altenhof & Bowen and Mitchell & Ritchey, Associated Architects

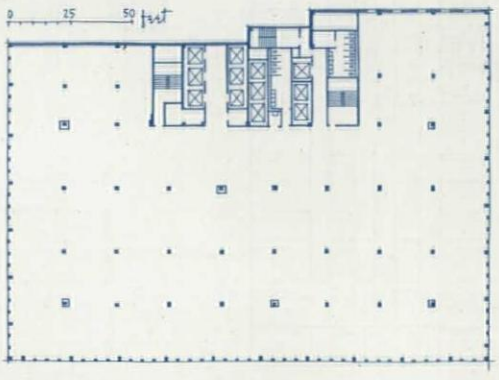
Area of site: 17,977 sq ft
Gross floor area: 436,807 sq ft
Office-use: 332,695 sq ft—76% of total
Number of floors: 30
Floor-to-floor height: 12'-0"
Over-all height: 370'-0"
Mullion spacing: 6'-8"
Materials & Methods: steel frame; 20' x 28' bays; aluminum skin wall; perlite back-up; double, insulating glazing; 180-degree reversible sash; ceiling panel heating and cooling on modular basis, plus air conditioning
Ground-floor use: entrance lobbies; store rental
Provision for car parking: none

Photos: Lionel Freedman









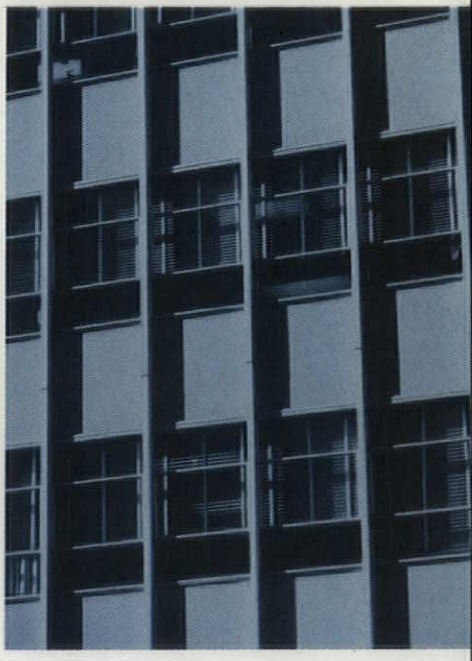
comparative data

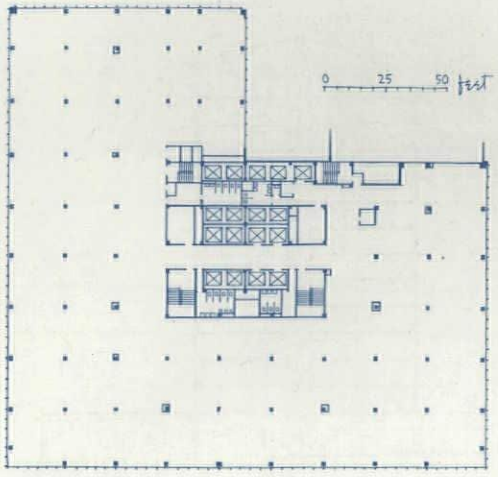
425 Park Avenue, New York, New York. Kahn & Jacobs, Architects; Partner-in-Charge: Ely J. Kahn; Project Manager: Arthur Frappier
Area of site: 27,941 sq ft
Gross floor area: 503,660 sq ft
Office-use: 429,826 sq ft—85.5% of total
Number of floors: 31, including ground floor and machine penthouse; 1 cellar; 1 sub-cellar
Floor-to-floor height: generally 11'-3½" and 11'-0"
Over-all height: 371'-7⅜"
Mullion spacing: 4'-11½" and 4'-10¾"
Materials & Methods: steel frame; 22' x 26' bays; glazed manganese brick piers; ¼" ceramic enameled glass spandrels; ¼" plate glass; aluminum sash, with fixed top light, up-sliding lower sash; peripheral air-conditioning system and internal distribution individually, thermostatically controlled in each unit
Ground-floor use: lobby; bank; automobile showroom; garage entrance; truck bay; cigar stand; core facilities
Provision for car parking: 80 cars in sub-cellar

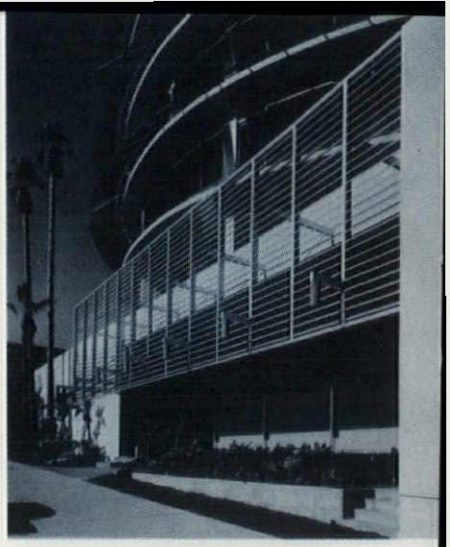
Photos: Gottscho-Schleisner

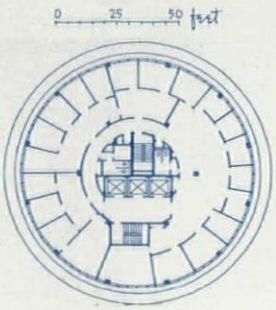
comparative data

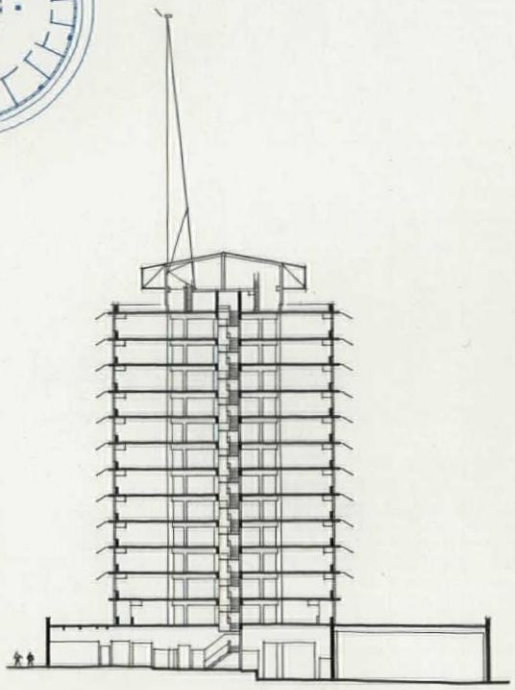
Colgate-Palmolive Building, New York, New York. Emery Roth & Sons, Architects; Irving E. Gershon, Chief Designer
Area of site: 200'-10" on Park Avenue; 191'-0" on East 49th St.; 128'-0" on East 50th St.
Gross floor area: 617,000 sq ft
Office-use: 530,620 sq ft—86% of total
Number of floors: 25 and tower
Floor-to-floor height: 11'-0" (11'-6" on offset floors)
Over-all height: 328'-0"
Mullion spacing: 4'-6"
Materials & Methods: steel frame in 22'-6" bays; aluminum sash and mullions; glass spandrels; tempered, structural glass; awning-type projected sash; fan-coil air-conditioning system for periphery; standard pressure for interior
Ground-floor use: lobby, bank, restaurant, stores
Provision for car parking: none
Photos: Gottscho-Schleisner











comparative data

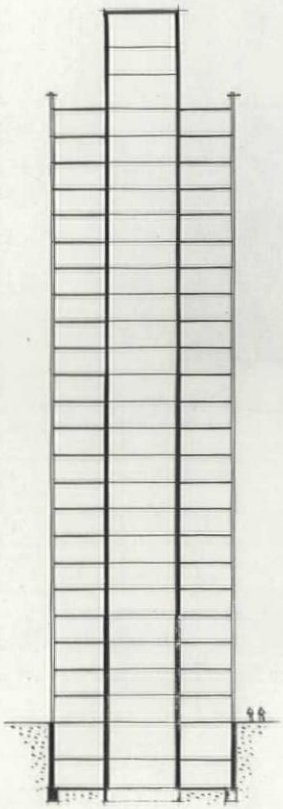
Capitol Records Building, Los Angeles, California. Welton Becket & Associates, Architects
Area of site: 43,400 sq ft
Gross floor area: 92,000 sq ft
Office-use: 79,120 sq ft—86% of total
Number of floors: 13 (local height limit)
Over-all height: 150'-0"
Mullion spacing: 3'-9"
Materials & Methods: flat-slab, reinforced-concrete structure, in 22'-0" x 23'-0" bays; concrete walls at first floor; above, reinforced-concrete spandrels, painted; plate and double-strength clear glass; fixed windows; refrigeration system with central plant for interior spaces; outer plenum serving perimeter offices
Ground-floor use: recording studios and related technical services; mechanical equipment; lobby
Provision for car parking: space at rear of building for 95 cars

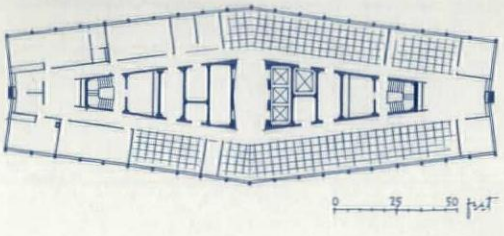
Photos: Robert C. Cleveland
Marvin Rand

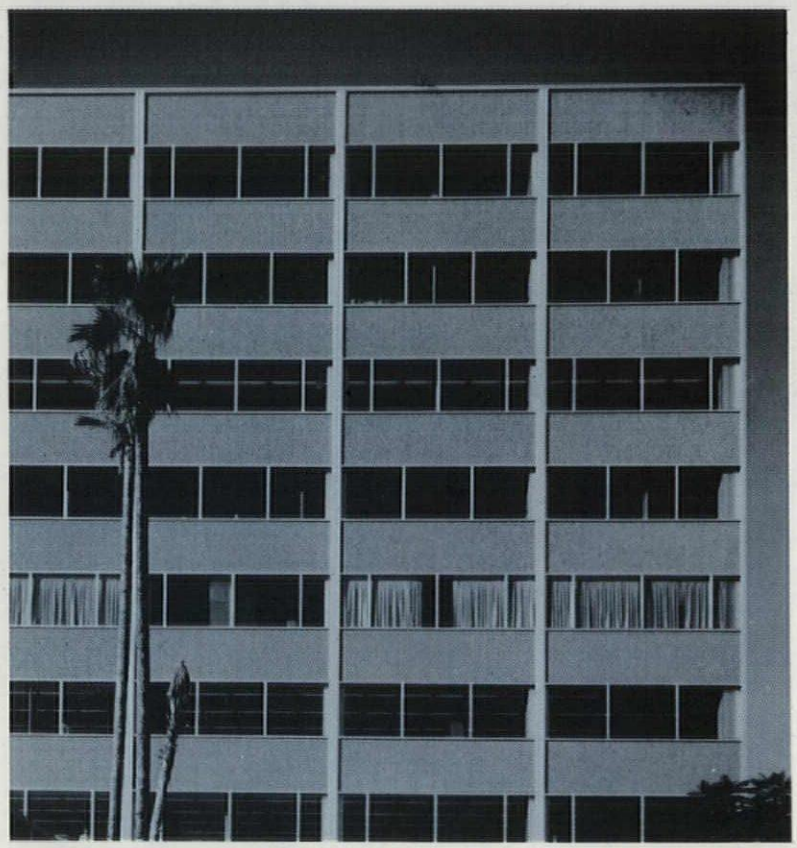
comparative data

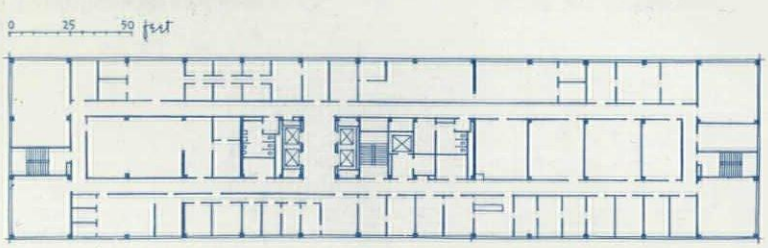
B. C. Electric Head Office Building, Vancouver, British Columbia. Thompson, Berwick & Pratt, Architects
Area of site: 47,872 sq ft
Gross floor area: 367,758 sq ft
Office-use: 287,314 sq ft—78% of total
Number of floors: 21; two basements; ground floor; mezzanine; three levels in penthouse
Floor-to-floor height: 10'-9"
Over-all height: 290'-0"
Mullion spacing: 3'-4"
Materials & Methods: reinforced concrete core, with slab floors carried by core and by steel columns on 10'-0" centers at outside wall; extruded aluminum curtain wall members; anodized aluminum column cladding; insulated 2-in.-thick steel panels with porcelain enamel finish on outside face; double-insulating plate glass panels (fixed). Air conditioning: floors are zoned into four quadrants with fan room in each; conditioned air, delivered to office space at inside corridor near ceiling, is recirculated at window sill to collector ducts below floor; air is also delivered to plenum above ceiling to control ambient temperature there
Ground-floor use: company departments that deal primarily with the public—new service applications; receiving cashiers, etc.; staff cafeteria; lounge; terrace; auditorium-assembly hall; bank
Provision for car parking: basement accommodation for 15 executive cars; parking lot for 185 cars

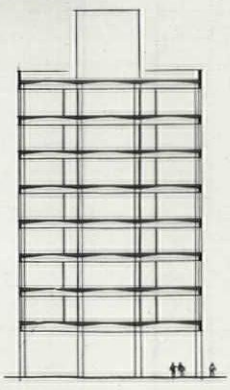
Photos: Graham Warrington











comparative data

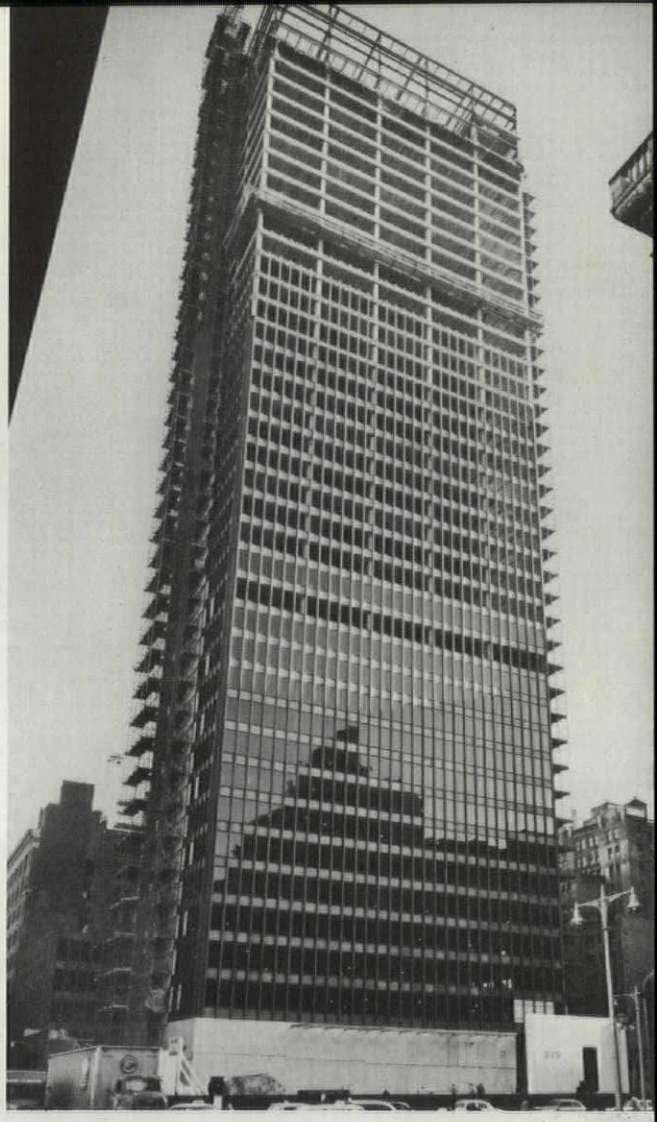
Police Administration Building, Los Angeles, California. Welton Becket & Associates and J. E. Stanton, Associated Architects
Area of site: 374,616 sq ft
Gross floor area: 82,340 sq ft
Office-use: 67,518 sq ft—82% of total
Number of floors: 9
Floor-to-floor height: 13'-0"
Over-all height: 158'-3"
Mullion spacing: 23'-6"
Materials & Methods: reinforced concrete frame, in 23'-6" bays; ceramic tile spandrels; terra cotta veneer end walls; aluminum window frames and mullions; heat-absorbing plate glass; fixed windows. Air conditioned by double-duct distribution system with mixing dampers actuated by pneumatic thermostatic controls
Ground-floor use: police department facilities most used by the public—business offices; information center; traffic division; also, offices of Police Commission, auditorium and stage, and jail for initial booking procedures
Provision for car parking: ground and deck area for more than 850 police cars; also, space for invited public parking

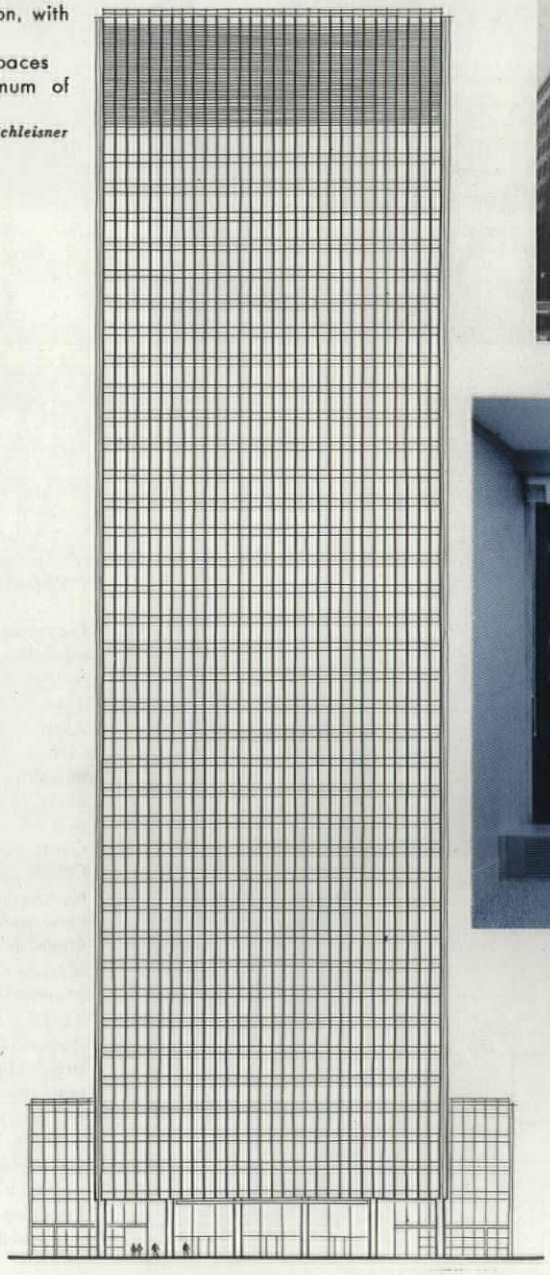
Photos: Julius Shulman

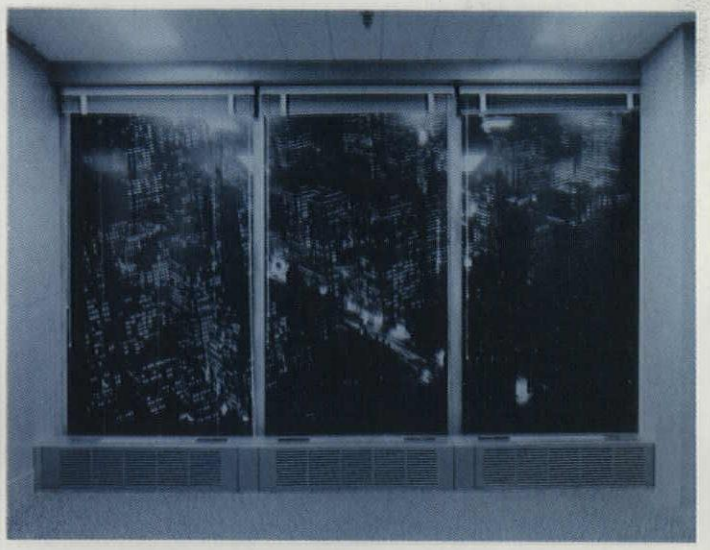
comparative data

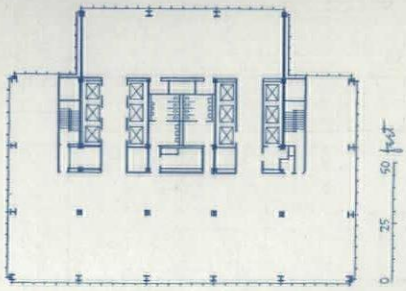
375 Park Avenue (House of Seagram), New York, New York. Mies van der Rohe and Philip Johnson, Architects, and Kahn & Jacobs, Associated Architects
Area of site: 61,000 sq ft
Gross floor area: 850,000 sq ft
Office-use: 600,000 sq ft—71% of total
Number of floors: 38, plus three levels below plaza and 45 ft of height devoted to mechanical equipment above the 39th floor level
Floor-to-floor height: 12'-0"
Over-all height: 516 ft
Mullion spacing: 4'-7½"
Materials & Methods: steel frame, in 27'-9" bays; mullions of extruded bronze with dark oxydized statuary finish, spandrels, brass-copper-zinc metal alloy, ⅛" thick; exterior walls, from 6" above finished floor to 2" below ceiling, gray-pink ¼" polished plate glass; serpentine used in two windowless bays; all glass fixed. On perimeter, high-velocity, air-induction air-conditioning system; 12" induction units. For interior, high-velocity double-duct system for vertical distribution, with mixing boxes on each floor
Ground-floor use: lobby; rental spaces
Provision for car parking: minimum of 100 cars in basement

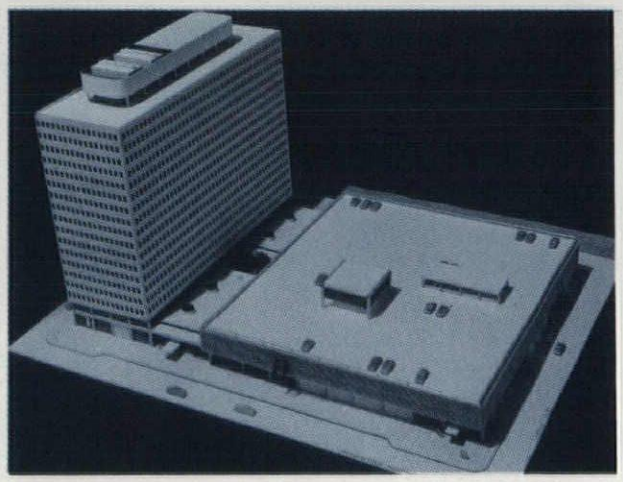
Exterior photo: Gottscho-Schleisner

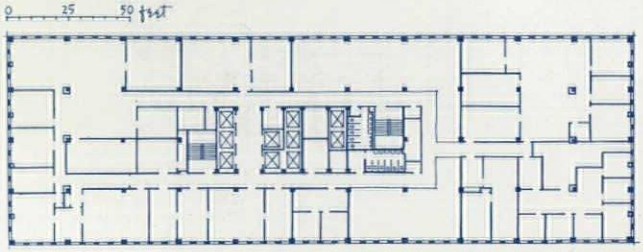


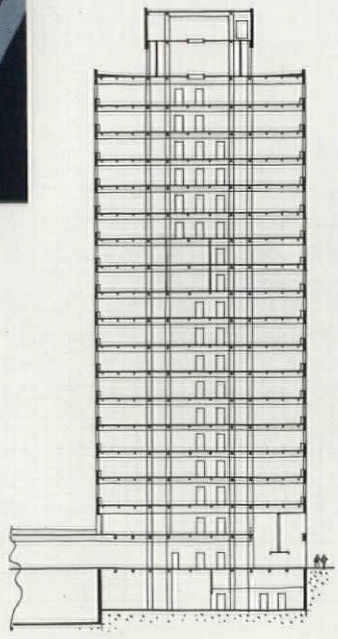












comparative data

Transportation Center, Penn Center, Philadelphia, Pennsylvania. Vincent G. Kling, Architect; Joseph G. Tighe, Project Manager

Area of site: entire group, including attached 3-story garage and connecting one-story structure occupies entire city block (270' x 400'); office building occupies about 23 percent of site

Gross floor area: 447,120 sq ft

Office-use: 371,110 sq ft—83% of total

Number of floors: 18

Floor-to-floor height: 11'-0"

Over-all height: 204'-6"

Module for window openings: 5'-9⅞"

Materials & Methods: steel frame in bays 23'-3½" x 21'-0½"; exterior wall, limestone; 3/16" glass sheet; fixed aluminum sash. High-velocity air-conditioning system above first floor; low-pressure system on ground floor and adjoining bus terminal

Ground-floor use: restaurant, lobby, bank, airline offices

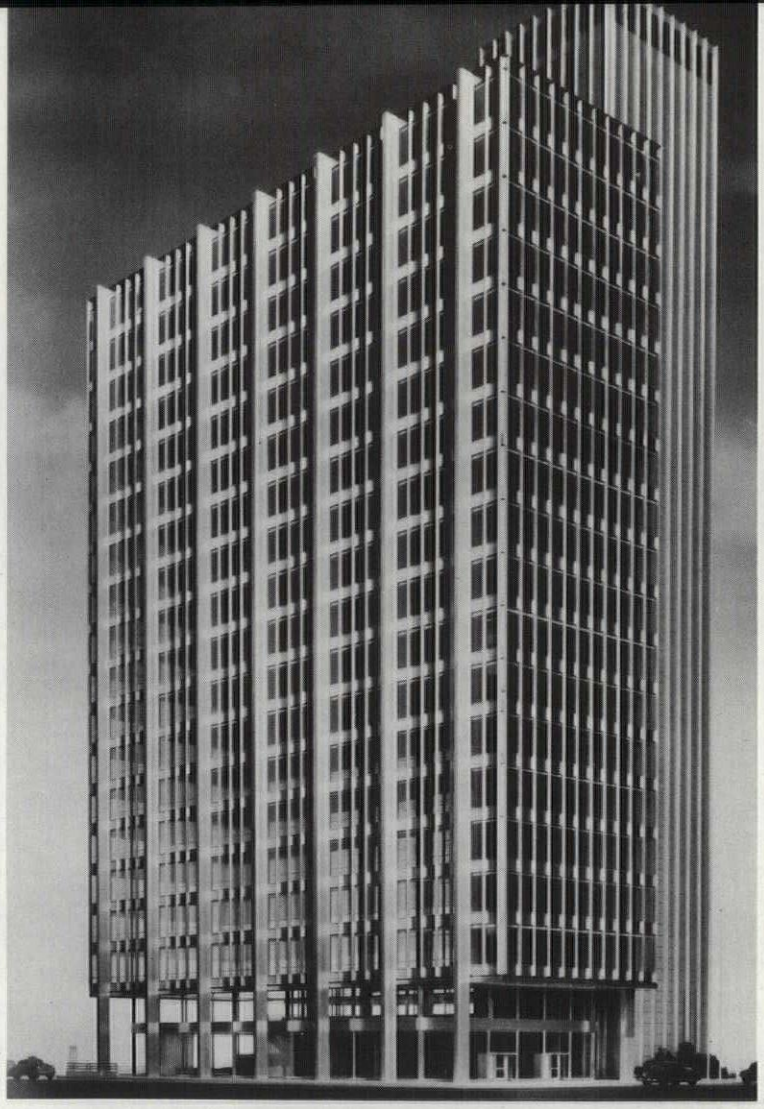
Provision for car parking: 1000-car parking in adjacent 3-story garage

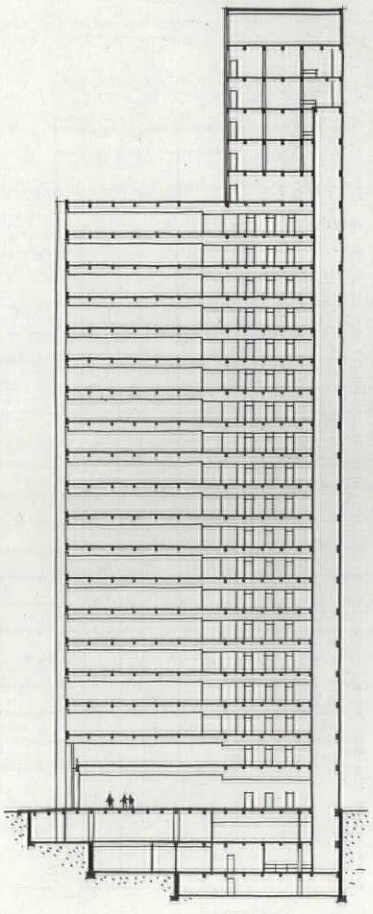
Photos: Lawrence S. Williams

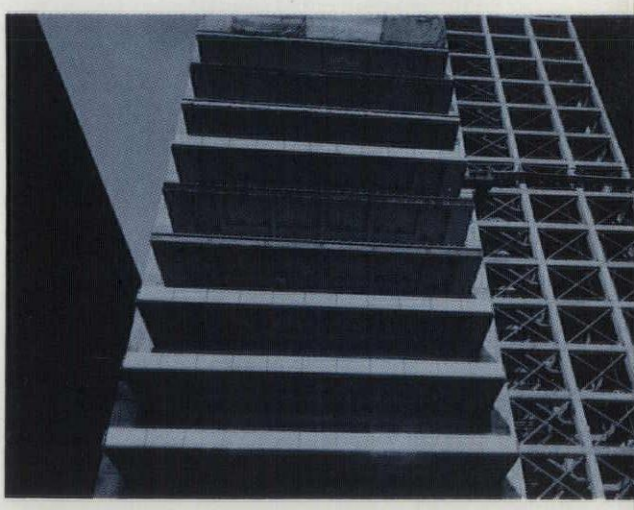
comparative data

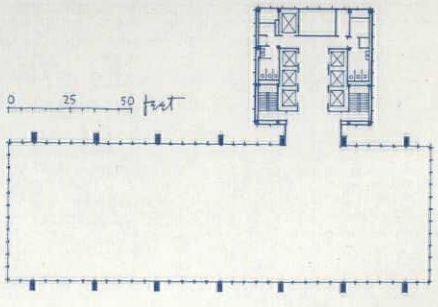
Inland Steel Building, Chicago, Illinois.
Skidmore, Owings & Merrill, Architects
Area of site: 23,040 sq ft
Gross floor area: 296,640 sq ft
Office-use: 237,312 sq ft—80% of total
Number of floors: office block: 19; service tower: 25; service annex building: 2
Mullion spacing: 5'-2"
Materials & Methods: two-legged, multi-story rigid frame of 58'-0" span, at 25'-10" on centers; exterior walls of stainless steel and double pane glass; fixed sash; two refrigeration compressors supply cleaned and cooled air
Ground-floor use: lobby; reception-exhibition area, to be occupied by Chicago Association of Commerce and Industry
Provision for car parking: 60-car garage on first basement level

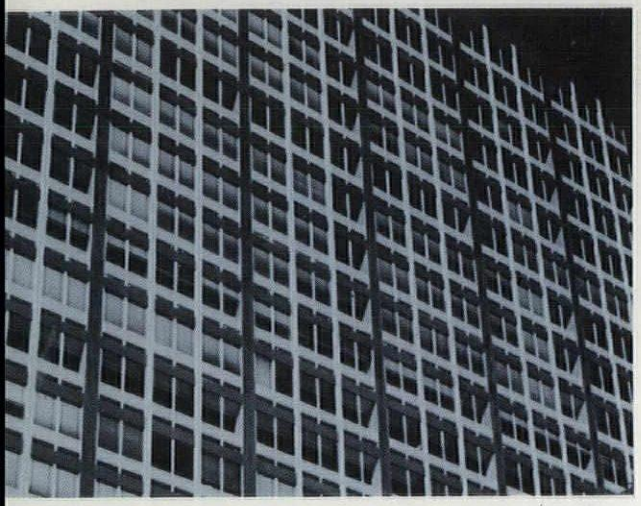
Photos: Louis Checkman
Hedrich-Blessing

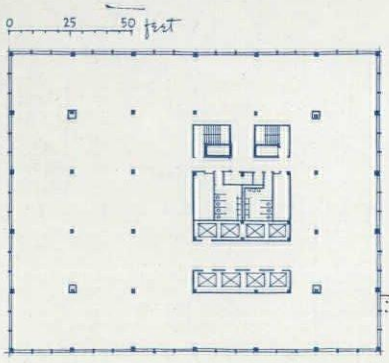


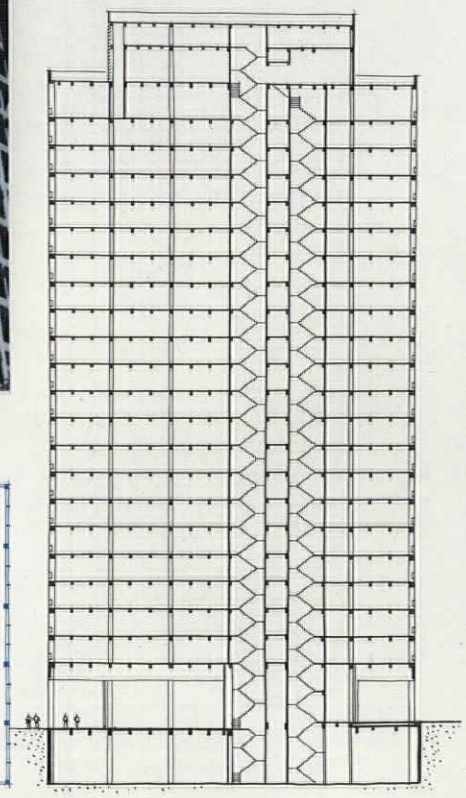












comparative data

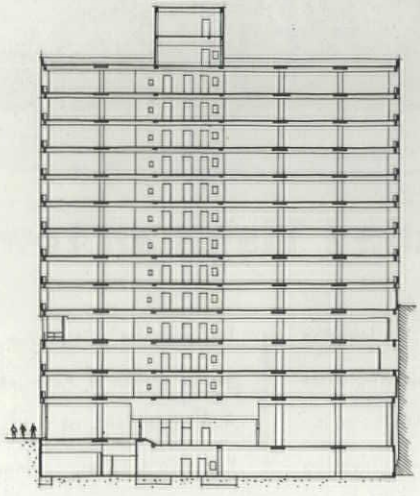
Mile High Center, Denver, Colorado.
I. M. Pei & Associates, Architects
Area of site: total complex, including tall office building; 4-story U. S. National Bank Building; and 2-story Transportation Building occupies a site of 79,800 sq ft
Gross floor area: (tower building only) 457,502 sq ft
Office-use: (tower building) 374,523 sq ft—82% of total
Number of floors: 23, plus basement
Floor-to-floor height: 11'-2"
Over-all height: 286'-0"
Mullion spacing: 4'-2"
Materials & Methods: steel frame, in 25'-0" bays; exterior wall; aluminum and porcelain enamel; polished plate glass; polished plate insulating glass between connectors and floor sill; fixed aluminum sash, aluminum frames. Perimeter induction air-conditioning system; conventional duct distribution at interior space
Ground-floor use: public lobby; plaza, landscaping; pools; no commercial space
Provision for car parking: none

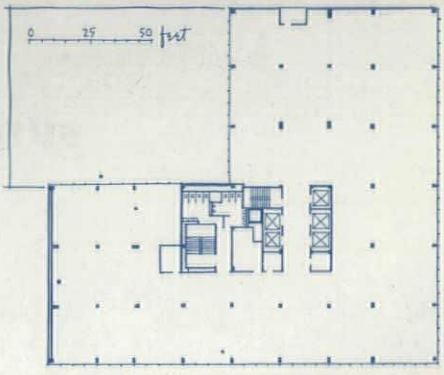
Photos: Julius Shulman

comparative data

Mall Office Building, Philadelphia, Pennsylvania. Charles R. Colbert, Architect-Planner; Mark P. Lowrey, Senior Associate; Salvatore C. Moschella, Associate; Arthur Rolfs, Jr., Production Chief
Area of site: 25,184 sq ft
Gross floor area: 244,512 sq ft
Office-use: 202,312 sq ft—82.5% of total
Number of floors: 13
Floor-to-floor height: 11'-4" in the main
Over-all height: 183'-3"
Mullion spacing: 5'-0" (typical)
Materials & Methods: reinforced-concrete structure in (typical) 20'-0" x 25'-0" bays; granite spandrels on lower floors; aluminum and glass curtain walls above; actinic glass; bright aluminum mullions; fully air conditioned
Ground-floor use: lobby, bank, rental space
Provision for car parking: 5000 sq ft, in interior court at street level

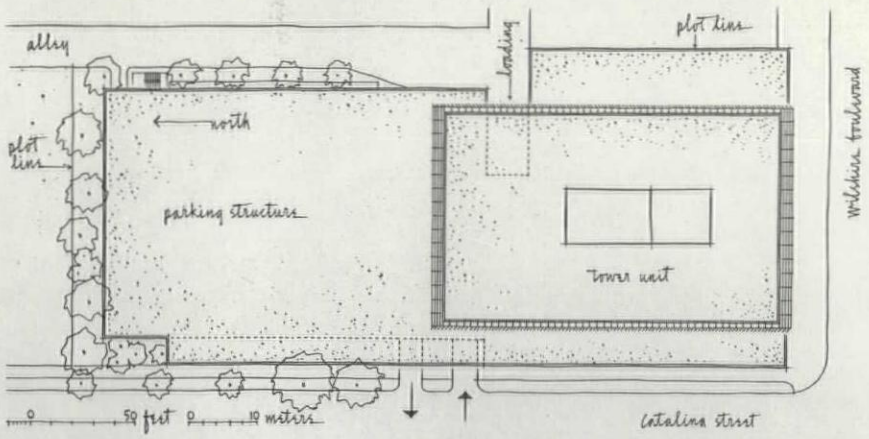
Photos: Lawrence S. Williams





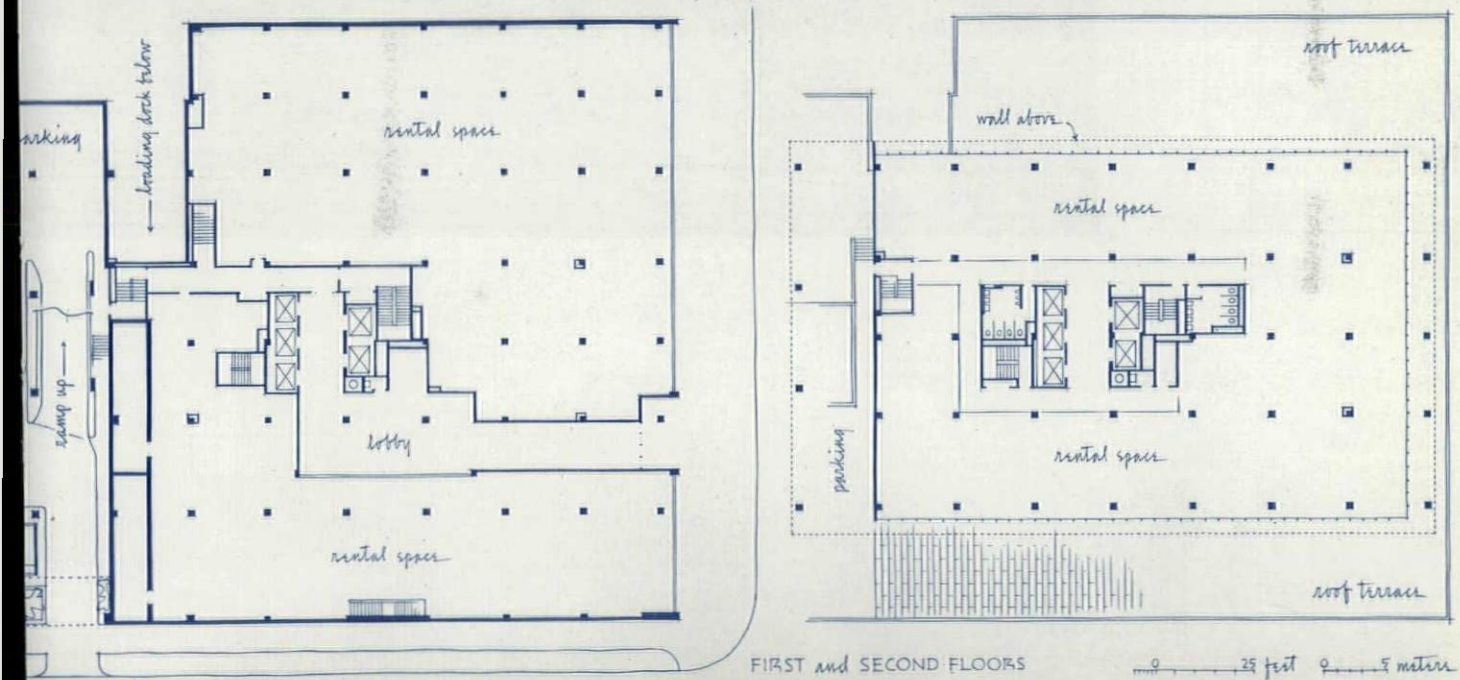
sun-shaded Tishman tower

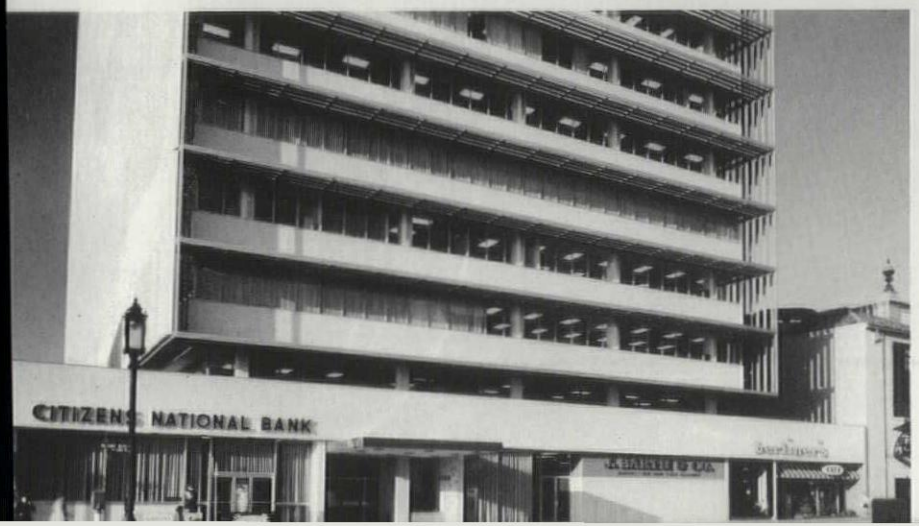
location	Los Angeles, California
architects-engineers	Victor Gruen & Associates
in charge, Los Angeles office	R. L. Baumfeld, partner
planning-engineering	Edgardo Contini, partner



Many factors distinguish this building from most of the current work in the high-rise office-building category. The structure is sited in direct relation to the regional network of highways and existing hotels. Garage facilities, located in an adjoining structure at the base of the office tower, have been provided in excess of the legal requirements. Direct interior connection permits tenants and visitors to reach offices under cover. There are open-air terraces for the use of the building's occupants. Well placed planting helps to tie office tower and garage structure to the residential neighborhood at the rear of the property. In the tower, natural light penetrates all of the offices on four sides of the central elevator and service core. Sun and sky glare are controlled by vertical and horizontal louvers (SELECTED DETAILS). Structurally, mechanically, and in the choice of materials, the building is of unusual interest.

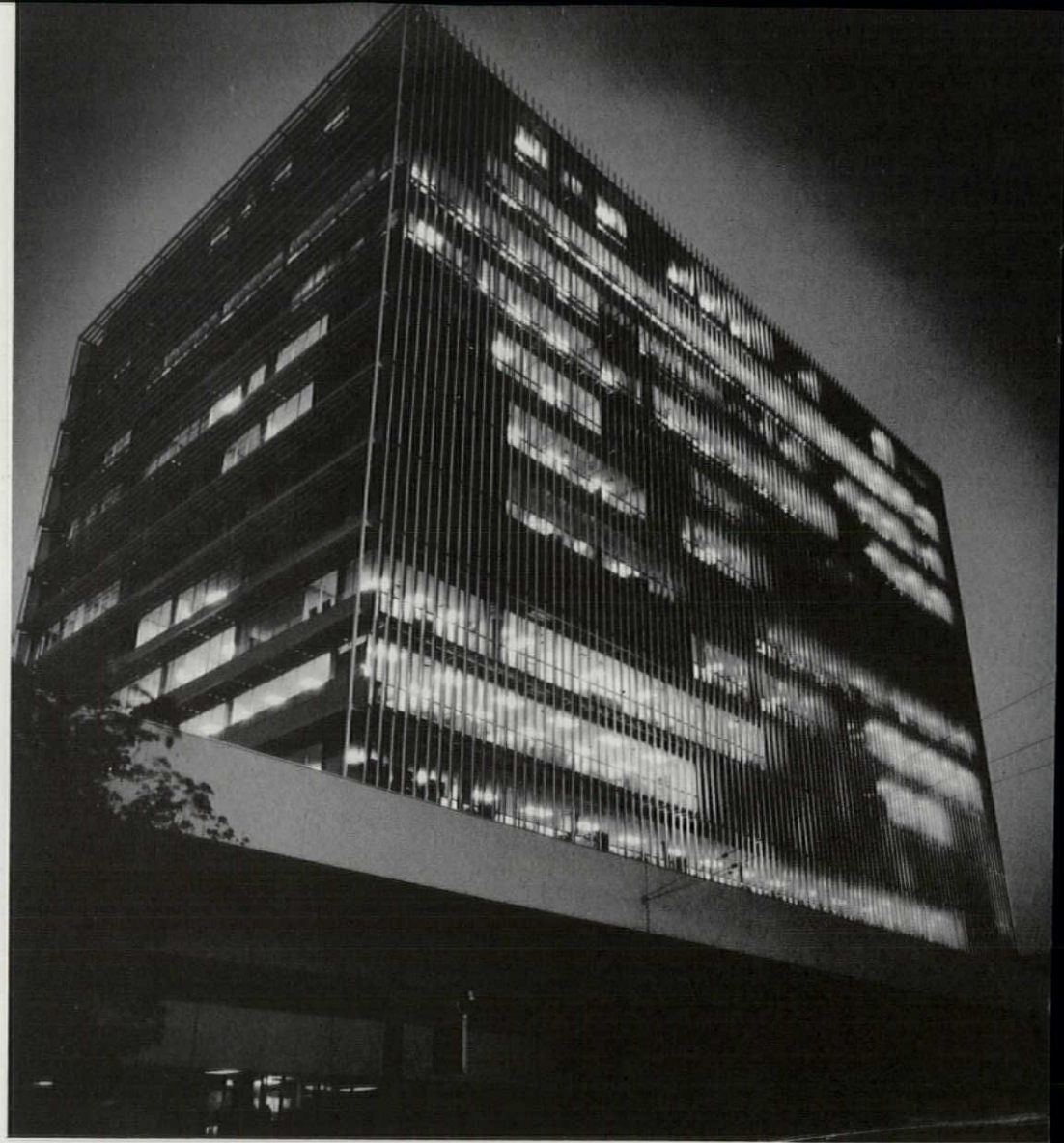
The office tower is a steel frame four bays wide, eight bays long. Beams perpendicular to the building's longitudinal axis rest on girders welded to columns. Beams are cantilevered beyond the column lines of the two central bays and connected by shear splices to beams which extend beyond the exterior-column lines. Rigidity is equal in both directions, because of the rotation of alternate columns. The rigid-framing system has made it possible to eliminate all structural walls above the basement level, since no shear

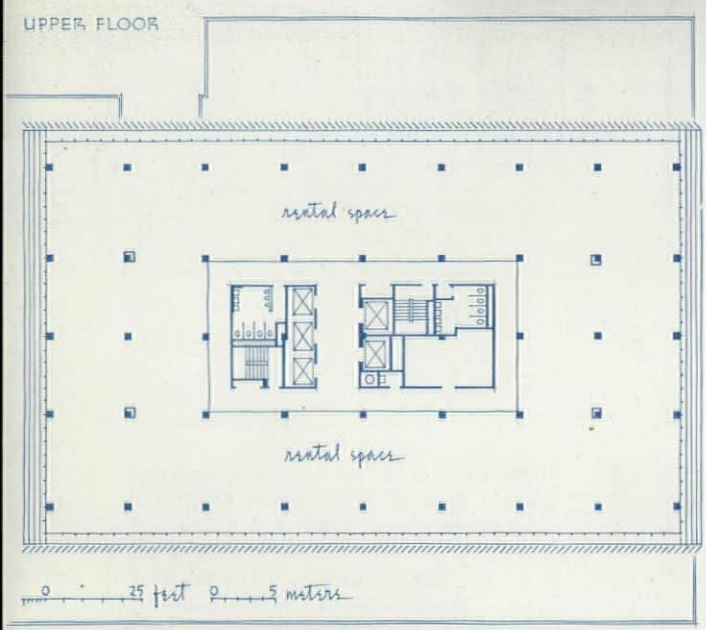




Aluminum louvers for sun-and-glare control lend the building a delicate surface texture, and a lightness not often found in large office building construction. Louvers on all four sides of the building are fixed to outriggers on the exterior. Heat rays are in this way stopped before reaching the skin of the building; a factor responsible for reducing the air-conditioning load by approximately 80 tons. Outriggers serve not only to support louvers but also to hold a traveling platform for window and wall cleaning and louver maintenance.

Photos (except as noted): Julius Shulman





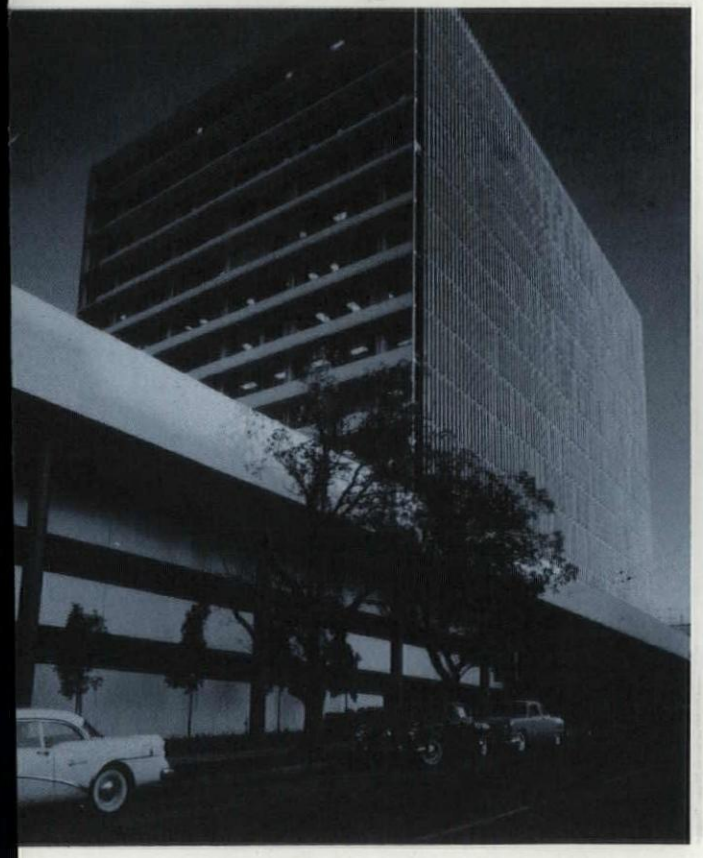
WEST ELEVATION

walls were required. Interior partitions as well as exterior skin are also non-structural and thus as light as possible. Weight of structural steel has been kept to approximately 10 lb per sq ft. The five-level garage structure is of reinforced concrete. As in the office tower, the lateral forces are transferred to the columns. Footings for garage and tower are supported on piles.

A central plant in the basement distributes both chilled water and low-pressure steam to fan rooms on every second floor. Conditioned air is distributed from the fan rooms by two sets of main ducts; one carrying chilled air, the other warm air. Mixing dampers blend chilled and warm air to provide the inside temperature desired by individual tenants. Ceiling diffusers supply the fresh air as well as remove the stale. The duct system is conveniently fitted between the two-level space created by girders and beams — headers parallel the girders; branches are located between beams. The basement is directly serviced by a truck loading platform and also contains the building's electrical transformers, switch gear, and telephone panels.

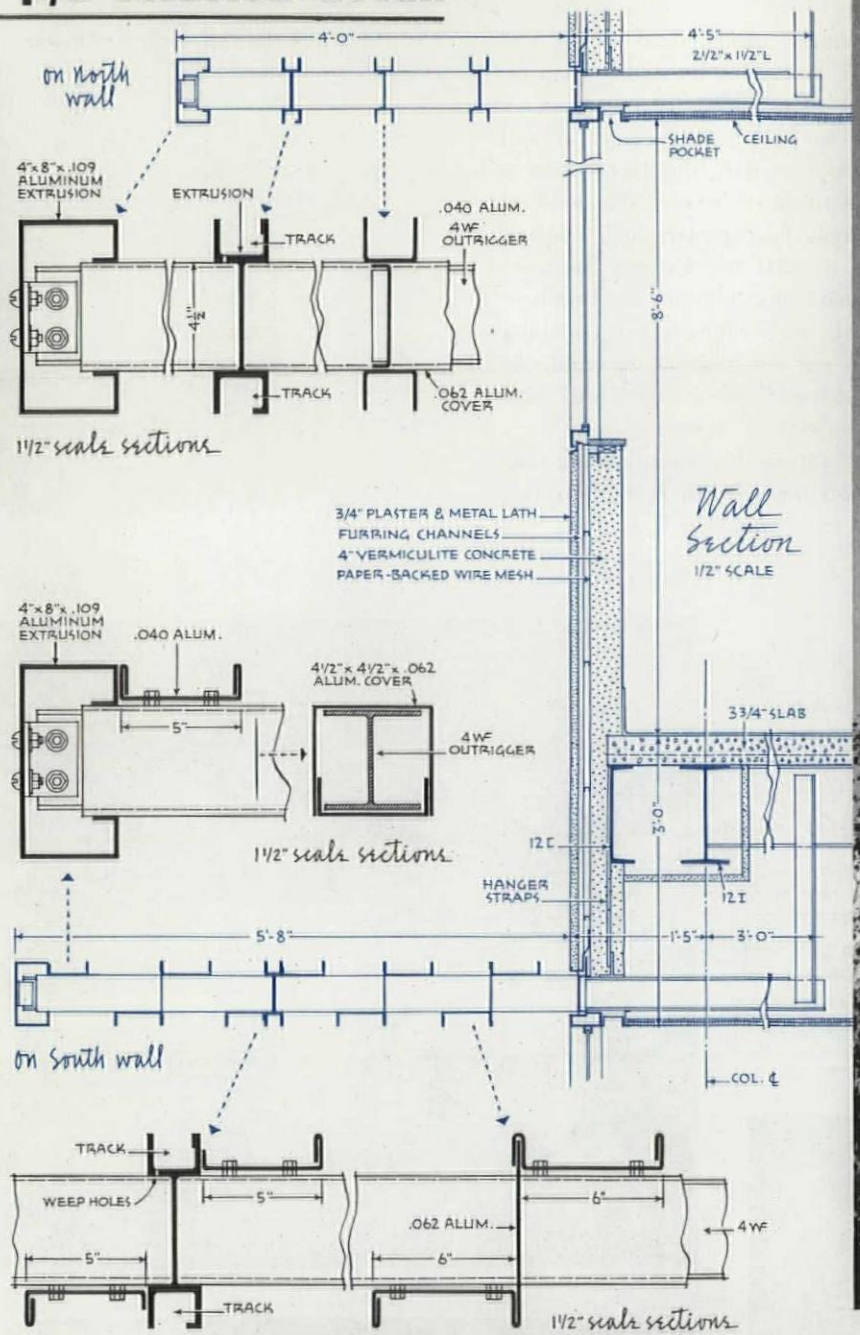
Consultants on the mechanical and electrical work were Ralph E. Phillips Inc. General Contractor was C. L. Peck.

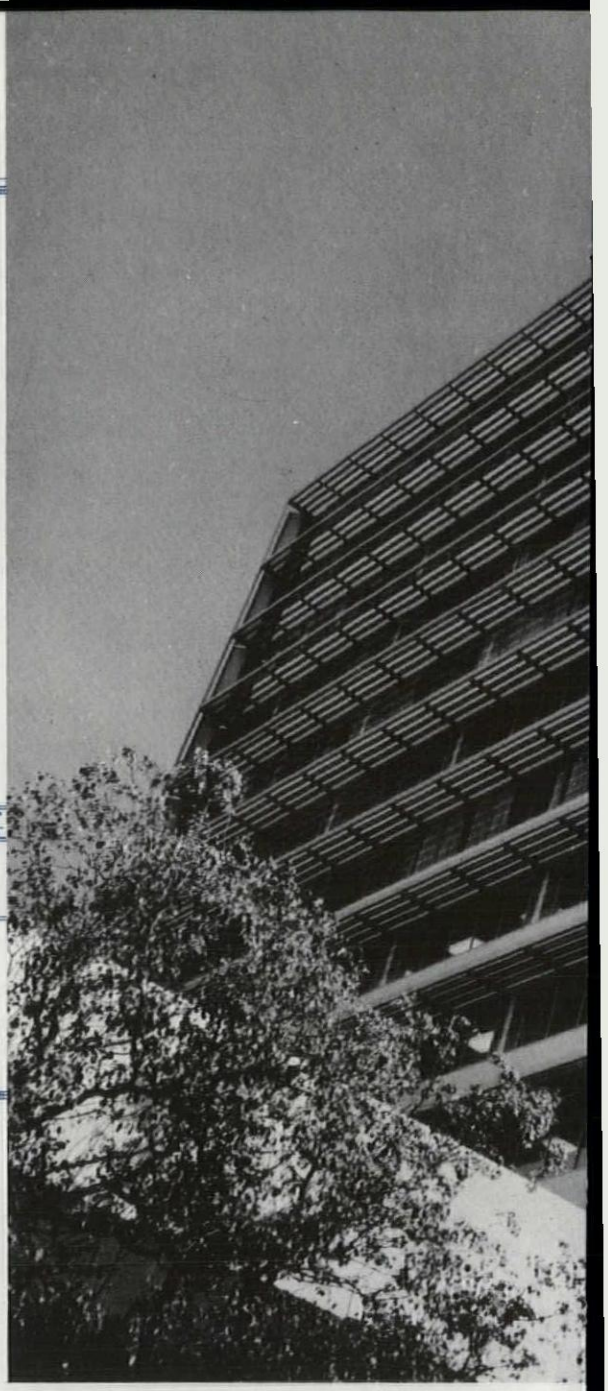
Steel-framed office tower is dramatically juxtaposed with broad reinforced-concrete base which contains parking space for 357 cars, mechanical equipment, shops, and other rental area. Exterior wall materials are: glass — clear and translucent — set in aluminum frames; aluminum for vertical and horizontal louvers; vermiculite concrete for spandrels at garage and at north and south façades of office tower; face brick for portions of the garage and basement walls. Concrete floor and roof slabs were cast in corrugated-steel forms, which have been left in place. Metal forms also served as temporary work floor for construction crew. Walls of street-floor lobby (right) *are surfaced with travertine and cement tile.*

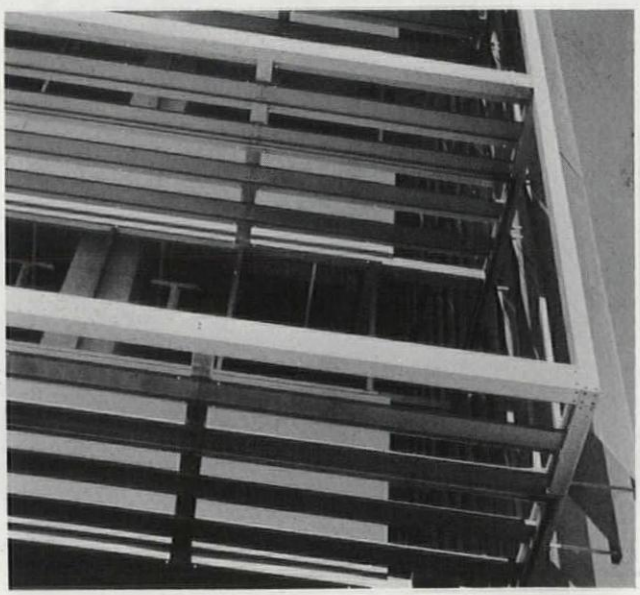


p/a selected detail

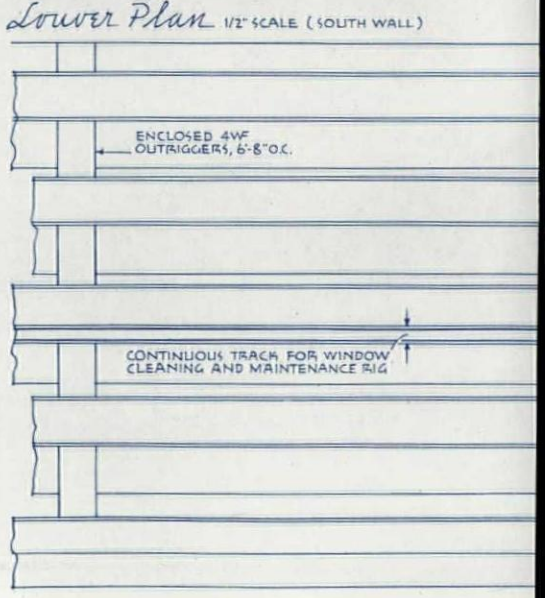
sun-control devices





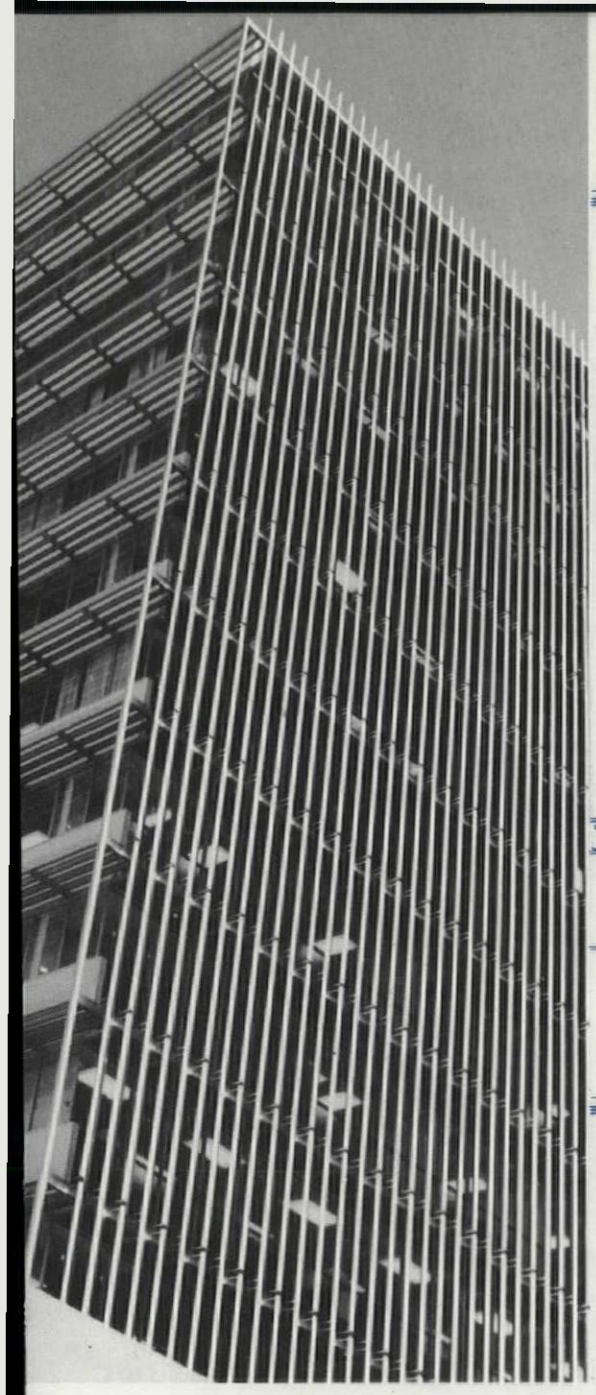


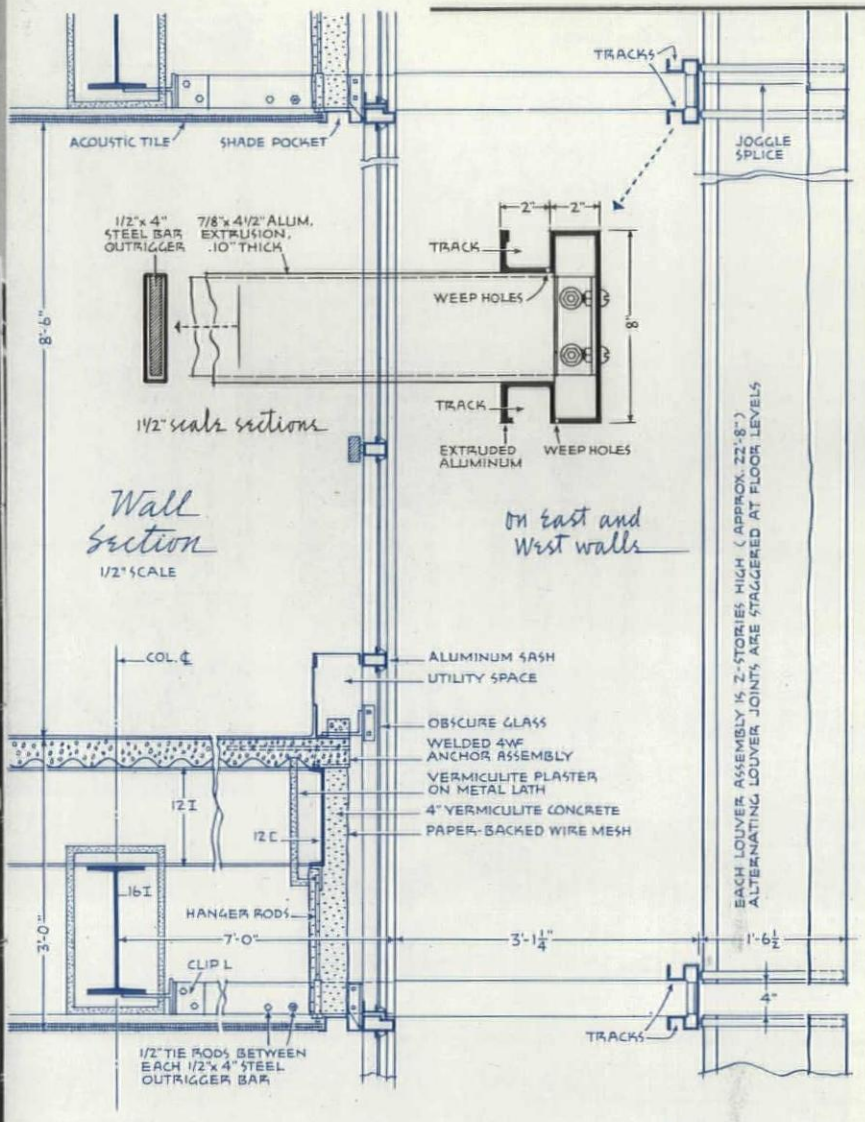
GORDON SOMMERS

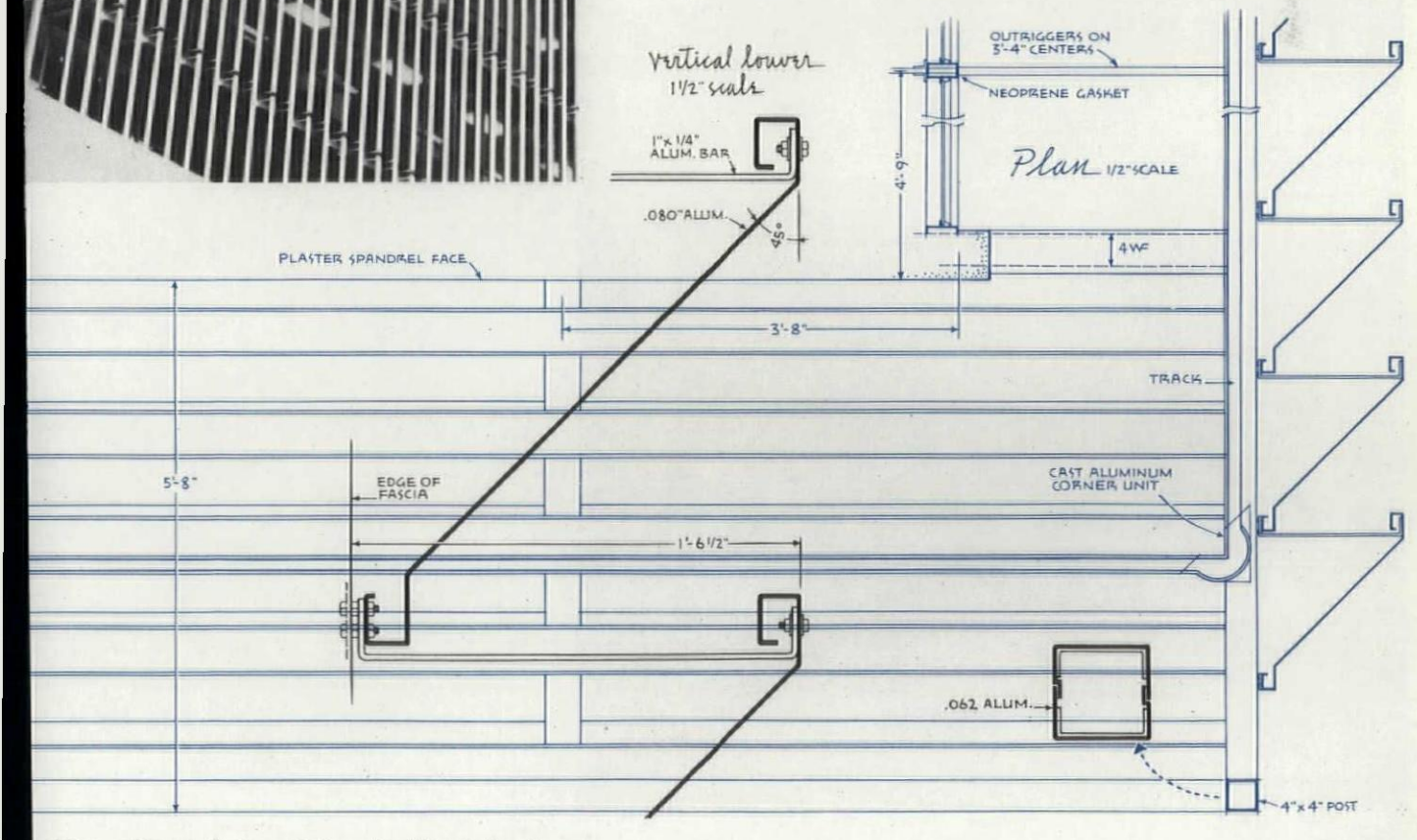


OFFICE BUILDING, Los Angeles, Calif.

sun-control devices



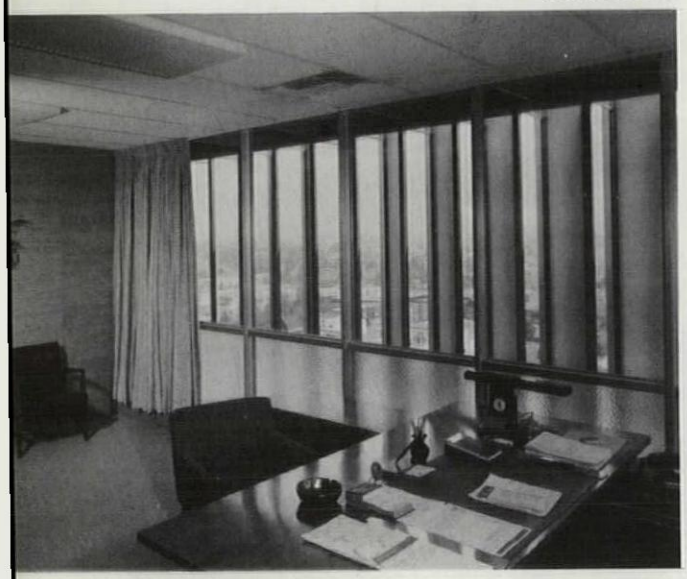




Victor Gruen & Associates, Architects-Engineers

sun-shaded Tishman tower

Gordon Sommers

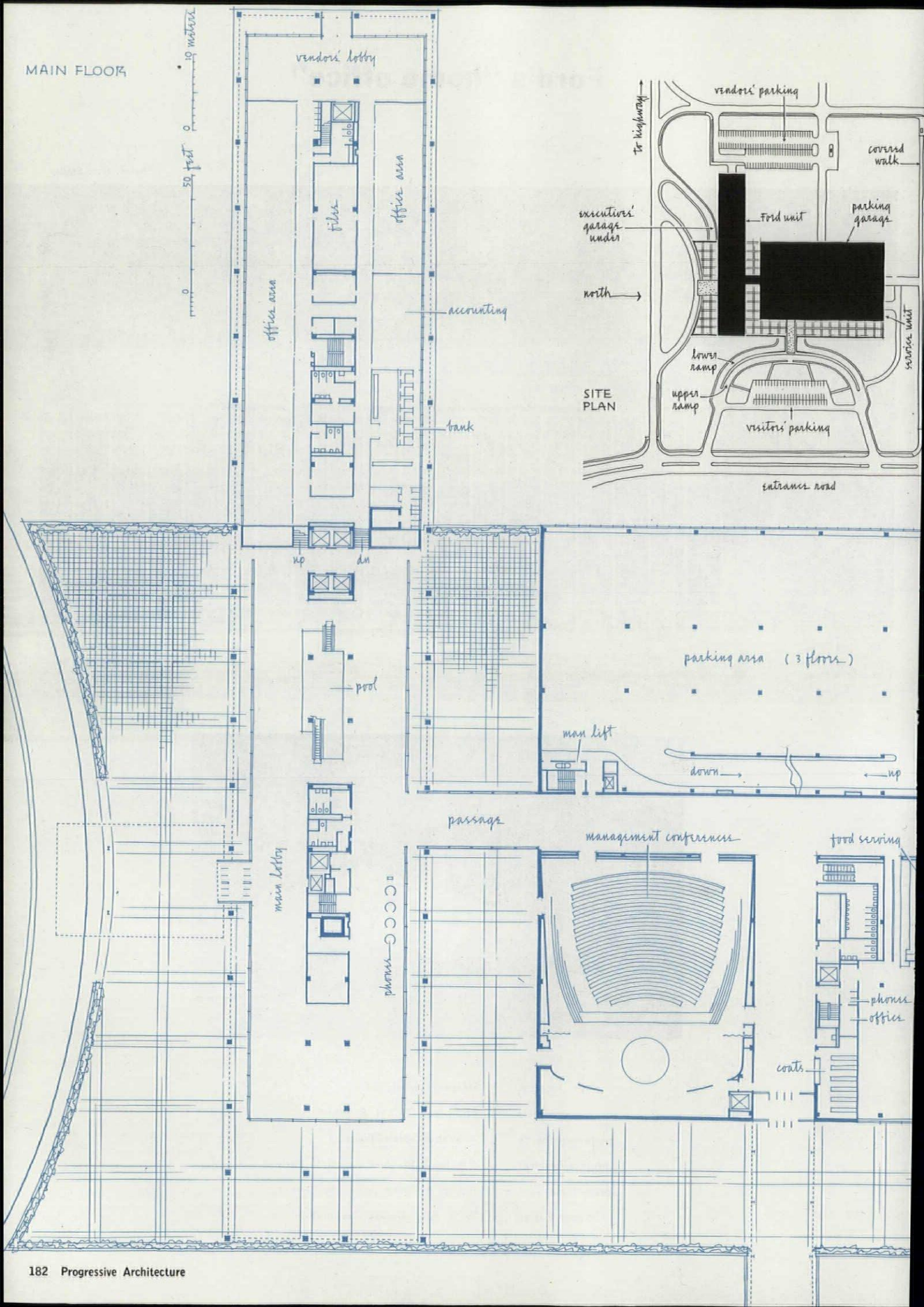


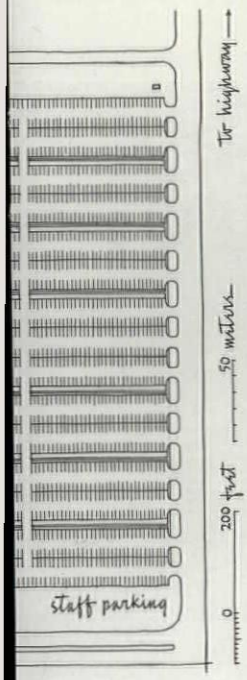
Office areas receive a maximum of controlled daylight through glass areas which continue around the entire tower building. Vertical members of the exterior screening device intercept low-angle morning and afternoon sun on the east and west. Horizontal canopies on the north and south sides block sky glare and high midday sun. Nonstructural exterior walls were made up of aluminum frames, shop fabricated and then attached to the cantilevered edges of each floor. Aluminum frames hold fixed, clear glass above the sill line; vermiculite concrete or obscure wire-glass in the spandrel section. Vermiculite concrete was pneumatically applied from the inside of the building, against a layer of paper-backed metal lath.

Ford's "home office"

Photos: Ezra Stoller

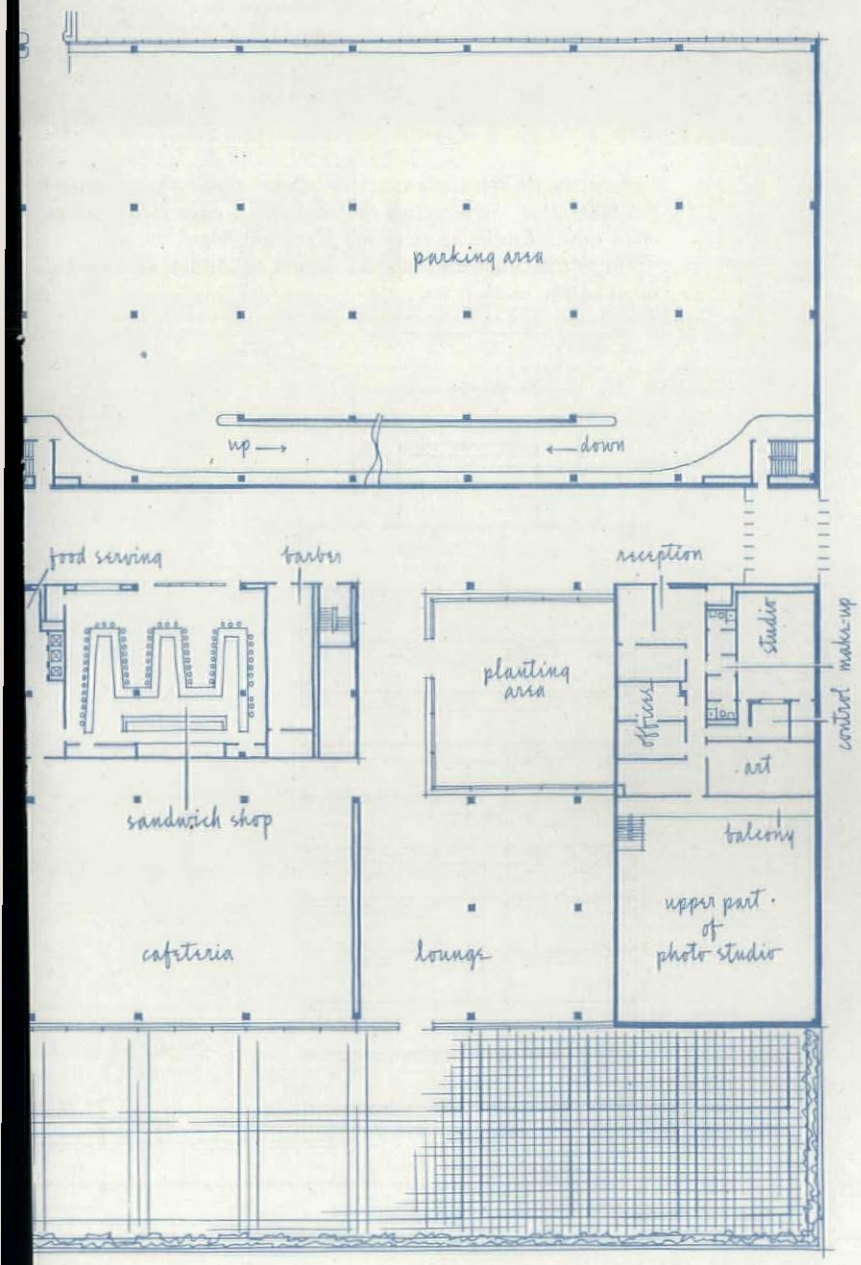
location	Dearborn, Michigan
architects	Skidmore, Owings & Merrill
partner-in-charge	J. Walter Severinghaus
project designer	Charles E. Hughes, Associate Partner
project manager	Robert K. Posey, Associate Partner
interior design	W. B. Ford Design Corporation


MAIN FLOOR
10 meters
0
50 feet
0
vendors' lobby
files
office area
office area
accounting
bank
up
dn
pool
main lobby
passage
phones
parking area (3 floors)
man lift
down
up
management conferences
food serving
phones
offices
coats
To highway
vendors' parking
covered walk
executives' garage under
Ford unit
parking garage
north
service unit
lower ramp
upper ramp
visitors' parking
entrance road
SITE PLAN



Central Staff Office Building for Ford Motor Company has, in addition to its own distinguished qualities, the benefit of a site 90 acres in extent—the landscaping of which, incidentally, was designed by the building's architects.

Two main portions comprise the complex that houses some 3100 employes—a 12-story, 200-ft-high office block to the south, and a three-level employe service annex to the north; the two joined by an enclosed passage. All areas are fully air conditioned. In the office-building portion, the lower 8 levels of which are connected by escalators as well as elevators, the architects have provided completely flexible, peripheral space, subdividable at will by an ingenious system employing a series of co-ordinated partition components that may be variously joined to create efficient office groupings (described in detail further on). According to J. Walter Severinghaus, S.O.M. Partner-in-Charge of the entire project, "this flexibility of office arrangement has already proved advantageous in making office layouts conform to administrative organizational changes."



In the service unit, there are a three-level parking garage, a 500-seat management conference room, a 625-seat cafeteria, a sandwich shop, lounges, and—in a penthouse—both large and small private dining rooms, and a roof garden.

The complex is entered from all four sides—a formal entrance on the south, reached by an elevated, curved ramp; a visitors' entrance to the east, with its own parking area; an entrance for vendors who come to talk business with Ford's Purchasing Department, at the west end of the office block; and, to the north, adjoining a huge parking field, the employes' entrance, that leads through the service annex to the office block.

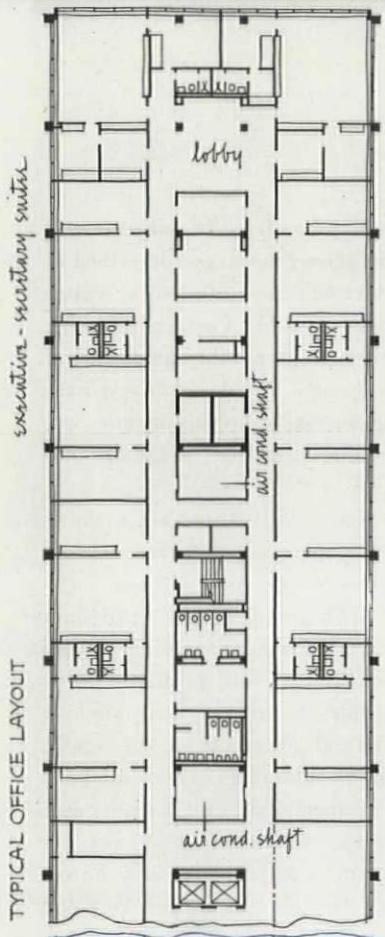
Since the site required building on point-bearing piles, many decisions about structure and surfacing materials (*see Materials & Methods, page 191*) were made with the purpose of achieving lightness—a steel-grid frame, with cellular-steel floors and movable interior partitions; curtain wall of dark-green, insulated, porcelain-glazed steel panels; aluminum grid members; heat-absorbing glass. Both heating and air conditioning utilize an interior dual-duct system, fed from a core; a window induction unit occurs in each 4′-8″ module. The entire plan, incidentally, is based on a 4′-8″ x 4′-8″ module.

This building is so enormous that one almost loses the sense of scale; the office block, for example, 85′-3½″ in width, is 536′-9½″ long. The service unit, at the north side of the scheme, extends another 408′. There are 950,000 sq ft of floor space; parking, either in lots or in the garage, is provided for 2300 cars; and—a pertinent statistic—there are 205,000 sq ft of glass used—nearly five acres.

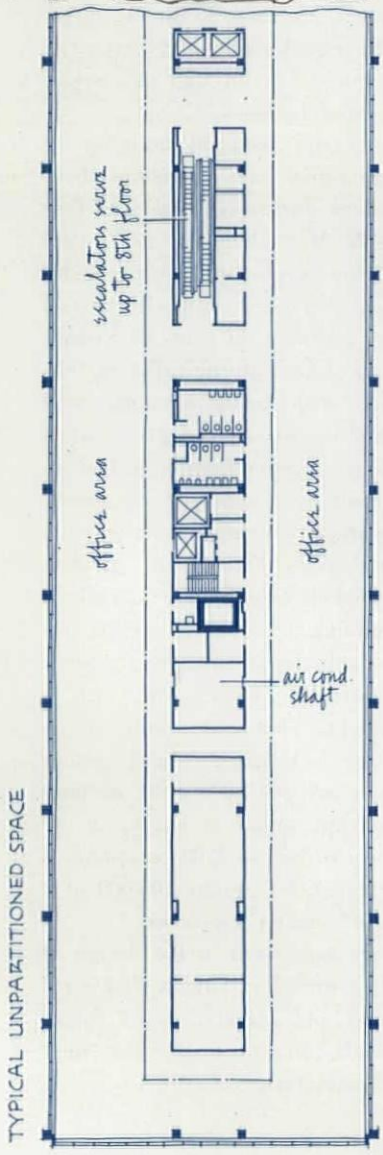
Engineers associated in the design of the building were Weiskopf & Pickworth (Structural) and Jaros, Baum & Bolles (Mechanical). Bryant & Detwiler were General Contractors.

The combined floor plan (left) *demonstrates the complete flexibility that characterizes the plan—from open loft space to office suites. Escalators serve the first eight floors.*

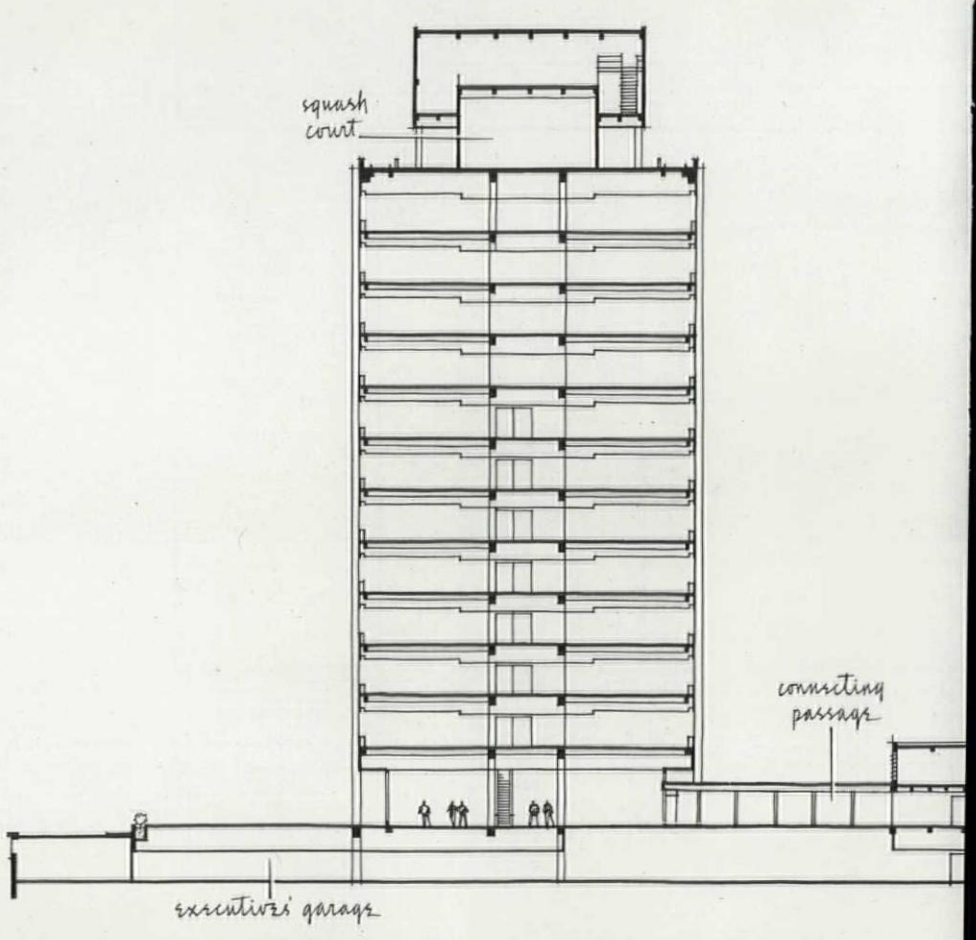
The entrance terrace (above) *occurs at the top of a curved ramp on the south front.*

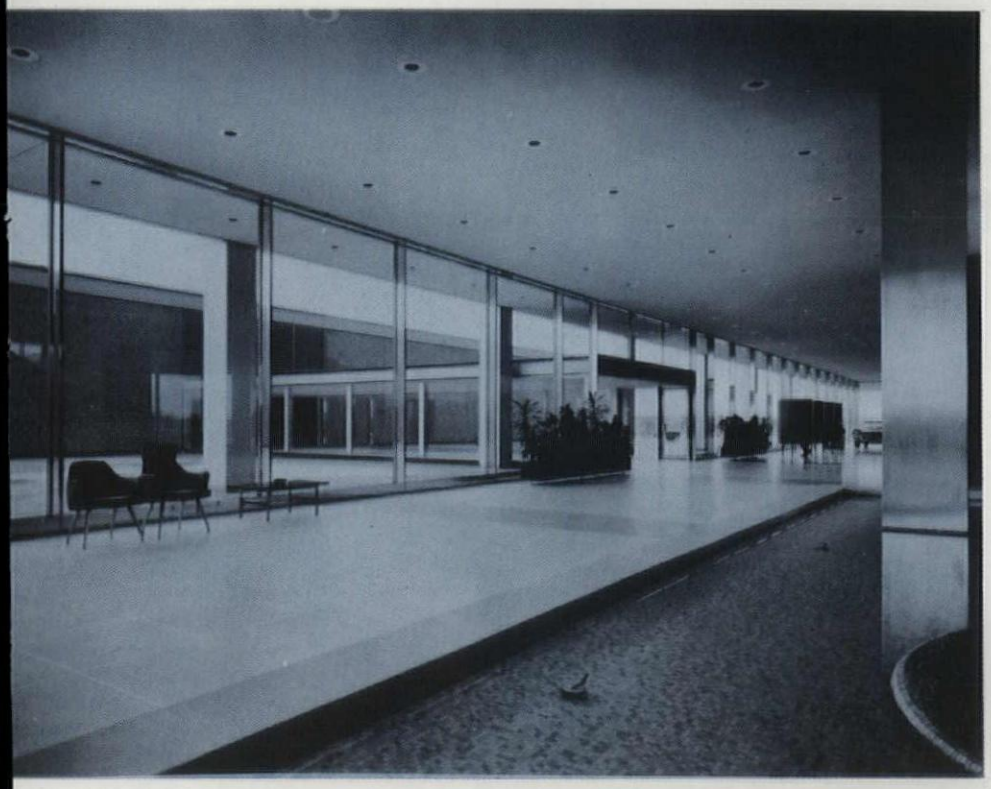


TYPICAL OFFICE LAYOUT



TYPICAL UNPARTITIONED SPACE

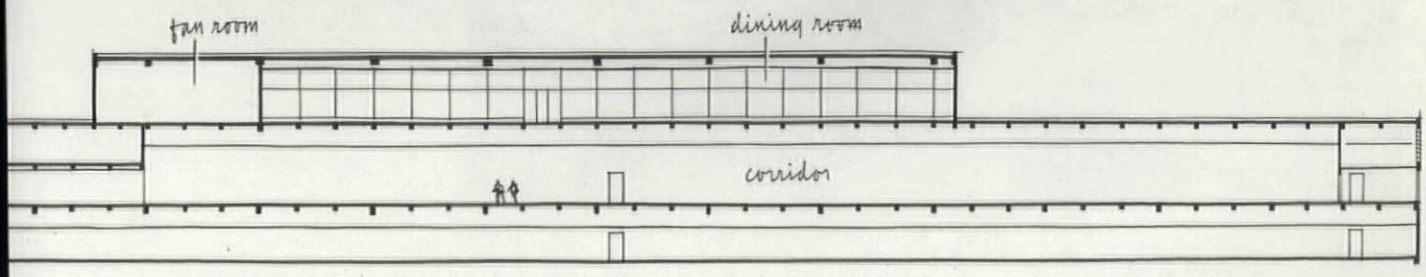


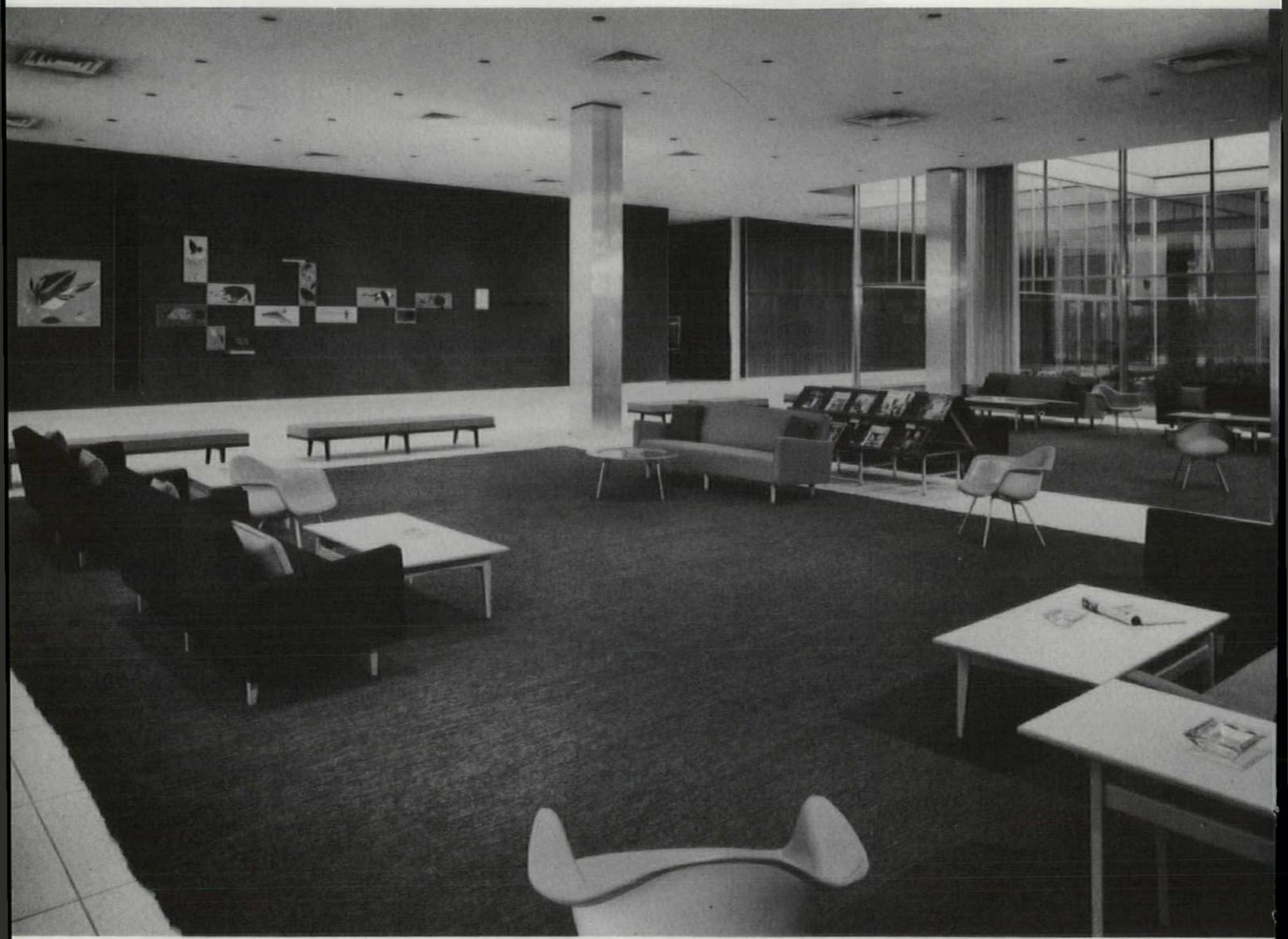


The wall facing the official entrance (above) *is of French Rouge Antique marble. The screen bearing the company name is rosewood, with aluminum inlays. The reception desk is made of rosewood and stainless steel.*

The rear portion of the lobby (left) *leads by an enclosed covered passage back to the service unit. A 37-foot, mosaic-lined pool with set sprays, designed by Richard Jennings, occupies a central location in the lobby.*

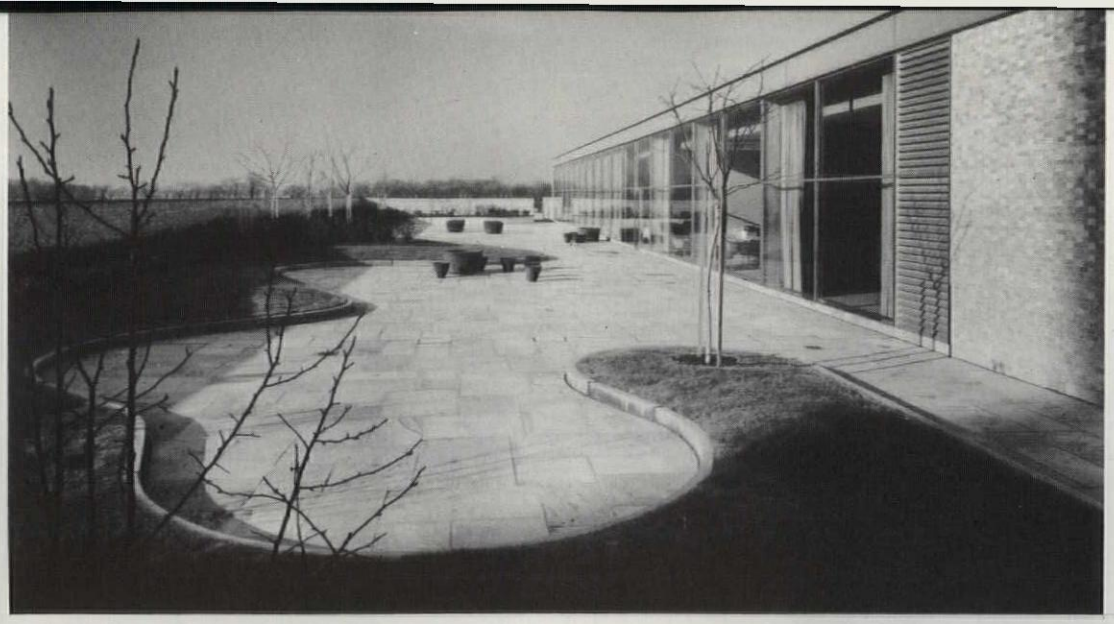
SECTION Thru MAIN CORRIDOR





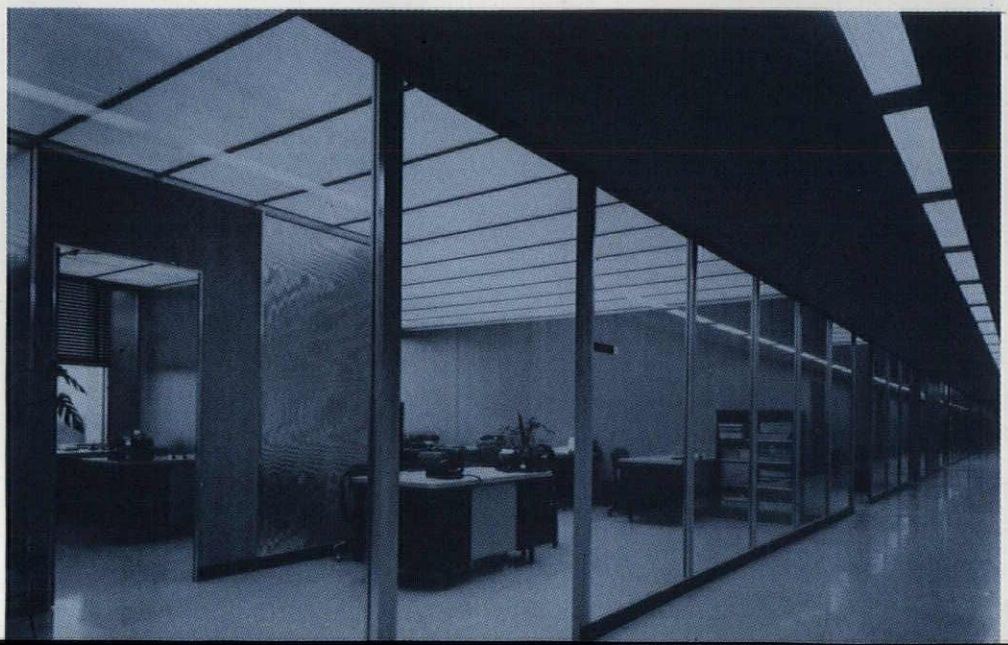
Adjoining the employes' cafeteria is a spacious lounge (above) *that looks out, through glass walls, onto a planted court. The three-dimensional abstraction, symbolizing Michigan wildlife, is by Charles Harper.*

Opening off the main corridor of the service unit is a sit-up sandwich shop (left), *with walls surfaced in cherry-veneer paneling. Rear wall of the cooking recess is green-glass mosaic; panels above are stainless steel. The chairs are green, and the rubber-tile flooring, beige.*

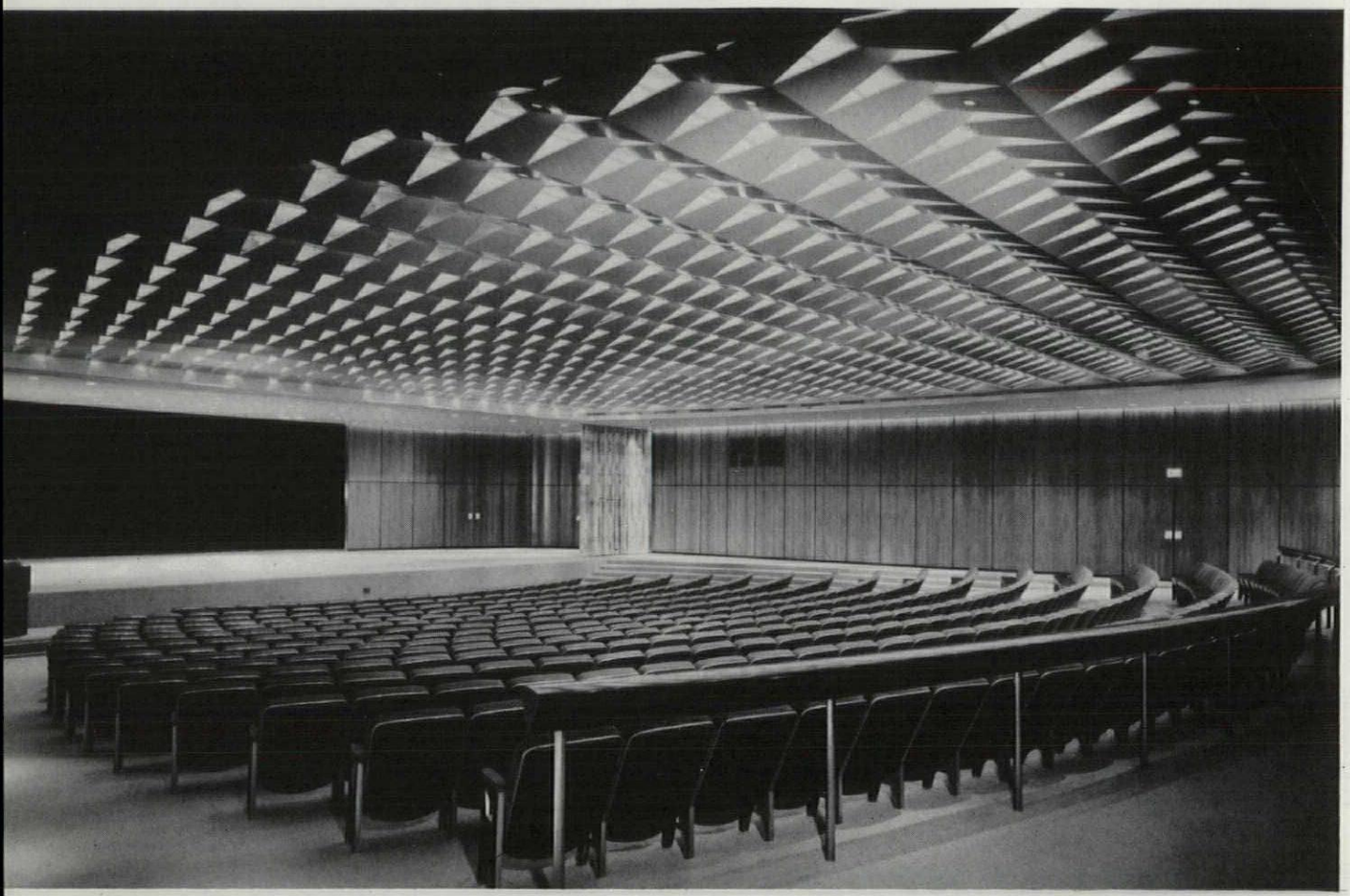


A penthouse, with a walled roof garden (S.O.M. designed), houses a series of private dining rooms, which, with folding partitions pushed back combine into one large room (bottom) *with adjoining lounge.*

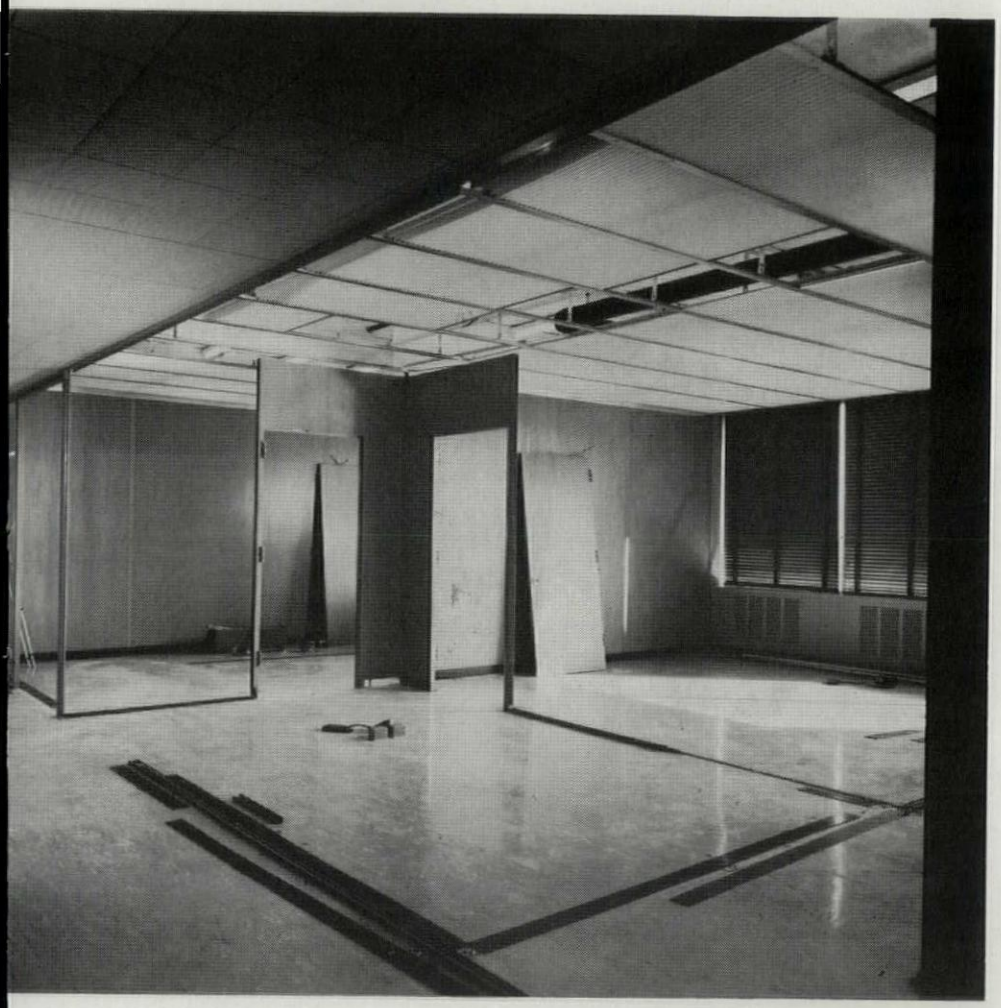
Ford's "home office"



Offices and office suites are very largely on display, due to the use of plate-glass panels as the standard corridor-wall unit. The modular partition elements are clearly shown in the pictures on these two pages—fireproof Korina veneer units where a solid wall is wanted, and aluminum-framed panels in both clear and textured glass. For the more elaborate office suites, carpeting, rather than rubber tile, is used for the floor surface.



Teak surfaces the walls of the 500-seat management conference room (acrosspage), *whose stage is equipped with a turntable. The ceiling is composed of bent, diamond-shaped panels of steel that conceal both incandescent and fluorescent lamps, which allow a wide variety of light quality and intensity. The floor cover is dark-gray carpeting.*



A panel, rather than post-and-panel, system constitutes the movable office partitioning. Components include 1¾"-thick panels with Korina wood veneer and fireproof core; plain panels framed in aluminum extrusions; corridor panels of polished plate glass. Ceilings are luminous vinyl plastic in office spaces and perforated-metal pans in corridors; flooring is light beige, marbleized rubber tile.

Materials and Methods

construction

Foundation: pile-supported concrete pile caps—Raymond Concrete Pile Company; concrete slabs and foundation walls. **Structures:** steel frame—Bethlehem Steel Company. **Wall Surfacing:** interior: glazed blocks, marble, plaster, wood-veneer paneling; exterior: fixed sash and insulated panels—Moynahan Bronze Company; porcelain enamel in aluminum frames—Ingram-Richardson Manufacturing Company; unit glazed brick—Claycraft Company; ceramic tile—American-Olean Tile Company; granite—Cold Springs Granite Company. **Floor Surfacing:** rubber tile—Congoleum-Nairn, Inc. **Ceiling Surfacing:** mineral textured tile, perforated metal pans—National Gypsum Company; acoustical plaster. **Roof Surfacing:** built-up roofing. **Waterproofing & Dampproofing:** cement waterproofing. **Insulation:** thermal: cellular-glass insulation—Pittsburgh Plate Glass Company. **Partitions:** offices: movable type, mineral core—U.S. Plywood Corporation; toilet: structural glass—Libby-Owens-Ford Glass Company. **Windows:** sash: fixed-in aluminum frames—Moynahan Bronze Company, E. K. Geyser & Company; heat-absorbing plate glass—Pittsburgh Plate Glass Company. **Doors:** interior: mineral core, wood veneer—U. S. Plywood Corporation; entrance: plate glass in stainless-steel frames—Moynahan Bronze Company; folding and overhead: stainless steel, flush hollow metal. **Hardware:** lock sets—Sargent & Company; door closers—Oscar Rixson Company, LCN Closers, Inc., Sargent & Company, Norton Door Closer Div. Yale & Towne Manufacturing Company; hinges—McKinney Manufacturing Company; casement—General Bronze Corporation; fire doors—Kinnear Manufacturing Company; panic exit—Von Duprin Div. Vonnegut Hardware Company.

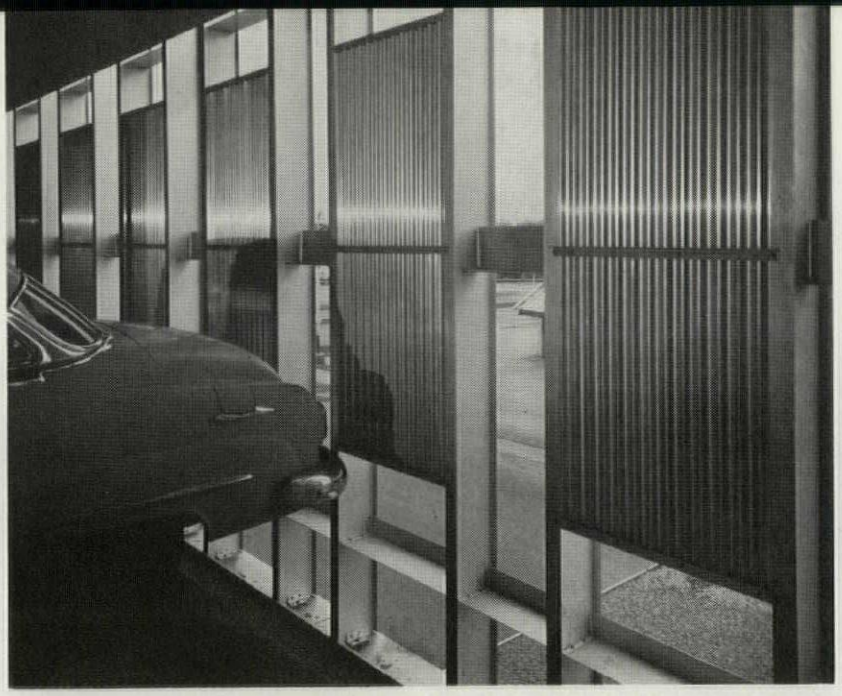
equipment

Specialized Equipment: auditorium seating—American Seating Company; program system—International Business Machines Corporation. **Elevators:** automatic scheduling—Haughton Elevator Company; cabs, doors—W. S. Tyler Company. **Moving Stairway:** Westinghouse Electric Corporation. **Lighting Fixtures:** luminous ceilings, recessed troffers, recessed incandescent—Fullerton Manufacturing Company; stage area: recessed spotlights—Century Lighting, Inc. **Electrical Distribution:** switchgears—Allis-Chalmers Manufacturing Company, Westinghouse Electric Corporation; cellular-steel floors—H. H. Robertson Company. **Plumbing & Sanitary:** water closets—American Radiator & Standard Sanitary Corporation and Case Manufacturing Corporation; lavatories—Sloan Valve Company; toilet seat—C. F. Church Manufacturing Company. **Heating:** main lobby: hot-air system, office areas: window induction units, penthouse: radiant-panel ceilings—York Corporation; furnace—Babcock-Wilcox Company, Cleaver-Brooks Company; radiators—Vulcan Radiator Company, American Radiator and Standard Sanitary Corporation; ducts—Thermotank, Inc.; controls—Johnson Service Company. **Air Conditioning:** centrifugal compressor—York Corporation; condenser—J. F. Pritchard Company; diffusers—The Pyle-National Company, Tuttle & Bailey Inc.; centrifugal blowers—Buffalo Forge Company; filters—American Air Filter Company; pneumatic controls—Johnson Service Company.

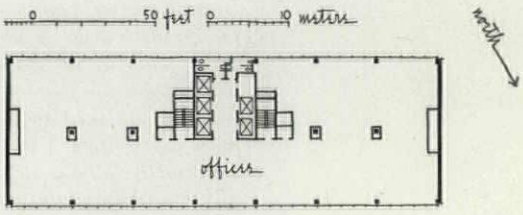
Paul Dorsey

the medical towers

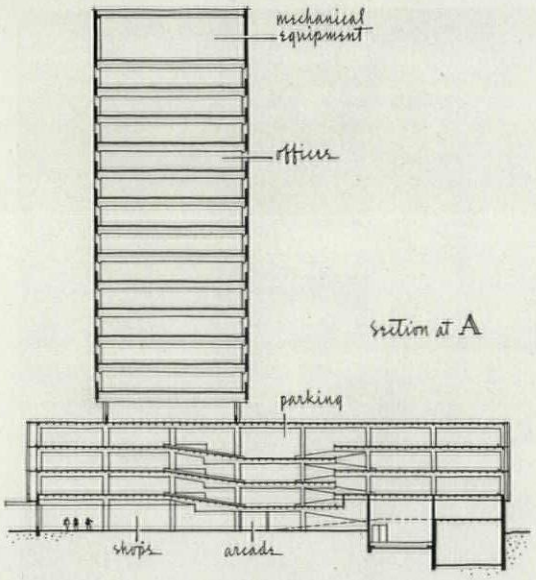
This building is located five miles from downtown Houston, in an area expected to expand rapidly within the next decade. Texas Medical Center, with its six major hospitals, adjoins this recently completed professional building, which, parenthetically, was honored last month with a national award of merit by the AIA. Offices for 125 doctors and allied specialists have been accommodated in the tower portion of the structure. Parking for all tenants and their patients is provided on three floors above the ground level. The open garage floors, above the glazed shopfronts of the first floor, have been screened by an aluminum grill, according to the architects, "to achieve the proper relationship of solids and voids, and still maintain a pattern compatible with the skin wall on the tower above." Exterior wall treatment of the upper office floors is an aluminum grid containing inserts of glass and porcelain-enameled panels. This pattern is repeated on all office floors except the fifth, where another window treatment has been introduced to separate visually the masses of the tower and the base. For simplicity, the aluminum framework has been carried beyond the office floors to conceal the mechanical equipment at the roof level where louvers permit free passage of air. Mechanical-Electrical Engineers were Bernard Johnson & Associates; Structural Engineer, Walter P. Moore; General Contractor, Tellepsen Construction Company.

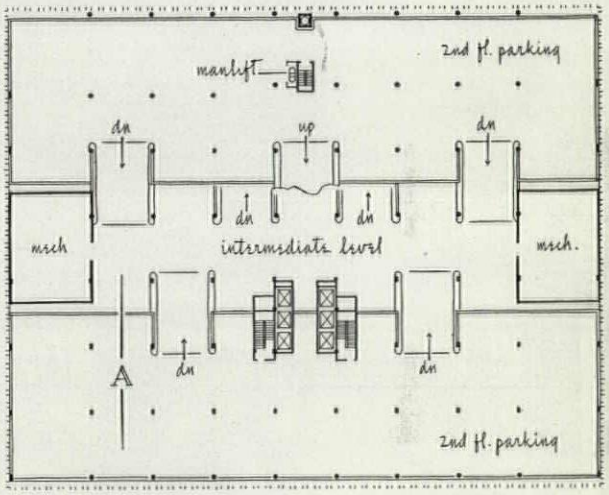


location	Houston, Texas
architects	Golemon & Rolfe
consulting architects	Skidmore, Owings & Merrill

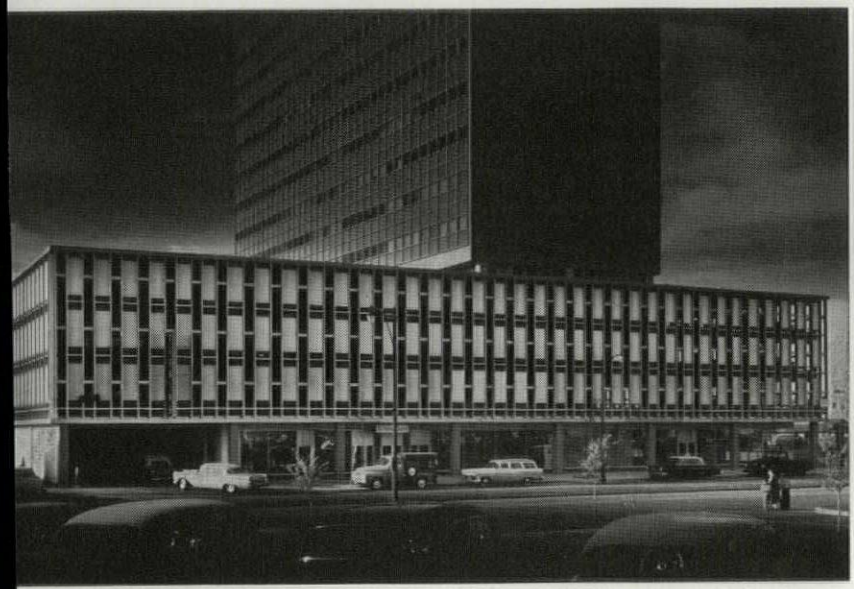


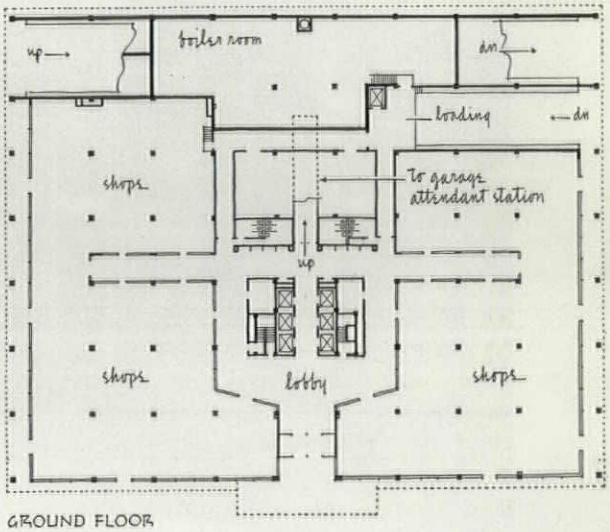
UPPER FLOOR (typical)



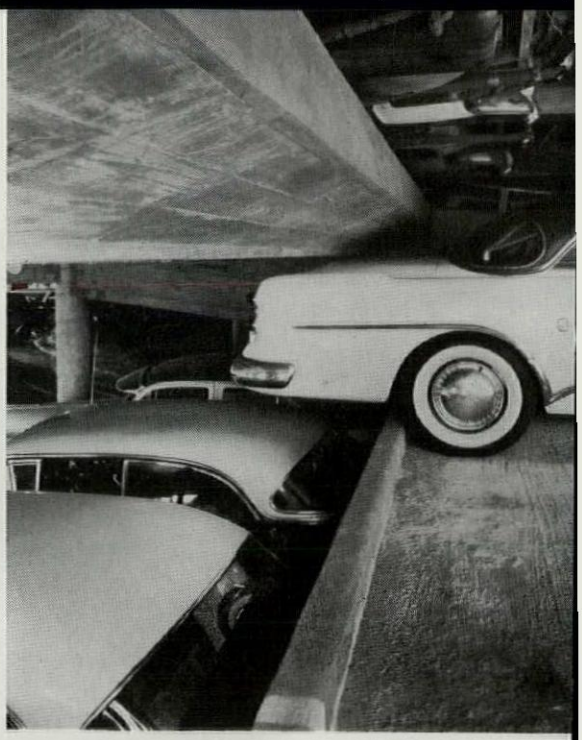


SECOND FLOOR





GROUND FLOOR



Structural, mechanical, and electrical: Columns and beams at the first floor and garage levels are of reinforced concrete. Concrete pan joist construction has been employed for the floor slabs in this area. The structural frame of the office tower is of steel—slabs are of steel decking with poured concrete topping. The tower portion of the building is air conditioned by an all-air, double-duct, high-velocity room unit system. The first floor is served by conventional, low-velocity, all-air, single-duct system. (See also MECHANICAL ENGINEERING CRITIQUE.) *Lighting fixtures for the tower portion are for the most part surface-mounted fluorescents with louvered bottoms. Public corridors have recessed incandescent fixtures.*

Considerable space has been saved in the garage structure by an ingenious arrangement of intermediate levels 5 ft below normal floor level, which permits ends of cars to overlap. The garage accommodates 525 cars—daily turnover is about 1800 cars. Automobiles are driven into the building and left with attendants on the first floor. A short interior corridor connects with the main lobby, shops, and elevators to the office tower.

Photos (except as noted): F. W. Seiders

Exterior and interior color schemes were based on white, silver, and aqua blue. Porcelain-enameled panels at curtain wall are aqua blue outlined with aluminum; end walls, white brick; exterior columns at first floor and underside of entrance canopy, ¾" x 1½" aqua blue ceramic tile; lobby floor and shopping arcades (right), *white terrazzo with blue-gray insert; walls of elevator shaft at lobby, Italian glass mosaic tile from pure white to dark turquoise.*

Color schemes and interior furnishings for most offices were established by the architects. Others were developed by designers chosen by individual tenants. Interior of reception room (above) *by Storecrafters, Inc., Houston; reception room* (left) *by Bolton & Barnstone, Architects.*

high-rise down to earth

by Richard Roth*

A remarkable phenomenon in the last decade in New York has been the activity of the firm of Emery Roth & Sons. In staggering numbers all over mid-town Manhattan (and recently in the downtown financial district) high-rise office buildings and new apartment buildings by the Roth brothers have replaced older structures. As Richard Roth, AIA and President, New York Society of Architects, himself says in this article, their aim has not been to "try to create masterpieces," but rather to understand the function of the building type, the aims of the clients (often builder-operators), the applicable codes and ordinances, and "to create the best that can be produced within the restrictions that are placed upon us."

Here, then, is the down-to-earth approach to the high-rising office structure, from which much can be learned.

Is architecture an art? Is it a profession? Is it big business? Actually, good architecture, particularly in our particular field of the "high-rise office building," has to be a combination of all three.

There is no other art or profession that affects so many people. A lawyer may be known for a spectacular practice, but his cases live only in a law book as the "State versus . . ." An occasional Dr. Salk or Dr. Fleming may change the way of life, but the majority of doctors and their services are thought of only in time of need; but even when the name of the architect is not known, no one in the civilized world can escape his product.

This office has been requested to contribute a portion to P/A's issue on "high-rise office buildings" because we seem to have the greatest number and volume of office building structures in the most dense center in the world—New York—and on the most obvious of the thoroughfares of that center. An article such as this cannot be too technical; technology, as a matter of fact, is only one facet of architecture. This article rather will be based on experience and training and the knowledge gained therefrom.

What do we mean when we say that architecture must be an art, a profession, and a business combined?

As an art we try to create beauty and develop the appeal that a building should have for its occupants. Most criticism voiced of today's architecture is concerned with the façade alone, while criticism of the functions of a building and its usefulness for its occupants is rarely, if ever, made. Yet the modern architect's knowledge of how to provide comfortable living and working surroundings has contributed much happiness for people—probably the greatest contribution to architecture that this generation has made to the profession.

As a profession we use our specialized knowledge to meet the requirements of our client. The client-architect relationship is dependent upon many factors. It requires a meeting of the minds and combining for the client our skills and a knowledge of his business to satisfy his needs—and to insure a profit for him.

Our particular field of practice is probably less understood than any other field of architecture. This is so, I believe, because it is almost inconceivable that one firm can turn out the number of buildings that we do and yet give each job sufficient study and accuracy to produce a relatively fine building. This can be done only because of our organization, our knowledge of our field, and the results we anticipate achieving. By the same token we are sometimes criticized unfairly, because of the basis on which we are judged: ours is not a field of architecture in which we create or try to create masterpieces. The entire endeavor in our office is to create the best that can be produced within the restrictions that are placed upon us; and these restrictions are seldom those of our client, but rather of lending institutions; economics; and municipal authorities' laws.

Unlike the buildings that are built for single large-corporation occupancy, (Lever House, Canada House, House of Seagram, Johnson Wax, *et al*) ours are a combination of the art of architecture and the economics of big business.

It is, therefore, even more important in our field, that the client relationship be carefully understood and carefully considered in each individual project. This sort of training is almost impossible to obtain academically; it is a training of adjustment, experience, personality, and psychology. Our close-knit organization is one that has been able to see the projected economics, the projected esthetic values, and the over-all picture, all resulting from our knowing the law and knowing the market and real estate.

This office is divided into a number of closely integrated departments—planning, design, tenant installation, construction, specifications, checking, municipal department work, contracts, and public relations. The close integration of the departments and the close control by the senior partners produces the magnitude (which sometimes nearly overwhelms us) of our work. We know that with the minimum number of qualified personnel, we have produced the maximum number of successful, esthetic, professionally sound, and economic jobs.

When we are approached by a client, whether he be repetitive (as most of ours are) or a new client, and whether the project is local or in a distant city, our method of setting about solving the problem is essentially the same. We know what specific information we require, and we realize that all this information cannot be obtained from the client; we must talk with real estate people and lending institutions, and recall from our experience similar situations in similar locations.

No matter what the circumstances, we know we cannot obtain a final solution in a day, and that the first thing we must do is to allow ourselves sufficient time for research to find the proper solution to the problem. We then go into the pure mechanics of the situation, and with many rough sketches, we arrive at what we feel will be close to the final solution.

*Of Emery Roth & Sons, Architects, New York, N. Y.

In New York City, we are, of course, very familiar with trends, real-estate values, tenant requirements, and naturally with zoning laws and building codes. Even with a shaft building, a chart of a sort is necessary, because the number of factors in relationship to the floor areas have to be considered. This would determine the economical height but still would not settle the esthetic form. Having mulled this over, subconsciously slept on it, and endlessly scribbled with a 6B pencil, we eventually reach a solution that satisfies both us and our client. Yet despite the fact that the method of approach is always the same, each job is looked upon as a fresh problem to be properly solved with fresh thinking.

functional problems involved

Functional problems are basic throughout the country. They are particularly accentuated in New York since so much is being done in this area, but they apply equally to Los Angeles, San Francisco, Philadelphia, Dallas, St. Louis, Chicago, Pittsburgh, and other large urban areas.

When I say functional planning problems are basic, they are problems of proper economics; as an example, the proper planning of the core (elevators, stairs, air conditioning, toilets, etc.) so that even though the market might be for large-space and single-floor tenant occupancy, possible future multiple tenancy can be economically accommodated. This heart of the building must be economically planned and at the same time provide the greatest flexibility for every conceivable type of tenancy or for future rearrangement. In one locale this core may be properly placed in the interior of a building; in another market it may well be more properly designed for the far end, to allow for maximum uninterrupted floor areas. These functions of planning must be carefully analyzed and will differ not only from job to job and city to city but even from site to site within a city where districts have been long established for different uses (insurance, large engineering firms, textiles, service organizations, financial, etc.)

depth of office space

In 1946, when this office designed its first postwar office building (a definite departure in design) we were inspired by the pure economics and efficient adaptability of factory-type window module spacing. In designing 505 Park Avenue (Aramco Building) we arrived at the strip window plan because we felt that it provided the least amount of disturbance for maximum flexibility in office planning. We had not arrived at the proper module sizes in this particular job, and, because of the size of the plot, established a module of 4′-4″ for the windows.

We have since, through our own interior planning department, found that 4′-6″ is a better window module, for it gives the best economical interior layout. Due to the particular problems of design in New York City, we now use 4′-6″ as a module in the majority of cases, but this is not an inflexible rule, and can be and has been varied. There have been times when we have used 4′-3″ center-to-center of windows; and then again, we have used as much as 4′-9″. Higher mathematics may prove that we are wrong in deviating from our standard 4′-6″, but controlling factors have caused these deviations from the norm.

It has also been established from a backlog of tenant installations that depth of offices vary between 12′-0″ for the minor executive to 24′-0″ for the "brass." Therefore any plan that has flexibility between these two points will facilitate office layout.

The 4′-6″ window module has proved most advantageous because it provides for a minimum 8′-0″ clear width of office and any maximum from that dimension upward. Where the structural column (approximately 20″ in size) intercepts the 4′-6″ module on the perimeter of the building, an office of 8′-6″, 9′-0″, or even 10′-0″ can be accommodated. In offices more than 10′-0″ in width, the column in no way interferes with the actual window module division, because the decoration and the decor of the space is dominated by the effect of strength of the continuous windows; this allows for the larger offices of 12′-6″ or more.

Architecturally strong and impressive as the Radio City masses may be, they do not, with their window-pier-window design, allow for this interior planning flexibility. Therefore—the new exterior design to suit interior plan spacing. It is as simple as that! Window-mullion-window-mullion (445 Park Avenue—Kahn & Jacobs); strip building with continuous windows and continuous masonry spandrels (575 Madison Avenue—Emery Roth & Sons); metal and glass "skin" buildings (Lever House—Skidmore, Owings & Merrill); and the metal and metal with the windows losing their accent in the dominance of the metal (99 Park Avenue—Emery Roth & Sons).

The depth of offices varies in proportion to the width, and the smaller offices of approximately 9′-0″ in width normally are 12′-0″ in depth. If the first line of columns from the perimeter of the building, therefore, is set back 20′-0″ to 22′-0″, room is ample for both smaller offices and secretarial pools or file spaces. Larger offices which vary in width from 12′-0″ to 20′-0″ are therefore satisfactorily contained within this 20′-0″ to 22′-0″ depth. The column spacing at 20′-0″ to 22′-0″ depth is economical for steel and satisfactory for reinforced-concrete construction.

The floor-to-floor heights that we currently use are based upon the fully air-conditioned office space potential. Prior to air conditioning as a must in office building offerings, floor-to-floor heights varied between 11′-0″ and 12′-6″. This was predicated on the theory that sufficient light and air should be offered the tenant.

With the advent of air conditioning, air was mechanically provided, and the continuous window module provided far more light than could be obtained under

the now antiquated window pier, "Renaissance," or "Gothic" adaptation in design. Since air conditioning scientifically provides sufficient air, it has been felt that the excessive floor heights previously designed are no longer a factor.

When originally planned in postwar construction, air conditioning was actually in its infancy, and ducts were normally run over corridors with the return-air system being provided through louvers in doors and through the corridor itself, and exhausted through elevator shafts, stairhalls, and toilets. Today, air conditioning is being provided on a much more scientific basis, and a multitude of complex considerations have to be carefully examined (flush ceilings, recessed lighting, flexibility of changes in plan as tenant departmental conditions change). Only with experience in the field of high-rise office buildings can this floor-to-floor height be established. It has been felt that exterior rooms of 8′-6″ in clear height are not only sufficient but are proportionately proper to the width and length of the rooms.

In brief, heights of floors vary between 10′-8″ and 11′-6″ for buildings constructed of structural steel. The variance is based on the size of the project and the size of the anticipated open office spaces to be constructed. While 8′-6″ is a good height for any office up to 20′-0″ x 24′-0″, in open clerical spaces, such as found in insurance company layouts, it would seem oppressively low.

On large plots, we provide the maximum floor-to-floor heights, and in narrow smaller plots we work to the minimum of 10′-8″ floor to floor. On such plots, where we will have large interior spaces, we feel that the 9′-0″ clear height is preferable. With normal column spacing, the 9′-0″ clear height can be maintained easily with 11′-4″ to 11′-6″ floor-to-floor height.

Some other considerations that affect our decisions are the height of the building and the size of the floor plan which ultimately affects the layout and distribution of air-conditioning ducts and lighting fixtures. The minimum, clear floor-to-finished ceiling dimension that we always maintain is 8′-6″.

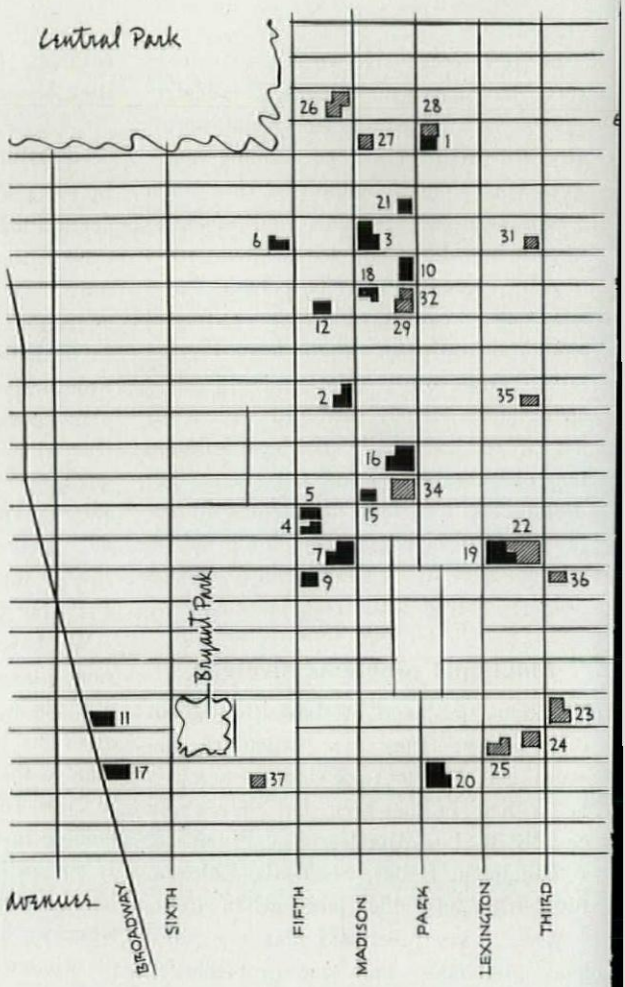
rule of thumb and elevators

Prior to self-service, automatic, elec-

Key (left) *to map below and illustrations (including net rentable areas). Listed in chronological order, from 1946 to current work in planning stage. Listings with asterisk occur outside area of map.*

Photos (except as noted): Adolph Studly

1 505 Park Avenue (170,000 sq ft)
2 488 Madison Avenue (200,000 sq ft)
3 575 Madison Avenue (350,000 sq ft)
4 579 Fifth Avenue (110,000 sq ft)
5 589 Fifth Avenue (91,000 sq ft)
6 720 Fifth Avenue (135,000 sq ft)
7 380 Madison Avenue (665,000 sq ft)
8 100 Wall Street (40,000 sq ft)
9 555 Fifth Avenue (200,000 sq ft)
10 430 Park Avenue (206,000 sq ft)
11 1460 Broadway (162,000 sq ft)
12 3 East 54th Street (175,000 sq ft)
13 156-158 William Street* (210,000 sq ft)
14 123 William Street* (375,000 sq ft)
15 415 Madison Avenue (200,000 sq ft)
16 300 Park Avenue (555,000 sq ft)
17 1430 Broadway (340,000 sq ft)
18 545 Madison Avenue (99,000 sq ft)
19 485 Lexington Avenue (680,000 sq ft)
20 99 Park Avenue (446,000 sq ft)
21 460 Park Avenue (244,000 sq ft)
22 750 Third Avenue (630,000 sq ft)
23 200 East 42nd Street (315,000 sq ft)
24 630 Third Avenue (130,000 sq ft)
25 355 Lexington Avenue (135,000 sq ft)
26 660 Madison Avenue (400,000 sq ft)
27 635 Madison Avenue (130,000 sq ft)
28 515 Park Avenue (145,000 sq ft)
29 400 Park Avenue (200,000 sq ft)
30 100 Church Street* (830,000 sq ft)
31 Third Avenue & 56th Street (80,000 sq ft)
32 410 Park Avenue (210,000 sq ft)
33 2 Broadway* (1,220,000 sq ft)
34 290 Park Avenue (500,000 sq ft)
35 Third Avenue & 51st Street (110,000 sq ft)
36 Third Avenue & 46th Street (350,000 sq ft)
37 107 West 39th Street (97,000 sq ft)



17

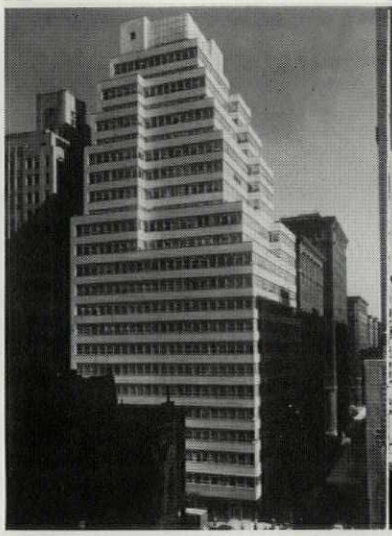
Broadway

4

Fifth Avenue

Madison Avenue

15



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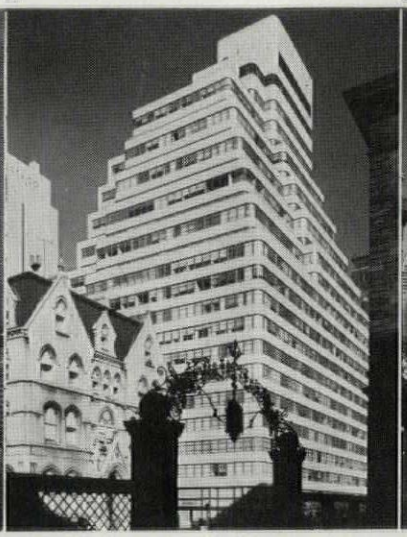


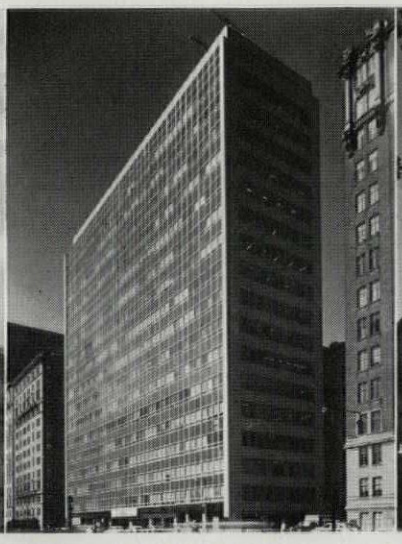
3

Park Avenue

20

29

10



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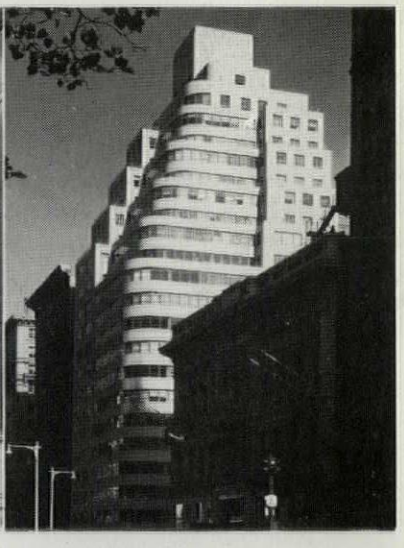
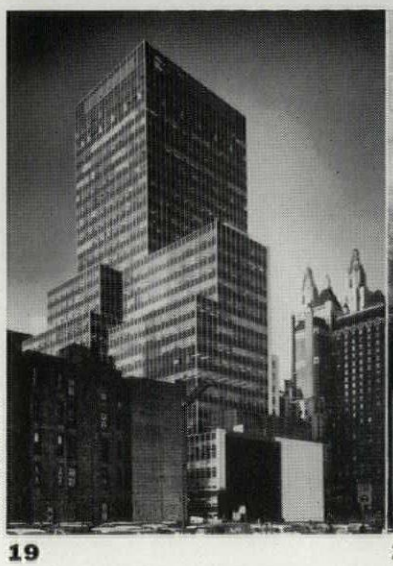


Third Avenue



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22

23

Gottscho-Schleisner

tronically controlled elevators, determination of number of elevators required in multiple-storied office buildings was based roughly upon 30,000 sq ft of rentable area per elevator, the speed and size to be determined by the final balance sheet. With the advent of operatorless elevators with their high efficiency of mechanized balance, the ratio has been raised to about 33,000 net rentable sq ft per elevator. In other words, analysis of a building with 100,000 sq ft of net rentable area would probably show (with a good elevator traffic analysis survey) that three elevators would suffice, whereas 10 years ago, we might well have made our layout based on four elevators. Actually, the problem is not as simple as stated, but forms a basis for us upon which we can make a preliminary layout. As a norm, 30,000 sq ft per cab is used, but for large banks of high-rise (2nd to 7th or 8th floor) elevators, we use 35,000 sq ft per cab. By the same token, on high-rise elevators, from the 18th floor up, we would reduce the square footage allotted per cab, to as low as 27,000 sq ft. Subsequently, we obtain from qualified elevator manufacturers the proper size, speed, and number of elevators required.

Other problems such as lighting, mechanical equipment, and the like are determined between us, as the architects, and experts in the various specialized fields.

In developing the design of our buildings, we invariably try to make the soundest possible evaluation of the requirements of the program and then provide the best possible utilization of materials that the limitations of the program permit.

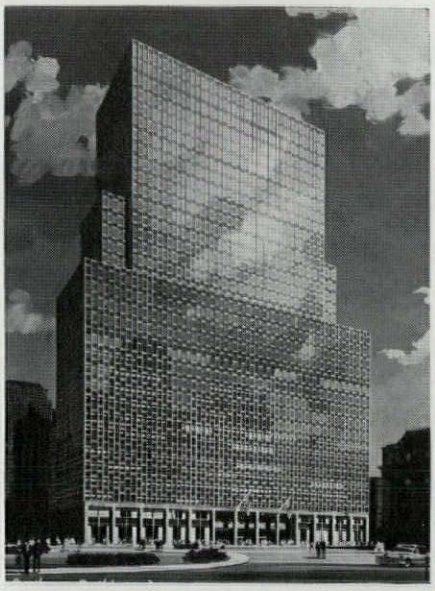
An interesting sidelight of our practice is our continuing relationship with clients. Very seldom do we draw up a formal contract; in most cases, a short letter of intent and determination of the fee forms the only agreement we find necessary.

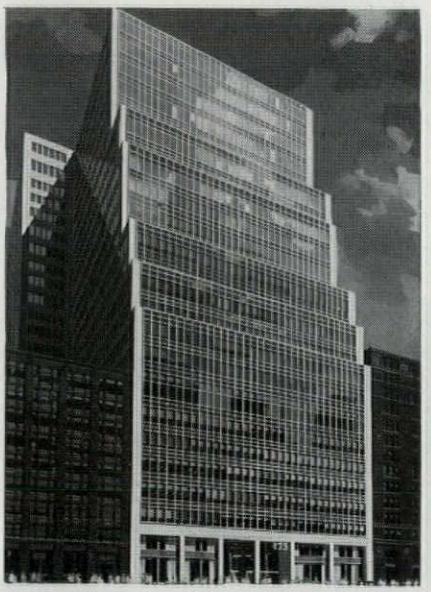
There is one characteristic we find is basic to all clients—and this is so whether the client be a Church Committee, the Housing Authority, the Board of Education, Public Works, or an office building investor—they all want the most for the money. And we have to know what to design and specify that is appealing to the eye, sound for the building, and economical for the builder.

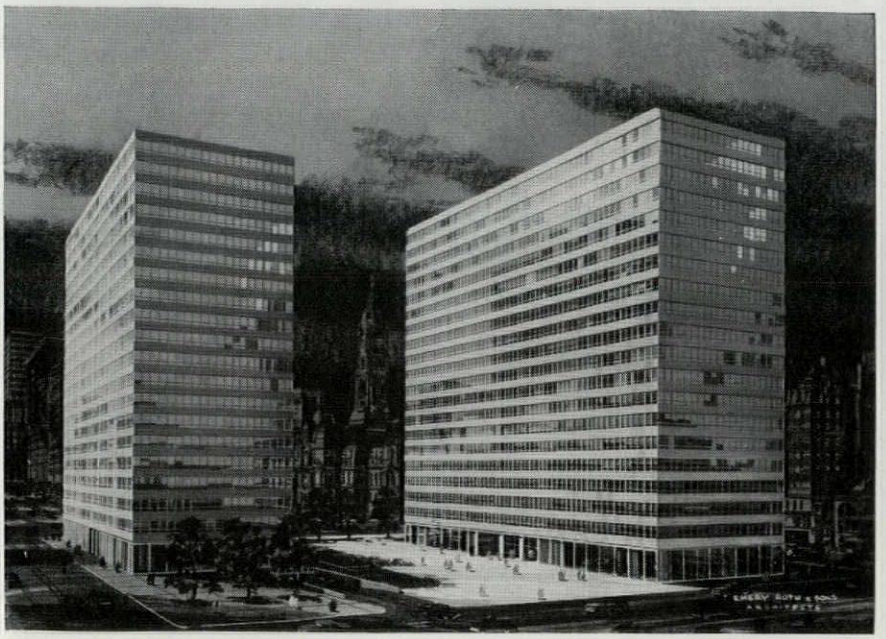
Designed for Uris Brothers (owners-builders), one of the firm's most constant clients, 2 Broadway, New York (below left), *now in the planning stage, will be 30 stories and contain 1,220,000 sq ft of net rentable area.*

Also for a recurrent client, Diesel Construction Company (owners-builders), is a downtown New York building at 123 William Street (below right), *now under construction.*

While most of the firm's work has been in and around New York, Philadelphia's new Penn Center has two Roth Buildings—#3 (left of photo, bottom), *completed, and #2, under construction. Client: Uris Brothers.*







The following article is extracted from a study made by Irving D. Shapiro, architect and urban land economist, of changes in office building design between the 20's and the 50's, drawing on an unpublished thesis by William L. Alden. The discussion is admittedly controversial. Architects specializing in this field see no changes yet produced by office automation. One automatic controls expert points out that many large users of computers have not so far found personnel needs seriously changed; yet other far-seeing pioneers in the field of automation do believe that serious disruption of office routine—and hence use of office space—will come inevitably, if not rapidly. Having opened up the field of CELA architecture (the effect of communications, electronics, and automation on planning) with a special issue in May 1956, P/A's Editors feel that Shapiro's discussion is a useful look at future office design.

from the 20's to automation

by Irving D. Shapiro

The concept of the automatic office is still far from the minds of most businessmen. However, when one considers the basic elements in a sequence of clerical operations and the ease with which automatic equipment has been able to master them, the development of the fully automated office seems imminent.

As a business becomes larger, the amount of paper work which has to be performed tends to increase disproportionately. Management must depend to an ever increasing degree upon reports on operations to keep it informed. These reports may vary from simple summmaries to an advanced system of statistical analyses. Moreover, the business operation itelf necessitates ever more paper work: bookkeeping records, orders, inventories, production scheduling, payroll preparation, and so on. The volume and repetitive nature of these clerical operations lend themselves to automation; at the same time the cost of clerical labor is, of course, constantly increasing. In addition, there is an increased realization that automation can yield valuable by-products. As a result of abstracting useful statistics from operating data, various departments of the company are supplied with quantitative bases for decisions regarding operations under their control.

Types of calculating instruments such as the abacus have been known and used for thousands of years. Fountainhead of the modern computer was the Jacquard loom (1801) which wove patterns in cloth according to directions supplied by a prepunched tape. Babbage's calculating machine (never built) followed in 1830, and Holerith's statistical machine, invented in 1887, embodied the basic principles of punched card accounting still used today. The thread of development was picked up by private companies who have advanced the punched card system from simple procedures to one of modern business's most potent management tools.

Yet punched cards in themselves do not produce an automatic office. The fully automatized business office was brought closer when Prof. Howard Aiken of Harvard built the IBM Automatic-Sequence Calculator, known as Mark I, between 1937 and 1944. In essence, it consisted of 78 adding machines and a desk calculator connected as one machine and controlled by a player-piano-type roll of paper. It was the first general-purpose "mechanical brain" able to perform problems in arithmetic and logic by accomplishing them in hundreds of thousands of sequential steps. From this beginning came the electronic computers currently in use. They are designed to solve specific problems, but they are all adaptable to automation of the modern business, since they contain five basic parts necessary to solution of a business problem:

1. An input unit through which can be fed all of the operating data which the computer will require.

2. A memory unit in which information such as mathematical tables, fixed routines, partially completed results, or other data can be stored and referred to automatically.

3. An arithmetic computing unit which performs the necessary calculations.

4. A control or programming unit which receives an order and directs other units.

5. An output unit by which the final results of the computer's work can be recorded.

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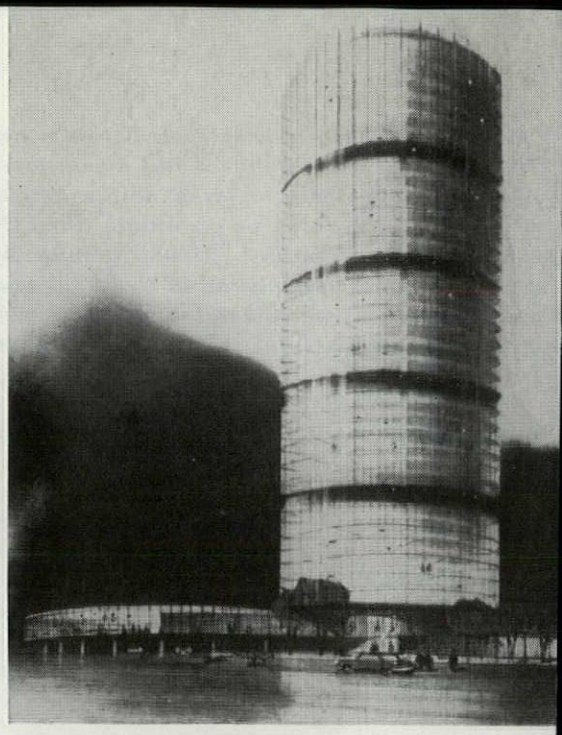
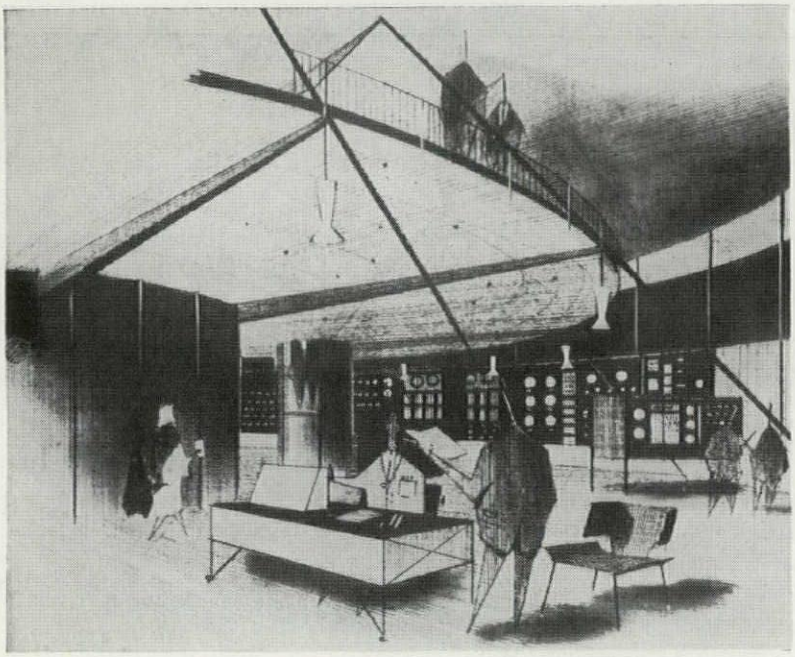
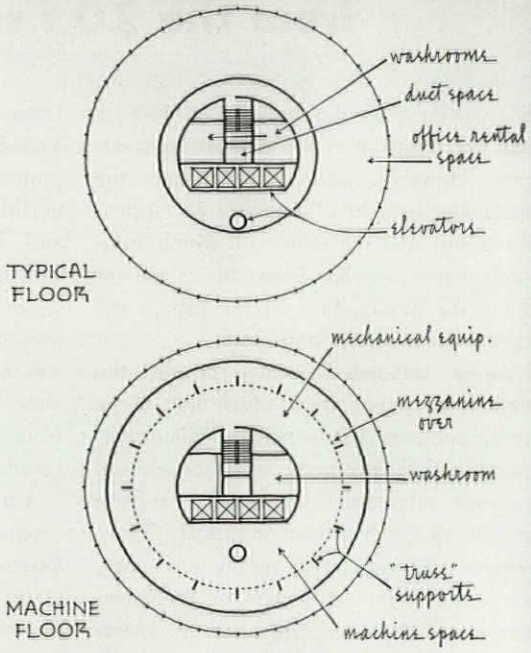
In urging business concerns to adopt automation, the savings generally emphasized by equipment manufacturers relate to clerical salaries, capital and inventory turnover, rapid accessability of information, and the by-products of useful statistics. However, concomitant with savings of salaries are savings in the cost of space.

It has been estimated that every office worker occupies from 175 to 200 square feet of space. Recently, IBM exhibited a system of electronic equipment designed for a major corporation. As a result of its installation, the services of 240 persons could be dispensed with. Net savings of some 40,000 square feet of space were thus made possible. Savings on rental of this space would constitute about two-thirds the rental cost of the equipment.

Savings can result even from use of individual items of equipment. One firm







Hypothetical automated office building, developed by Irving Shapiro and Louis M. Naidorf, Architects. Machine floors such as the one above would contain central processing, printing, typing, and memory units and would occur in groupings at every sixth or seventh floor, as indicated in the exterior perspective. Plans at right are of executive and machine levels.

installed an electronic computer for the purpose of billing. Used only 40 hours a month, it handled the work formerly done by 45 to 50 employes. Space-rental savings from its installation could be calculated at about $30,000 annually.

Let us examine possible decrease in construction costs in more detail. The reduction of human occupancy in office buildings may reduce the first cost of construction, through the operation of various portions of building codes, such as requirements governing means of egress, sanitation facilities, ventilation, and elevators.

Obviously, a decrease in human occupancy will result in a commensurate decrease in required stairs (usually based on occupancy per floor). As for sanitation facilities, the required ratio of water closets to persons will affect the number of installations; the number of lavatories (varying from one for 15 to one for 45 persons) will change; so will, for example, the number of required drinking fountains. Moreover, there would be considerable savings in pipes, fittings, hot water heaters and tanks, plumbing chases, and all the labor involved in the installations.

Ventilation is normally required for all spaces above or below grade, with or without windows, designed for human occupancy only. Decreased human occupancy may result in savings through reduction of ventilating sash, ventilating equipment, or both.

Since the detailed solution of individual vertical transportation problems is a highly specialized art, no generalization can be made about savings in number of elevators as a result of automated office space. However, since the prime purpose of elevators is to move persons vertically with speed, safety, and convenience, a reduction in human occupancy should result in a concomitant reduction in the cost of vertical transportation.

Occupancy of sections of office buildings by machines will probably result in a change in types of finishes. Structural slabs will not require resilient floorings; exposed cinder-block walls will probably suffice as partitions; exposed structural slab soffits could serve as ceilings, with no need for concealing ducts, conduits, and piping.

The absence of windows in the exterior walls surrounding electronic equipment should effect substantial savings in initial construction costs. Elimination of wide expanses of glass, and of sash, as well as the installation costs of lintels, flashing, calking, and auxiliary savings in elimination of interior items such as venetian blinds will be important; equally to be considered are reductions in the amount of heating and cooling equipment through lessened heat loss or gain.

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The acceptance of office automation will undoubtedly result in changes in characteristics of commercial buildings other than those previously mentioned. There can be little factual basis for observations of events yet to transpire, but let us speculate.

It is possible, for instance, that disruptions in "linkages"—relations and interactions among business establishments—may result from a decreased number of persons employed "downtown." Restaurants, drug stores, barber shops serving occupants of office structures, can be affected, as may be retail merchandising in the core of the city which depends on week-day customers. Greatly changed demands on public mass transportation systems can result, and the parking problem becomes less acute.

Most important, patterns of land use may change as the construction of highly specialized space replaces space in which one type of business activity can easily be substituted for another. With long-existing linkages severed, the city may more readily tend to divide itself into nuclei which are physically distinct from one another: a retail sales nucleus, one for recreation, another for intellectual and cultural activities, a manufacturing nucleus, one for business management activities, and others.

Probably a more fruitful speculation would be to consider the type of building that would best serve the automated business office. Two possibilities would have to be considered: new buildings, specifically designed for the new functions, and conversion of existing buildings.

If one were to advance the premise that new office structures designed for office automation will be erected, those portions of the standing stock which can be converted to mechanization will have to do so to compete. The special requirements for the housing of automatic office equipment are:

1. Some temperature, humidity, and dust control.

2. Floors capable of supporting concentrated weights of fairly large magnitude.

3. Availability of large quantities of power.

4. Accessibility for purposes of installation, service, and replacement.

It is probable that none of the standing stock can provide for these specialized conditions, but some may be converted to do so. Since the requirements of machines are such that their alloted area can be at a distance from their related executive areas, three solutions present themselves for consideration:

1. A grouping of office structures under single control, such as Rockefeller Center, will be able to provide great quantities of prime office space for executive use and a considerable volume of space occupied by electronic equipment. The latter may be located either underground or in one of the smaller structures in the grouping whose entire area has been converted to the use of machines by tenants of the Center.

2. Independently controlled office structures could have their fees placed under single ownership with one of the buildings converted to provide space suitable for machines. The automatic equipment thus installed would then be linked to the remaining structures for the mutual use of their tenants.

3. The introduction of "electronic clerical" firms in stategically located structures designed and constructed or converted to provide the highly specialized space they would require. These firms will provide automated clerical services for companies whose needs do not warrant investment in equipment of their own.

In considering the new "automatic" office building, four premises have been made:

1. Initially, new office structures will not be specialized to the extent of housing only machines. Though probably the ultimate refinement in automatic office space, such a condition is not considered.

2. Given a choice between occupying a flawlessly lighted and ventilated interior room or one on the perimeter of the structure with a view to the outside through glass (or plastic), the executive would generally prefer the latter.

3. The economics of land utilization will still be such that height and concentration will be desirable in strategic areas.

4. Occupancy characteristics will determine, to some degree, the appearance and function of the structure.

Since machines will require specialized space and highly specialized maintenance, their concentration in relation to the functions of the human occupants of the other elements of the structure would seem warranted. In relating the machines to the functions of the human occupants of the other elements of the building, their prior classification into groups is desirable. Such a classification may consist of:

1. Small, light, self-contained units intended for use within specific departments.

2. Larger interrelated units intended for use by large segments or departments of an organization.

3. Large master computers and data analyzers, operating continuously, receiving information gathered and transmitted directly from points of operations over the entire globe, constantly relating and analyzing factors relative to the entire organization, automatically preparing operating statements based upon the most recent condition of the company as an aid to executive decision; i.e., a master central memory unit.

These three groups are in a sense analogous to local, state, and federal levels of government and single occupancy office structures might reflect this similar relationship "geographically." Therefore, depending upon the specific type of office activity fostered by the building and upon the preceding classification of machines, one might find the automatic equipment in class (1) distributed throughout the various departments, that in class (2) clustered at perhaps every sixth or seventh floor and the automatic equipment falling into class (3) concentrated on some lower level of the structure.

The sketches on the facing page attempt to suggest the preceding relationships as they might manifest themselves architecturally. Obviously, little detail can be offered in the absence of a specific client with his unique requirements.

*The Tall Office Building Artistically Considered**

by Louis Sullivan

The architects of this land and generation are now brought face to face with something new under the sun — namely, that evolution and integration of social conditions, that special grouping of them, that results in a demand for the erection of tall office buildings.

It is not my purpose to discuss the social conditions; I accept them as the fact, and say at once that the design of the tall office building must be recognized and confronted at the outset as a problem to be solved — a vital problem, pressing for a true solution.

Let us state the conditions in the plainest manner. Briefly, they are these: offices are necessary for the transaction of business; the invention and perfection of the high-speed elevators make vertical travel, that was once tedious and painful, now safe, rigid, economical constructions rising to a great height; continued growth of population in the great cities, consequent congestion of centers and rise in value of ground, stimulate an increase in number of stories; these successfully piled one upon another, react on ground values — and so on, by action and reaction, inter-action and inter-reaction. Thus has come about that form of lofty construction called the "modern office building." It has come in answer to a call, for in it a new grouping of social conditions has found a habitation and a name.

Up to this point all in evidence is materialistic, an exhibition of force, of resolution, of brains in the keen sense of the word. It is the joint product of the speculator, the engineer, the builder.

Problem: How shall we impart to this sterile pile, this crude, harsh, brutal agglomeration, this stark, staring exclamation of eternal strife, the graciousness of those higher forms of sensibility and culture that rest on the lower and fiercer passions? How shall we proclaim from the dizzy height of this strange, weird, modern housetop the peaceful evangel of sentiment, of beauty, the cult of a higher life? . . .

As I am here seeking not for an individual or special solution, but for a true normal type, the attention must be confined to those conditions that, in the main, are constant in all tall office buildings, and every mere incidental and accidental variation eliminated from the consideration, as harmful to the clearness of the main inquiry.

The practical horizontal and vertical division or office unit is naturally based on a room of comfortable area and height, and the size of this standard office room as naturally predetermines the standard structural unit, and, approximately, the size of window openings. In turn, these purely arbitrary units of structure form in an equally natural way the true basis of the artistic development of the exterior. Of course the structural spacings and openings in the first or mercantile story are required to be the largest of all; those in the second or quasi-mercantile story are of a somewhat similar nature. The spacings and openings in the attic are of no importance whatsoever (the windows have no actual value), for light may be taken from the top, and no recognition of a cellular division is necessary in the structural spacing.

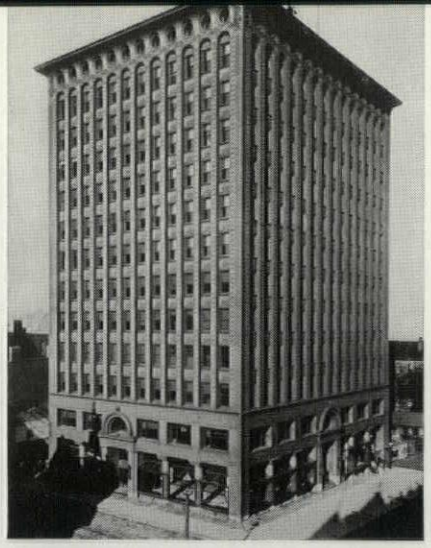
Hence it follows inevitably, and in the simplest possible way, that if we follow our natural instincts without thought of books, rules, precedents, or any such educational impedimenta to a spontaneous and "sensible" result, we will in the following manner design the exterior of our tall office building — to wit:

Beginning with the first story, we give this a main entrance that attracts the eye to its location, and the remainder of the story we treat in a more or less liberal, expansive, sumptuous way — a way based exactly on the practical necessities, but expressed with a sentiment of largeness and freedom. The second story we treat in a similar way, but usually with milder pretension. Above this, throughout the indefinite number of typical office tiers, we take our cue from the individual cell, which requires a window with its separating pier, its sill and lintel, and we, without more ado, make them look all alike because they are all alike. This brings us to the attic, which, having no division into office-cells, and no special requirement for lighting, gives us the power to show by means of its broad expanse of wall and its dominating weight and character, that which is the fact — namely, that the series of office tiers has come definitely to an end.

This may perhaps seem a bald result and a heartless, pessimistic way of stating it, but even so we certainly have advanced a most characteristic stage beyond the imagined sinister building of the speculator-engineer-builder combination. For the hand of the architect is now definitely felt in the decisive position at once taken, and the suggestion of a thoroughly sound, logical, coherent expression of the conditions is becoming apparent.

When I say the hand of the architect, I do not mean necessarily the accomplished and trained architect. I mean only a man with a strong, natural liking for buildings, and a dis-

*This essay was first published in *Lippincott's*, March, 1896.



Guaranty Building, Buffalo, N. Y. Louis Sullivan, Architect. 1894

position to shape them in what seems to his unaffected nature a direct and simple way. He will probably tread an innocent path from his problem to its solution, and therein he will show an enviable gift of logic. If he have some gift for form in detail, some feeling for form purely and simply as form, some love for that, his result in addition to its simple straightforward naturalness and completeness in general statement, will have something of the charm of sentiment.

However, thus far the results are only partial and tentative at best; relatively true, they are but superficial. We are doubtlessly right in our instinct, but we must seek a fuller justification, a finer sanction, for it. . . .

We must now heed the imperative voice of emotion. It demands of us, what is the chief characteristic of the tall office building? And at once we answer, it is lofty. This loftiness is to the artist-nature its thrilling aspect. It is the very open organ-tone in its appeal. It must be in turn the dominant chord in his expression of it, the true excitant of his imagination. It must be tall, every inch of it tall. The force and power of altitude must be in it, the glory and pride of exaltation must be in it. It must be every inch a proud and soaring thing, rising in sheer exultation that from bottom to top it is a unit without a single dissenting line — that it is the new, the unexpected, the eloquent peroration of most bald, most sinister, most forbidden conditions.

The man who designs in this spirit and with the sense of responsibility to the generation he lives in must be no coward, no denier, no bookworm, no dilettante. He must live of his life and for his life in the fullest, most consummate sense. He must realize at once and with the grasp of inspiration that the problem of the tall office building is one of the most stupendous, one of the most magnificent opportunities that the Lord of Nature in His beneficence has ever offered to the proud spirit of man.

That this has not been perceived — indeed, has been flatly denied — is an exhibition of human perversity that must give us pause.

One more consideration. Let us now lift this question into the region of calm, philosophic observation. Let us seek a comprehensive, a final solution: let the problem dissolve.

Certain critics, and very thoughtful ones, have advanced the theory that the true prototype of the tall office building is the classical column, consisting of base, shaft, and capital — the moulded base of the column typical of the lower stories of our building, the plain or fluted shaft suggesting the monotonous, uninterrupted series of office-tiers, and the capital the completing power and luxuriance of the attic.

Other theorizers, assuming a mystical symbolism as a guide, quote the many trinities in nature which indicates the beauty and conclusiveness of such trinities in unity. They aver the beauty of prime numbers, the mysticism of the number three, the beauty of all things that are in three parts — to wit; the day, subdividing into morning, noon, and night; the limbs, the thorax, and the head constituting the body. So they say, should the building be in three parts vertically, substantially as before, but for different motives.

Others, of purely intellectual temperament, hold that such a design should be in the nature of a logical statement; it should have a beginning, a middle, and an ending, each clearly defined — therefore again a building, as above, in three parts vertically.

Others, seeking their examples and justification in the vegetable kingdom, urge that such a design shall above all things be organic. They quote the suitable flower with its bunch of leaves at the earth, its long graceful stem, carrying the gorgeous single flower. They point to the pine tree, its massy roots, its lithe, uninterrupted trunk, its tuft of green high in the air. Thus, they say, should be the design of the tall office building: again in three parts vertically.

Others still, more susceptible to the power of a unit than to the grace of a trinity, say that such a design should be struck out at a blow, as though by a blacksmith or by mighty Jove, or should be thought-born, as was Minerva, full grown. They accept the notion of a triple division as permissible and welcome, but non-essential. With them it is a subdivision of their unit: the unit does not come from the alliance of the three; they accept it without murmur, provided the subdivision does not disturb the sense of singleness and repose.

All of these critics and theorists agree, however, positively, unequivocally, in this, that the tall office building should not, must not, be made a field for the display of architectural knowledge in the encyclopaedic sense; that too much learning in this instance is fully as dangerous, as obnoxious, as too little learning; that miscellany is abhorrent to their sense; that the sixteen-story building must not consist of sixteen separate, distinct, and unrelated buildings piled one upon the other until the top of the pile is reached.

To this latter folly I would not refer were it not the fact that nine out of every ten tall office buildings are designed in precisely this way in effect, not by the ignorant, but by

the educated. It would seem indeed, as though the "trained" architect, when facing this problem, were beset at every story, or at most, every third or fourth story, by the hysterical dread lest he be in "bad form"; lest he be not bedecking his building with sufficiency of quotation from this, that, or the other "correct" building in some other land and some other time; lest he be not copious enough in the display of his wares; lest he betray, in short, a lack of resource. To loosen up the touch of this cramped and fidgety hand, to allow the nerves to calm, the brain to cool, to reflect equably, to reason naturally, seems beyond him; he lives, as it were, in a waking nightmare filled with the *desjecta membra* of architecture. The spectacle is not inspiriting.

As to the former and serious views held by discerning and thoughtful critics, I shall, with however much of regret, dissent from them for the purpose of this demonstration, for I regard them as secondary only, non-essential, and as touching not at all upon the vital spot, upon the quick of the entire matter, upon the true, the immovable philosophy of the architectural art.

This view let me now state, for it brings to the solution of the problem a final, comprehensive formula.

All things in nature have a shape, that is to say, a form, an outward semblance, that tells us what they are, that distinguishes them from ourselves and from each other.

Unfailingly in nature these shapes express the inner life, the native quality, of the animal, tree, bird, fish, that they present to us; they are so characteristic, so recognizable, that we say, simply, it is "natural" it should be so. Yet the moment we peer beneath this surface of things, the moment we look through the tranquil reflection of ourselves and the clouds above us, down into the clear, fluent, unfathomable depth of nature, how startling is the silence of it, how amazing the flow of life, how absorbing the mystery. Unceasingly the essence of things is taking shape in the matter of things, and this unspeakable process we call birth and growth. Awhile the spirit and the matter fade away together, and it is this that we call decadence, death. These two happenings seem jointed and interdependent, blended into one like a bubble and its iridescence, and they seem borne along upon a slowly moving air. This air is wonderful past all understanding.

Yet to the steadfast eye of one standing upon the shore of things, looking chiefly and most lovingly upon that side on which the sun shines and that we feel joyously to be life, the heart is ever gladdened by the beauty, the exquisite spontaneity, with which life seeks and takes on its forms in an accord perfectly responsive to its needs. It seems ever as though the life and the form were absolutely one and inseparable, so adequate is the sense of fulfillment.

Whether it be the sweeping eagle in his flight or the open apple-blossom, the toiling work-horse, the blithe swan, the branching oak, the winding stream at its base, the drifting clouds, over all the coursing sun, form ever follows function, and this is the law. Where function does not change, form does not change. The granite rocks, the ever-brooding hills, remain for ages; the lightning lives, comes into shape, and dies in a twinkling.

It is the pervading law of all things organic, and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that the life is recognizable in its expression, that form ever follows function. This is the law.

Shall we, then, daily violate this law in our art? Are we so decadent, so imbecile, so utterly weak of eyesight, that we cannot perceive this truth so simple, so very simple? Is it indeed a truth so transparent that we see through it but do not see it? Is it really then, a very marvelous thing, or is it rather so commonplace, so everyday, so near a thing to us, that we cannot perceive that the shape, form, outward expression, design or whatever we may choose, of the tall office building should in the very nature of things follow the functions of the building, and that where the function does not change, the form is not to change?

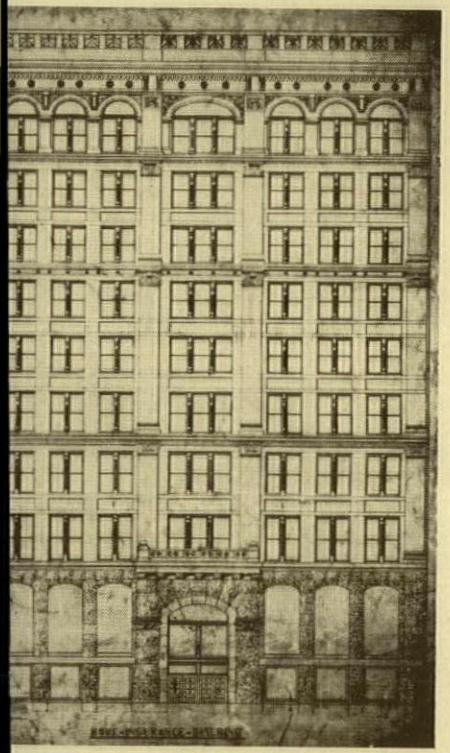
Does this not readily, clearly, and conclusively show that the lower one or two stories will take on a special character suited to the special needs, that the tiers of typical offices, having the same unchanging function, shall continue in the same unchanging form, and that as to the attic, specific and conclusive as it is in its very nature, its function shall equally be so in force, in significance, in continuity, in conclusiveness of outward expression? From this results, naturally, spontaneously, unwittingly, a three-part division, not from any theory, symbol, or fancied logic.

And thus the design of the tall office building takes its place with all other architectural types made when architecture, as has happened once in many years, was a living art. Witness the Greek temple, the Gothic cathedral, the medieval fortress.

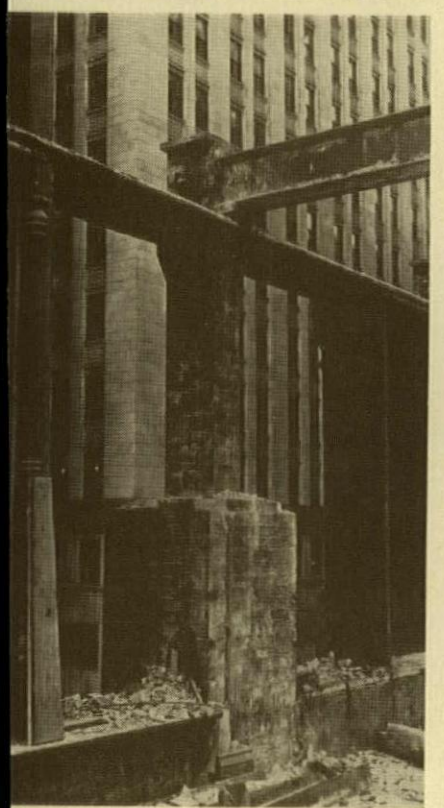
And thus, when native instinct and sensibility shall govern the exercise of our beloved art; when the known law, the respected law, shall be that form ever follows function; when our architects shall cease struggling and prattling handcuffed and vainglorious in the asylum of a foreign school; when it is truly felt, cheerfully accepted, that this law opens up the airy sunshine of green fields, and gives to us a freedom that the very beauty and sumptuousness of the outworking of the law itself as exhibited in nature will deter any sane, any sensitive man from changing into license, when it becomes evident that we are merely speaking a foreign language with a noticeable American accent, whereas each and every architect in the land might, under the benign influence of this law, express in the simplest, most modest, most natural way that which it is in him to say; that he might really and would surely develop his own characteristic individuality, and that the architectural art with him would certainly become a living form of speech, a natural form or utterance, giving surcease to him and adding treasures small and great to the growing art of his land; when we know and feel that Nature is our friend, not our implacable enemy—that an afternoon in the country, an hour by the sea, a full open view of one single day, through dawn, high noon, and twilight, will suggest to us so much that is rhythmical, deep, and eternal in the vast art of architecture, something so deep, so true, that all the narrow formalities, hard and fast rules, and strangling bonds of schools cannot stifle it in us—then it may be proclaimed that we are on the high-road to a natural and satisfying art, and architecture that will soon become a fine art in the true, the best sense of the word, an art that will live because it will be of the people, for the people, and by the people.

PROGRESSIVE ARCHITECTURE IN AMERICA

HOME INSURANCE BUILDING — 1883-85
William LeBaron Jenney, Architect-Engineer
Chicago, Illinois



Burnham Architectural Library



Chicago Historical Society

Chicago in the Eighties was a city of big business and bold ventures. Short of buildings and of architectural tradition, long on ambition, enterprise, and the will to experiment, it was the logical place for the promotion of a radical, new kind of construction: the skeleton frame. The economic possibilities of the multistoried building were attractive and unlimited; a flamboyant faith in the future was part of the pioneer spirit that lingered in this crossroads center of the West. The dream of the skyscraper—prophesied by Viollet-le-Duc, publicized by Bogardus, belatedly patented by Buffington—was actually realized by Chicago architects and engineers, in a decade that produced more revolutionary structural innovations than had any previous period in the history of architecture.

The invention of the skyscraper can be credited to no one man; its crystallization is found in no single monument. Of the many structures involved, all are of interest as links in the chain of development and some, like the ten-story Home Insurance Building by William LeBaron Jenney, are of particular significance. While not the handsomest or the tallest of the early skyscrapers, this building has several special claims to fame. As one of the most completely evolved of the early experimental systems of fireproof, skeleton construction, it represented a bold step forward. That its weight was not carried on masonry bearing walls but on the metal frame was attested by three investigating committees at the time of its demolition in 1931. In the words of Thomas Tallmadge, head of the Marshall Field Committee, this was ". . . the first high building to utilize as the *basic* principle of its design the method known as skeleton construction, and . . . there is considerable evidence that Major Jenney, in solving the particular problems of light and loads appearing in this building, discovered the true application of skeleton construction to the building of high structure and invented and here utilized for the first time its special forms." The Home Insurance Building also marked the initial architectural use of Bessemer steel I-beams, first rolled while the building was still under construction, and installed, on the request of the Carnegie Company, above the sixth floor.

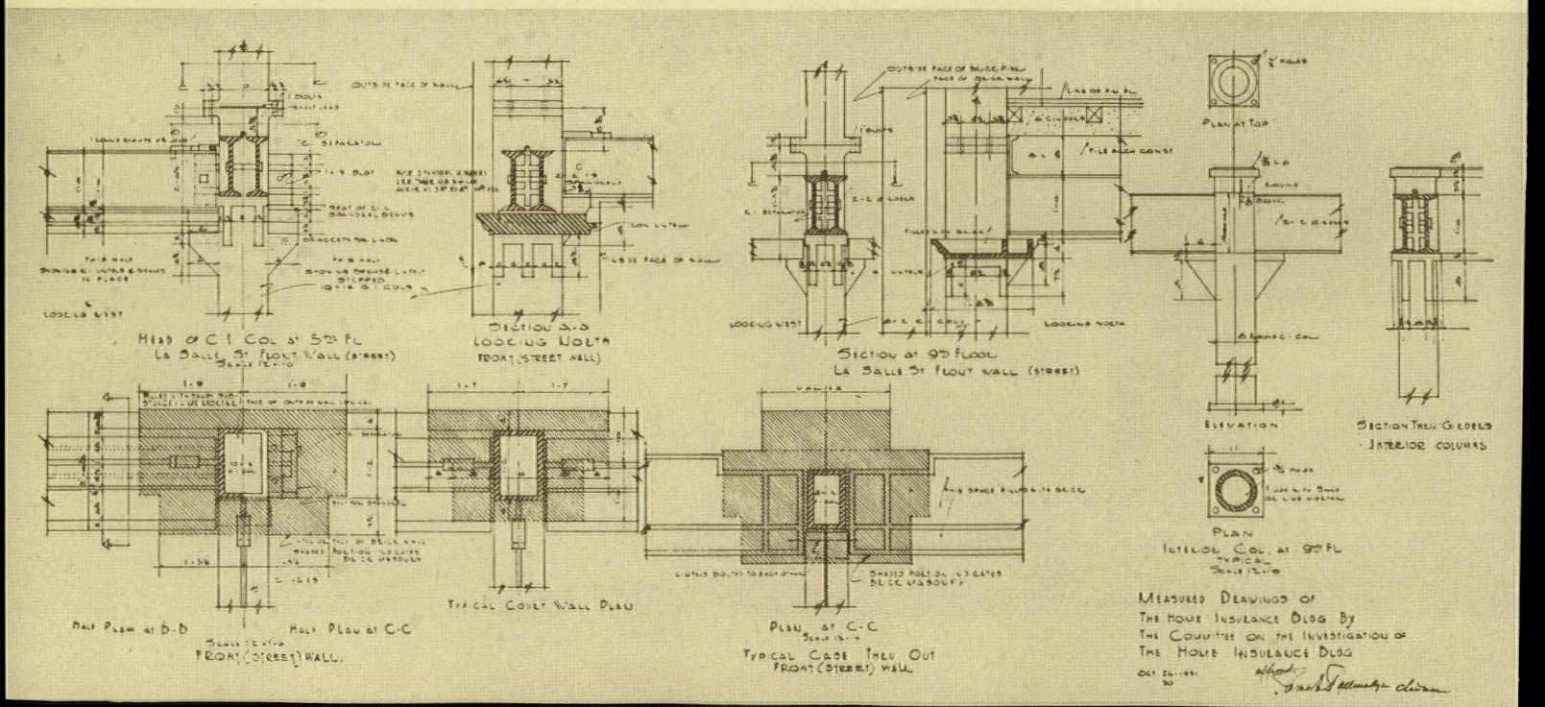
While his contemporaries were aware of the importance of Jenney's structural pioneering, they deplored his lack of finesse with classical detail. Disparaged as an architect, it was not until his Home Insurance Building was torn down that the full extent of his engineering contributions was known. Although it had been previously understood that an interior-framing system of metal columns and beams carried a good part of the load, it had usually been assumed that the exterior masonry piers were self-supporting. When these piers were stripped away from the embedded metal columns at the third story and midway between the fourth and fifth floors, it was found that no faults occurred in the remaining masonry, proving that even the exterior pier load was carried on the metal frame. Only brick party walls—still required by law at that date—and the lower two stories of masonry on the main façades, requested by the client, kept the building from being pure skeleton construction. Nor was the curtain wall actually constructed, as such, until four years later, in Holabird & Roche's Tacoma Building of 1889.

The exact nature of Jenney's iron-and-steel frame was revealed during demolition. A series of vertical cast-iron columns, each a single story in height, reached from foundation to roof in the interior of the building and started at the third floor on the two main exterior façades. Bolted together, they became progressively smaller toward the top of the building. These columns were joined by steel and wrought-iron beams, fastened to them by angle-iron brackets. Heavy, cast-iron lintels, the full thickness of the wall, were attached to the exterior columns. Just above these lintels at the third, fifth, eighth, and tenth floors were spandrel girders formed by two or more wrought-iron I-beams, 12″ deep, connected to the columns. These acted as bracing and ties for the columns, and as supports for the masonry spandrels and narrow cast-iron mullions dividing the large double windows. Two 12″ wrought-iron girders connected each exterior column with its opposite interior column; interior columns were joined by pairs of 12″ wrought-iron beams. Floor beams were typical 8″ wrought-iron, on 5′ centers, supporting flat arches of tile. The outside walls of the first two stories of rusticated granite backed with tile, battered from 4′ at the base to 2′-10″ at the top of the second story, were considered superterrene foundation. Above this point, the framework formed a rigid, stable, metal cage.

"It is nearly impossible to appreciate today," wrote Col. W. A. Starrett in the great skyscraper era of the Twenties, "what a daring thing these men did forty years ago when they ran up buildings to fourteen stories on iron-and-steel skeletons resting on experimental foundations, on empirical calculations that the buildings ought to stand. When they did stand, and others even heavier and higher, skeptics were not silenced. . . . Disaster was predicted for years and by men of technical knowledge. We know now that their fears were baseless." Measured against today's advanced technology, the courage and imagination of these early Chicago architects is a continuing source of wonder, long after the skyscraper has become a commonplace.

ADA LOUISE HUXTABLE

Pictorial and research assistance: Burnham Architectural Library of Art Institute of Chicago; Chicago Historical Society.



panel curtain-wall construction

by Harold R. Sleeper*

Curtain walls have sprung to full bloom almost overnight. In an incredibly short period of time they have come into being and represent a real revolution both in the designing and building of our structures.

It is, therefore, not surprising that their design and erection is attended with confusion and regrets. Mistakes and failures are bound to follow when new concepts and methods of building find such wide acceptance in so short a time. Conventional construction has matured over the centuries. "Time" has always been the only real basis for testing elements of buildings; laboratory tests are inconclusive. In our hurry to use curtain walls we lack even these tests for most of the curtain wall assemblies used, and "time" has not afforded outdoor experience tests to mature. So today we are learning as we go along by observing the behavior of recently constructed buildings.

The prototypes which approach this type of construction are the thatched huts of tropical countries such as the Filipino nipa hut. Bamboo poles for columns and beams hold subframes of split bamboo to which are attached the thatch wall covering or thatched windows. Nearer in time, we still have with us the "continuous-window" factories built earlier in this century.

Our one great advantage today over other centuries of building is that we can and do disseminate our experiences, and thus successes and failures may be common knowledge immediately. The two conferences regarding Metal Curtain Walls sponsored by the Building Research Institute, Washington, D. C., (hereinafter referred to as BRI), brought together all parties interested in that subject with excellent results. Research—such as conducted by the Princeton School of Architecture, resulting in "A Study Prepared for the Committee of Stainless Steel Producers, American Iron and Steel Institute" —has given us a fine concept of where we stand today as has the Building Research Advisory Board's and the American Institute of Architects' survey of this field. Architectural magazines are a real continuing medium presenting architects, engineers, and the entire industry with examples of what is being done and how.

Frankly speaking, there have been many acknowledged failures reported in curtain-wall structures: from leaks to excess air infiltration, from noise made by panel movements to panel warpages, from out-of-plumb walls to broken glass. In addition, high costs are often quoted for curtain walls. However, this is no reason for discouragement. What architect has not had failures even in the older types of construction? Few tall buildings have been erected without leaks and huge sums have been spent to correct these conditions.

The AIA Research Advisory Service published in the *Bulletin*, July-August 1955, "Architects Use of Metal Wall Panels." This summary of a survey of architects tells what, where, and why curtain walls have or have not been used. It sums up what variety of stock panels are desired, preference as to jointing methods, and panel finishes. Most interesting are the architects' comments on a host of details resulting from their experience. In many cases ways to avoid pitfalls are stated. The survey shows that curtain walls have many likely points of failure, but that solutions to prevent these are being found. Comments from the surveys have been used in this article under the appropriate headings.

BRAB's "Survey of Metal Curtain Walls" was a companion survey to that of the AIA. It was addressed to owners of buildings using curtain walls and to the contractors who had erected them. This survey pinpointed curtain-wall faults in a most constructive manner. For instance, infiltration was reported to be the most frequent trouble—starting with air, then dust, water, and lastly snow. The most troublesome joints were around windows, next, the horizontal joints. Only 14 percent reported complaints about drafts at walls; however, some 40 percent reported that the surface of the wall was cold to the touch. Distortion of panel surfaces was found in 16 percent of the buildings. Joints were recalked in periods of six months to two years in 7.5 percent of the buildings. Defective panels occurred in 5½ percent of the cases reported. A very large proportion of both owners and contractors stated that they would use or recommend the use of this type of construction again. In fact, only four owners out of 157 replied in the negative.

The wide acceptance, all over the world, of curtain-wall buildings will force testing, standardization, and acceptable procedures of fabrication and erection. The complexities are great, but today we have the facilities and the know-how to solve the problems. The limitations of the use of curtain walls are mostly due to lack of experience and accepted standards, and the consequent higher price in some types of designs. Naturally, where design calls for deep window reveals, this method of facing is not well adapted unless sun shades are used. Its advantages to date have been far from realized either design-wise or price-wise. In this country, with few exceptions, its merits of adaptability have been only partially realized—that is, as buildings faced on one flat plane. As designers become more familiar with the possibilities for integrating the panels with sun-shades, louvers, and overhangs, the monotony now associated with our façades should disappear.

TERMINOLOGY

Any discussion of curtain walls should be preceded with some explanation of the

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current terminology. Even those long associated with designing, building, and erecting these walls had difficulty, at a recent committee meeting of the BRI, in formulating definitions. The definitions shown *(Figure 1)* are those accepted generally by the BRI for metal curtain walls except that panel types were not defined. Although "Panel Curtain Walls" is the correct name for this subject, for brevity in this article "Curtain Walls" is used.

In general, the first classification of a curtain wall is its visual characteristic, the second is its method of support, and the third is its method of assembly. Joints are also classified, as shown later in the discussion of "Joints."

Many architects and builders apply the word "skin" to a panel curtain wall. To avoid a confusion in terms, it seems advisable to limit this word to either the outer facing or "outer skin" of a panel or to the "inner skin" or back facing of a panel. The "core" is the material or materials behind the outer skin of a panel. Words such as mullion, transom, muntin, sill, frame, trim, rail, stop, etc. retain their usual connotations.

TOLERANCES AND CLEARANCES

Structural tolerance. In designing curtain walls, consideration must be given to the deviation from the plumb line of the structure upon which the wall is hung. For instance, if the outer concrete column face projects one in. nearer the building line than planned, the curtain wall will, under normal conditions, also project one in. out from its planned location. On property lines encroachments may be serious matter. Erectors report that such conditions are frequently encountered. One case was quoted where such a deviation was four in. The curtain-wall erector had no choice but to follow the structure. At one floor this resulted in a wavy front, when viewed from the sidewalk, as well as a great projection over the building line.

An allowable tolerance should be decided upon, and to insure that a maximum deviation from the norm is secured, it is essential that specifications should be definite and supervision adequate. The American Institute of Steel Construction code of standard practice provides that the plumb and level error not exceed one to 1000 for exterior steel columns. The deviation in concrete structural members or steel fireproofed with concrete or masonry is likely to exceed that of steel considerably. Until general agreement for these factors in concrete construction is obtained, each office will have to use its own judgment as related to its specific problems.

It is questionable whether the exterior steel allowance stated above is satisfactory, since this would allow the steel of a 200′ high building to lean toward the building line 2.4″ between sidewalk and top. Unless the architect has provided extra space between the structure and curtain-wall backing for the adjustment necessary to plumb the wall, this would be critical. It seems to be agreed that the maximum tolerance for a structure whether of steel or concrete should be one in. from bottom to top. This tolerance should apply also to the fireproofing. In a steel structure this may be easily achieved but may be difficult in a concrete frame.

Erection allowance. The second BRI conference recommended that in addition to the tolerance required for structural framing the erector needs a two in. minimum clearance between the structure and the inside of the curtain-wall panel or unit in order to erect his work from the inside of the building without a scaffold. Even this space will not allow the wall to be secured to fasteners located in the mid-height areas of deep spandrels or on the center of large columns.

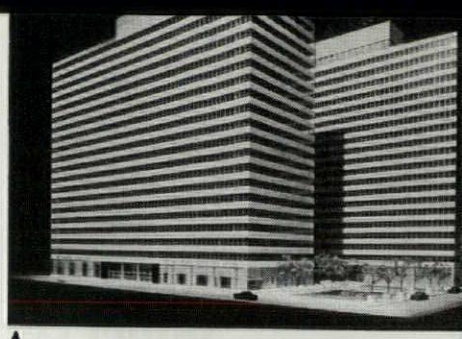
Another factor must be considered in addition to the two mentioned above and that is the movement of the frame or structure due to temperature change. This movement is generally compensated for between joints of panels or units and will be discussed under those subjects.

The architect's prime responsibility is to establish tolerances and to insure that they are met. Today few specifications cover the subject especially as "how" and "who" is to enforce any stated requirements.

CONSIDERATIONS IN SELECTING CURTAIN-WALL TYPES

The development and detailing of a curtain wall usually stems from the aesthetic or appearance consideration. However, this is far from the only factor which may influence the design.

The curtain-wall type may be dictated by the method of air conditioning or the type of air conditioning may be changed to fit the desired appearance. These two factors must be jointly considered before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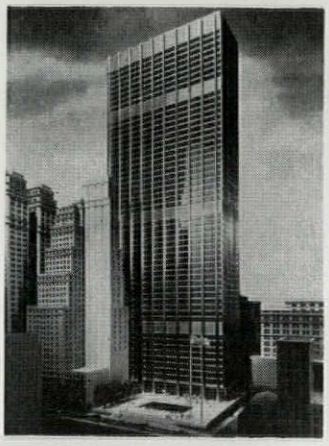
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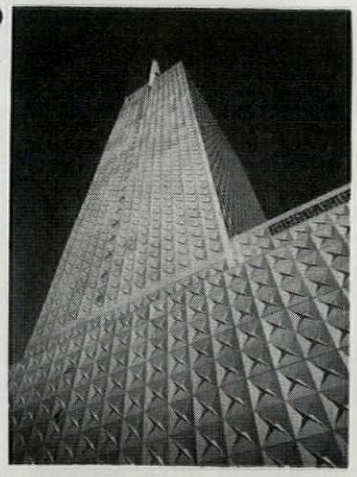
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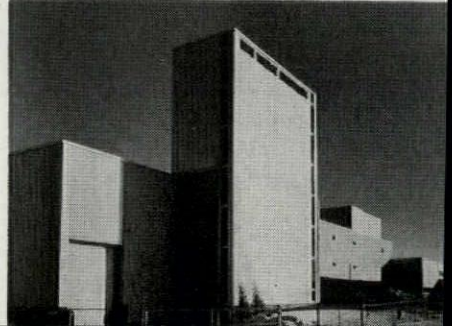
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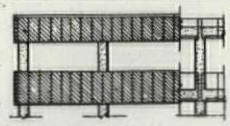
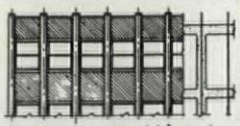
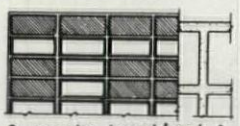
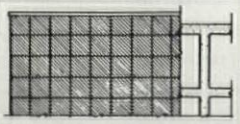
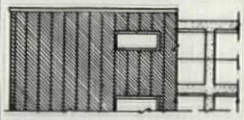
TYPES OF PANEL CURTAIN WALL

				
Supports not a primary element of expression.	Supports (mullions) clearly expressed.	Supports (vertical & horizontal members) clearly expressed.	Supports not expressed.	Supports not expressed.
SPANDREL TYPE	MULLION TYPE	GRID TYPE	SHEATHED TYPE	SHEATHED TYPE (INDUSTRIAL)
VISUAL CHARACTERISTIC AND SIZE LIMITATIONS				
Horizontal line dominant. Joints vertical. Length of spandrel unlimited. Width of interlocking panels 4'-4" max., height 8'-0" max.	Vertical lines dominant. ℄ to ℄ of mullions, generally 4'-5". Width of panels max. 4'-4", height max. 8'-0".	Vertical & horizontal line equally dominant. Area between support members 32 sq. foot max. Width of panels 4'-4" max., height, 8'-0" max.	Non-lineal pattern. Joints vert. & hor. usually without trim, individual panel size: max. width 3'-10", max. height 8'-0"	Non-lineal pattern. Joints vertical Panel size: width approx. 4', height 60' max.
TYPES OF PANELS				
Skin | Open Sandwich | Closed Sandwich	Skin | Open Sandwich | Closed Sandwich	Skin | Open Sandwich | Closed Sandwich	Skin | Closed Sandwich	Skin | Open Sandwich
EXTERIOR PANEL MATERIAL				
Metal, Stone | Metal | Metal Precast conc.	Metal, Stone, Glass | Metal | Metal	Metal, Marble, Stone, Glass | Metal, Glass | Metal	Stone | Metal Precast conc.	Metal | Metal

PANEL CURTAIN WALL: Exterior nonloadbearing wall made up of panels (1) attached directly to building structure with an adjustable attachment, or (2) mounted on supports (subframe), which in turn, are attached to building structure by adjustable attachments. Exterior surface of panels forms face of building; interior surface may or may not form interior finish.

SUPPORTS: Structural elements independent of structural framing made of angles, plates, channels, etc., to which panels are attached. Supports may be (1) integral with panel construction or (2) a subframe erected independently of panel construction.

ADJUSTABLE ATTACHMENTS: Angles, plates, and brackets with devices which allow for three plane adjustment to compensate for minor irregularities in the building structure; used to attach supports to building structure.

PANEL FOR PANEL CURTAIN WALL: Single element of any size or shape made of one material or assembly of materials, one side of which forms exterior building face and which protects the building from weather.

WINDOW-TYPE PANEL: Transparent glass and frame incorporated in panel curtain wall.

Skin-type Panel: Panel made of one material.

Sandwich-type Panel: Panel made of assembly of several materials.

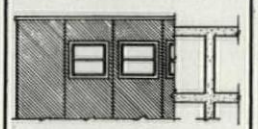
Open-sandwich Type Panel: Sandwich panel with top and bottom edges closed.

Closed-sandwich Type Panel: Sandwich panel in which all edges are closed except for weep holes and vents.

WALL UNIT: Preassembly of several panels of any type. Units may or may not include trim, may be one or several stories high.

ASSEMBLY METHODS (for erection)

1. By individual panels.
2. By wall units



WALL UNIT

SIZE LIMITATIONS

Wall units width 6'-0" max.
Heights 1 to several stories
Supports for wall units are usually modification of those used for individual panels.

Figure 1—types of panel curtain-wall construction and terminology (above). A (acrosspage)—*Penn Center Office Buildings, Philadelphia—limestone spandrels and glass; Emery Roth & Sons, Architects.* B—*Chase Manhattan Bank, New York—metal mullions, metal spandrels, and glass; Skidmore, Owings & Merrill, Architects.* C—*Lutheran Brotherhood Building, Minneapolis—stainless-steel grid, porcelain-enamel panels, and glass; Perkins & Will, Architects.* D—*Republic National Bank, Dallas—façade sheathed with aluminum panels; Harrison & Abramovitz, Architects.* E—*High Voltage Engineering Building, Burlington, Mass.—industrial structure sheathed with aluminum panels; Carleton Richmond, Jr., Architect.*

a decision is made. The peripheral air-conditioning system will require space for duct work at the exterior columns either located outside of the columns (requiring large mullions) or inside of the columns (requiring furring space which lessens the floor area). Today a Tishman building is being erected on Fifth Avenue in New York where the duct arises at midpoint between the columns. The double-duct system, which supplies air at the ceiling provides the designer with greater latitude as space for heating pipes only is needed at the columns. The choice is often dependent on the relative costs of these systems.

Orientation, sun shade devices, and the desired amount of fenestration may influence the choice of a curtain-wall construction system.

The proportion of insulated curtain wall in relation to glass area should be studied for each of the elevations. The initial and operating costs for air conditioning are vitally affected. This in turn might influence the type of curtain wall. For instance, one elevation without windows might use the sheathed-type wall whereas other elevations might require windows and use the spandrel-, mullion-, or grid-type curtain wall.

The importance of studying the relative transparent glass area may be realized from the following figures based on a typical multistory office building. Costs include construction, air conditioning, operating, interest, and amortization for 25 years, based on a back-up curtain-wall meeting the New York City Code. Building orientation was true north. If a west wall first calculated with 65 percent glass area is changed to 25 percent glass area, each foot of glass taken out will save the owner $.80 per year.

These figures would vary with each building and cannot be applied generally. Yet this brings out the point that the relative areas of fenestration to insulated curtain walls is an important design factor.

Where city codes require fire-rated exterior walls, a back-up masonry panel is added from top of floor slab to the underside of window sill. This would not necessarily affect the selection of the type of curtain wall, but it might affect the attachments, insulation, location of vapor-proofing, and type of panel selected.

Curtain wall costs on many of today's buildings are disregarded because of their value from a publicity viewpoint. But those buildings built as an investment or

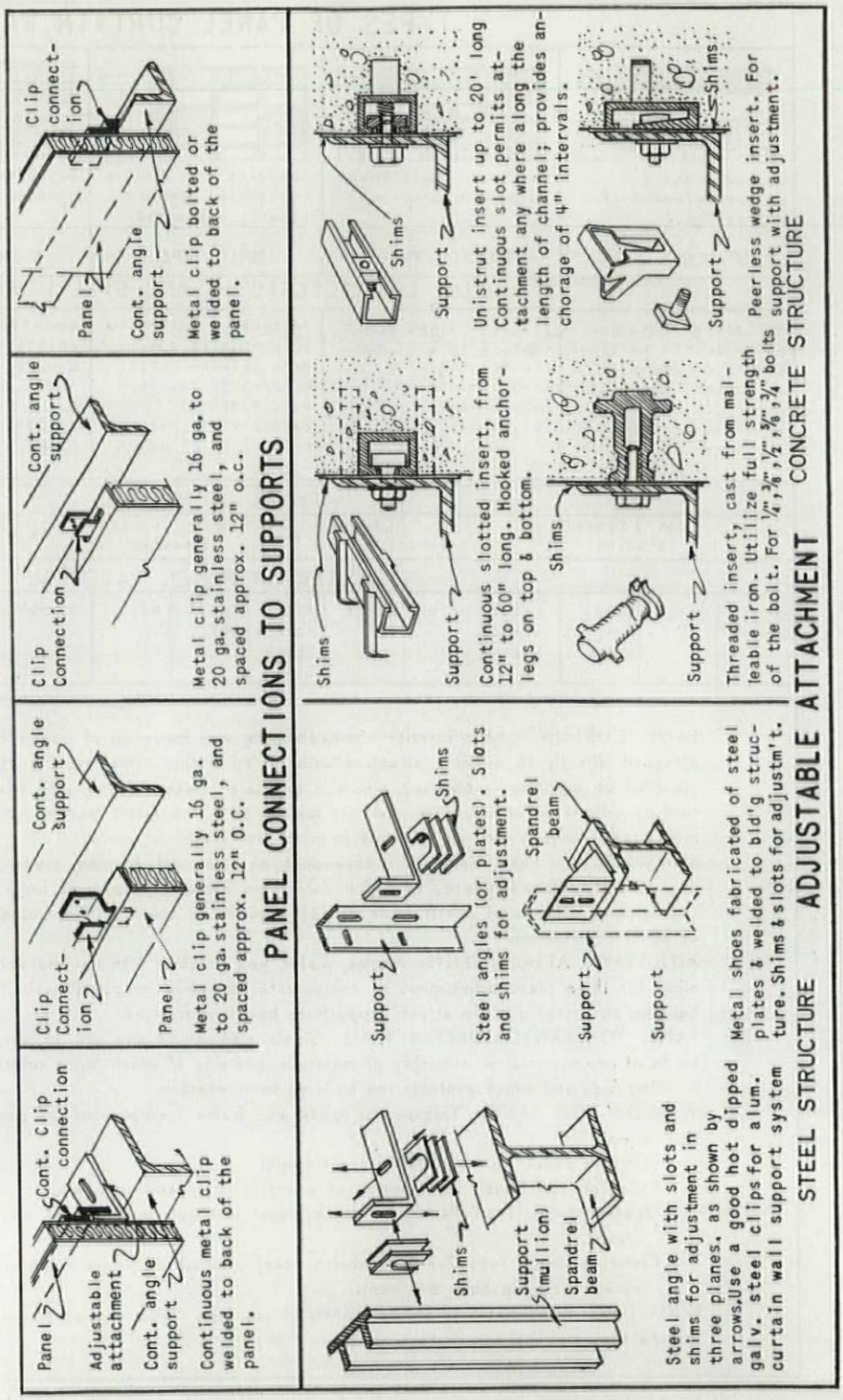


Figure 2

to be sold need a careful cost analysis to establish whether this method is appropriate as to cost.

It is difficult to evaluate the comparative costs of a building, if built with curtain walls or in the old manner. Actual bids would have to be taken simultaneously to obtain a true comparison from two full sets of documents. One large company has built similar apartment buildings in both manners and has found that by using stock curtain-wall units costs

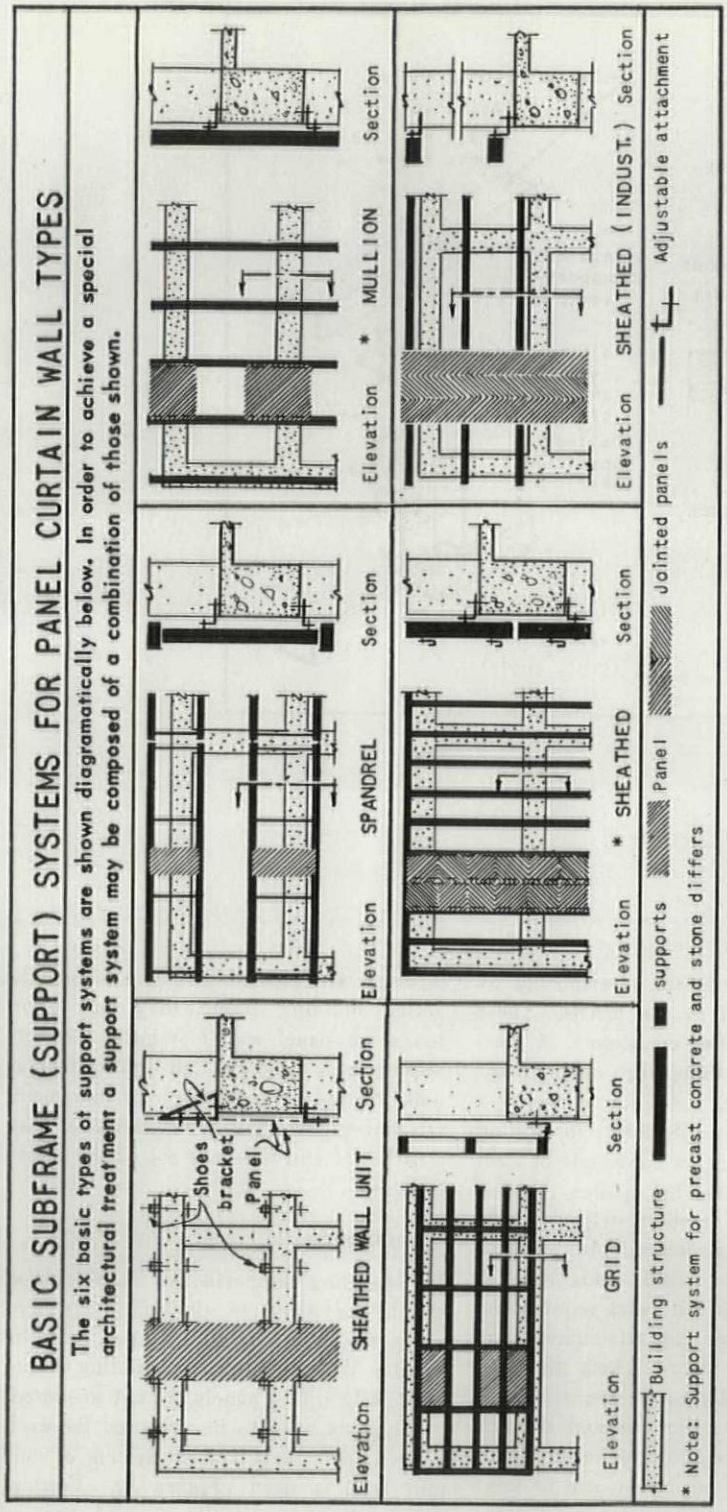


Figure 3

are apparently less for the curtain-wall building. Conversely, other sources state that they have found that curtain walls would have added to the cost of a specific building.

The comparable costs of curtain walls cannot be determined with any degree of accuracy unless all factors are considered. That is, weight, as applicable to the foundations and structure, attendant saving in floor area, as well as the obvious costs of building the exterior walls and of time saved. The proportionate glass area is not really a consideration as curtain walls may be designed with no glass area or large glass areas as can buildings with masonry or stone walls.

METHOD OF ATTACHMENT

Attachments are devices for securing or hanging the curtain wall to the structure of the building *(Figure 2)*. When supports are used between the structure and the panels, attachments hold the supports onto the structure; when the supports are omitted attachments directly secure panels to the structure. Such panels have to be especially designed and reinforced to compensate for the lack of supports. Panels are hung to supports with clips of a variety of types.

Attachments are always adjustable to allow for the proper alignment of the supports or panels, in three planes. This is accomplished by means of slotted holes and shims.

In steel structures angles or brackets, either continuous or in sections, are generally used; inserts are built into the concrete frames.

The attachment design should include a good factor of safety and be fire resistant up to 1500 F.

There is disagreement as to whether attachments should be connected to the structural steel in the shop or on the job. Erectors claim that the extra cost of field connections is more than compensated for by the accurately located job connected attachments. The current recommendation is to connect attachments to the frame after the frame is erected in order to insure accurate locations.

The attachment member usually fastened by a welded fillet to the structural steel, whether angle shoe, channel, or bracket, should generally be 3/16" to ¼" thick galvanized steel or stainless steel. Bituminous coatings on steel may suffice if abrasion can be prevented. Bolts connecting the attachment to the supports or panels are probably the weak link, either from fire-hazard standpoint or corrosion-wise. So the usual ½" bolt should not be used unless checked for the actual conditions.

It is recommended that any one attachment be of sufficient strength to sustain the load of each panel or unit (if erected in units), so that during erection or in case of fire this connector will sustain the entire load. Bolts, of course, should be of similar or at least of metal compatible

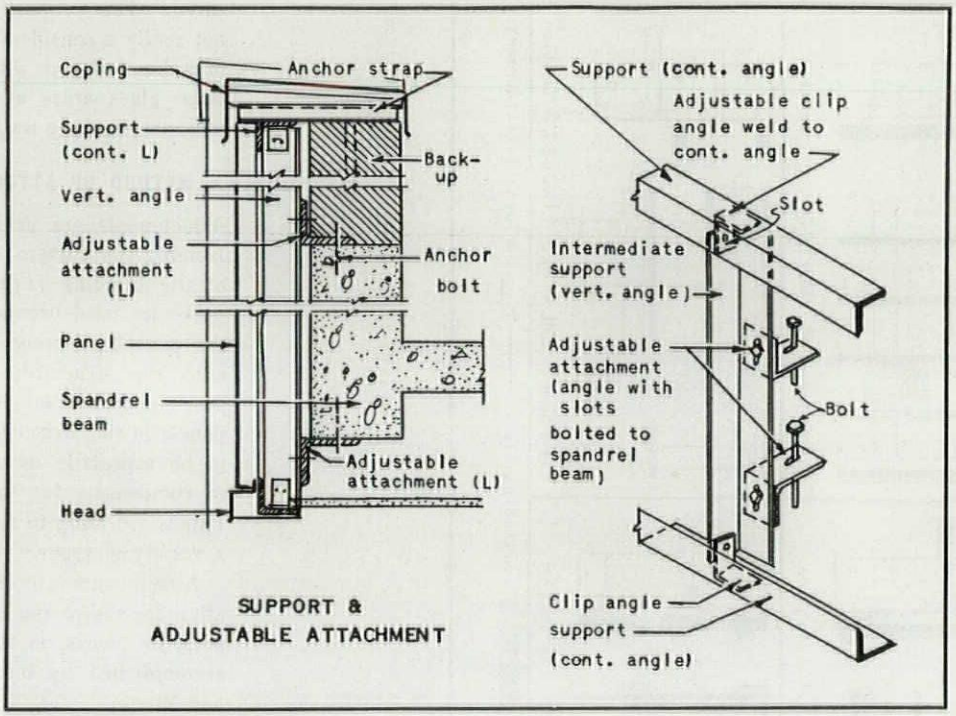


Figure 4

to that used for the attachment itself. When dissimilar metals are used, such as connections between panels and supports, gaskets should be employed.

The location of connectors should be selected for ease of access during erection or panel removal for later replacement. With mullion-type supports attachments are generally located at the top of the spandrel beam behind the mullions. In some cases one is located at the top and one at the bottom of this beam. Mullions (every third, fourth, or fifth) are generally centered on columns, but cases occur where the columns are well back of the mullions (with cantilevered slabs) and the mullions spaced with no definite regard to columns. The width between mullions may be dictated by interior requirements, design consideration, panel size maximums, or a combination of several of these.

To prevent loosening of fasteners due to vibration the use of lock-type washers of the external tooth variety is advisable.

Studs may be placed in steel or concrete with powder power wherever it is possible to use the required tool.

Panels are generally held on the supports or directly to the attachments by clips, spot welded to the panels. These clips slip over mating connectors. A plastic insulation on these clips will prevent metal conductance.

To provide greater flexibility in locating attachments—either on a concrete or steel structure—channels, flat plates, angles, either continuous or short strips, may be built in to the structure. As wall assembly progresses, weld studs can be welded to these at the exact required locations. To these the attachments are bolted. On steel frames, long threaded studs can be welded to the beams so that the threaded ends project through the fireproofing to receive the attachment angle.

Continuous slotted devices can be used as inserts in concrete or can be tack-welded to steel. This method provides for attachment at any location in one plane.

Where back-up spandrel walls are used or where masonry spandrel back-up occurs below the spandrel beam, it is better practice to provide the attachments at the top and/or bottom of the spandrel beam itself rather than at the top and/or bottom of the masonry wall *(Figure 4)*. It has been found that if attachments to masonry are located below or above the actual building frame, they may allow too much panel wall movement and consequent risk of leaks, air infiltration, or noise caused by excessive joint movement. Of course, secondary attachments at window heads and sills are not of the above category.

SUPPORTS

In designing supports full consideration should be given to thermal movement, since the temperature variation will be greater than that of the building frame especially where panels are not insulated.

Supports have to be designed for each application unless a stock system of curtain wall is used *(Figure 3)*. Vertical members are generally erected one or two stories high and the two abutting ends connected to one attachment—the lower end movable with a slip joint and top end fixed or jointed between attachments with a sleeve connection. Horizontal supports should be designed in a similar manner.

How directly related the temperature of the supports is to the exterior skin must be evaluated according to the type

of panel used and whether air wash will occur back of the face skin to prevent a build-up of temperature. It is clear, however, that supports must be designed for their thermal movement. Unless this is done buckling of the supports would occur and this, of course, would cause a deformation of the panels.

CURTAIN-WALL PANELS

Daily we may expect new materials and new combinations of materials for use in curtain wall panels. Skins of metal and glass are common but marble, stone, and ceramic veneer and tile being used more and more add to the design possibilities. The House of Seagram now being completed in New York has glass and bronze for the curtain-wall panel faces generally, but certain tiers of panels, where transparency is not desired, are faced with marble.

Size limitations. Panel sizes are not generally standardized except by some manufacturers. The manufacturers do, however, set up maximum sizes—some times in square feet and at others by maximum dimensions. The recommended sizes are based on the outer skin materials. Practical recommended sizes are (from second BRI conference):

1. Aluminum, stainless steel, coated steel: 4′ to 5′ wide by story height with maximum width of 6′ by any reasonable length.

2. Aluminum, anodized: sheets up to 5′ wide by story height.

3. Porcelain enamel on aluminum, or on aluminized steel: recommended size 4′x5′ with maximum 4′x8′ for flat panels; for special conditions panels as large as 5′x12′ can be obtained.

4. Porcelain enamel on steel: recommended size 4′x5′ or 6′ with acceptable maximum of 4′x8′.

5. Glass: plate thicknesses from ¼″ to ½″. Practical size 10′-10″ width by 11′-8″ length with a maximum of 10′-10″ by 15′. For insulating glass units the recommended maximum is 70 sq ft. Larger sizes, however, are available.

6. Roll forming: economically limited to the continuous production of repetitive units. Variations are very expensive; sharp corners not possible. Maximum width 2′-0″.

7. Die forming: the recommended size is 5′-0″ by story height, although in special cases these panels could be 6′ by 16′ high. For economy, die forming is appropriate only where many panels of similar size are to be used.

8. Press breaking: limit of length 14′-0″, many breaks (press breaking machines) are only 12′-0″ long. Cannot produce sharp corners; the heavier the gage the greater the corner radius.

9. Casting: Usual size found to be satisfactory is 4′x5′ for either aluminum or bronze, but for special cases sizes up to 6′x10′ have been made. The thickness varies from ⅛″ to ¼″ increasing from the minimum as the sizes are enlarged.

10. Extrusions are discussed later under "Frames."

types of panels

The skin-type panel, uninsulated, is often used in industrial buildings and naturally is the most economical. It may be used with any type of curtain wall, but in industrial work it is usually used with sheathed metal panels of narrow width and long length.

Some manufacturers refer to skin-type panels with insulation attached, but for this discussion those will be referred to as open-sandwich panels. Skin panels are fast and easy to erect because of their light weight. Consequently, large areas made into panels or units can be erected quickly. Industrial plants, using long lengths of narrow widths can be sheathed with attachments made directly to the wall girts.

Such skins are generally fluted, ribbed, corrugated, or of some other deformed surface. Aluminum deformed skins have been made in lengths up to 60′.

Sandwich-type panel (also called "solid"). Any type of insulated panel is generally referred to as a sandwich panel (or solid panel). The assembly may be of great variety and combination of materials. Laminated panels indicate that several layers of materials are adhered together. The panel core may be of insulation or insulation plus other boards or honeycombs, or without insulation and with boards or honeycombs.

Today panels run from ¾″ to 4″ thick with the majority 1″, 1½″, or 2″ thick. Panel weights vary according to the panel assembly, but for preliminary weight calculation the following figures are average: 1″ thick, 5½ psf; 1½″ thick, 7 psf; 2″ thick, 8 psf.

When panels are to present their inner skin as an interior finish, a metal back and probably a closed sandwich-type panel will be selected. When this inner skin is to be shop-finished great care must be used in erection and transporting. When it is to be job finished, it is shop prepared to receive paint. However, when no panels are to be used as interior wall finishes, then open back panels may be considered.

Data for clearances around panels, because of movement and material tolerances, is included under "Joints."

Open-type sandwich panels. These have two to four sides open and may also have an open back. With face and back skins these panels frequently are made with open sides; in other words, these panels are those not completely encased within a skin. Such panels are more economical than if completely covered.

Closed type (or box). Such sandwich panels are enclosed on four sides by the skin. However, it is now recognized that closed panels are not completely air-tight. Such panels can be achieved, but only at great expense. They have, for example, been used on airplanes where their cost is of little concern. Nor are such panels desirable because of the danger involved in pressure differentials which might deform the panels. Even if hermetically sealed panels were feasible, the chance of pin holes developing later must be considered.

It is to be assumed that water may find its way into any panel and so all should have weep-holes to allow the water to escape, since freezing or trapped water may cause severe damage. Nearly all closed-sandwich panels have flat faces and hence are frequently laminated.

The selection of panels is, of course, primarily dependent on the desired appearance as to the texture, color, and size limitations. Cost is generally important. The prior decision as to type of curtain wall to use does not limit to any great extent the selection of the panel, except for "industrial sheathed type."

When a formed or patterned surface is desired and not a flat panel, the closed-sandwich panel need not be considered. Colors and texture, of course, can be had in any type of panel.

Weatherproofness. Keeping out the weather is dependent on the entire wall assembly and not just the panels, although panels are likely to have more joints than other elements where water in its various forms may penetrate.

This will be discussed under "Joints" and "Sealants."

thermal considerations

1. *Temperature differentials.* The industry doesn't agree on the exact temperature differential to allow for in the design of panels. However, the BRI meeting set 150 F to 180 F, under normal conditions, as the maximum outer skin surface temperature with the minimum (coldest) based on that indicated by weather reports of the building locality.

Indoor temperatures may range from 30 F minimum to plus 100 F air temperature. (This may run up to 140 F where panels are adjacent to heating elements.) This variation from outdoor to indoor temperature is important especially where panel faces form both inside and outside finishes.

So panel designs must furnish means of taking care of the stresses set up by the temperature variation. This would include: mounting flexibility, joint design, and panel faces made so that they may move without distortion. Panel movement may be anticipated (*by use of Table V*).

2. *Thermal transmission.* A recent study has shown that architects and engineers seldom demand a specific heat transmission value ("U" value) for curtain wall panels. The second BRI meeting did not agree on such a value.

When single glass comprises a very large proportion of the wall surface (60 to 70 percent), it is obvious that no amount of insulation can overcome the large uninsulated area. Where double glazing is used the condition is changed.

The thickness of a panel and the insulating value of the insulation used have, of course, great bearing on the heat transmitted through the wall. To date, few tests on completed panels are available as a guide to the selection of a panel to meet definite requirements, although some manufacturers do rate their standard panels. "U" ratings of standard panels of the sandwich type run from 0.15 to 0.33 according to the manufacturers. The ability of the skin to reflect heat is also to be taken into account. Panel transmission is not the answer to the total wall transmission as the joints, mullions, windows, and other members all contribute to the heat loss.

Vapor Control. Condensation is inevitable on the inner side of the exterior skin when warm, moist air hits the night cooled surface. The resultant moisture may damage some types of insulation and, in the case of laminated panels, it may damage the adhesives used to bind the panel together. When dissimilar metals are in contact the presence of moisture may be extremely damaging. The first precaution is to select panel cores which will not be damaged by moisture. Next, the inside surfaces of the outer skin should be impervious to vapor. Lastly, the moisture within the panel, which enters as vapor as well as water, should be able to drain out either by venting or via weeps or flashings.

Even though the insulating panel core is not subject to damage by water when saturated, its thermal properties are impaired.

Through-metal-conductors, such as studs and stiffeners, lead to surface condensation. This can be avoided by use of non-hydroscopic insulators such as high strength plastics or impregnated felts.

Sound control. Noises caused by panel movement which may sound like popping, cracking, banging, or squeaking is avoidable by proper joint and panel design. Avoid metal to metal movement, rubbing, or scraping by allowing proper clearance for expansion. The question of isolating the interior from the usual exterior street noises (approximately 30 db is required) is no problem since ¼" plate glass will provide approximately 30 db sound loss and panels that weigh three psf will do as much. Most panels of the sandwich type are likely to weigh from five to eight psf and the sound transmission loss is directly related to the weight of the wall. For situations where a greater transmission loss is desired, then double glazing and much heavier panels or double panels would have to be used. This condition would have to be considered in the case of air-terminal buildings, auditoriums, and other buildings where the exterior noise level is above average or where extreme quiet is required inside.

The question of sealing the floors vertically, one from the next one above, at the spandrel beam is important. At least a complete air stop should be provided. For better results semi-compressed foam rubber or another sound dampener may be used.

Fire-resistance. The question of fire-resistance of curtain walls is controversial and few tests have been made on panels to determine their resistance. The glass element of the curtain wall should perhaps be recognized as the part that governs its performance during either interior or exterior fires. Rated walls, two hours or four hours, as now required by many cities, are built with back-up masonry behind the panels from floor to sill. However, some codes do not limit the size of the glass areas and when glass is carried from floor (4" above) to bottom of spandrel beam no back-up wall is required, and in such cases the fire-resistive panel, in front of the spandrel beam, would be of no use.

Building codes are slowly recognizing the need for change in regard to fire-resistance of exterior walls. The National Board of Fire Underwriter's Code has recently adopted new requirements based on the proximity of the wall from either the property line or to the nearest building. In general, its requirements are: wall of building on property line, two-hr fire resistance; wall of building three to 10 ft back of property line, one-hr fire resistance; wall of building 30 ft or more back of property line, no incombustible construction.

Adhesives for panels. The second conference on curtain walls held by BRI set up the following requirements for bonding agents used in panels. (This report has been briefed.)

1. Heat tolerance to meet surface skin temperature, max. 180 F, min. that of weather reports of locale.
2. Water resistance, based on continuous water immersion.
3. Flexibility, to vary with the characteristics of other panel components.
4. Strength, to resist known stresses.
5. Durability, ASTM D-1037 (this may be excessive for some materials).
6. Shear test.
7. Creep test (support of sustained loads over long periods).

PANEL DESIGN

Skins. Thickness, gages, and shapes of material for panels will vary depending on spacing of stiffeners or the panel's structural characteristics inherent in its formed shape. Gage of the metal may also be selected to meet required fire resistance values of local building codes or to eliminate the possibility of cracking or chipping of the finish applied to them due to deflection of the panel surface.

Sandwich panels. In sandwich structures, the function of the facing is to carry the stresses due to the loading, whereas the function of the core is to space the facings so as to obtain sufficient flexural rigidity and provide enough support to make them elastically stable under high stresses and, of course, to provide

TABLE I: Steel

	Notes	Gages	Thickness	Finish
Sheet (flat)	Laminated	16 ga	.0598" 1/16"—	Porcelain enamel
	Laminated	18 ga	.0478" 3/64"+	Porcelain enamel
	Laminated	20 ga	.0359" 1/32"+	Porcelain enamel
	Non-laminated	16 ga	.0598" 1/16"—	Porcelain enamel
	Non-laminated	18 ga	.0478" 3/64"+	Galvanized or galv. with color bond or baked-on enamel or painted
Deformed (pressed, stamped, or rolled)	Non-laminated	18 ga	.0478" 3/64"+	Galvanized or galv. with color bond or baked on enamel or painted or metallic coated steel

TABLE II: Stainless Steel

	Notes	Gages	Thickness	Finish
Sheet (flat)	Not laminated	20 ga	.0375" 1/32"+	Dull cold rolled, bright cold rolled, polished, or polished and tampico brushed.
Deformed (pressed, stamped, or rolled)	Not laminated	20 ga	.0375" 1/32"+	Dull cold rolled, bright cold rolled, polished, or polished and tampico brushed.

the required insulation value.

The important mechanical properties of a core material are: tensile strength, compressive strength, and modulus of elasticity in the direction perpendicular to the plane of the facings; shear-strength in planes parallel to the facings; and modulus of rigidity measured in planes perpendicular to the facings.

1. *Non-laminated panels.* These are composed of an outer skin, core of insulation, and with or without inner skin. Outer skins are usually braced with steel angles, tees, or Z-bars. The insulation may be placed directly back of the skin or, when braces are used, the insulation is located between these braces. If rigid insulation is used, an air space may be left between the outer skin and insulation. The insulation is secured to the braces.

2. *Laminated panels.* Outer and inner skins are glued to core under pressure. Core may be either insulation by itself or insulation with a rigid surface applied between the insulation and the outer skin. The rigid surface would then reduce the number of braces necessary to keep the skins from warping.

Exterior skins currently used for panels. The architect may develop new profile skin features and joints for metal panels if a job is of sufficient size to warrant making special forming rolls or dies. If either deformed or extruded shapes will serve the same purpose, the deformed shapes are least expensive.

1. *Gages* used:

US Standard Revised, for hot and cold rolled steel sheets

US Standard, for stainless steel and Monel metals.

Brown & Sharp or American Wire, for aluminum, copper, brass, bronze, and nickel.

2. *Steel* (*see Table I*).

3. *Stainless steel* (*see Table II*). Type 302 (17-19 percent chrome, 8-10 percent nickel most often used and has more corrosion resistance than type 430 (14-18 percent chrome). Type 430 should not be used near sea coast.

Single coat of porcelain enamel may be applied in a spatter or discontinuous pattern thus permitting the stainless steel to show through. Same effect obtainable on textured sheets leaving high points uncoated. This is not possible with any other metal.

4. *Aluminum* (*see Table III*). Textured finishes or pretreatments may be used as final finishes with a suitable temporary protection, or as preliminary surfaces to receiving additional protective or decorative finishes. Surface pretreatment will eliminate the variations of the natural finish. Porcelain enamel on aluminum not only offers a wide range of colors, but also in case of damage to the enamel the appearance, due to oxidation of the metal, is not likely to be marred as in the case of enamel on steel.

Frosted or caustic etch finish. This is created by a low-cost chemical treatment well suited to all forms of aluminum and to large areas. The final effect has an attractive sparkle like that of finely etched glass. It is frequently used in contrast with other aluminum finishes on a wall surface. When used as a final finish it should always be protected with clear lacquer immediately after etching.

Satin finish. A soft texture of fine parallel scratch lines produced by a mechanical belt sander employing various grades of emery abrasive. This finish is slightly more expensive than the caustic etch. It is not recommended for large

TABLE III: Aluminum, Other Exterior Skin Materials

	Notes	Gages	Thickness	Finish
Sheet (flat)	Non-laminated	16 ga	.0508" 3/64"+	Anodized or electrolytically created integral colors or porcelain enamel
Deformed (rolled, pressed)	Non-laminated	16 ga	.0508" 3/64"+	Anodized or electrolytically created integral colors or porcelain enamel
Extruded Extruded: is forced through die and assumes same cross section as die aperture	Non-laminated		Thickness varies with die designs	Anodized or electrolytically created integral colors or porcelain enamel
Cast Casting: poured into molds	Non-laminated		Requires a min. thickness in excess of that necessary for sheet or extruded sections, usually 1/8" to 1/4"	
(5) Muntz metal (yellow brass containing 60 percent copper and 40 percent zinc)	Sheet (flat) by rolled process	8 ga	.1285" 1/8"+	Satin finish and oxidation, then lemon oil
(6) Marble	1/4" marble, insulation, with or without thin marble inner skin		Group "A" sound marble; min. thickness 1 1/4"; or 7/8" if in semi-structural metal frame	Natural, sand, grit, or hone and polish
(7) Glass Tempered glass			Fused on glass ceramic colors; max. size 4'-0" x 7'-0" x 9/32" thick	Opaque or polish and twill
Structural glass			Homogeneous colored glass; max. size 6'-2" x 10'-10" x 11/32". Other thicknesses — 3/8" and 1/2"	Polish and suede
Double-glazed insulating glass units			Combination of polished glass, rough plate, heat absorbing, or structural max. size 70 sq ft x 1-1/16" thick	Polished and rough one side
(8) Stone			Max. size 8'-0" x 4'-0" x 3" or 6'-0" x 3'-6" x 2" or 4'-0" x 3'-0" x 1 1/4" thick	Sand, saw, smooth, planer or rub. Recommended finishes smooth or planer
(9) Concrete	Lamination of 1 3/4" concrete, 1 1/2" insulation, 1 3/4" concrete		Size 8'-0" x 8'-0" x 5" or 8'-0" x 10'-0" x 5"	Outer skin of aggregate such as granite or applied finish such as ceramics
(10) Ceramic	Adhesion to backing by dry method or cement		Impervious ceramic tile or 1" de-aired, extruded, impervious clay body (for larger tiles)	Glazed or unglazed

TABLE IV: Laminates

Outer skin	Core	Inner skin
16, 18, or 20 ga porcelain enamel steel	1/4" aluminum honeycomb; 22 ga electro-galv. steel (or) 24 ga zinc-bonded steel; rigid insulation	18 ga steel painted (or) 16, 18 (or) 20 ga passivated zinc-bonded steel
16 ga porcelain enamel steel	Rigid insulation (or) lightweight concrete	16 ga porcelain enamel steel (or) galv. steel or wall board
20 ga porcelain enamel steel	3/16" or 1/4" asbestos-cement board; 26 ga zinc-coated steel; rigid insulation	3/16" or 1/4" cement board (or) 26 ga zinc coated steel (or) 20 ga porcelain enamel steel
18 ga porcelain enamel steel	1/4", 1/2" (or) 3/4" aluminum honeycomb	18 to 24 ga passivated zinc bonded steel

flat areas due to the difficulty of obtaining a uniform appearance, but may be effectively used on such items as windows, mullions, or trim.

Sand burnished finish. A fine, uniform, matte finish created by loose sand, gravel, steel balls and an agitating process. It is particularly well suited for flat sheet or cast spandrels.

Sandblast finish. A rapid and inexpensive treatment that produces a pleasingly rough texture. It is created by compressed air and washed silica sand in various grades of coarseness. The surface of sandblasted aluminum, because of its roughness, will in time collect and retain dirt unless protected by anodizing or lacquer. Sandblasting is not recommended for flat sheet because of distortion problems and difficulty in obtaining a uniform appearance.

Bright or buffed finish. A highly lustrous but costly finish produced in several stages by muslin buffing wheels and sometimes by hand operations. Buffing is usually considered too costly and difficult to apply on large areas, but is applied to narrow areas when a quality finish is desired.

Characteristics of other exterior skin materials are listed acrosspage (*Table III*).

Panel insulating material. Any type of insulation may be used in a closed-sandwich type panel (closed all sides); in open-sandwich type panels and in skin panels rigid-type insulation should be used.

Various types of insulation materials, their size, thickness, weight, moisture, and fire resistance qualities, are shown (*see chart below*).

Interior skins currently used for sandwich panels.

1. *Exposed to view.* May be any of the metals and finishes shown for outer skins with gage descreased, i.e., thickness of metal reduced as there is no wind load to cause damage. However, caution should be taken to protect areas which may be leaned against or kicked. Interior skins may also be of plywood, masonite, asbestos, etc.

2. *Not exposed.* May be any surface material which will protect the insulation in the panel from damage during construction. If panel is a closed-sandwich type the interior and exterior skins should have similar coefficient of expansion and contraction to prevent opening of the closed joints.

Examples of laminated panel types currently used. Steel, where shown (*see Table IV*), will be either galvanized or finished with a protective coating on outside. When laminated to another material and no air or moisture can contact the interior surface it may be left unfinished.

Windows. A window panel unit, which is a transparent framed glass panel incorporated in a curtain wall, will not be discussed in detail as "windows" is not a subject possible to cover here.

The connections of the window frame to other panels may or may not vary from that of other panels.

A very important aspect of curtain walls is the fact that designers may use windows where they wish and need them. In many applications panels and window panels may be interchanged even after the building is completed.

Window washing of large glass areas of air-conditioned buildings is seldom done today from the outside. It is usual practice to use window types that are pivoted and opened only by key for this purpose or to use projected windows, both of which are cleanable from inside. Of course, permanent movable scaffolds can be used for fixed-glass panels if the budget allows for this large initial investment.

Operable windows should be carefully weather stripped in air-conditioned buildings. The specifications should require that sash joints be positively sealed during fabrication. Calking of sash joints has been necessary on some jobs after erection but with a resulting marring of appearance. Joints between windows and other elements are considered under "Joints."

Curtain walls are complex assemblies of great variety. We must of necessity consider the operating costs of these walls. In air-conditioned buildings the heat gain is of the greatest importance.

Where windows occur the "U" value is 1.13 for a single glass and 0.45 for double glazing. This can be compared with the "U" value of panels which may vary from 0.33 to 0.10.

In addition, the glass areas may store up substantial amounts of solar energy when the sun shines. That is, glass panes become radiators at this time and add to the cooling load. Heat-absorbing glass is

Chart—various types of insulation materials

Insulating material	Wt.#/sq'	Thick.	Sizes	Conductivity BTU/inch	Moisture resist.	Fire resistance	Termal expansion	Cost	Remarks
Gypsum board	5.23	¼"-⅜"-½"	4'x6' to 12'	1.41	Poor	Excellent		12¢	
Asbestos cement *	3.75	5/16" to 2"	4'x6',8',9',10',12'	.40	Fair (Expands)	Incombustible	Negligible	40¢	
Calcium silicate **	3.00	½" to 2"	4'x8',10',12'	.75	Poor	Excellent	Negligible	High	
Cemented excelsior	2.3	1' to 3½"	32"x96"	.45	Fair (Expands)	Incombustible	Negligible	11 to 12.5¢	
Foamglass	.75	2" to 5"	12"x18"	.39	Excellent	Incombustible	Negligible	13¢	Vapor proof
Paper honeycomb I	.7			.39	Fair	Poor	Negligible	16¢	Batts resist fire to 450°, Fibers to 1000°
Cork board	.6	1" to 6"	12"x36" to 36"x36"	.26	Fair	Fire retardant	Negligible		
Glass Fiber Board	.47	1" to 4"	24"x48"	.24	Good	Incombustible	Negligible	65¢	
Aluminum honeycomb	.4				Excellent	Incombustible	High	80¢	
Paper honeycomb	.3	to 6"		.58	Fair	Poor	Negligible	12¢	
Mineral Wool	.25			.27	Fair	Excellent	Negligible	2¢	Vapor proof
Polystyrene foam	.16			.27	Excellent	Self-extenguish.	Negligible		1 to 5 mix shrinks considerably in curing
Pumice concrete	8.0			2.42	Poor	Excellent	Small		
Perlite concrete	2.6			.77	Poor	Excellent	Small		
Foam concrete	2.5			.6	Good	Excellent	Small	10¢	1 to 6 mix shrinks considerably in curing
Vermiculite concrete	2.25			.76	Poor	Excellent	Small		
Sprayed asbestos	.9	½" to 2"		.26	Good	Excellent			

*With fiberboard core ** Marinite, I With perlite fill. NOTE: costs are approximate.

CHART DATA FROM "CURTAIN WALLS OF STAINLESS STEEL" A STUDY BY PRINCETON UNIVERSITY SCHOOL OF ARCHITECTURE, PUBLISHED BY AMERICAN IRON AND STEEL INSTITUTE.

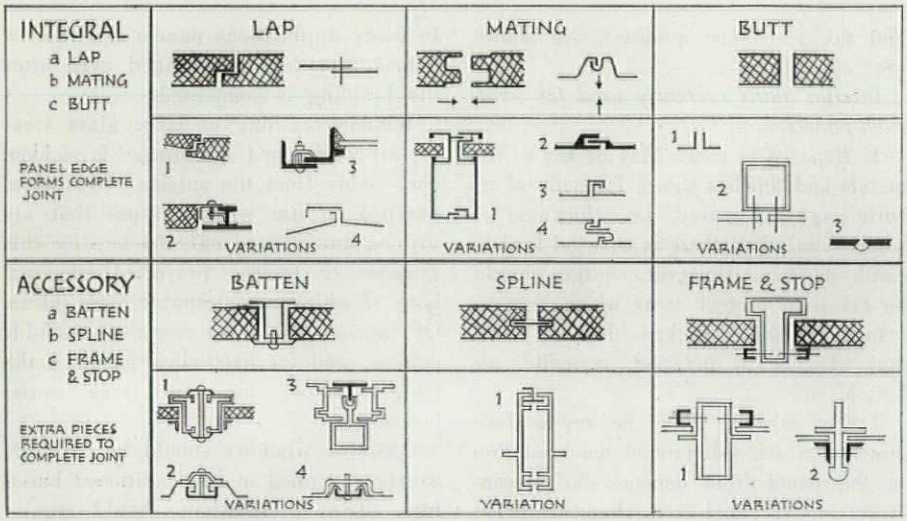


Figure 5—panel joint types. (Data from second BRI conference; drawn by author.)

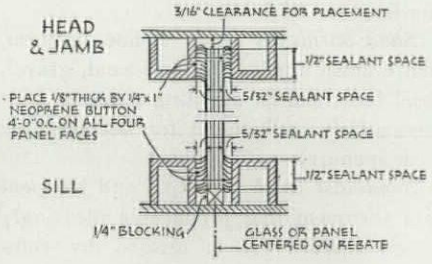


Figure 6—recommended clearances in using stops or moldings with glass. (Detail from Curtain Wall Seminar, New York Chapter Producers' Council; drawn by author.)

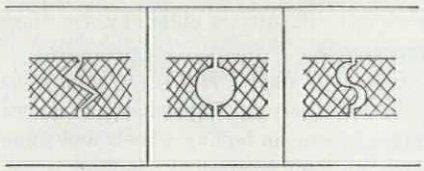


Figure 7—pressure reducing air pockets in panel joints. Narrow apertures and joints widen within.

TABLE V: Thermal Expansion of Materials

Material	Coefficient of thermal expansion in inches per inch of material for 1 F change in temperature	Dimensional changes occurring in 5 and 10 ft of material at maximum temperature variations indicated					
		100 F		150 F		200 F	
		5'-0"	10'-0"	5'-0"	10'-0"	5'-0"	10'-0"
Carbon Steel (enameling iron)	.0000065	.039"	.078"	.058"	.116"	.078"	.156"
Stainless Steel (302)	.0000096	.058"	.1152"	.0866"	.1732"	.1152"	.2304"
Aluminum	.0000133	.0798"	.1596"	.1197"	.2394"	.1596"	.3192"
Glass (plate) and asbestos-cement board	.000005	.030"	.060"	.045"	.090"	.060"	.120"
Marble	.0000056	.0336"	.0672"	.0504"	.1008"	.0672"	.1344"

of value on sunny exposures. To offset this effect to a greater degree double glazing with heat-absorbing glass on the outside and ordinary glass on the inside may be used. For fuel saving in the winter the two glasses should be reversed. Some day a window may be developed that can be reversed in winter so that the heat-absorbing glass is on the inside.

When single glass of either type is used, venetian blinds, or other reflective shades or screens should be used.

The relative area and orientation of windows is important. Southern exposures can be further relieved of heat gain by horizontal sun shades; east and west walls may lower their operation costs by the use of vertical louvers or egg-crate overhangs. When cost comparisons are made which include not only first costs but also future costs, then the extra for sun shades may prove economical.

METAL FRAMES

Nearly every curtain wall has metal members to frame or secure the panels. Supports may show, be covered by thin metal, or they may be hidden behind the panels as in the sheathed-type wall. Even in the latter windows are framed in by metal members.

Fabricating processes limit the sizes of certain metals used for the above purposes, especially mullions.

Extrusions in aluminum can be economically made when the shape is contained within an 8" diameter circumscribing circle. The lengths may be from 3' to 36' with practical limitation of 6' to 16'. Shapes may be of any complexity and solid or hollow. When quantities weighing less than 2000 lb are to be used, special inquiry before using should be made.

In bronze the economical size for extrusions should be contained in a 7" diameter circumscribing circle. Bronze is extruded in a solid shape only.

Roll forming for steel, aluminum, or bronze is usually selected from stock forms known to all. Special roll forming is not practical for a single project.

The other limitations as to size and contour of methods of fabrication were discussed under panels.

Jointing dissimilar metals. Where mullions, molds, and other members join panels or supports, care must be taken to prevent contact of dissimilar metals. Such metals, when moisture is present, will corrode by the action of electrolysis. The results may be staining, pitting, or disintegration of metal. Compatible metals are safe in contact. Steel, stainless steel, and galvanized steel are all compatible. Aluminum is compatible with stainless steel, zinc, white bronze, hot-dipped galvanized metal; aluminum is incompatible with bronze, copper, and steel. Copper and lead are incompatible.

The separation of incompatible metals is best achieved by materials other than paints, but in certain situations paints such as zinc-chromate or bituminous will serve. Other satisfactory methods are the use of plastics, calking, tapes, and gaskets.

JOINTS

Joints in curtain-wall construction allow for movement due to: vibration, thermal changes, wind loads, and material manufacturers' tolerances. Experience proves that "joints" are the most critical element of this complicated system of construction. Failures can be attributed to lack of proper criteria or data for calculations, failure to consider all the elements involved, poor workmanship, lack of centralized responsibility for assembly and workmanship.

Joints considered here refer to all jointing of elements and so may be completed either at the shop or in the field. They may be hidden or concealed and many of them may never appear on a drawing. They occur between materials of various coefficients of expansion; some may be rigid and others subject to great movement. Though just a void, until calked, they join panels to masonry, panels of glass or other material together, windows to frames, glass to sash, and frames to panels.

Joint types. There are a variety of joint types. One should be selected prior to establishing the specific details of either its design or sealant to be used. When using a stock panel and stock system, the choice of joint may be limited to one or two types.

Panel joints were classified by the second BRI curtain wall conference as follows (*see Figure 5*).

When selecting and detailing joints, one must give consideration to the method of erecting the panels or units and insure that panels may be installed and removed (if damaged) from the inside.

Joint detailing. Only joint types for use with fillers are discussed. Provide for all the calculable movement which may occur and for the differential in movement between the materials to be joined. The filler (sealant) is a most important factor and should be studied after the joint detail is determined. If the joint depth and width are not adequate to contain the sealant, no sealant will serve its purpose. Panels secured by stops greatly reduce the space for sealants. Sealant space should be calculated after allowing for maximum expansion of and tolerances for materials and panel deformation by wind.

A rule of thumb given at the New York Chapter Producers Council, Curtain Wall Seminar, January, 1957, reads: "It is recommended that in using stops or moldings, the glass or unit size should allow ¼" at sill for blocking 3/16" clearance at jamb and head for placement, 5/32" space for sealant on either face, ½" overlap of molding to face, so that your sealant on either face is approximately 5/32" thick, and bears on both surfaces a minimum of ½"." (*See Figure 6.*)

In addition, this was stated: "Don't seal butted or mitred joints of exterior stops; concentrate sealant behind moldings and let stop weep."

Where joints are to be filled by gun-type sealant, the following proportions of width to depth were recommended at the second BRI conference: "width to be approximately 40 percent of depth."

Designing for wind pressure. Wind is the worst element to combat in sealing a building. There are several formulas for converting wind velocity to pressure, but as yet no standard has been accepted for joint design. Ensewiler's formula, $P = .002496\ V^2$ is the one now suggested for use. (P = pressure, V = velocity.) The maximum wind velocities for design assumption in this continent should be 150/mph unless local records or building codes indicate otherwise.

No general agreement was reached at the BRI conferences as to the limiting deflection to use for wind loading on joints such as a ratio of 1 to 240.

Wind loads create problems of noise by vibration or rubbing of panels. Wind and rain in combination with atmospheric pressure differentials, between the inside and outside of panels, may exert such pressure that normally tight joints will leak. The danger of water freezing within the wall is real and so another factor points to the necessity of permitting any water that enters to drain out immediately.

Direct wind pressure on the joints may be reduced by built-in air pockets or expansion cushions. Such joints designed with a small orifice which increases in area within the joint tends to reduce the pressure and break capillarity (*see Figure 7*).

The fact that wind pressure of 100 mph may deflect the center of a 5'x10' glass panel 1¾" is a warning as to the necessity of providing for this movement. This is an extremely important consideration when using glass approaching the maximum sizes as set up in the table for panel materials.

Although not joints, weep holes should be designed so that they are baffled to prevent a water column build-up. A 150 mph wind can create an 8" head of water in a weep hole.

Designing for thermal movement. Temperature stresses as discussed for panels have great bearing on joints, and the variation of joint widths is dependent on size of panels, material of skin, and materials surrounding panels. Temperature stresses are best provided for in the bottom of the frame. Stop-type joints and integral joints do not easily accommodate great joint movement.

The movement of outer skins of panels, because of change in temperature, may be calculated (*from Table V*) and proper clearances allowed. Select the anticipated maximum temperature variations, i.e., 100 F, 150 F, or 200 F appropriate for the building location and read down in that column.

Clearance, to allow for the calculated movement, is essential to avoid: deformation of face (oil canning), rubbing and consequent noise, falling out of panels, displacement of sealant at joints and possibly opening of the joint seal, and cracking of glass.

When one material is framed by another, such as occurs in a large glass opening, space for the relatively greater

movement of the frame than the glass is needed; a joint design that is ample and yet maintains tightness required.

For instance, a large aluminum frame may contract by change in temperature ¼″ while the glass it contains moves only 1/10″. Space for the sealant to compress must be allowed under this condition.

Tolerance of materials. All manufactured materials are made to maximum and minimum tolerances. For instance, if one material is delivered of maximum size, such as glass, and an aluminum frame comes with the minimum size tolerance, the rebate becomes too crowded for the sealant. Say the aluminum allowance is 1/32″ and the glass the same, then as a result the actual materials would take 1/16″ more space than indicated on the drawing.

SEALANTS (Joint fillers)

non-rigid type

1. Mastic fillers (either shop or site applied). Applied by gun, hand, or as tape. Also called calking and glazing compounds.
2. Gaskets, mastic or resilient type such as plastic, neoprene, felt, etc.
3. Cover tapes.
4. Metallic strips, spring or interlocking.

rigid type

1. Bonded. Metallic (welding); nonmetallic, chemical adhesive or chemical bond.

The industry agrees that sealants should not be the final answer against infiltration, but good joint design should set its goal to preclude water leakage.

Both of the two types of joints—one that is flexible and waterproofed with a sealant or one that is mechanical, solid, and leakproof—have their rightful place if properly designed.

The Caulking and Putty Section of the National Paints, Varnish and Lacquer Association is working on performance specifications for sealants.

The Aluminum Window Manufacturers Association has in co-operation with the Glazing Compound Manufacturers, produced a document with performance specifications and tests for glazing compounds of the conventional vegetable oil knife types for metal faced sash and channel glazing. The Porcelain-Enamel Institute is also involved in a study of sealants.

In speaking of sealants, we include both calking and glazing compounds. Today these compounds are complex and superior to those used a few years ago.

Putty types of glazing compound, so long used for wood sash glazing, and the Federal Specification type glazing compound are not for use in panels containing large glass areas. These materials were first formulated for use where periodic painting of windows was planned. They needed painting to preserve their volatile oils. Also the oil-base compounds allow for little movement; after 10 years exposure it will elongate perhaps 10 percent of its applied width while other, newer types will elongate at the same time in the same joint 100 percent without shear or damage. These oil-base compounds may be used on small lights, but when the glass is over 24″ in both directions, the new sealants should be used on one or both faces at least as auxiliary sealant.

Every joint should be tailor-made and the architect should consult an expert in specifying sealants. Perhaps the sealants for a joint should be a combination of two (or even three) types of mastic, one a tape and the other applied by gun.

For example, polybutene tapes are extruded 1/16″ thicker than the maximum calculated joint and to be effective must be under compression. They are inexpensive and ideal for bedding, but they will attract and hold dirt because of their nondrying characteristics in an exposed position. Therefore, exposed sealant might be used in combination with the tape to match the aluminum trim color and to form a skin which will stay clean —such as a polysulphide compound. In fact, there are several of this type, one allows for maximum bonding and another allows for maximum movement.

Also consider staining or bleeding of compounds. Some of the gun types will stain stones and marble. Polysulphides will stain some bronzes. It is safest to test for stains.

We now have new compounds, such as polybutene (tapes) and polysulphide liquid polymers (by gun). The latter, however, is a two part material and not as easy to install as the older types of compounds. There is no doubt that a material having the advantages of both may be perfected soon.

Calking may be applied by hand, gun, or in the form of preformed tapes. Tapes of several widths and thicknesses available in rolls may be shop or job applied. When shop applied tape is used, a design clearance of ¾″ should be made to allow the panel or unit to be moved into place over the next panel during erection without damaging the tape. This allowance may have been provided in the space furnished between the building frame and the back of the panel as discussed earlier.

Premold gaskets of neoprene, plastic, or felts, etc., may be shop installed and used in lieu of mastic fillers.

Neoprene gaskets, perhaps the newest sealant on the market developed after long experience with automobile windows and windshields, hold great promise for tight curtain walls. No calking or glazing compound is necessary with gasket-type sealants.

Inland Manufacturing Division of General Motors Corporation and Eero Saarinen & Associates collaborated to invent a neoprene gasket. All angles are injection molded forming an endless sealant. Pressure insert strips are inserted after the pane or panel and gasket are erected, clamping the assembly in place. Special tools have been developed to simplify the installation of both gaskets and strips.

More recently, duPont, Pawling Rubber Company, and Skidmore, Owings & Merrill have also jointly developed such a gasket vulcanized on all four corners, which fits snugly around the edges of the pane. A pressure stop of aluminum brings pressure on the glass through the synthetic rubber, sealing the glass on three lines of contact.

Time saved in preparation, installation, and cleaning-up should prove an economy plus the long life expectancy. These must be weighed against the initial costs of the materials in comparing this form of sealant with the more conventional types.

Life of nonrigid sealants. Reports from owners of many new buildings indicate recalking has been necessary too often soon after completion.

Great strides in the development of compounds and a better understanding of their use should avoid this in the future.

Sealants, if ideal, should last 50 years and some day that goal may be possible. Today, the best that the industry can expect is 25 years of life, assuming that

the best materials are used correctly. This means not only good detailing and specifications, but real supervision. Such a guaranty may now be secured from some manufacturers. To achieve long life for sealants and, consequently, low maintenance costs, high initial material costs are necessary.

ERECTION

Erection problems frequently originate with design and are often ones that could have been avoided in the early drafting room stage. For instance, cases have occurred where it was feasible to erect all of the work from the interior except for one element which requires a scaffold to allow its attachment from the outside. This, of course, increased the erection cost which if considered at the proper time, could have been avoided. Inside erection should be planned except for very low buildings where scaffold costs are negligible. Failure to install from the inside has doubled the erection costs according to reports from a firm of experienced erectors.

Architects should consult erectors and builders to avoid such extra and unnecessary costs. Designers should be aware of how their designs are going to be assembled and erected.

Detailers should remember that building products are not fabricated to absolute dimensions. All products have their tolerances. Even sheet steel is made to specified tolerances and not to exact sizes. Recut steel to meet even closer tolerances may be had at a price. So besides the tolerances for structure, movement of supports and of panels, details should include further tolerance for fabrication.

Erection drawings have been approved which were physically impossible of execution. Other very complicated work has been easily erected as the details were fully considered before approval.

The fewer job-sealed joints the better the chance for a tight job. Completely tight seals are more easily shop made.

Reference has been made to the necessity of providing weep holes. These holes are a trouble to the erector who must keep them free of dirt and other matter that may clog them; plugged holes may weep into rather than out of the building.

size of units or panels for erection

Every job should be analyzed before making the decision as to the size and weight of panels or units to be erected.

First assume that these elements will be lifted on the job hoist and should not exceed the weight that can be handled by two men (250 lb) or by four men (400 lb).

Next consider whether the use of a crane is feasible without a cost penalty or whether space is available for its use. Crane rentals and operation are expensive.

Standard panels for industrial work may be made in long lengths and have been erected in 60 ft lengths. However, the question of transportation and wind effect during erection must be taken into account. Twenty-ft lengths are recommended for this type of panel as practical, but they do require more field joints.

The second BRI conference agreed as follows: From standpoint of fabrication a wall unit in modules of 4′ to 5′ in width and one story high (approximately 12′) is most desirable and practical.

From the standpoint of handling, crating, and shipping, it was agreed at the same meeting "that the practical limitation would be a unit 8′ wide by one story high (approximately 12′). This envisions the possibility of shop fabrication of two or more units into a larger one to be erected at the site."

In breaking down units for assembly the following points should be thought through:

1. Should panels and windows be combined.

2. Should mullions be separate units or combined with a panel.

3. Should the spandrel panel be a part of the frame or should it be field installed in the frame.

Erection procedure. In industrial-type buildings, using skin panels, it is usual for the erector to work consecutively around the building. On high-rise buildings this is not always possible as certain panels must be omitted for chutes, hoists, and other openings.

Back-up walls where required by codes introduce another erector's procedural problem. Other trades have to be co-ordinated and work may be delayed. Speed of erection is slowed and costs increased where panels are shop finished on the inside and must be protected from staining, scratching, and abrasion during handling at plant and at the site. This must be accounted for in any decision as to the method of finishing the inside of panels which will be exposed to view.

With open-sandwich panels without inner skin, the question of whether to install the insulation in the shop or on the field may possibly arise. Whether these panels are outer skin and insulation or outer skin, insulation, and inner skin, the shop-assembled panel should prove the most economical when all costs are included.

Packing and crating will be dictated by the type of material. Materials to be job painted may be bundled together or shipped loose. Erectors ask that architects realize that such material may be scratched or marred and that they make provision in the finished job painting for correction of such damage. This will prove much more economical than insisting that such products be boxed and crated.

The size of bundles or crates should be co-ordinated with the facilities for hoisting at the job.

Curtain walls are expected to be erected plumb and true, to accurate lines and grades so that the wall will not be wavy or irregular. This, of course, means that tolerances and allowance have been provided in the design. Most important to fulfilling this requirement is that the general contractor provide proper marks for both line and level at sufficient locations on each floor. These should be established by qualified engineers in advance of their need by the wall erector. The architect should specify these bench marks and see that they are provided. Lack or late provision for these will prove costly in time and money for the erector.

The trades involved in curtain-wall erection vary, but iron workers are most usually used, followed by sheet-metal workers. Some times a combination of both trades are involved. Less frequently they are erected by carpenters. Jurisdictional disputes do occur, but generally they are settled locally by the trades involved and the erection subcontractor.

Curtain walls can be erected more quickly than the conventional wall, but this requires that the work should not start until conditions are ripe. On multistory buildings the concrete slabs or arches should have a lead of six to eight floors or more. As the curtain-wall workmen become organized their work will speed up, so that as the concrete man tapers off at the pent house the curtain-wall erectors will be close behind. Loss of time because of weather is rare in curtain wall erection. On the Socony Mobil Building in New York no time was lost by this trade due to weather, since the work was erected from the inside.

SPECIFICATIONS

There seems to be nearly universal approval of providing one trade section for the entire work involved in building curtain walls. This section of the specifications would group all phases of the work, regardless of the trades involved, and thereby establish one over-all responsibility. This section, of course, should be part of the general contract.

The second BRI Curtain Wall conference named this section "Metal and Glass Curtain Walls." Insofar as this conference was limited to metal curtain walls perhaps they hesitated to make the title more general. It would seem advisable to include other types of materials too, if they were being used on the same project.

So it seems logical to include any and all curtain-wall work in the same section whether of metal, marble, tile, stone, or concrete, and that the section title should include the appropriate materials.

The logic of using one very comprehensive section is based on experience which has proved that curtain-wall construction has been hampered by poor coordination of the many trades involved, by lack of control, and by inability to establish whose mistake caused a failure.

The items to be included in the specification scope of this section are offered as a guide; however, each project must be analyzed for special conditions.

SCOPE

1. work included:

a. Attachments, including connection to structure, and to supports or directly to panels, (if supports are not used), with all welds, connectors, rivets, bolts, nuts, shims, and other attachment members and devices. (If any shop connections are to be made to steel these would be omitted here and included in Structural-Steel Section.)

b. Steel supports (subframes) including their connection to panels and other members with all welds, connectors, rivets, bolts, nuts, and other devices.

c. Flashing of curtain walls at floors, windows, roofs, copings. (This to be included in addition to the usual Flashing Section.)

d. Mullions, grids, frames, muntins, transoms, and other metal trim and molds.

e. Panels and their frames, stops, strips, molds, clips, and attachments including accessories for joints. This would include all cores including insulation, skins, and their finishes.

f. Window frames, sash, connections, and hardware.

g. Door frames, doors, and store fronts which are part of the curtain wall, including hardware.

h. Ornamental louvers (as differentiated from mechanical louvers, meaning those that are strictly a part of the curtain wall).

i. Window stools (if part of wall).

j. Sun-control devices which are part of the curtain wall.

k. Venetian blind pockets which are part of curtain walls.

l. Glass and glazing and calking (all sealants).

m. Guaranty (suggested for two to five years).

n. Cleaning, removal of excess sealants and dirt; work to be left in good condition. (Final cleaning to remove dirt and foreign materials deposited after work has been erected and cleaned in this section to be done by general contractor.) General contractor to be informed of proper materials and methods for final cleaning.

2. work excluded from this section:

a. Radiator or convector brackets attached to curtain wall—in Heating Section.

b. Window stools and brackets (if not part of curtain wall)—in Metals Section.

c. Mechanical louvers—in appropriate mechanical trade.

d. Waterproofing of masonry and concrete spandrels.

e. Final cleaning and protection of curtain walls—in General Contractors Section.

f. Mechanical louvers which are not part of curtain wall.

g. Masonry apron wall including insulation and vapor barrier.

h. Store fronts and generally first floor doors and windows which are not part of the curtain wall.

i. Painting of inner panel skins and other interior curtain wall elements exposed to view (if not shop finished).

WHAT CAN BE DONE TO FURTHER CURTAIN-WALL CONSTRUCTION?

Remarkable results have been achieved by curtain walls in view of their short history and limited field tests. Many failures have been mentioned herein, but many very successful jobs have been completed. We badly need building code revisions in many large cities, although the four codes nationally used allow for such construction. National organizations may give direction and impetus to such changes, but they can only be accomplished at the local level. Architects and others in the industry must stress the need for such changes in their own communities to assure action.

Curtain walls which entail so much technological know-how should be definitely sponsored by a new organization, a trade association or institute composed of all segments of the industry. This should be a broader organization than those established for the limited fields of other trade associations. It should, to function properly, include the architects and engineers who initiate the projects and who use the systems. An organization where all interested parties could pool their knowledge and experience.

With such an organization standards and criteria for testing, for performance and specifications for materials and erection could be evolved. This article then indicates the basic need for further standards to lessen the unknowns for the designers and detailers of curtain walls. Until then, may good luck attend them!

Appropriate drawings have been culled from the "Curtain Walls Section" of Architectural Graphic Standards, *5th Edition, by Ramsey & Sleeper, published by John Wiley & Sons, Inc., to illustrate this article, except where credited otherwise.*

Reception area, prototype for those throughout the Socony Mobil floors, uses co-ordinated colors, contrasting textures, clean-lined furniture as key to executive surroundings.

Louise Sloane

office-building amenities

An encompassing example of the challengingly diversified interior-design problems arising from the new requirements of today's office buildings, is Socony Mobil Oil Company's New York headquarters. The company occupies twenty-one floors, plus portions of the second floor, concourse, and sub-basement of the Socony Mobil skyscraper, presenting a comprehensive assignment to the office of J. Gordon Carr & Associates, which handled all planning, design, decoration, and supervision of construction of interior spaces.

Bypassing the many office interiors successfully designed for this job, we have chosen to show on the following pages such specialized office-building spaces—all for employes' benefit—as a recreation lounge, a cafeteria, four private dining rooms, a training center, a kitchen, and a clinic. Each of these spaces, decorated and furnished by Leigh Allen of James G. Carr, Inc., extends the architect's efforts into an entirely different design area, expands the demands upon his facilities and skills.

We find the solutions exceptionally noteworthy, not merely because the versatility to handle well a job of this scope is impressive, but also because each individual space is creatively thought through, down to such a small but untrivial detail as handbag-hooks under the cafeteria tables!

office-building amenities

client	Socony Mobil Oil Company, Inc.
location	New York, New York
architect	J. Gordon Carr & Associates
designer-decorator	Leigh Allen

An inviting and informal atmosphere encourages employes to enjoy the large lounge, adjacent to the cafeteria. Brilliant colors—rust, deep aqua-blues, warm grays, orange-pumpkin—give visual excitement; contrasting fabrics—textures, stripes, plaids—provide surface interest. The furniture, in its lines and in its comfort as well as in its arrangement, contributes to the "living room" effect. Carpeting, lighting, a wall of cork tile, a mural divider, and planting help to achieve a decidedly noninstitutional look.

Photos (except as noted): Ezra Stoller

Coiled walls may be rolled away so that the lounge opens into the cafeteria, where colors repeat the scheme of the lounge. Chairs are plastic-upholstered, half in aqua and half in rust; table-tops are light-oak laminated-plastic to echo the oak woodwork in the lounge. The vinyl-tile floor combines the theme colors, and is designed to divide the area visually into sections.

Cafeteria seats 535 diners, with lunch hours staggered to accommodate the more than 2000 employes who use it. Serving stations are behind stainless-steel-framed plastic screens, the translucent laminate gaily patterned and colored.

data

lounge and cafeteria

Partitions: oakwood/ John Langenbacher Co., Inc., 550 Barry St., New York, N. Y.

Panels in Screens: Polyplastex United, Inc., 411 Madison Ave., New York, N. Y.

Furniture: J. G. Furniture Co., 102 Kane St., Brooklyn, N. Y.; Edgewood Furniture Co., Inc., 334 E. 75 St., New York, N. Y.; M. Singer & Sons, 41 E. 57 St., New York, N. Y.; George Tanier Inc., 521 Madison Ave., New York, N. Y.; Lehigh Furniture Co., 16 E. 53 St., New York, N. Y.

Table Tops: Parkwood Laminates, Inc., 33 Water St., Wakefield, Mass.

Upholstery: Gilford Leather Co., 515 Madison Ave., New York, N. Y.; Shulman Fabrics, Inc., 40 E. 34 St., New York, N. Y.; Knoll Textiles Inc., 575 Madison Ave., New York, N. Y.; Stroheim & Romann, 35 E. 53 St., New York, N. Y.; Kent-Bragoline Inc., 509 Madison Ave., New York, N. Y.

Walls: cafeteria: Plasti-Spray/ Progressive Industries, 50-02 23 St., Long Island City, N. Y.; lounge: Armstrong Cork Co., Lancaster, Pa.

Hard-Surface Floor Covering: Robbins Floor Products, Inc., Tuscumbia, Ala.

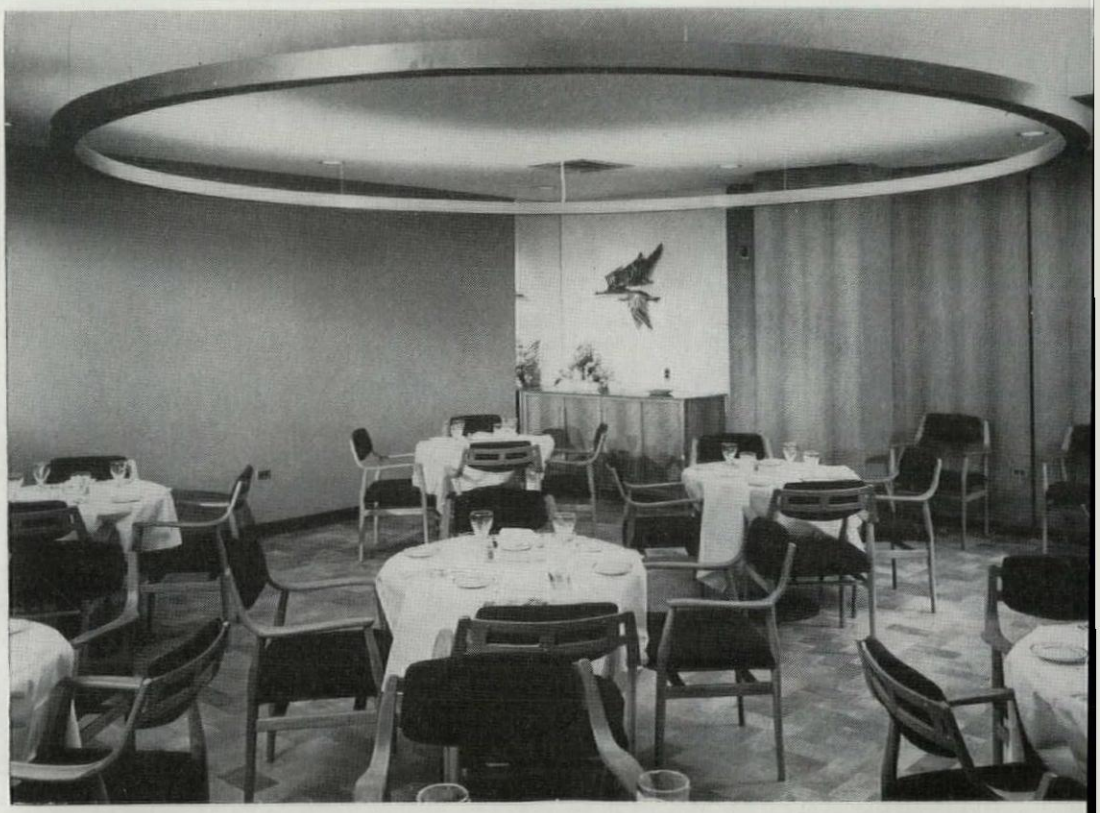
Carpet: Gulistan by A & M Karagheusian Inc., 295 Fifth Ave., New York, N. Y.

Ceiling: "Travertone"/ Armstrong Cork Co.

Lighting: Gotham Lighting Corp., 37-01 31 St., Long Island City, N. Y.

office-building amenities

Private Dining Room E has the feeling of a man's hunting lodge—highlighted with sculptured flying geese—carried out in teak walls, leather-tile floors, and two walls painted a brilliant, outdoor blue. The color plan is blue and beige, with dark brown accents.



Private Dining Rooms F and G may be used as one or separately, with a Modernfold door dividing them. To compensate visually for the long, narrow space, end walls are painted a brilliant green (repeated in the chair upholstery), and the wide irregular stripe of the carpet runs across the narrow dimension.

data

dining room E

Cabinetwork: Burma teak/ John Langenbacher Co., Inc.

Furniture: George Tanier, Inc.

Fabrics: Knoll Textiles, Inc.

Floor: leather tile/ Edgar S. Kiefer Tanning Co., 564 W. Randolph St., Chicago, Ill.

Accessories: Sculpture Center, 167 E. 69 St., New York, N. Y.

Lighting: Gotham Lighting Corp.

dining rooms F and G

Cabinetwork, Partitions: Rhodesian walnut/ John Langenbacher Co.

Room Divider: Modernfold Door Co., Inc., 60 S. Terrace Ave., Mt. Vernon, N. Y.

Furniture: M. Singer & Sons.

Fabrics: F. Schumacher & Co., 60 W. 40 St., New York, N. Y.

Carpet: V'Soske/ Lord & Adams, 4 E. 53 St., New York, N. Y.

Lighting: Gotham Lighting Corp.

dining room D

Cabinetwork: African Jewel Tree/ John Langenbacher Co.

Furniture: Lehigh Furniture Corp.

Fabrics: Rancocas, 139 E. 57 St., New York, N. Y.

Carpet: V'Soske/ Lord & Adams.

Ceiling: Kilnoise/ New England Line Co., Adams, Mass.

Lighting: Gotham Lighting Corp.

dining room A

Cabinetwork: Brazilian rosewood/ John Langenbacher Co.

Furniture: J. G. Furniture Co.

Fabrics: Knoll Textiles, Inc.

Drapery: Marion V. Dorn, 8 E. 54 St., New York, N. Y.

Carpet: V'Soske/ Lord & Adams.

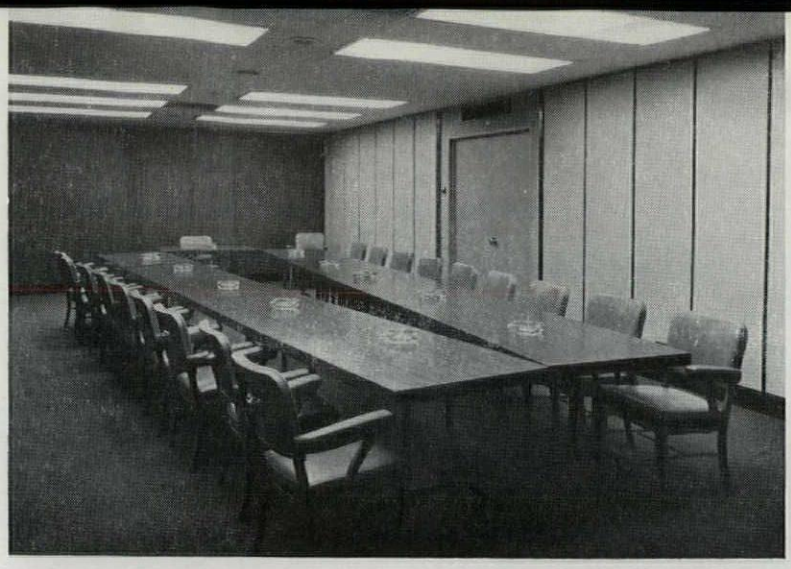
Ceiling: "Travertone"/ Armstrong Cork Co.

Incandescent Lighting: Edison Price, Inc., 180 Center St., New York, N. Y.

Private Dining Room D was designed to appear as part of a walled patio. The wall opposite the entrance, of large scale bucks and decorated tiles, stops about 18″ below the ceiling. Mirror from tiled area to ceiling suggests an open area beyond. The grayed grassy-green carpet and orange upholstery add to the effect of outdoors and sunlight.

Executive Dining Room A has no outside windows, a difficulty skilfully disguised by flooding one entire wall with incandescent light, treating the ends as small windows filled with planting, and draping the center with a specially designed, large-scale casement fabric. The color scheme is burnt orange and blue-green.

office-building amenities



data

training center

Walnut Paneling: David Kramer, Inc., 129 DeGraw St., Brooklyn, N. Y.

Fold-away Tables: Howe Folding Furniture, Inc., 1 Park Ave., New York, N. Y.

Straight and Folding Chairs: Dancker & Sellew Inc., 318 Broadway, New York, N. Y.

Carpet: Karagheusian.

Audio-Visual Consultant: Ken Killian Co., 723 Prospect Ave., Westbury, Long Island, N. Y.

Ceiling: "Travertone"/ Armstrong Cork Co.

kitchen

Glazed Ceramic-Tile Walls: American Olean Tile Co., Lansdale, Pa.

Floor and Base: quarry tile/ Ludowici Celadon Co., Chicago, Ill.

Ceiling: mill-finished aluminum pans/ Armstrong Cork Co.

Equipment: stainless steel/ S. Blickman, Inc., Weehawken, N. J.

Layout: in collaboration with J. Gordon Carr and I. Blickman of S. Blickman, Inc.; David J. Berge, Brass Rail Restaurant Organization, New York, N. Y.

Air Diffusers: polished chrome plate/ Anemostat Corp. of America, New York, N. Y.

Recessed Fluorescent Troffers and Incandescent Downlights/ Gotham Lighting Corp.

medical reception area

Cabinetwork: birch/ John Langenbacher Co.

Furniture: Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.; Advance Design Inc., 45 W. 33 St., New York, N. Y.; Orsenigo Furniture Co., 160 E. 56 St., New York, N. Y.

Fabrics: Knoll Textiles, Inc.

Drapery: L. Anton Maix, 162 E. 59 St., New York, N. Y.

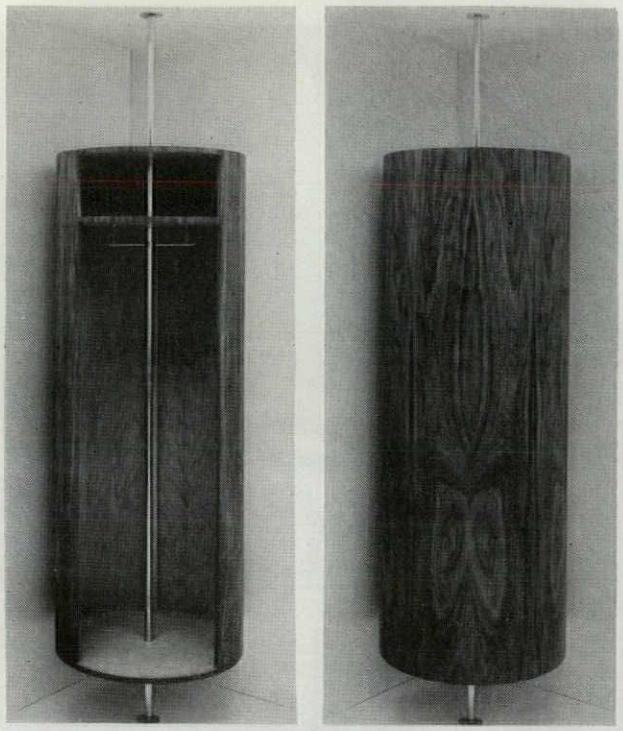
Floor: Armstrong Cork Co.

Ceiling: "Travertone"/ Armstrong Cork Co.

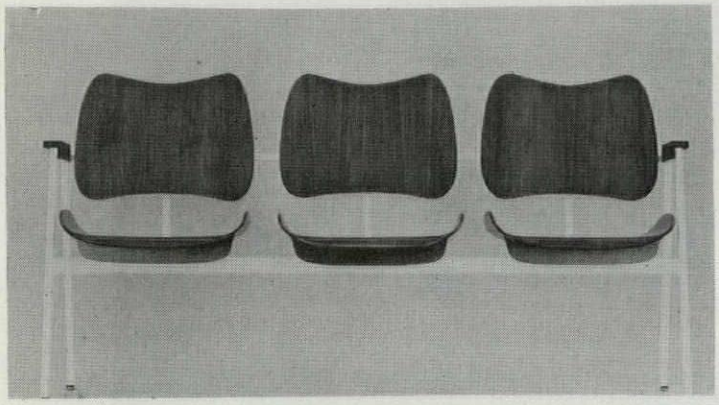
Training center for audio-visual presentation to personnel of all departments is divisible by sliding door panels into separate, sound-proof rooms, each completely equipped for training demonstrations. Dominant color scheme is bamboo and blue, with walnut tones. Chairs and tables fold for portability and storage. Motion-picture screens are electrically operated, ceiling-hung, flush-mounted, and the speakers and microphones are flush-mounted in the ceiling. Photograph (*above*) shows an area enclosed to approximately 17′ x 35′; and (*below*) expanded to auditorium size, 50′ x 50′. *Photos: Mobil Photo Library*

Called "the world's largest all-electric, completely air-conditioned kitchen," this serves the employes' cafeteria and all private dining rooms, preparing noon meals for 2500 persons. It is the result of two years of planning and installation, and makes maximum use of automation—from vegetable peelers to silver-burnishing machines. The floors are of nonslippery, easy-to-clean red quarry tile, walls of decorative glazed tile and stainless steel. Shelving, corners, and most equipment are of stainless steel. Ceilings are of perforated aluminum acoustical pans.

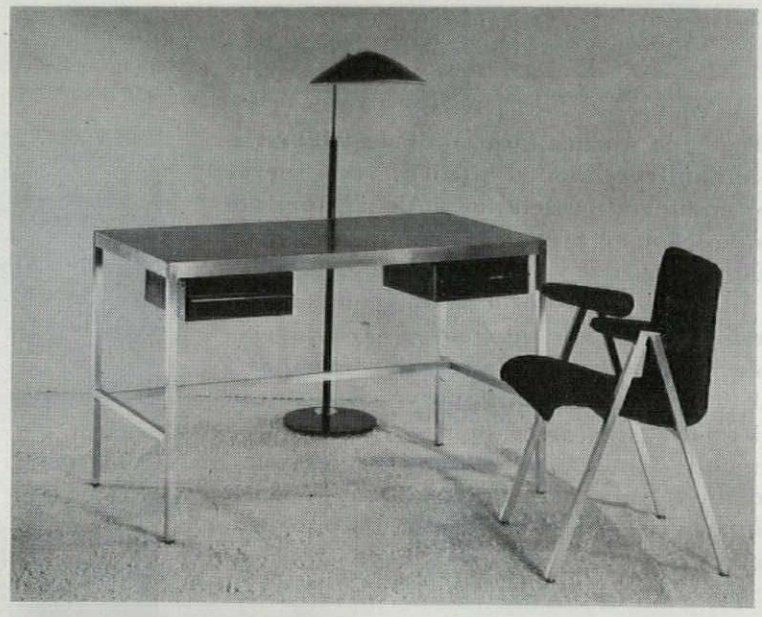
Reception area for medical facilities includes a custom-built clinic equipped to give employes complete physical examinations, inoculations, emergency treatment, health counseling. Warm color plan of yellow and gray, with soft textures and contrasting surfaces, avoids hospital look.



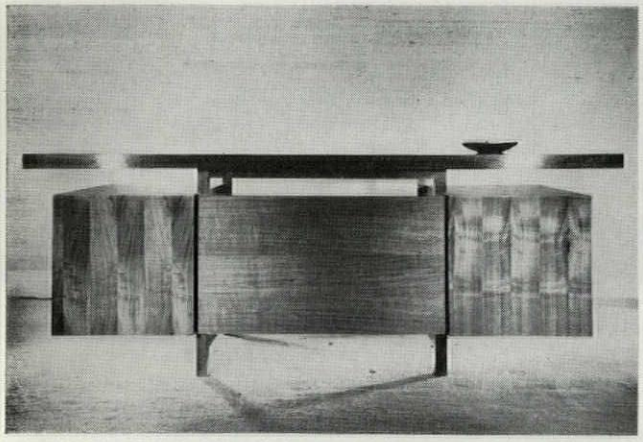
Office Storage Unit: revolving costumer/ supplements or substitutes for closet/ space-saving, requires no structural changes/ accommodates six coats and stores hats, overshoes/ may be floor-to-ceiling mounted, as shown, or wall-mounted on adjustable hinged brackets/ walnut, with satin-chrome fittings/ 5' 6" high, 24" diam./ designed by von der Lancken and Lundquist/ **Lehigh Furniture Corporation, 16 E. 53 St., New York, N. Y.**

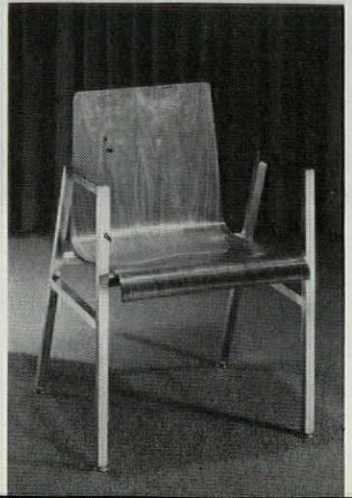


Contour Space Seating: "Formational"/ three-passenger continuous seating unit/ molded seats and backs, walnut or upholstered/ enameled-steel frame, white or charcoal/ seats adjustable for desired height, entire unit adjustable on floor level/ designed by William H. Sullivan/ **Standard Furniture Co., Herkimer, N. Y.**

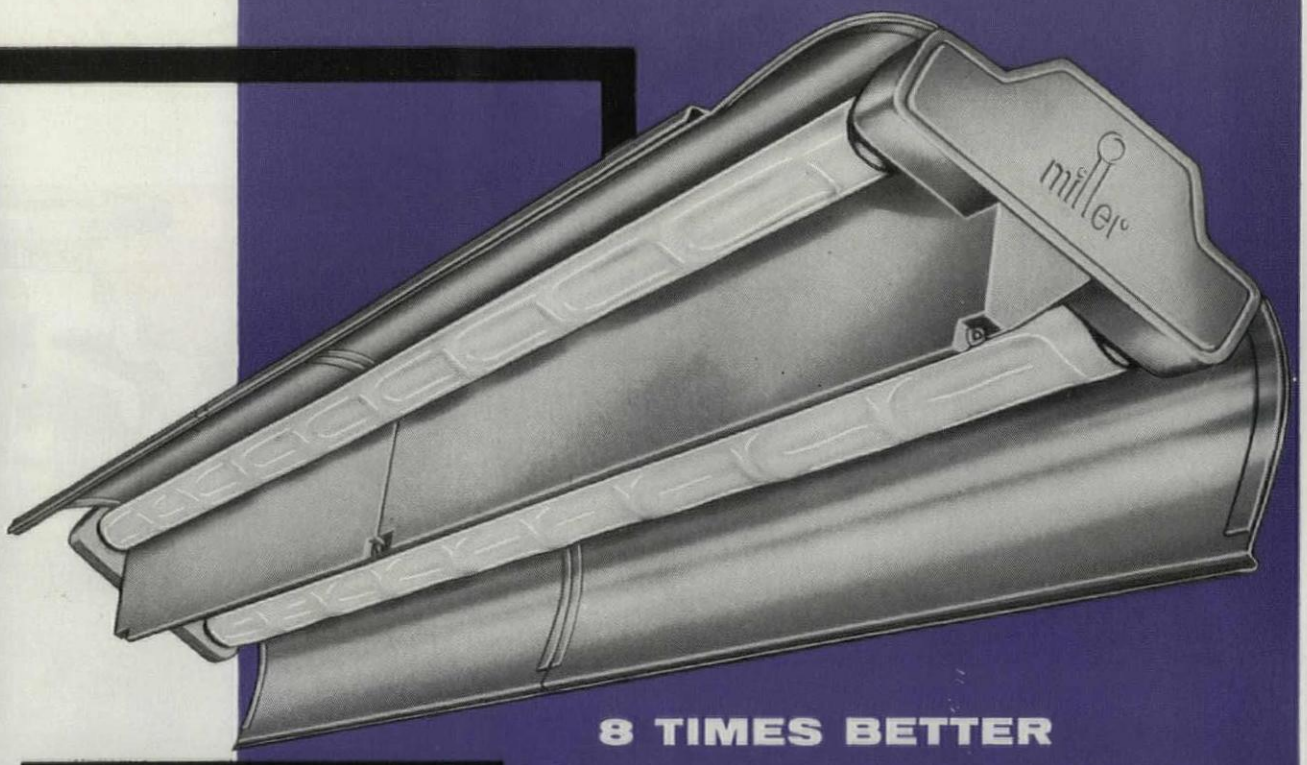


Executive Desk: walnut, cantilever construction, double pedestal/ 29" x 36" x 72"/ satin-finish brass hardware/ hand-rubbed linseed oil or clear lacquer finish/ Pendaflex drawer fittings/ solid walnut legs, stretchers, cross-beams/ designed by Victor DeLynn/ **DeLynn Associates, Inc., 122 E. 42 St., New York, N. Y.**





Magnesium Furniture: light, strong, welded for durability, trouble-proof finish/ desk (above) 48" x 24" x 29"/ American Black Walnut veneer drawers; chair (above) 23" x 20" x 30", upholstered over foam rubber; chair (left) 21" x 19" x 31", walnut seat and back/ **Mueller Metals Corporation, Grand Rapids, Mich.**



8 TIMES BETTER BRIGHTNESS CONTROL WITH NEW POWER-GROOVE FIXTURE

THE NEW MILLER INDUSTRIAL IP 2501-08

- Alzak aluminum reflector
- 35° crosswise shielding
- 25% upward light

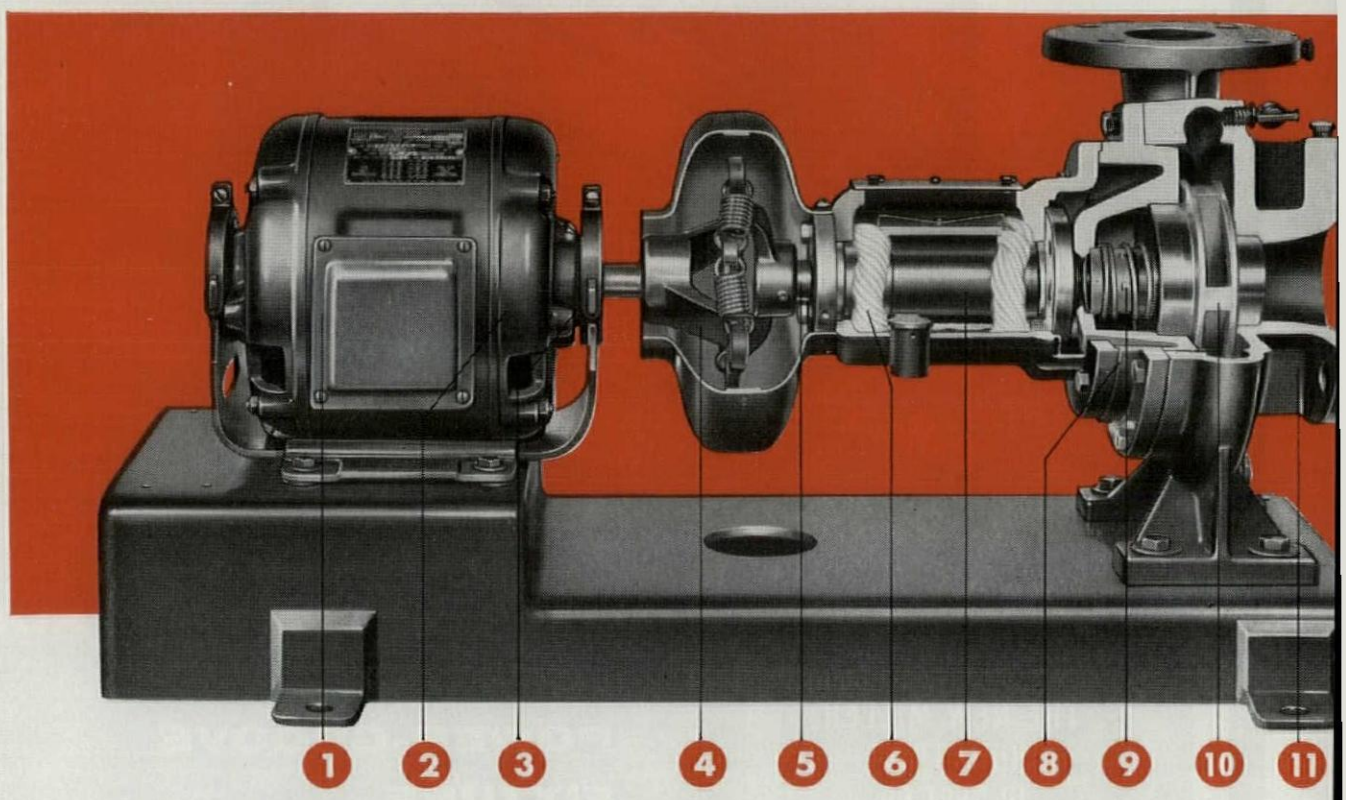
Now, with this new 8′ Miller fixture, you can efficiently harness the 26,000 lumen output of two G-E Power-Groove fluorescent lamps. It provides seeing comfort while enabling users to obtain high levels of light with fewer fixtures. The key comfort feature is the specially designed Alzak aluminum reflector with 35° crosswise shielding. *This limits brightness within the shielded zone to less than ⅛ that of comparable fixtures with porcelain enamel finish!* A 25% upward light component gives comfort a further assist by helping to control brightness contrasts. And the ventilated open top has a "self-cleaning" action which helps keep light output high and maintenance costs low. A louvre with 30° lengthwise shielding is available.

miller
SINCE 1944

Miller is the *first* major manufacturer to market an all-new fixture for use with Power-Groove lamps. For further information, contact your representative, or write:

THE MILLER COMPANY, DEPT. IPG-6, MERIDEN, CONNECTICUT

FOR CIRCULATING WATER *Silently*



B & G UNIVERSAL PUMPS...for larger installations

The circulating pump in a hot water heating or chilled water cooling system is the connecting link between the mechanical equipment in the boiler room and the structure itself. *Silent*, *vibrationless* operation is therefore the prime requirement pump for this type of service. The features noted abov the reasons why the B&G Universal Pump fully meets this r

THE MOTOR

1. **Extra quiet.** The Universal Pump motor is specially constructed, tested and hand-picked for extra-quiet operation.

2. **Sleeve bearings.** Motors are equipped with oil lubricated sleeve bearings—essential to silent operation and long life.

3. **Mounting.** Universal motors, through 5 HP, are NEMA ring-type mounted and completely suspended in noise-dampening rubber. All motors are drip-proof.

THE PUMP

4. **Coupler.** Self-aligning, spring-type...another warranty of silent operation, plus excellent pump and motor protection against the stresses of starting torque.

5. **Shaft.** Big—oversized—affording large bearing surfaces. Made of special alloy steel, polished to mirror finish. Heat-treated integral thrust collar absorbs end-thrust... lengthens seal and motor bearing life.

6. **Lubrication.** Genuine oil circulating. No grease to c nel or harden. Oil level indicator permits visual ch

7. **Sleeve bearings.** An essential for quiet, vibratio operation and long life of both pump and motor outstanding Universal feature.

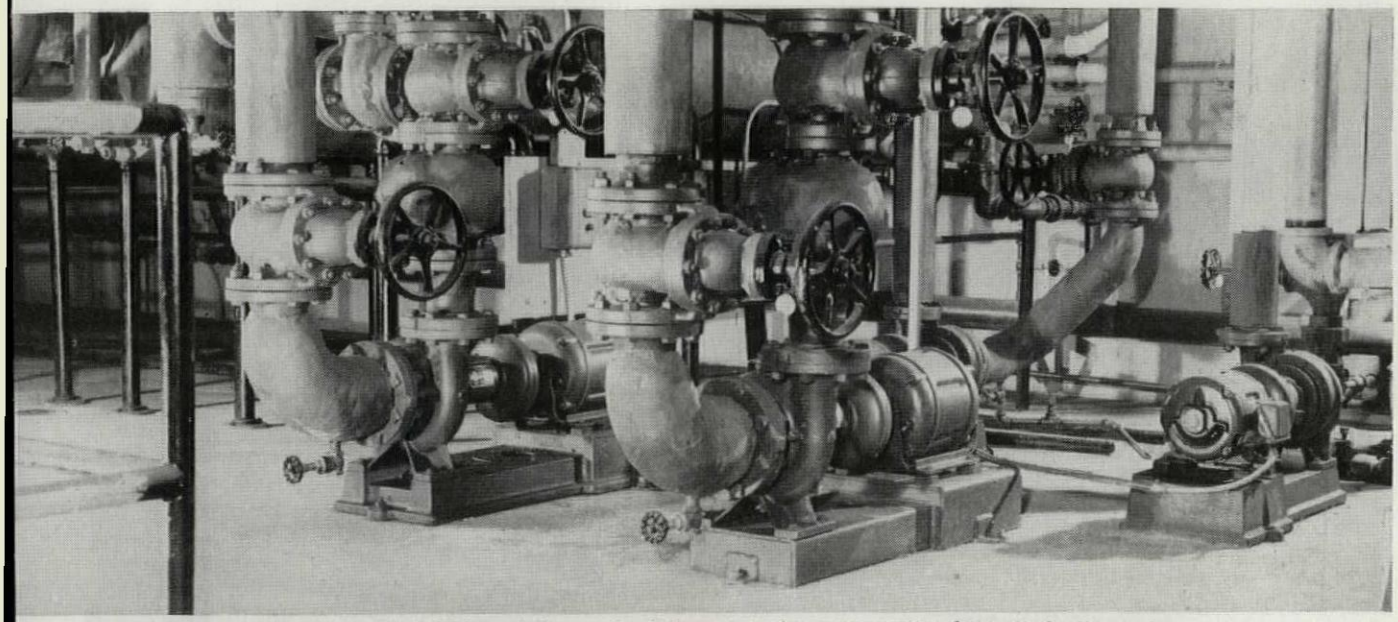
8. **Vertical split case—removable bearing frame.** Th tire bearing frame assembly with impeller is easil moved from volute. No pipe connections to brea motor to remove...all the advantages of split design. All bearing frame assemblies are interchange

9. **"Remite" mechanical seal.** Positively prevents leakage up to full design pressures. The seal is lubricating and features a floating seat of diamond "Remite"—a B&G development.

10. **Hydraulically balanced impeller.** Balancing cha and thrust pressure relief holes in the impeller re thrust to a minimum.

11. **Solid volute.** Support feet directly below volute ab piping strains without distorting pump alignment.

IN HEATING AND COOLING SYSTEMS



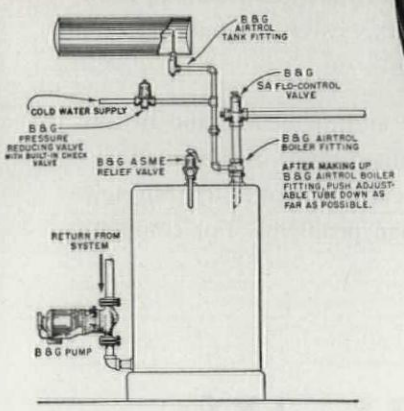
Battery of silent B&G Universal Pumps circulating a two-pipe, reverse return hot water heating system.

B & G BOOSTER PUMPS

The fact that over 2,000,000 B&G Boosters are in operation today is ample evidence that their quality has never been challenged.

These pumps satisfy the most exacting requirements of circulated water systems for heating and cooling. Above all they are *quiet, vibrationless*... the prime essential of a circulating pump. B&G Boosters are dependable, perform faithfully for years without endless minor and major repairs. They are backed by a manufacturer equipped to give assistance in any problem of design or installation and whose distributors maintain adequate stocks to serve your needs.

For a complete description of the features which have made the B&G Booster the preferred pump, send for Bulletin IA-856.

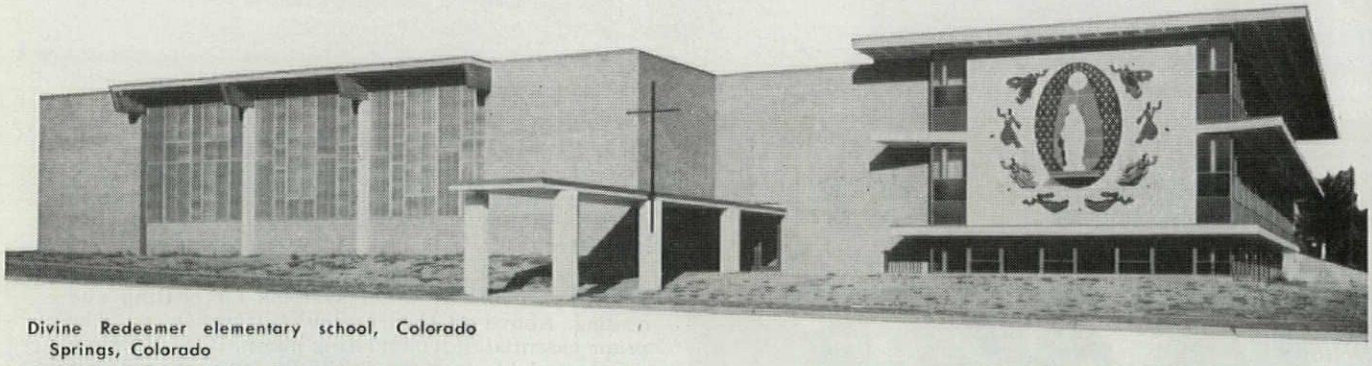


Typical B&G Hydro-Flo System with built-in domestic water heater.

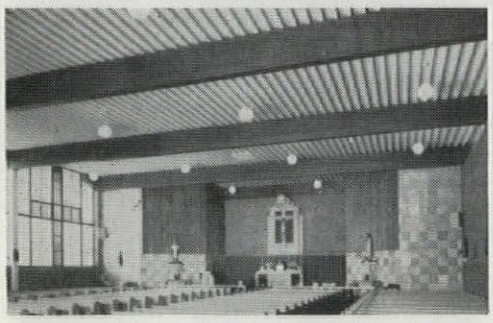
The 300 homes of this building project are heated with B&G Hydro-Flo forced hot water systems.

BELL & GOSSETT
COMPANY
Dept. EU-37, Morton Grove, Illinois
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, W. Toronto

WHICH IS THE ADDITION?



Divine Redeemer elementary school, Colorado Springs, Colorado
Architects: Toll and Milan, Denver
Contractor: Long Construction Company, Denver



Rilco laminated wood beam sizes 77′ x 11″ x 34⅛″ and 67′ 4″ x 7″ x 34⅛″.

The two portions of this structure are basically different in construction. In the chapel (addition) Rilco wood laminated beams helped the architect to add warmth and beauty to the interior at the same time conforming in line with the previously built school. Yet the chapel maintained its own identity.

The architect stated, "Shape was dictated by the need for harmony of the existing classroom (right). Laminated beams allowed a quickly erected and inexpensive structural system that serves as its own decoration."

Fire-safe Rilco wood laminated arches, beams and trusses with Rilco Deck permit an unlimited range of design at surprisingly low cost. These members could offer a fresh new answer to one of your own design problems. For complete information write . . .

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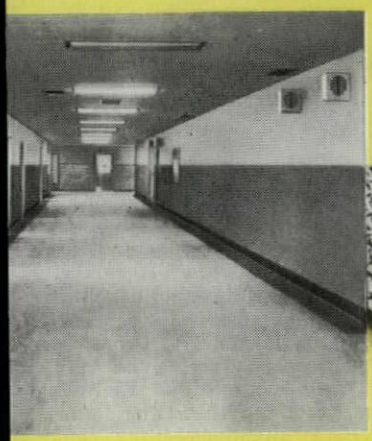

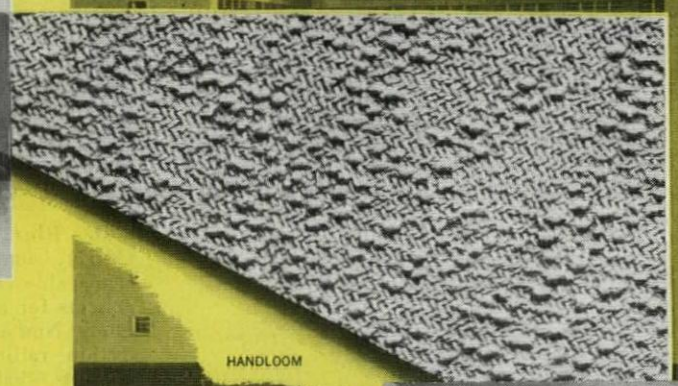

HANDLOOM

o cold laboratory look for this
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ill cheer and interest patient
d visitors alike . . . yet main-
nance will never be a problem.

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ver show stains from anxious
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heeled carriages . . . the dis-
lorations of time. And in the
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crtex VEF adds a feminine,
t serviceable, touch.

here's extra cheer here too, that
n't be seen . . . in the time
ved than can be devoted to
re important tasks, because
crtex is so easy to care for . . .
the money saved because
crtex is so long lasting.

an practically, efficiently and economically
attractively, colorfully and interestingly
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l tri-dimensional and textured patterns
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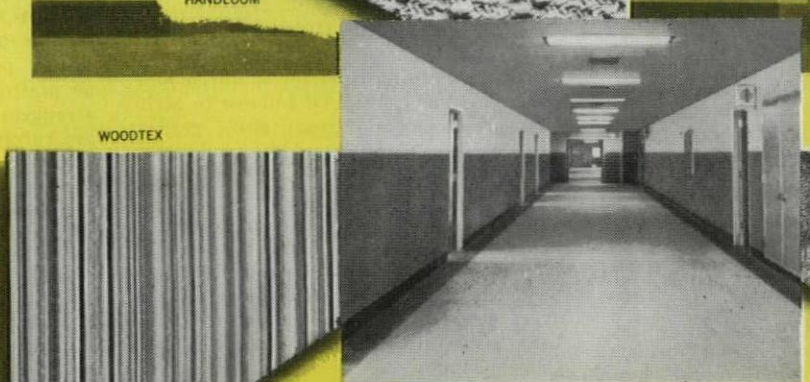
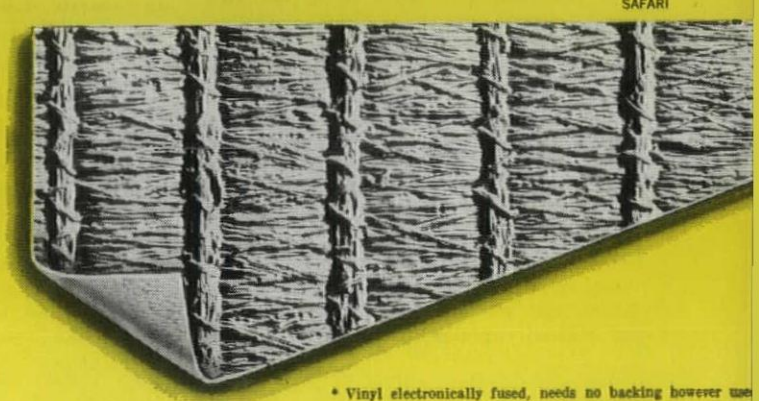


WOODTEX

PRINCESS

Pleasing—Practical—Efficient Corridors wainscoted in Vicrtex VEF at Grady Memorial Hospital in Atlanta, the second largest building under construction in the United States. Robert & Co. Associates—Architects.

SAFARI



L. E. CARPENTER & COMPANY, INC.

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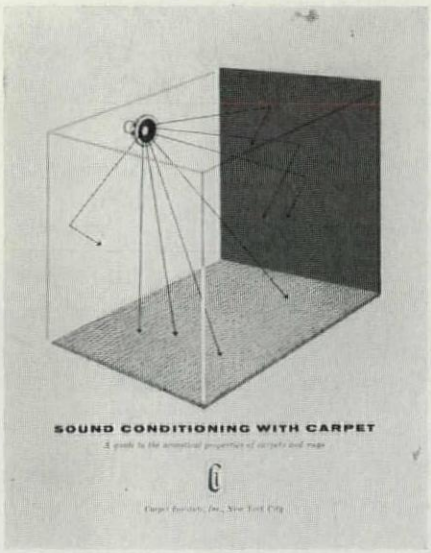
Mills: Wharton, New Jersey

* Vinyl electronically fused, needs no backing however use



To combat increasing noise-level in homes—increased in recent years by use of more glass and other hard reflective surfaces; by installation of more mechanical devices, radios, TV sets; by lighter construction and lower ceilings—Carpet Institute, Inc., of New York, recently undertook a survey to determine the sound-absorptive characteristics of carpeting and to investigate its potential as a sound-conditioner or basic acoustical material.

The results of these tests appear in the publication, Sound Conditioning with Carpet—*a guide to the acoustical properties of carpets and rugs. Illustrated sections describe three series of tests performed to estimate: absorption of air-borne noises; sound-absorption efficiency; reduction of impact noises. Conclusions are presented in graphic form and an outline of functional-decorative characteristics—based on density and depth of pile, backing materials, underlays, pile structure, and fiber content.*

Copies of Sound Conditioning with Carpet, *12-p., are available on direct request to Carpet Institute, Inc., 350 Fifth Ave., New York 1, N. Y.*

R. C.

Editor's Note: Items starred are particularly noteworthy, due to immediate and widespread ★ *interest in their contents, to the conciseness and clarity with which information is presented, to announcement of a new, important product, or to some other factor which makes them especially valuable.*

air and temperature control

114. Trane Centravac. 65-p. data book on automatic hermetic centrifugal water chiller for air-conditioning and process systems. Discusses features, controls, and intallation of unit composed of two-stage motor-driven centrifugal compressor, shell-and-tube type evaporator and condenser of similar construction. Numerous photos, drawings, and diagrams illustrate components and operation of system. Outlines selection procedure; offers charts of dimensions, capacity ratings, water pressure drops. The Trane Co., La Crosse, Wis.

115. Gas Vent Pipe and Fittings, AIA 30-D-4, 16-p.

116. Facts About Gas Venting, AIA 30-D-4, 16-p. Two booklets on insulated gas venting systems for use with home gas appliances. First booklet presents components in catalog form. Shows round and oval pipes with galvanized-steel outer casing, aluminum inner pipe, and special coupler connection; lists standard-length pipe sections and adjustable, telescopic type. Discusses economies in design and installation of system. Photos, outline drawings. Second booklet outlines fundamentals of gas venting. Detail drawings show installation of vertical vents in most common locations. Includes: data on selection of vents and planning system for particiular requirements; partial catalog of components. Metalbestos Div., William Wallace Co., Belmont, Calif.

117. Duct Sizing Calculator, 21-p. instruction manual with pocket containing sliding-scale air-conditioning duct calculator. Manual explains procedure for determining residential heat gains. Supplies map and chart for calculating outdoor temperature range to determine capacity of air-conditioning units; discusses factors influencing duct and register size and location. Gives instructions for using calculator to size complete supply- and return-duct systems for small homes. Armstrong Furnace Co., Columbus 8, Ohio.

construction

285. 1956 Grading Rules for Southern Pine Lumber, 172-p. pocket-size handbook of revised grading rules for southern pine, effective June 1, 1956. Of interest to architects are: new all-purpose stress grades; stress ratings for all widths and thicknesses of lumber; mandatory seasoning provisions; higher stresses for lumber with low moisture content; new data on paneling; and better finishing grades. Also includes information on characteristics and properties of southern pine; gives table of average weights of lumber. Southern Pine Inspection Bureau, P. O. Box 1170, New Orleans, La.

286. Nova Building Products, 68-p. pocket-size building manual, counterpart to earlier Nova handbook, describes variety of products from concrete mix to shakes and their applications. Presents data on pouring foundations, waterproofing concrete slabs, repairing defective masonry, installing pre-framed jalousies, and applying shakes to sidewalls with special clip attachment. Provides tabular guides, drawings, and details. Nova Sales Co., Trenton 3, N. J.

287. Facts About White Pocket Lumber, 8-p. bulletin providing general information on white pocket characteristic of wood, caused by fungus growth that is arrested in processing of lumber. Gives report on strength tests to determine fungus effects on lumber utilized in house construction; recommends most suitable applications for affected members. Four-color photos show white pocket lumber employed in framing, siding, and paneling. West Coast Lumbermen's Assoc., 1410 S.W. Morrison St., Portland 5, Ore.

288. Blumcraft Aluminum Railings (M-57), 48-p. catalog illustrating interchangeable stock aluminum-railing components for assembly by local metal fabricators. New addition to line of trapezoidal-section railings, adjustable newel posts, brackets, balusters, and rail panels is section on flexible room dividers using slotted posts and cork, wire mesh, glass, or plastic panels as well as post-and-shelf arrangements. Components for all units are carefully detailed, shown in assembly, dimensioned, and keyed to full-size section drawings. Blumcraft of Pittsburgh, 460 Melwood St., Pittsburgh 13, Pa.

289. How to Build Homes That Will Outlast the Mortgage, 28-p. booklet describing use of pressure-treated lumber in homebuilding to prevent costly decay and termite damage. Photos contrast effects of extensive termite and fungus attacks upon untreated and pressure-treated framing members. Discusses value of soil poisons and termite shields; recommends preservatives to be used in pressure treatment. Drawing indicates construction members requiring treatment. Cost analysis, termite-distribution map, photos, sketches. American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill.

290. Stran-Steel Buildings, 20-p. booklet demonstrating design versatility and economy of prefabricated modular-steel construction for industrial or commercial purposes. Handsome four-color renderings show rigid-frame and bow-string truss designs adapted to specific requirements of manufacturing and processing plant, warehouse, retail shop, bus terminal, and service building. Illustrates erection procedure and variety of available components ranging from fasteners, flashing, and panels to

canopies and ventilators. Provides floor plans and details of frame at critical points. Stran-Steel Corp., Detroit 29, Mich.

291. Walls of Steel, AIA 17-A, file folder containing 17 pamphlets on various aspects of curtain-wall construction. Includes reprints from major architectural publications: Design of Stainless Steel Curtain Walls, Curtain Walls of Stainless Steel, Behavior of Stainless-Steel Curtain Walls, Porcelain-Enamel Curtain Walls. Also, series of case studies providing descriptions, photos, and detail drawings of structures erected in recent years. Two brochures in color. United States Steel Corp., 2831-525 William Penn Pl., Pittsburgh 30, Pa.

★ **292. Lupton Windows and Curtain Walls,** folder containing assorted data on aluminum or steel doors and windows as well as aluminum curtain-wall systems. Offers tab-indexed, illustrated door and window catalog with detail drawings for double-hung, projected, casement, industrial, and glass-block windows; curtain-wall catalog contains details and specifications. Illustrated data sheets indicate range of design solutions possible using curtain-wall system. Also, set of detail and assembly drawings for complete system. Michael Flynn Mfg. Co., 700 E. Godfrey Ave., Philadelphia 24, Pa.

★ **293. Sealuxe Metal-Glass Façade System,** AIA 17-A, 12-p. technical guide to specification of metal-glass façade system for multistory buildings. Six sections include: dictionary of appendages and accessories in aluminum, stainless-steel, and bronze—ventilator panels, windows, solar devices, finishes, display elements; outline of components for complete façade; preliminary planning outline; list of design considerations—esthetic, module, materials, finishes, economics, waterproofing; data on specifications and drawings; account of technical requirements. Universal Corp., 6710 Denton Dr., Dallas, Tex.

294. Overly Products, AIA 16-A, 20-p.

295. Overly Products, AIA 12-C, 16-p. Two product guides describing and illustrating manufacturer's line of building components. First booklet covers: metal door frames; hollow metal, wood, and tin-clad doors; hardware. Shows trim shapes, isometric construction details, standard door designs, sections. Scope of second booklet includes batten-type aluminum roofing, coping, window sills, spandrels, and solar canopies. Provides photos, installation details, section drawings. Overly Mfg. Co., 574 Otterman St., Greensburg, Pa.

★ **296. Specifications for Metal Lath and Furring,** AIA 20-B-1, 20-p. specification booklet—one of 1957 Building Products Literature Competition award winners—covers all phases of metal-lath construction. Specifications for solid and hollow partitions, wall furring; metal lath attached directly to wood supports; contact, furred, and suspended ceilings; beam and column fire-proofing; exterior stucco reinforcement. Fire-resistive ratings table; design tables; sizes and spacings. Perspective details. Metal Lath Manufacturers Assoc., Engineers Bldg., Cleveland 14, Ohio.

★ **297. Ferrobord Steeldeck Roofs,** AIA 12-A-3, 38-p. catalog on lightweight steel roof decking system—with interlocking members—adaptable to flat, pitched, or curved surfaces. Illustrates components, clips, and accessories; provides series of installation details, typical sections, step-by-step erection procedure. Discusses design procedures for reinforced-concrete slab construction using inverted decking units as form. Design calculations for seismic and lateral forces; complete set of safe-load tables; photos; insulation chart. Truscon Steel Div., Republic Steel Corp., Youngstown 1, Ohio.

298. Wolmanized Lumber, 16-p. booklet presenting features of pressure-treated lumber for rot and termite-resistant construction. Discusses use in process and refrigeration plants, concrete and masonry structures, air-conditioned buildings, outdoor installation, farm and home construction. Lists typical users; numerous photos; specifications. Koppers Co., Inc., Pittsburgh 19, Pa.

299. Open-Web Steel Joists, AIA 13G, 24-p. publication containing basic data on open-web steel joists in both shortspan and longspan series. Provides perspective drawings and photo details showing anchorage methods, bridging, connections, and centering as well as installation of pipes and ducts. Illustrates series of longspan-joist designs: underslung- and square-end; parallel chords; single- and double-pitched top chords. Code of Standard Practice, specifications, loading tables. Steel Joist Institute, Dupont Circle Bldg., 1346 Connecticut Ave. N. W., Washington 6, D. C.

201. Porcelpanels, 4-p. bulletin covering subject of insulated porcelain-enameled panels for curtain-wall construction. Studies of panel designs in seven actual buildings are featured. Lists advantages; describes colors, finishes, textures, weather-sealing, and enameling process. Photos, drawings. Ingram-Richardson Mfg. Co., Beaver Falls, Pa.

202. Granite in the School, 12-p.
203. Granite in the Hospital, 12-p.
204. Granite in Places of Worship, 12-p. Three brrochures, illustrated with sketches by AIA members, explore structural and ornamental characteristics of granite as used in particular building types: school, hospital, or church. Presents original desidn ideas to stimulate imaginative use of materials for benches, play sculpture, pools, memorials, carved panels, steps, columns, table tops. Data on costs, colors, properties, sizes, finishes. Cold Spring Granite Co., Cold Spring, Minn.

doors and windows

304. Ador Sliding Glass Doors, AIA 16-E, 12-p. pamphlet describing all-aluminum glass sliding doors for residential applications in all climates. Cutaways show weatherstripping at threshold, header, interlocker, and jamb. Photos indicate precision design of sliding mechanism utilizing stainless-steel track and steel roller bearings. Also stresses corrosion resistant finish, snap-on glazing bead, and custom hardware. Shows installation procedure; provides installation and glazing details, full-size construction details, dimensions. Ador Sales, Inc., 2345 W. Commonwealth Ave., Fullerton, Calif.

305. Twin-Beam Church Windows, 8-p. pamphlet featuring extruded-aluminum window sections for dual-glazed church windows. Key drawings show Gothic, circular head, and rose windows formed of sections with projected-type ventilators. Details explain installation at critical points. Photos, drawings, specifications. Industrial Engineering Works, 67 Bloomsbury St., Trenton 6, N. J.

306. Modernfold Doors, 14-p. brochure illustrating features of accordion-fold

(Continued on page 244)

PROGRESSIVE ARCHITECTURE, 430 Park Avenue, New York 22, N. Y. I should like a copy of each piece of Manufacturers' Literature circled. We request students to send their inquiries directly to the manufacturers.

114	291	202	647
115	292	203	648
116	293	204	738
117	294	304	739
285	295	305	864
286	296	306	865
287	297	492	866
288	298	493	961
289	299	523	962
290	201	524	70

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POMONA TILE, the creative name in ceramic floor and wall tile.

PAUL McCOBB: functional furniture designer and originator of the "Linear look" in contemporary furniture. Famed for his imaginative uses of unorthodox materials, he recently introduced designs combining structural aluminum and natural woods. Winner of many "Best Design" awards.....

MILLARD SHEETS: water-colorist, muralist, illustrator, mosaicist, architectural designer, director, teacher, and lecturer. Winner of scores of awards for watercolors and other paintings, his works are to be seen in the permanent collections of more than forty museums and galleries.

DOROTHY LIEBES: textiles designer and colorist, and the winner of many national and international awards in art and design competitions. Director, trustee, and member of more than a score of art and professional societies and schools, her work has been exhibited in countless museum and gallery shows.

SAUL BASS: designer, consultant in integrated design- planning for industry; also well-known for unusual movie- title designs. Teacher, lecturer, and member of the executive board of the International Design Conference at Aspen. Winner of scores of national and international awards.....

PAUL LASZLO: industrial designer and interior designer. He is a renowned exponent of the new "romantic movement" in home interiors. Known as a "radical architect" in Vienna before World War II, he says he follows no formula or dogma except what he terms "ABC's of good design, artistry, beauty, comfort."

p/a manufacturers' literature

(Continued from page 241)

fabric-covered doors for installation in homes, offices, or restaurants where space flexibility is desirable. Shows three types of track switch and unusual door types. Supplies drawings and data on door and track dimensions, track applications, standard sizes. Features special sound-insulated doors and new hardware designs. Photos show completed installations. Drawings, specification, charts. New Castle Products, Inc., New Castle, Ind.

electrical equipment, lighting

492. Architectural Floodlighting, 8-p.

493. Modern Outdoor Lighting, 12-p. Two bulletins dealing with exterior lighting applications illustrate numerous examples. Dramatic effects of highlighting building forms and surfaces are shown in first booklet, which provides suggestions for selection and location of floodlights; recommends footcandle levels for particular surface materials. Second bulletin serves as guide for planning attractive lighting installations in parking areas around shopping centers or suburban businesses. Discusses costs, requirements, appearance. Shows luminaire designs and accessories. General Electric, Schenectady 5, N. Y.

finishers and protectors

523. Silicone Masonry Water Repellents, 4-p.

524. Silicones, 8-p. Two pamphlets describing various applications for silicone products. First brochure deals with durable silicone water repellent for masonry. Discusses advantages; lists properties. Photos show comparative test results using silicone-treated and untreated masonry soaked in water. Specifications. Second booklet lists typical uses, benefits, and technical characteristics of silicone products. Includes adhesives, damping fluids, electrical insulations, glass-surface coatings, polishes, paints, and rubber products. Charts, photos. General Electric Co., Silicone Products Dept., Waterford, N. Y.

insulation (thermal, acoustical)

647. Foamglas Insulation, AIA 37-B, 24-p. booklet containing data on latest recommended procedures for application of all-glass cellular insulation to roofs, curtain walls, core walls, and concrete ceilings. Also shows methods of perimeter insulation. Provides typical details and photos taken during installation. Separate section describes primers, adhesives, and finishes to be used in application. Technical data on heat transmission values is tabulated in chart form. Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.

648. Fiberglas PF Duct Insulation, 4-p. file insert discussing advantages of semi-rigid fibrous-glass insulation boards for exterior application to warm-air ducts operating up to 250 F. Gives technical and design data. Photos illustrate finishing procedures and application to curved surfaces. Keyed drawings explain four installation methods. Specifications. Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

specialized equipment

738. Electronic Control Center, 8-p. brochure discussing functions, features, and advantages of centralized automatic control for visual supervision of entire heating and air-conditioning system. Illustrates panelboard components in full color and describes each in details. Chart shows standard symbols used in schematic illustrations on panelboards. Specifications. Barber-Colman Co., Rockford, Ill.

739. Rolling Gymstands, AIA 35-F-11, 16-p. catalog illustrates operating features of four rolling gymstand types: standard, recessed, movable, and special balcony models. Shows typical installations. Section on optional accessories: end rails and panels, rear filler boards, scorer's table, ventilating grills. Tabulated space requirements, seating

(Continued on page 250)

ect: Ernst Payer, A.I.A.

Photographer: Hedrich-Blessing

CRA

Redwood . . . for harmony in texture

Not the least of redwood's architectural virtures is its ability to combine pleasingly with other construction materials—brick, stone, concrete, glass. As handsomely illustrated in the Cleveland, Ohio estate shown here, redwood's natural beauty of grain, color and pattern will enhance both site and structure.

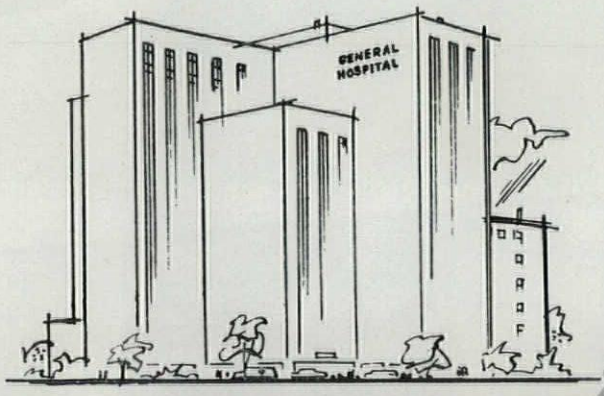
CALIFORNIA REDWOOD ASSOCIATION
576 Sacramento Street · San Francisco 11, Calif

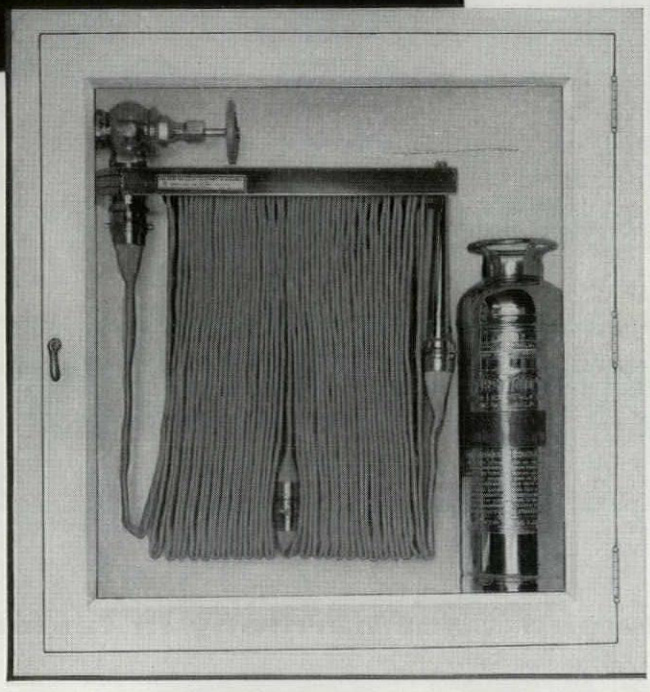
CALIFORNIA REDWOOD

For Interior Fire Protection in

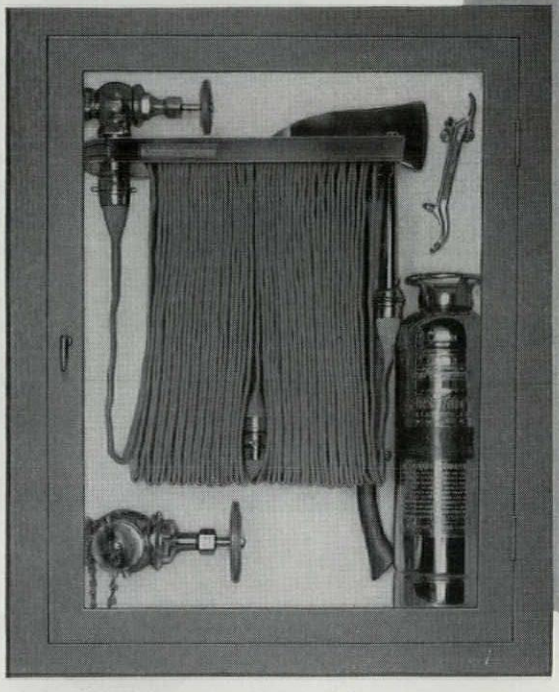
Hospitals, Hotels, Apartment and Office Buildings

Of the various **ALLENCO** *products and models, these two types are most often used in this field—*





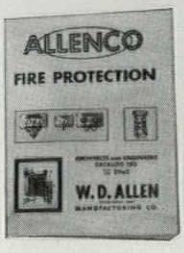
Allenco Unit 215 gives choice of 4 hose-sizes, 4 hose-lengths and other factors.



Allenco Unit 192 adds handiest water-source for use by Fire Department.

Cabinets are "custom-sized" and are available in several different groups with Allenco Hollow Steel Door, Nella Sheet Steel Door, Aluminum Doors, and other styles. Rigid and true-to-size, they go in faster . . . look better . . . serve perfectly.

Catalog 150
(A.I.A. file 29e2)
contains full details in simplest form, including standard quotable specifications.
Write for your copy now . . .



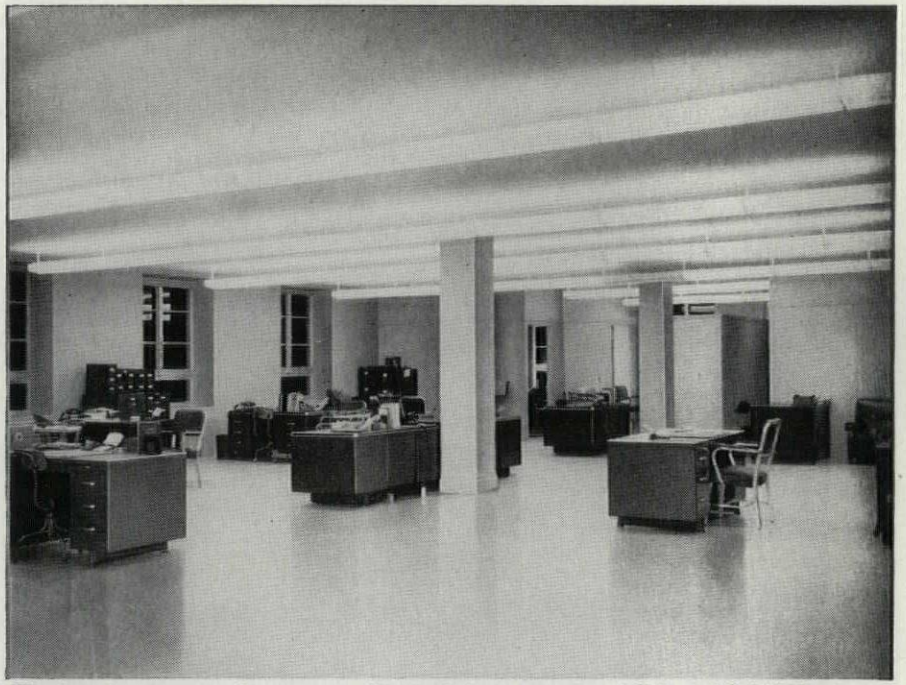
ALLENCO

5 miles of Gold Seal® Floors exclusively for Maine State Office

ARCHITECTS: Miller & Beal, Inc., Portland, Maine. ASSOCIATE ARCHITECTS: Desmond & Lord, Boston, Mass. FLOORING CONTRACTOR: Portland Veos Tile and Flooring Co., Inc., Portland, Maine

Aerial view of the new Maine State Office Building with the Capitol building at the rear.

specified Building!



Here's an interior view showing a small part of the installation of Gold Seal Inlaid Linoleum. Actually, about 3½ acres of floor space are covered with this ⅛" burlap-backed "Veltone."

MORE than 148,000 square feet of Gold Seal Veltone® ⅛" Inlaid Linoleum has been specified and installed in the new Maine State Office Building at Augusta, Maine.

Originated by Gold Seal, "Veltone" provides an attractive, long-wearing, all-over decoration for use in all public buildings, schools, hospitals, offices, etc. Veltone's excellent resiliency provides quiet and comfort under foot. The unique design of this Inlaid Linoleum literally hides foot marks . . . it's exceptionally easy to clean and keep clean because of its density and surface smoothness. This ease of maintenance naturally reduces the expense of building service and upkeep. For those who prefer the modern textured look in Inlaid Linoleum, Gold Seal offers Sequin®—⅛" thick—with all the advantages of "Veltone."

Gold Seal Vinylbest* Tile and Gold Seal Asphalt Tile were also used in special areas such as the food and photo laboratories.

Specifications—Gold Seal Veltone: 6′ wide yard goods, ⅛" gauge, burlap-backed. Install over suspended wood, or suspended concrete under-floors. Available in 8 colors—Pompeian Grey, Heather Tan, Spicewood, Bermuda Grey, Light Tan, Grey, Brown, Surf Green. Also made in standard gauge for residential use—in 9 colors.

Send for Free Technical Data Book—"Why Resilient Floors"—containing 36 pages of information to help you specify the correct resilient floor for any type of commercial, institutional or residential building. Address Architects' Service Department, Gold Seal Floors and Walls, Congoleum-Nairn Inc., Kearny, N. J.

PROVIDE YOUR CLIENTS WITH THE FINEST IN FLOORING — SPECIFY GOLD SEAL

FOR HOME...BUSINESS...INSTITUTIONS:

BY THE YARD AND TILES—Inlaid Linoleum • Nairon® Plastics • Vinylbest* Tile • Cork Tile • Rubber Tile Asphalt Tile

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RUGS AND BROADLOOM—LoomWeve®

SATISFACTION GUARANTEED OR YOUR MONEY BACK

FOR THE LOOK THAT'S YEARS AHEAD

Gold Seal® FLOORS AND WALLS

*Trademark

p/a manufacturers' literature

(Continued from page 244)

capacities; diagrams; sight-line study; planning procedure; typical gym floor-plans showing location of stands. Specifications. Wayne Iron Works, 147 N. Pembroke Ave., Wayne, Pa.

specialized equipment

864. Vibrechord Chimes, 16-p. pocket-size pamphlet providing series of two- and three-signal wiring diagrams for six paging and alarm systems used in any building type. Includes automatic chimes set off by door-opening or temperature rise and push-button type for signaling family members or nurses at will. Edwards Co., Inc., Norwalk, Conn.

865. Color Guide to Bathroom Design and Decoration, giant-size 28-p. spiral-bound guidebook designed to aid decorators in planning harmonious and unusual decorative schemes using vitreous china bathroom fixtures finished in choice of five porcelain-enamel colors. Series of color plates suggest variety of alternate color relationships—within each of several basic layouts—co-ordinating bath tile, walls, floors, cabinets, accessories, and fixtures. Catalog section shows range of bathtub, lavatory, and water closet styles. Briggs Mfg. Co., Detroit, Mich.

866. 1957 Revco, information kit containing latest data on built-in refrigerators and freezers for contemporary and traditional kitchens. Includes: complete specifications, installation instructions, catalog brochure, and 16-page brochure of selected kitchen designs featuring four-color photos and perspective drawings of each. Revco, Inc., Deerfield, Mich.

surfacing materials

961. Hanley Duramic Brick, AIA ★ 3-F-2, 4-p. folder encloses pictorial data illustrating variety of effects achieved with vitreous ceramic glazed brick. Photos show several actual installations including walls at New York Museum of Modern Art where bricks of varying tone and mottled pattern are design feature. Also highlights solid and speckled glazes in other applications. Chart listing of standard colors in tile and brick. Hanley Co., Inc., 101 Park Ave., New York 17, N. Y.

962. Vitrolux, 4-p. leaflet providing information on polished plate-glass surfacing material with fused-on ceramic color for decorative sheathing of any building type. Renderings show several applications of spandrel glass in conjunction with ribbon windows. Gives data on size, thickness, installation. Shows eight standard colors. Libbey-Owens-Ford Glass Co., Toledo 3, Ohio.

interior furnishings

Multipurpose Series, selection of handsome folders and brochures designed to illustrate latest contemporary-style furniture in Herman Miller collection. Catalogs show molded plastic chairs designed by Charles Eames and individual units in multipurpose series—cabinets, tables, stacking and cushion chairs, desk components and desks. Other folders illustrate room arrangements using items in catalog for restaurants, schools, hospitals, public spaces, hotels, motels, and offices. Photos, drawings. Send requests directly to: James Lucas, Herman Miller, Exhibitors Bldg., Grand Rapids, Mich.

70. Wood-Furniture Specifications, AIA-35, 44-p. specification guide intended to provide architects with up-to-date information on materials, finishes, and construction of wood laboratory furniture as well as aid him in specifying installation procedures for best results. Key drawings, sections, and details indicate important construction features of sliding and swinging door cabinets; open-leg tables; table tops of various compositions. Paragraphs in specification section, covering all necessary data can be copied intact or condensed. Kewannee Mfg. Co., Adrian, Mich.

"A skyscraper must be rising in every inch a proud and soaring thing, sheer exultation." • Louis Sullivan

MURCHISON TOWER

new home of the First National Bank of Denver

This bold imposing landmark on the Denver sky line is the city's tallest and largest office building. It rises 28 stories above Denver's mile high elevation and has 586,000 sq. ft. of floor space.

Located in the heart of Denver's financial district.

Roof is designed as a heliport.

Parking wing provides space for 450 cars.

Once set, a Powers pneumatic thermostat holds temperature constant day after day It needs no frequent checking or readjustment.

POWERS

QUALITY SYSTEM OF AIR CONDITIONING CONTROL will regulate the modern high velocity year 'round air conditioning in this prestige building. Occupants of each space can dial the temperature they like and enjoy utmost comfort.

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Simplicity and dependable performance of a Powers pneumatic control system enables it to provide utmost comfort with a minimum of maintenance.

To get the biggest return on the investment in air conditioning ask your architect or engineer to include a Powers Quality system of control. For further information write The Powers Regulator Co., Skokie, Ill. Offices in Chief Cities.

(c35)

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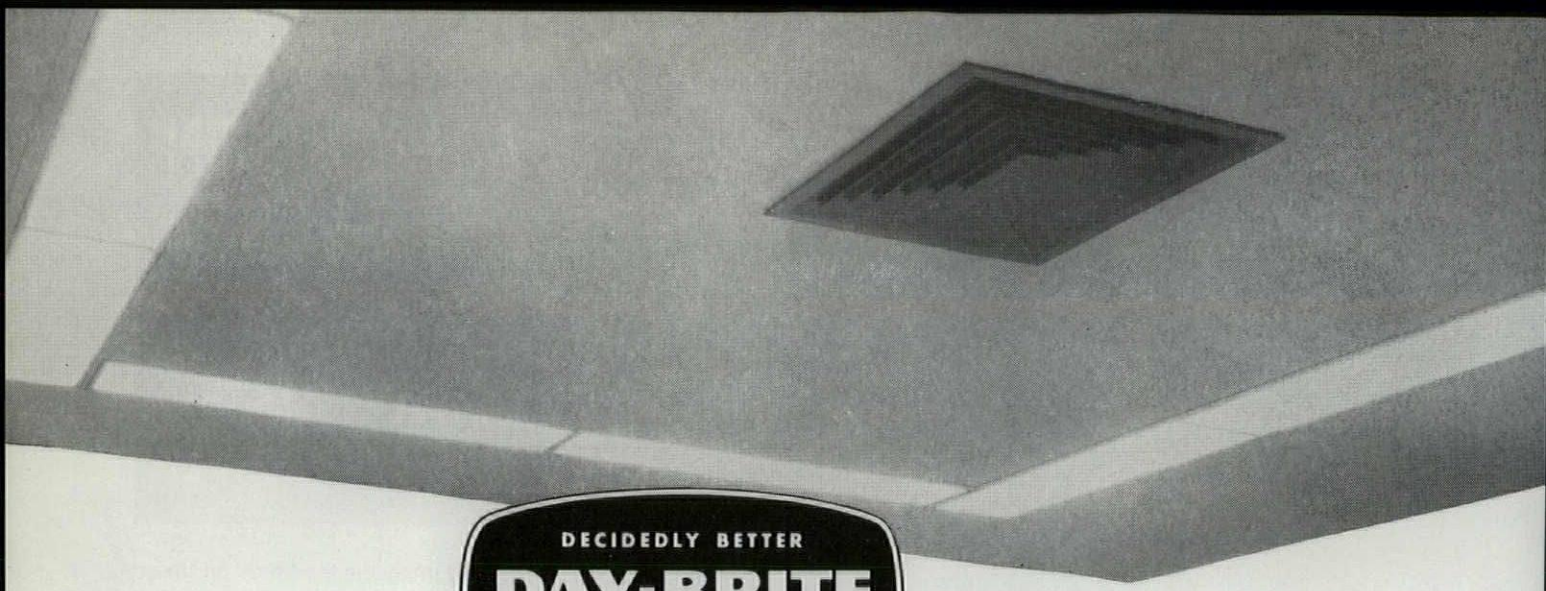
Architect: RAYMOND HARRY ERVIN • Mechanical Engineers: MARSHALL & JOHNSON ALL OF DENVER, COLORADO

Builders: MEAD & MOUNT CONSTRUCTION CO. • Mechanical Contractor: NATKIN & CO.

THE POWERS REGULATOR COMPANY • 65 Years of Automatic Temperature and Humidity Control



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Lighting that has no "or equal"

How do you feel about substitutes?

If alternate "or equal" fixtures are offered when you've specified Day-Brite, do you readily accept them?

More and more top architects don't. They've learned from experience that the design and quality of Day-Brite fixtures have no "or equal."

All fluorescent lighting fixtures may look good and sound good—on paper. But the safe and sure way to satisfy your clients and yourself is to make a point-by-point comparison of all fixtures *before* you specify.

Then you're sure to do as most experienced architects do, namely, to specify *and insist on* Day-Brite . . . the one lighting fixture that enhances both the job and your own reputation.

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IN CANADA: AMALGAMATED ELECTRIC CORP., LTD., TORONTO 6, ONTARIO

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NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMEN

DAY-BRITE LIGHTING MAKES THE BIG DIFFERENCE HERE

"White Columns" is the new home of WSB Radio and WSB-TV in Atlanta, Ga. It was designed and constructed by The Austin Company. Electrical Contractor: Eckardt-Ness Electric Co., Atlanta.

Conference Room. Day-Brite recessed troffers enhance the quiet dignity of this important gathering point.

Employes' Lounge . . . a room designed for relaxation. No harsh brightness from these Day-Brite recessed Mobilex® and troffers.

Porcelain enamel fired on steel at 1550°

Weis *Vitre-Steel* compartments are porcelain enameled inside and out for a lifetime of beauty and utility. Exposed surfaces are then refired in your choice of Weis *Vitre-Steel* colors. Glass hard, AA Grade, acid-resisting *Vitre-Steel* withstands not only normal everyday usage, but is highly resistant to acids, cleaning compounds and even defacement. Perfect for hospitals, schools, offices, factories . . . wherever you install them. Available in ceiling-hung type as shown, or floor-braced styles.

WEIS

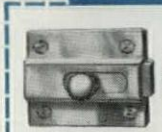
WRITE FOR NEW COMPLETE CATALOG

HENRY WEIS MANUFACTURING COMPANY, INC.
667 Weisteel Building, Elkhart, Indiana

SPECIFICATIONS: Panels, stiles and doors shall be flush construction, and shall be made of two face plates of not less than 18-gauge enameling iron with formed edges, cemented under pressure to fiberboard core and joined by welding abutting edges at suitable intervals. Edges shall be bound with die-drawn stainless steel moldings interlocked under tension onto formed edges, mitered and welded at corners and welds ground smooth. Partitions and doors shall finish 1″ thick; stiles shall finish 1¼″ thick.

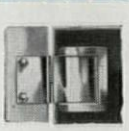
All surfaces, concealed and exposed, shall receive a vitreous porcelain enamel ground coat. All exposed surfaces shall then be given a cover coat, in a color selected from the Weis color chart of decorator colors.

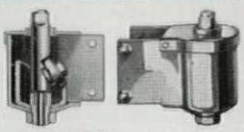
Doors shall be hung on WEIS gravity hinges with upper hinge mounted in recess in edge of door. Doors shall be fitted with slide bar latch, combination keeper and bumper and coat hook with rubber-tipped bumper, all to be brass, chromium plated. Latches and coat hooks shall be attached with theft-resistant screws.


SLIDE BAR LATCH

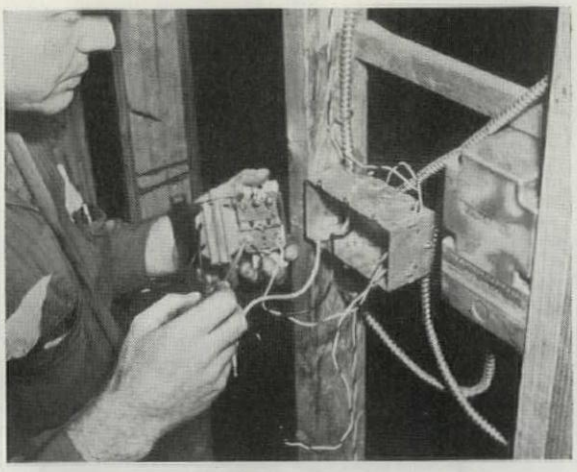

COMBINATION KEEPER AND BUMPER


COMBINATION COAT HOOK AND BUMPER


CUTOUT TYPE TOP DOOR HINGE


CUTAWAY

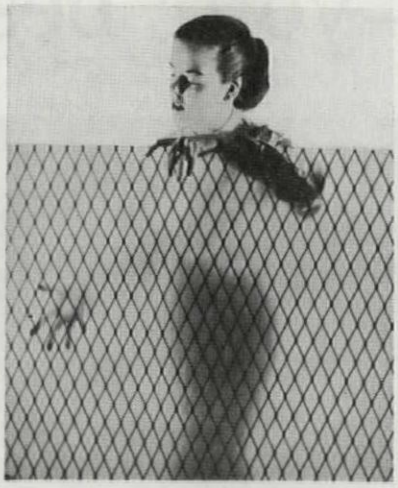
UNIVERSAL BALL BEARING GRAVITY TYPE BOTTOM DOOR HINGE



Automatic home fire-alarm system—providing simple, low-cost safety feature—operates on a small transformer easily installed in standard three-gang outlet box in bedroom (far left). *Control panel, measuring 4¾" x 6½" for surface or flush mounting—contains transformer, test button, and ringing bell. Automatic fire detectors are installed in typical attic and basement areas* (left) *and connected to control unit by ordinary bell wire. Edwards Company, Inc., Norwalk, Conn.*

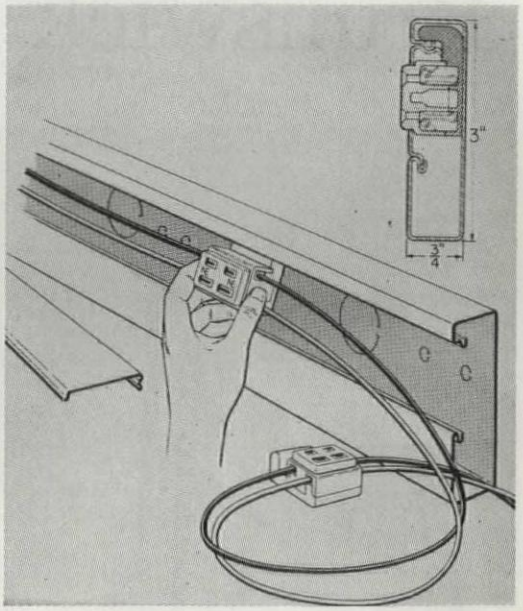
Dust-laden air flows through 13,000-v ionizer section of new electronic air cleaner system (right). *Given a positive electrical charge, dust particles become positive ions which are attracted to negative 6500-v collector plates. Particles smaller than smallest known virus are collected. Automatic cycle washes dirt away. Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis 8, Minn.*

Individual, trapezoidal, classroom tables (pushed together) allow several children to confer and work as a group (left). *Glides on legs won't mar or scratch floor surface. Available in four colors: gray, brown, turquoise, and terra cotta. Shwayder Brothers, Inc., 4270 High St., Detroit, Mich.*

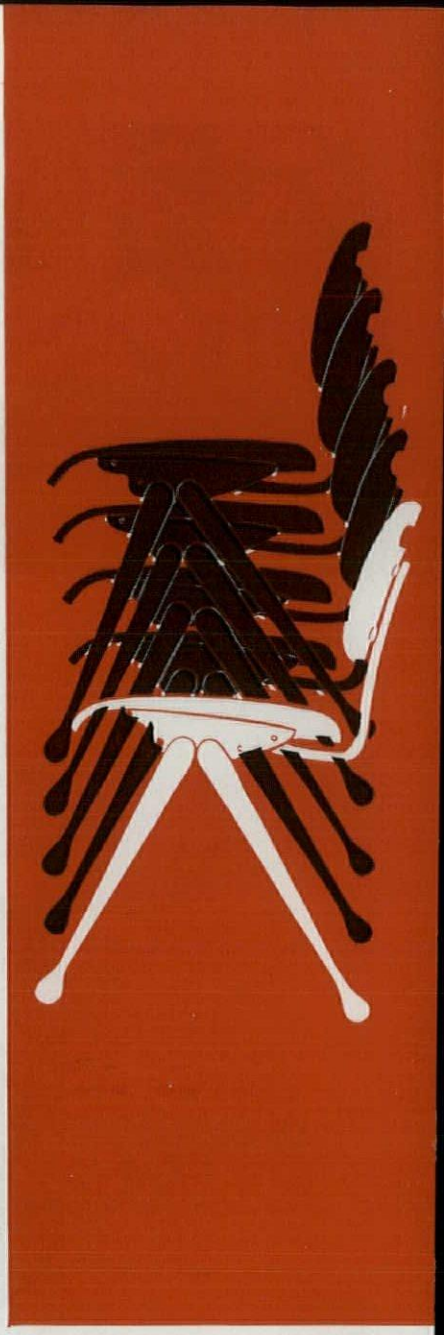


Metal-reinforced translucent plastic panels—using either aluminum or steel diamond-mesh—have high impact resistance (left). *Sheets can be obtained in both standard and special fire-retardant types, in clear, and in five colors: blue, green, yellow, sky blue, and coral. Panels available in lengths of 8' and 10' and widths of 1', 2', 3', and 4'. Resolite Corp., Zelienople, Pa.*

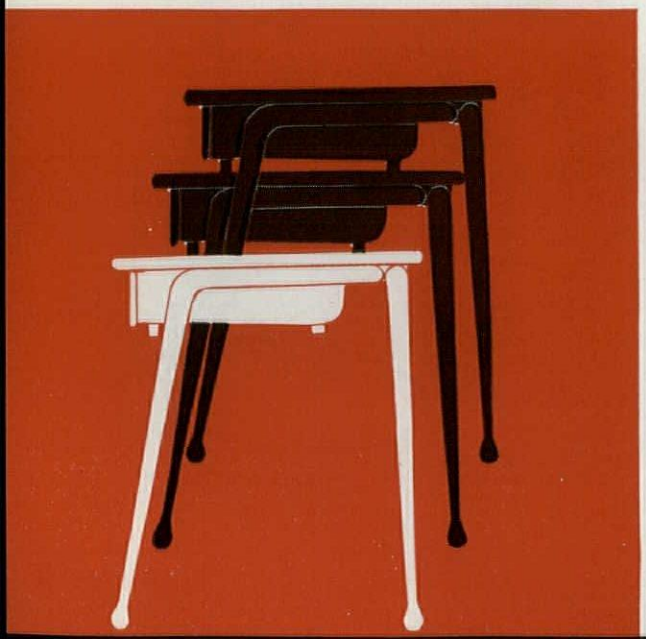
Baseduct—complete electric wiring system at baseboard level—is available in 5' lengths with duplex receptacles on 30" and 60" centers. Over-all dimensions are 3" high and ¾" wide. Mounting holes in base permit easy installation of system; ¾" knock-outs in base of duct facilitate wiring operations. National Electric Products Corp., Gateway Center, Pittsburgh, Pa.

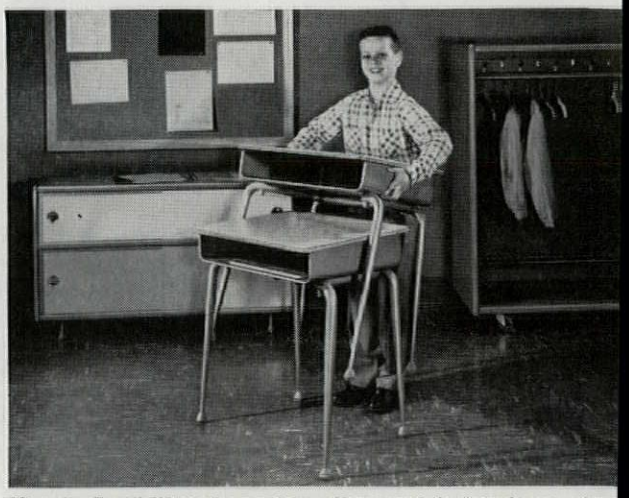


Geography class now . . . class conference next . . . P.T.A. party tonight . . . maybe a library next month! Modern rooms must be *flexible* to meet needs like these. And Brunswick furniture makes them so. Chairs, desks, tables and cabinets can be rearranged in moments. Your rooms are always ready for next hour . . . or next year!



Brunswick Flexibility–your best

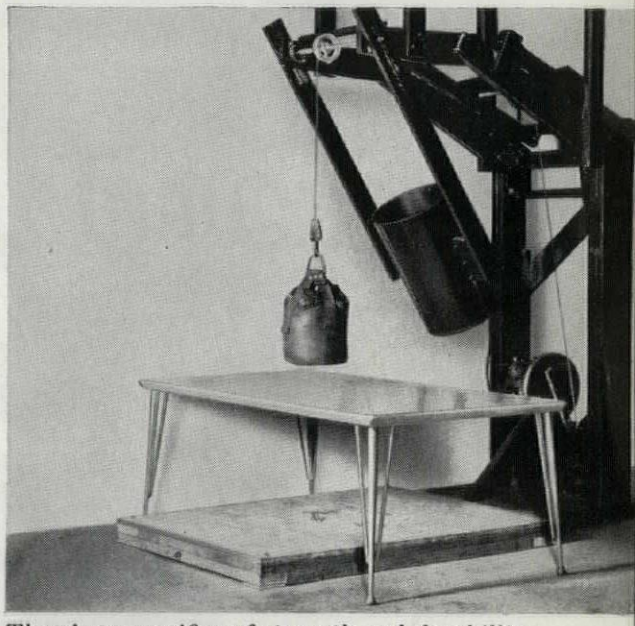




Here's flexibility in *action*. Brunswick furniture stor stacks, moves and groups in moments to accommod changing classroom needs and modern teaching metho Each piece has many exclusive features. Your Brunswi representative will gladly explain them in detail.

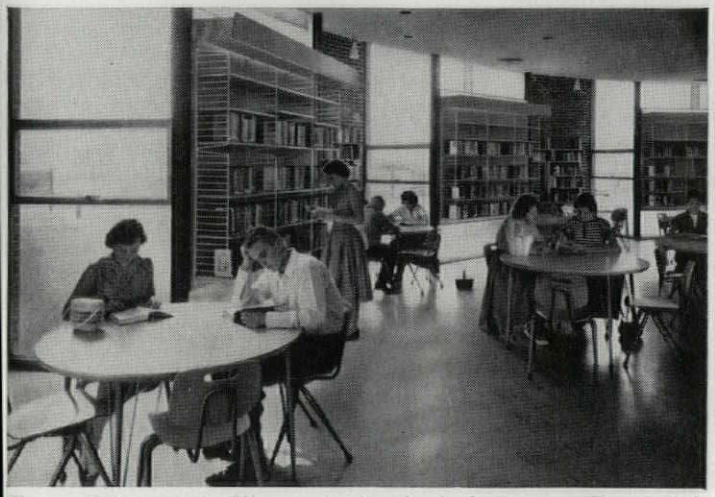
Rooms serve many more purposes with Brunswick flexible folding equipment. Folding stage (above) makes any area a theater in minutes. Folding gym seating ends the necessity for temporary seating. Folding partitions divide rooms instantly. Here's new flexibility tailored to *your* requirements!

Any student, teen to tot, can easily move these cabinets on wheels. Designed to use individually or *combine* . . . into a room divider or mobile book center, for example. Deep shelves have generous storage space. These handsome, functional cabinets go *where* you need them . . . *when* you need them!



There's no sacrifice of strength and durability in order to bring you Brunswick flexibility. Rigid construction and quality materials cut maintenance costs to an absolute minimum. You get all the reliability for which Brunswick has been famous for 112 years.

investment... *today and for years to come*



From classroom to library to teacher's lounge . . . Brunswick has the most *complete* line of school equipment in America. For basic flexibility and lasting durability . . . for careful individual attention to *your* specific needs . . . for functional beauty with a future . . . your wisest investment is Brunswick!

Today's school equipment has two basic functions: to make limited space work harder . . . and limited budgets stretch further. Brunswick does both.

As the acknowledged leader in flexible design, Brunswick makes space serve more uses, more hours per day, than other lines. And Brunswick's exclusive durability features keep maintenance costs to a minimum.

That's why today . . . and for years to come . . . Brunswick is your best investment. See your representative, or write to The Brunswick-Balke-Collender Company, 623 South Wabash Avenue, Chicago 5, Illinois.

Brunswick

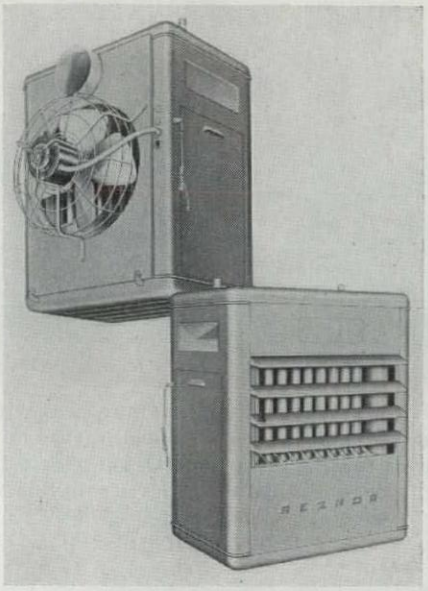
One line continues to set the pace . . . it's BRUNSWICK

(Continued from page 256)

air and temperature control

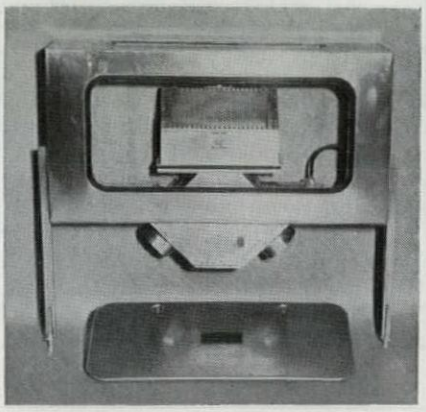
Wall Insert Heater: equipped with solid-aluminum reflectors and liquid-filled thermostat, wall-inserted automatic electric heater features new projected frame design—to keep furnishings and draperies clear of heating element. Special adaptor kit for surface mounting is available through manufacturer. Heaters come in wide range of sizes and seven capacities (1 to 5 kw) to suit requirements of any room. Cavalier Corp., 343 W. First St., Chattanooga, Tenn.

Reznor Unit Heater: new, suspended, gas unit-heater features automatic two-speed fan control and clean all-over design (*right*). Controls, grouped within cabinet, are installed and serviced through access panel at side. Fan motor is mounted directly to wire fan-guard, eliminating



girder-type motor base. Automatic control increases or decreases fan speed according to period of burner operation (or temperature of heat exchanger). Models are equipped with toggle fan-switch and pull cord for independent cooling; vertical louvers, discharge nozzles are optional. Reznor Mfg. Co., Mercer, Pa.

Dual-Duct Air Mixer: all-aluminum air-mixing unit for dual-duct air-conditioning systems features self-contained automatic volume control to maintain constant room-air supply, regardless of inlet pressures. Removable panel permits access to sound-



hushing chamber and mixing apparatus (*above*). Warm air and cold air are delivered through dual ducts at bottom and mixed according to thermostatic setting in bellows arrangement behind perforated cover. Capacities of basic unit range from 100 to 300 cfm. Buensod-Stacey, Inc., 45 W. 18 St., New York 11, N. Y.

construction

Stock Steel Columns: new development in structural framing—stock steel columns in square, rectangular, and corner types—is said to be applicable to any type of construction where straight-line design is desirable. New columns eliminate need for costly forms and permit direct connec-

(Continued on page 268)

NERVE CENTER
for *"CONTROLLED CLIMATE"*

with **VARI-VAC** differential heating systems

- Centralized controlled adjustment of vacuum or pressure, *automatically* adjusts heat medium to balance with varying heat loss of a building due to changing outside weather conditions.
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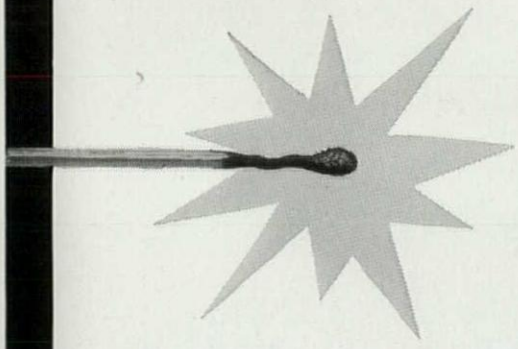


is fire-protected

by **Permalite**®

insulating concrete

Behind the gleaming aluminum face of the 20-story tower of the Bank of the Southwest Building, in Houston, Texas, is a curtain wall of light weight insulating concrete made with Permalite expanded perlite aggregate. The diagram shows clearly how architect Kenneth Franzheim designed this wall to gain a full 4-hour fire rating. Portland cement and Permalite, in a 1-to-4 mix with an air-entraining agent, were machine applied. The architect's office states that the finished wall proved to be very hard, dense and structurally sound.

IN ACTUAL FIRE TESTS of 4″ perlite insulating concrete walls, such as this one, the temperature of the unexposed face averaged only 159°F. at the end of 4 hours. A further advantage is found in the fact that Permalite insulating concrete has only limited expansion at high temperatures and does not tend to bulge or spall off as do concrete and plaster made with heavy, unexpanded aggregates.

MORE AND MORE, architects are designing for light weight insulating concrete curtain walls, since the many Permalite curtain wall jobs now standing have proved that Permalite insulating concrete provides adequate strength and fire protection, as well as additional acoustic and thermal insulation values.

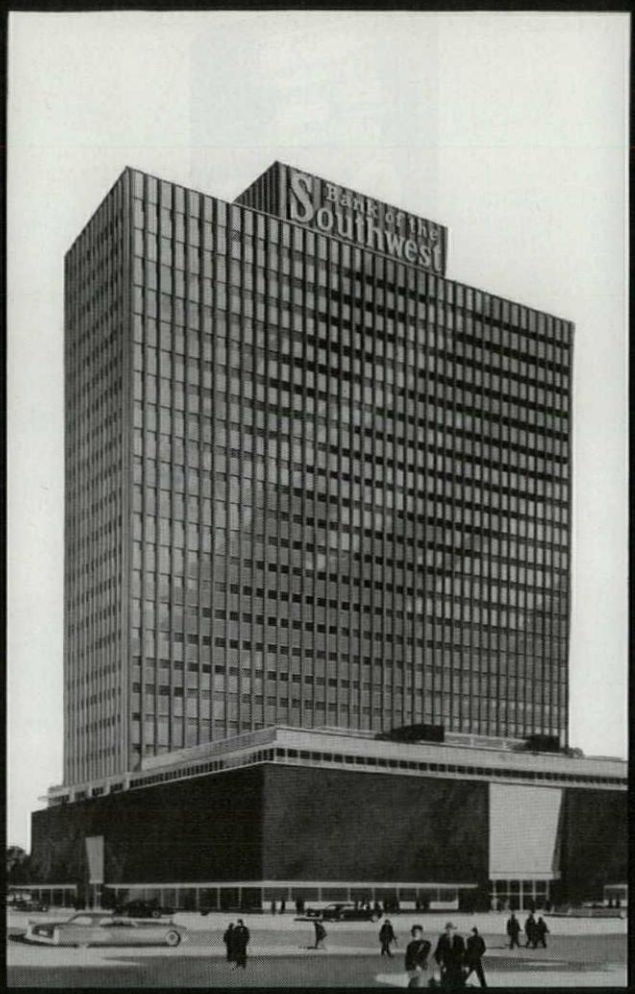
write for information PERLITE DEPARTMENT
GREAT LAKES CARBON CORPORATION
612 south flower street, los angeles, california

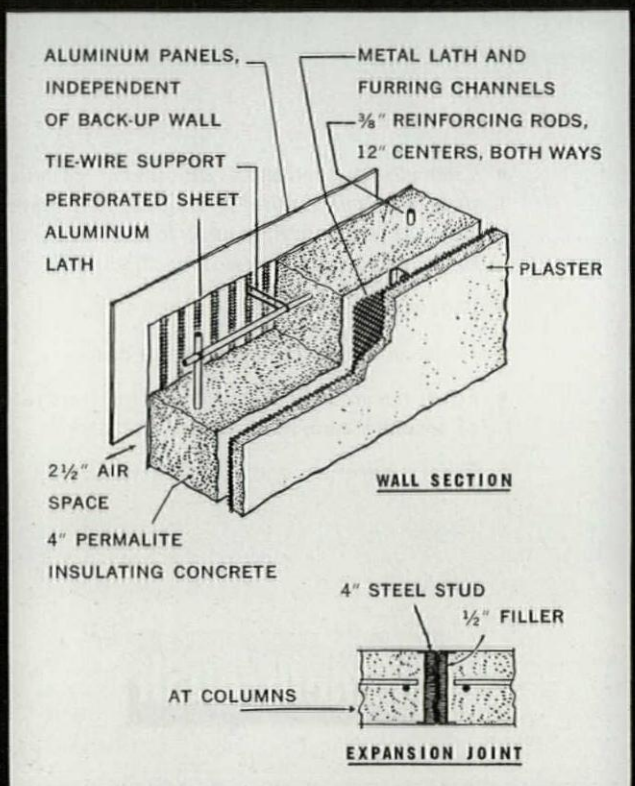
ARCHITECT:
Kenneth Franzheim, Houston, Texas.

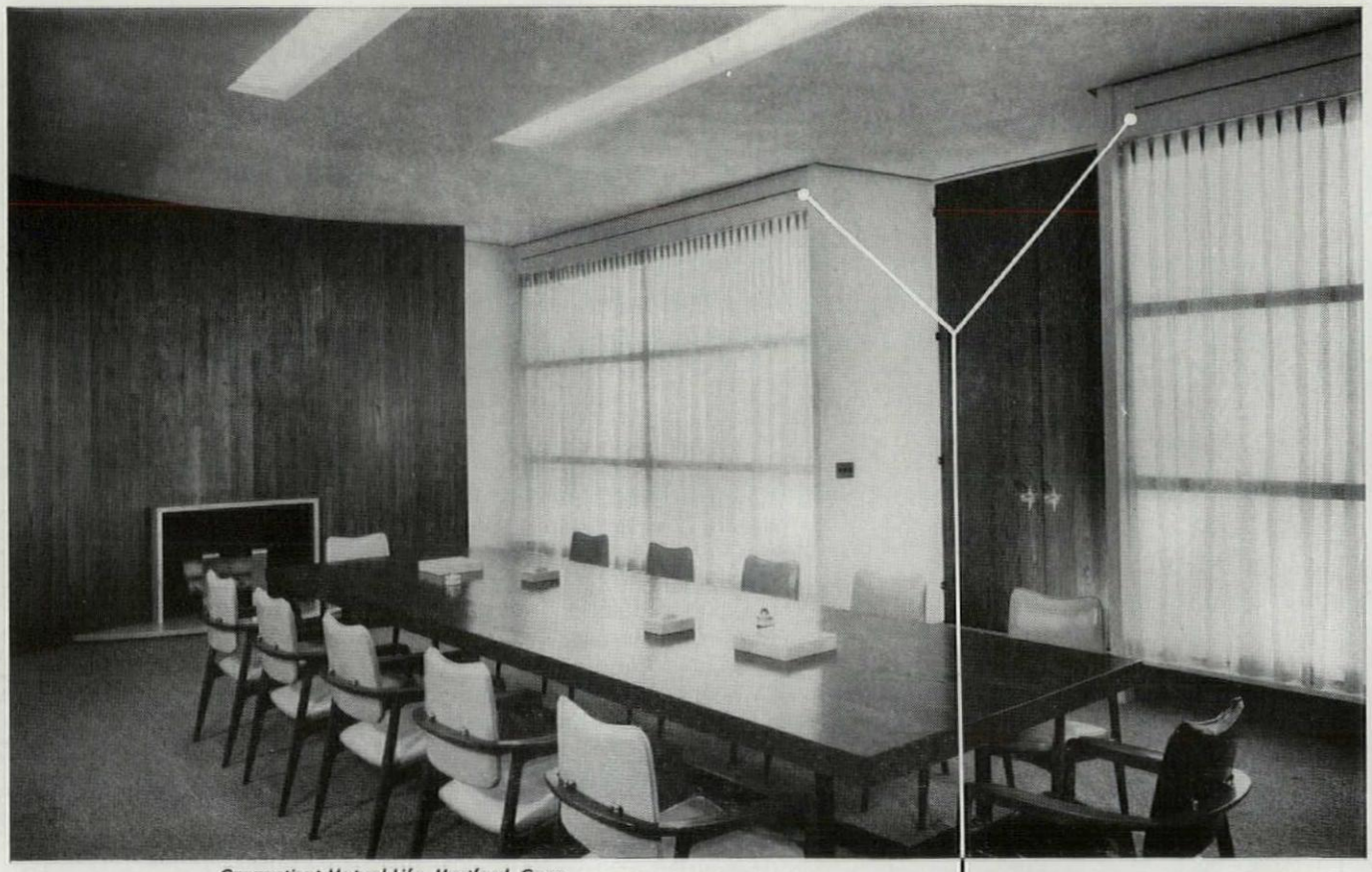
GENERAL CONTRACTOR:
W. S. Bellows Construction Co., Houston, Texas.

CURTAIN WALL HUNG BY:
A. A. Greer, Inc., Dallas, Texas.

PERMALITE SUPPLIED BY:
Perlite of Houston, Inc., Houston, Texas.







Connecticut Mutual Life, Hartford, Conn.

Architect:
Peter Fraser Jr.
New York, N. Y.

Engineers:
Jansen & Rogan
New York, N. Y.

Heating & Vent. Cont.:
Capital Ventilating Co.
Hartford, Conn.

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p/a products

(Continued from page 258)

tion of windows and wall panels to column sides. Fabricated from structural steel angles, channels, or plates, columns can be specified to meet particular conditions. Shlagro Steel Products Corp., Somerville, Mass.

Sonolastic Sealing Compound: synthetic-rubber calking and sealing compound is especially suitable for curtain- and panel-wall construction where high weather-resistance, strong adhesion, and durability are required. Liquid, composed of sulfurized rubber polymers, is combined with activating agent to form rubbery substance after application. Resiliant joint is said to withstand effects of panel distortion under extreme temperatures. Compound used with metal, glass, or concrete, and available in 10 and 2½ lb units—consisting of base and activator—can be specified in neutral, tan, black, aluminum, and gray. L. Sonneborn Sons, Inc., 404 Fourth Ave., New York 16, N. Y.

Daylite Skylight: packaged skylight, fan, and fluorescent light-fixture unit, designed for installation on flat and pitched roofs offer combination of features: concealed 8″ fan—for continuous or intermittent operation; ball-bearing motor, said to require no oiling; vented translucent acrylic-plastic ceiling panel providing flush-ceiling appearance; and weatherstripped louvers at ends of unit which operate automatically. Curved acrylic-plastic skylight, available in 3 colors, rises 12″ above top of roof. Daylite Engineering Co., 14753 Aetna St., Van Nuys, Calif.

doors and windows

Picture-Vue Sliding Door: new all-weather horizontal sliding glass doors are composed of two heavy crystal glass units surrounded with extruded aluminum and self-contained within extruded-aluminum frame. Doors are mounted on adjustable ball-bearing rollers; threshold fits flush with floor. Double-woven wool-pile insulation is said to assure adaptibility in any climate. Equipped with interior locks, 6′-10″ high, doors are available in widths ranging from 5′ to 20′. The Moloney Co., 13125 Shaker Sq., Cleveland 20, Ohio.

Ualco Projected Window: to prevent unauthorized opening of windows in commercial and industrial buildings, top-hung inward-projecting aluminum window is equipped with concealed key-operated hardware. Hoppers open and close conventionally. Windows, glazed with ¼″ sheet glass or ½″ insulating glass, are supplied with vinyl weatherstripping if specified. Southern Sash Sales & Supply Co., Inc., 818 20 St., Sheffield, Ala.

electrical equipment, lighting

Guth Slimlex Fixture: new line of shallow, surface-mounted fluorescent luminaires for low-ceiling installation are made in variety of models including solid-edge and luminous-edge types. Luminaires of heavy-gage steel with white baked-on finish are available in two- or four-fixture sizes and 4′ or 8′ lengths. Units, 4½″ deep, are fitted with louver diffuser, metal cross-baffles, or low-brightness lens. Edwin F. Guth Co., St. Louis 3, Mo.

finishers and protectors

Simoniz-Vinyl Floor Wax: self-polishing floor wax now combined with vinyl can be used on asphalt, rubber, or vinyl-tile flooring as well as linoleum and finished wood. Versatile new floor wax—available in pints, quarts, half-gallons, and gallons—provides high water-repellent and scuff-resistant qualities. Simoniz Co., 2100-20 Indiana Ave., Chicago 16, Ill.

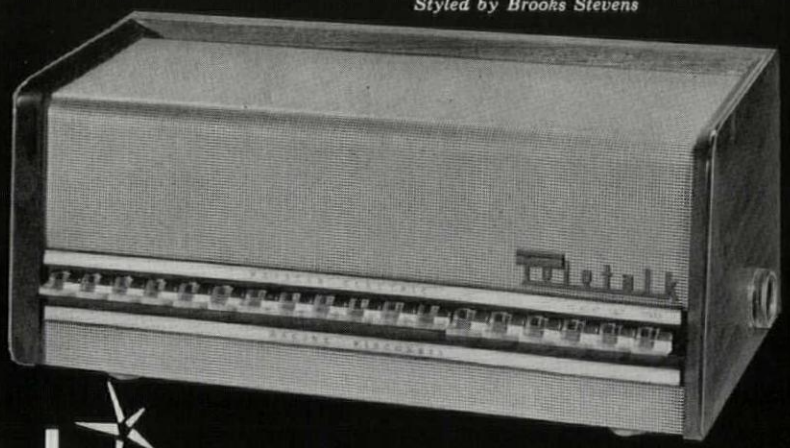
sanitation, plumbing, water supply

Ascot Water Heater: gas-fired automatic-coil water heater, only 43″ high and 14″ wide, delivers up to 120 gal of hot water per hr—to suit requirements of hunting

(Continued on page 272)

THE FINISHING TOUCH... WITH A FLAIR!

Styled by Brooks Stevens



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Its name: Dallas Memorial Auditorium

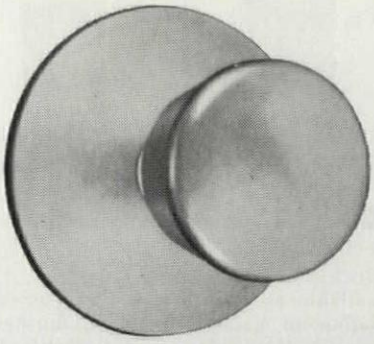
Its location: Dallas, Texas

Its architect: George L. Dahl, architects and engineers

Its contractors: R. P. Farnsworth & Co., Inc.

Among its appointments: Yale 8000 Series Locksets

Its consultant: Ammann & Whiteney, consulting engineers



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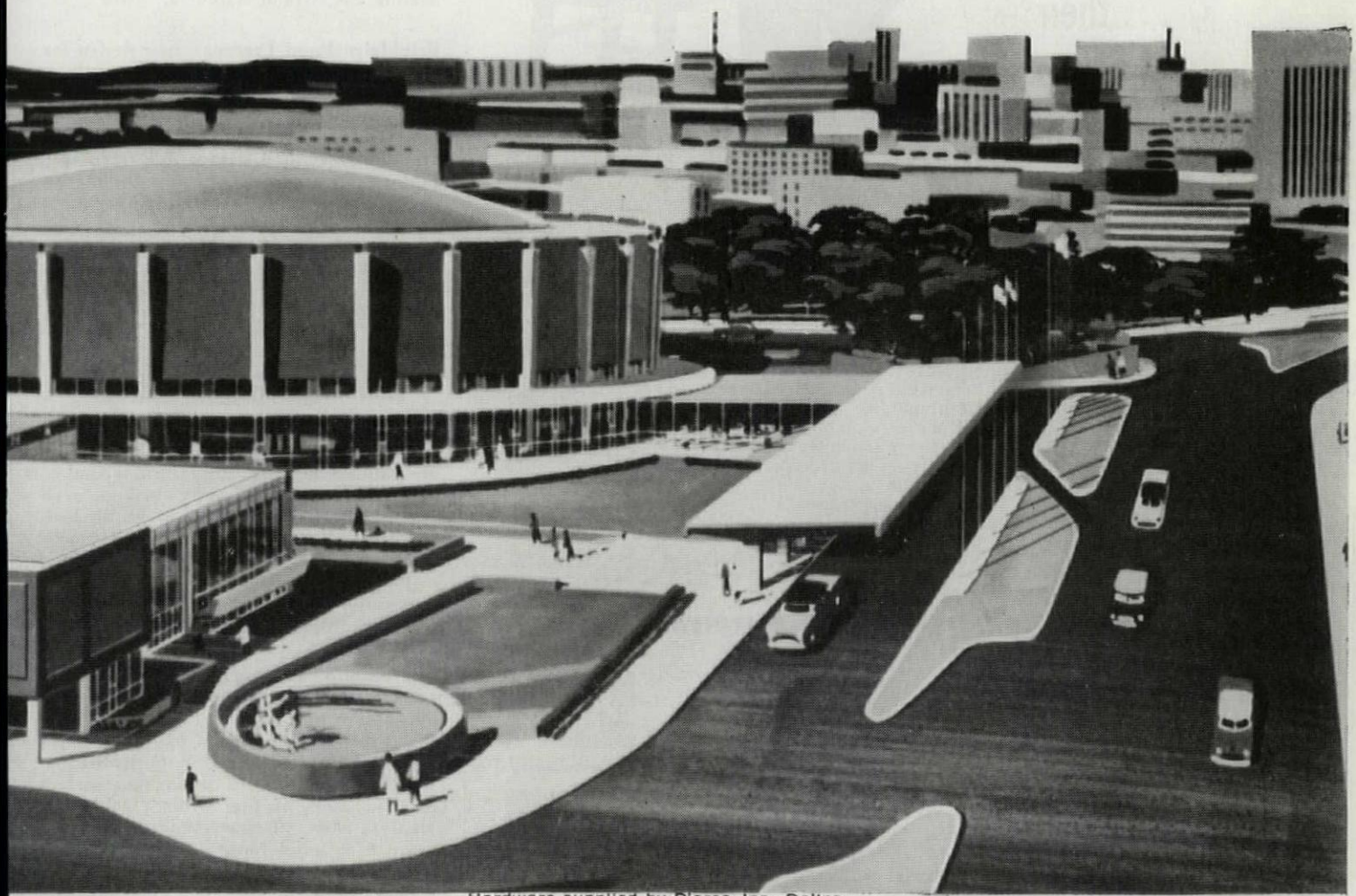
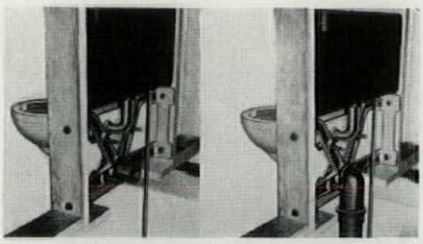


Hardware supplied by Pierce, Inc., Dallas

(Continued from page 268)

lodge, weekend cottage, and other out-of-the-way places where gas is brought in small tanks. Compact unit is said to heat instantly, using only amount of gas needed to supply immediate hot-water demand for shower, laundry, or kitchen use. Exterior of heater is finished in porcelain-enamel with heavy chrome trim; controls are built in. Heaters are available in two sizes for wall-mounting in unobtrusive location. Southern Heater Co., Inc., Dept. PA, 844 Baronne St., New Orleans, La.

State Wall-Hung Closet: for residential bathrooms, new wall-hung closet combination with syphonic-action reverse-trap bowl and concealed tank unit (*right*) can be installed in any 6″ wall with connection to standard 4″ soil line or—with fittings—to copper tube. Closet package consists of: wall-hung vitreous china bowl; porcelain-on-steel tank with special sweat-resistant coating; hardware and fittings for horizontal or vertical discharge. If necessary, front access panels with mounting frame



are available as accessory. For rear-access installation in garage or closet, finished bathroom wall of plaster or wall tile is recommended. Bowls and panels are produced in white and six pastel colors. Ingersoll-Humphryes Div., Borg-Warner Corp., Mansfield, Ohio.

specialized equipment

Teacher's Desk: new contemporary-styled teacher's desk features cantilevered metal-and-plastic, birch-grained top with protective aluminum banding. Rubber-cushioned ball-joint, electroplated glides prevent floor damage and insure automatic alignment to floor. Drawer pedestal, providing large bottom file-drawer and top box-drawer, has one-piece steel body wrap-around of welded channel construction; center drawer is equipped with two-section front tray. Desks are available in single- and double-pedestal models. Matching chair has foam-rubber padded seat and back. American Seating Co., Grand Rapids 2, Mich.

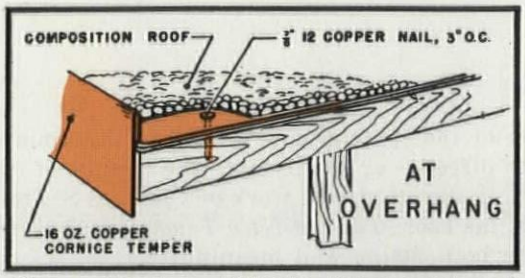
Frigidaire Food Freezer: new design for upright food freezer offers many construction and functional advantages as well as trim uncluttered appearance. Boxlike cabinet styling permits optional built-in installation or flush alignment with kitchen base cabinets. Door—with five full-width interior shelves and rack—is inset in one-piece insulated steel cabinet; door handle fits almost flush with surface. Unit is equipped with four generous shelves and deep bottom roll-out drawer. Freezer—14 cu ft in size—stores up to 490 lb. Frigidaire Div., General Motors Corp., Dayton 1, Ohio.

surfacing materials

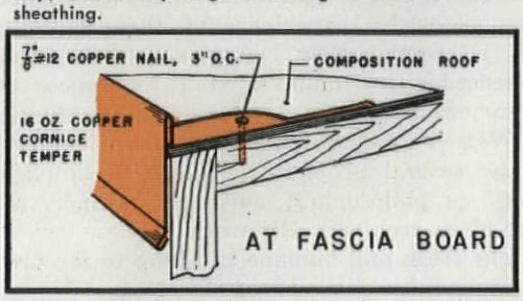
Parkraft Flooring: factory-squared hardwood panels for wood-block flooring effect are said to compare in cost to complete strip-flooring installation by obviating need for subflooring or sheathing. Redoak panels, 2′x4′, with factory-matched blocks on exposed face are ¾″ thick and reported to provide rigid squeek-free floor in direct application over joists. Jasper Wood Products Co., Jasper, Ind.

Micromatic Veining: new process for marbleizing vinyl-asbestos tile enhances appearance of moderate-cost resilient flooring. Precision equipment used to control process is said to insure uniform distribution of delicate veins throughout surface and thickness of tile. Grease-, acid-, and alkali-resistant tiles, available in 21 colors—are 9″x9″ and range in thickness from 1/16″ to 3/16″. Azrock Products Div., Uvalde Rock Asphalt Co., Box 531, San Antonio, Texas.

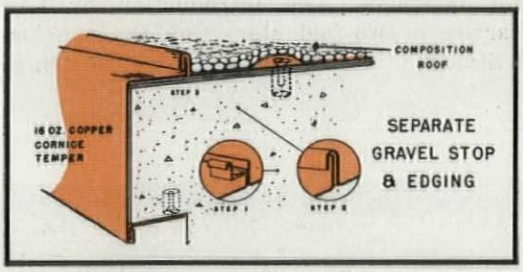
Roof edgings of copper give lasting protection



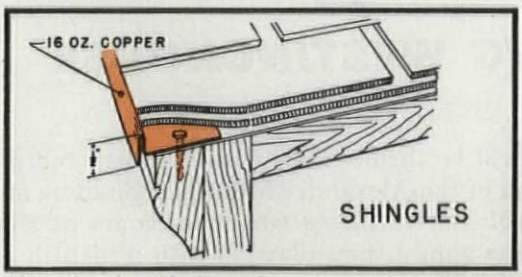
Copper edging has a 4" flashing flange, a ¾" gravel stop, and a drip edge extending at least ¼" below sheathing.



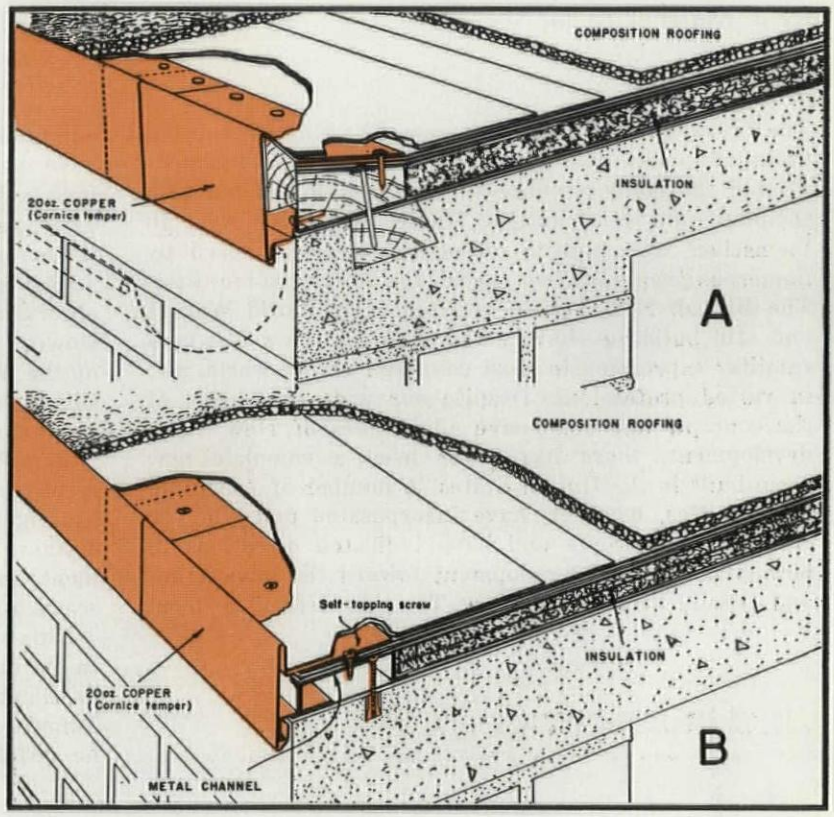
Same as edge for overhang, except that outer face is deeper for neat appearance and bottom edge is turned back to form a hem, canted outward to serve as a drip.



Edging for built-up composition roofing on a concrete deck, designed to show minimum of waviness or buckling. Facing strip is free to slide because of clinch lock seam at top and bottom. Standing seam at top is rolled toward outside and serves as gravel stop. Bottom seam is simple clinch lock joining fascia with stiffening strip for trim appearance and to provide a drip edge.



This edge for shingle roofs serves as a guide and assures alignment of shingles at end of every slope—protects the exposed edges of shingles.



Edges for insulated built-up roofs. There are two problems. One is a firm and secure fastening for the metal so that it will retain its bond with built-up roofing. The other is construction to prevent horizontal shear at the margin of the relatively soft cellular insulating material. Figure A shows how to meet these problems with wood nailers—Figure B, with incombustible metal channels.

All roofing materials, whether for flat or steep roofs, need edgings and flashings. The more durable edgings and flashings are of metal. And the preferred metal is copper—because of its lasting qualities, easy workability, weather-tight performance when properly installed.

The drawings on this page illustrate good sheet copper practice for the more common types of roof construction. For full details and suggested specifications, send in the coupon below for a copy of The American Brass Company's "Modern Sheet Copper Practices."

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the "new town" idea*

by J. Marshall Miller **

The "New Town" idea is not new. The English Garden Cities of Letchworth (1904) and Welwyn (1920) demonstrated the many advantages of planning and building complete new communities. These two towns were in themselves a composite of earlier ideas proposed by numerous people in their search for better communities. The British New Towns—started after World War II and still building—have made the term, New Towns a familiar expression in most countries of the world, and in varied professions. Despite our wide knowledge of the concepts and conclusive advantages of New Town development, there has never been a complete new town built in the United States. A number of American communities, however, have incorporated many of the New Town concepts and have indicated directions in both planning and development toward the advantages and possibilities of the New Town concept. The most outstanding of the "partial new towns" in this country have been, directly or indirectly, the result of the imagination, inspiration, and work of Clarence S. Stein. The title of his book, *Toward New Towns for America*, is therefore both fitting and meaningful.

For many years Stein was a student and keen observer of the work of Ebenezer Howard and Raymond Unwin. The successful experience of these buildings of the first two British New Towns, known as Garden Cities, influenced and stimulated Stein to propose and strive for somewhat similar developments in America.

Toward New Towns For America is primarily a record of the several projects in which Stein played leading roles as philosopher, advocate, planner, consultant, and often architect. His work in these developments brought fresh and humane thinking to the townscape and community patterns of America.

This volume is logically simple and straight-forward in its organization and, as such, is easy to follow and excellent for reference. The introduction by Lewis Mumford carries a two-fold story: on the one hand, he unfolds Stein's professional life's story, casting it

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* **Toward New Towns for America.** *Clarence S. Stein. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y., 1957. 263 pp., illus. $10.*

** *Associate Professor of Planning, School of Architecture, Columbia University.*

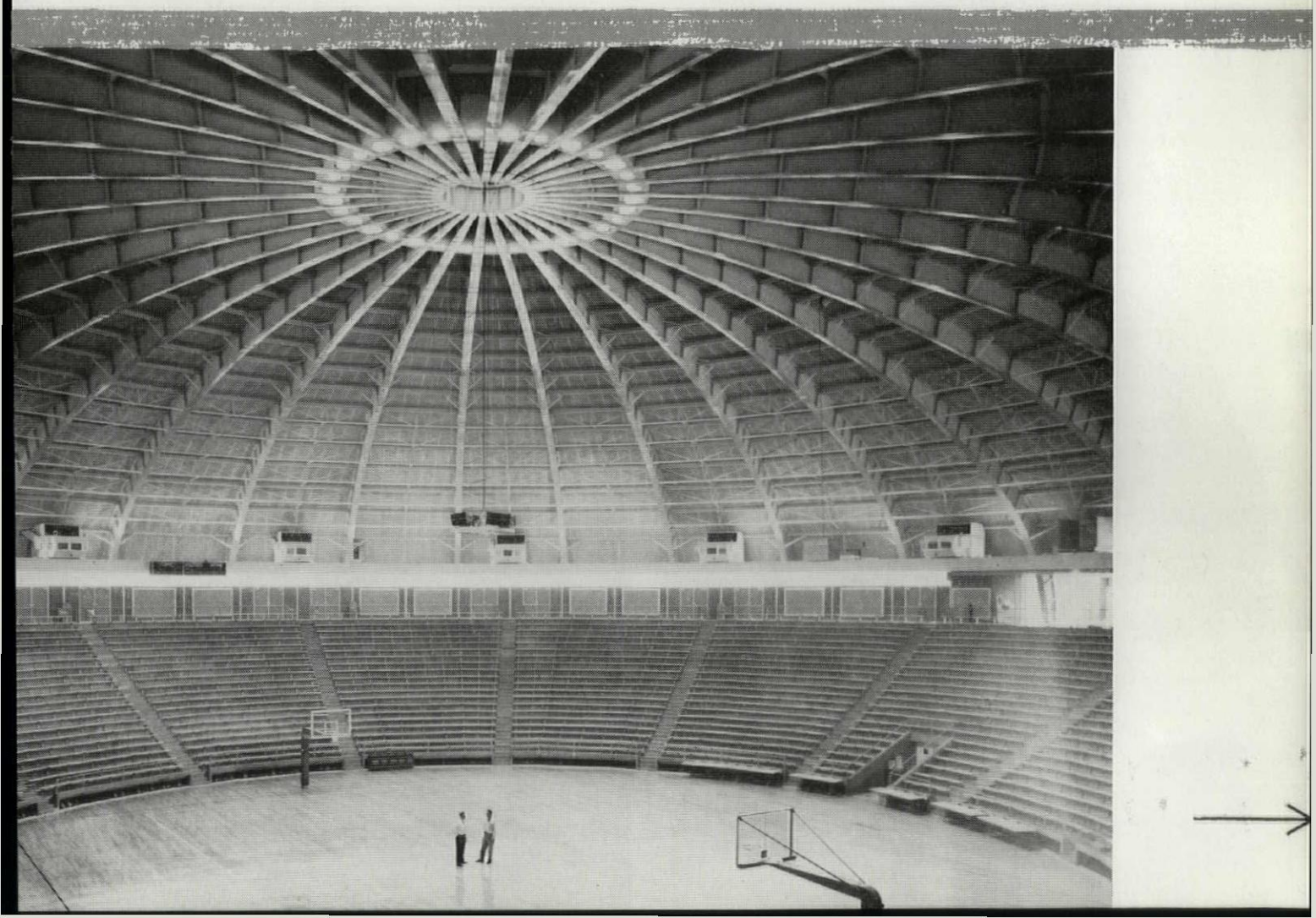
in a framework which portrays the influences that molded and enriched Stein's thinking, of individuals and associates who played significant parts in helping to shape his attitudes: attitudes and ideas often developing from the collaborative focus of kindred minds on desirable objectives of community and regional planning. At the same time, Mumford outlines the story of the more important and positive experiments in urban design in America. He also indicates the significance of the Regional Planning Association of America and the valuable and constructive work which this group played in shaping many of the ideas which were later translated into actual private and public planning programs.

The book is devoted almost entirely to a careful description of each of the experiments in community building in which Stein played a significant part. Each project or program is logically outlined from the basic concepts and purposes, both financial and physical, through the several steps of promotion, planning, financing, and building; with a final section appraising the living qualities, and a summary of the lessons learned.

Sunnyside Gardens

The author devotes the last portion of the book, appropriately, to: (1) a listing of some of the requirements and principles which he believes indicate the form of the new communities of the future; and (2) an appendix which includes several detailed reports and memoranda to the Resettlement Administration in 1935, authored principally by Stein, which are appraisals, primarily, of plans and suggestions for a comprehensive approach to the development of the Greenbelt Communities about to be undertaken.

Although Clarence Stein is in many respects an individualist, professionally, we see here that many of



the "new town" idea

the projects described in this book are, in reality, the result of team effort, with Stein as one member of the team. Stein is the first to admit that many of the ideas which were incorporated into these experimental projects were developed in collaboration with his associates. Perhaps the one name associated with Stein more often than any other is Henry Wright. It was the team of Stein and Wright that planned Sunnyside Gardens, Radburn, and Chatham Village—the three American communities in which the superblock concept was first demonstrated.

The first experiment described by the author is Sunnyside Gardens, located in the Borough of Queens, New York City. This project was sponsored by the City Housing Corporation and built in 1924-28. The purposes of the Corporation were "To produce good homes at as low a price as possible." The Corporation as well as the planners admitted that this development was an experiment. Sunnyside is an example of what careful planning and simple, well studied architecture can achieve within the limited framework of standard city blocks.

Among the lessons learned and conclusions reached as a result of this first experiment were: (1) green commons in the center of blocks can be developed and preserved through private deed restriction; (2) the grouping of buildings of different heights and bulk may increase the architectural interest of a development; (3) successful investment housing for those of limited income is possible.

After more than thirty years, Sunnyside is still a successful demonstration of good planning resulting in an attractive and livable environment. The financial success of Sunnyside, coupled with the restrictions of physical layout at that location, led the City Housing Corporation to search for an undeveloped tract of farmland in the New York area where the Corporation, with the help of Stein and Wright, could incorporate a greater number of the Garden City principles. A suitable site was found in the Borough of Fairlawn, New Jersey, about sixteen miles from New York. Land purchase started early in 1928. Herbert Emmerich, General Manager of the Corporation, and an active participant in the team discussions of development

possibilities, suggested in a crude sketch an idea for a residential "superblock." This idea was discussed, refined by the architects, and finally emerged as the basis of the Radburn Plan.

The construction of Radburn had hardly gotten under way when the Wall Street market collapsed in 1929. The City Housing Corporation proceeded to build at Radburn, but at a decreased rate. As the depression continued, the Corporation suffered financial reverses. Most of the land purchased for Radburn had to be sold. Home owners in the new community lost their jobs and many lost their homes. Fortunately, the major portion of two superblocks had been completed—enough to demonstrate a new form of community building which came to be widely known as the "Radburn Idea."

Although the new community was forced to eliminate two of the basic Garden City ideas—industry and surrounding greenbelt—sufficient elements of the Radburn scheme remained to set a new pattern of land development. The essential elements of the Radburn Idea are: (1) the superblock with no vehicular traffic crossing through the block; (2) specialized roads built

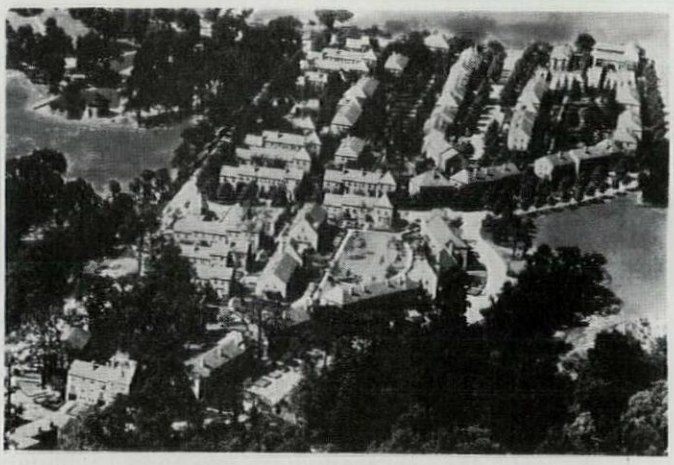
Radburn Village

for one use, instead of all uses; homes serviced with short dead-end roads called *cul-de-sacs*; (3) separation of pedestrian and automobile traffic; (4) houses planned so that living and sleeping rooms face gardens and parks; (5) large parks forming the central core and backbone of the superblock, these block parks connected with each other by pedestrian under- or over-passes.

While in themselves these elements were not com-

pletely new, at Radburn they were interwoven to form a new unity related to the realities of present-day living. The Radburn Plan incorporated several facilities and areas which were primarily for the use of the community as a whole. The ownership and maintenance of these "public facilities and areas" present a very real problem to a land developer or to a community. At Radburn, the City Housing Corporation devised a plan to meet this problem. The Radburn Association was incorporated as a non-profit corporation, empowered to collect and disburse annual charges, to maintain the necessary community services, parks and recreation facilities, and to interpret and apply any protective restrictions. All home owners or tenants of Radburn were obliged by contract to become members of the Association. It is now recognized in any development of land involving multi-ownership of private properties and common ownership of public properties, that some type of an organization like the Radburn Association is imperative to the success of the development.

The Radburn Idea, both as to physical development and as to corporate ownership and maintenance of



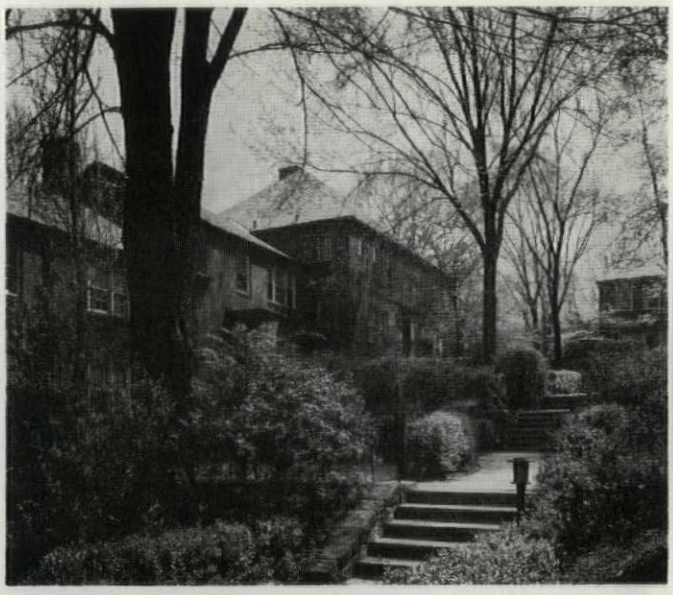
Chatham Village

community facilities and services, has proved highly successful during the past twenty-five years. Radburn has served as an inspiration and guide to literally hundreds of developments, both public and private.

While Radburn was being built, Stein and Wright were asked to make studies for a housing development in Pittsburgh, Chatham Village. The Buhl Foundation, sponsor of the project, sought to achieve two goals through this type of investment: (1) provide housing for those of limited income; and (2) demonstrate the security of 100% investment in good large-scale housing.

Chatham Village, located on one of Pittsburgh's many wooded hilltops, gave Stein and Wright another opportunity to experiment and demonstrate the advantages of the principles and elements employed at Sunnyside and Radburn.

Chatham Village, with less than 200 dwellings (all rental units), was organized into three medium-sized superblocks, each with a central block-park and pedestrian paths. The entire project was surrounded by a rather limited but successful wooded greenbelt. The planners took special care to preserve the topography and the many fine trees. The reviewer believes it to be one of the most attractive and most livable housing schemes to be found in the U.S.



Chatham Village

The three projects, Hillside Homes and Phipps Garden Apartments (I) and (II), all located in New York City, also are described in this book and are evidence of Stein's varied abilities as planner, architect, and economist. Hillside, especially, exemplifies his ability to design a rather complete, well integrated

the "new town" idea

neighborhood within the framework of a rigid city pattern. Hillside provides medium rental units and an abundance of community and recreation facilities.

The Greenbelt Towns, built by the Resettlement Administration of the U.S. Government during the 1930's, exemplified again the significance of the Radburn Idea. The teams of planners charged with the layout of these new communities were well aware of the principles of Garden City development and the recent experiments at Sunnyside and Radburn. Clarence Stein was not directly involved with the planning of these, but upon official invitation offered constructive criticism and appraisal of the plans as they were being developed. Stein, with a businessman's approach, reviewed the proposals for these communities from the standpoint of original cost and cost of operation and maintenance. Through the years Stein has kept a rather careful tabulation of how these Greenbelt Towns are working out financially. These communities cannot actually be classed as New Towns, for they all lack one essential feature—industry, or comparable job opportunities. They do, however, have most of the

other characteristics: variety of housing, shops, schools, churches, parks, recreational and other community facilities and amenities, and a greenbelt encircling the town.

Today, the three towns completed under this program: Greenbelt, Md., near Washington, D.C.; Greenhills, near Cincinnati, Ohio; and Greendale, near Milwaukee, Wis., are excellent examples of Garden City ideas as applied in America. Stein is enthusiastic in his praise of the Greenbelt Towns. He points out, although they are not utopias they are living, growing realities. We who know these communities, including their limitations and shortcomings, tend to share Stein's enthusiasm.

The last community which is described in this book is Baldwin Hills Village, a housing development in the Southwest section of the City of Los Angeles, Calif. Stein, as a consulting architect, worked with a group of local architects in the layout of what might be called the most complete and most characteristic expression of the Radburn Idea. Planned as one large superblock with rental housing for 627 families, Baldwin Hills

the "new town" idea

Village exemplifies a very livable environment, recognizing the needed convenience of the automobile, but offering protection from its dangers, providing ample green areas and the other amenities of good urban living. All these are incorporated and at very nominal rentals.

Planned and built in the three-year period, 1938-41, Baldwin Hills Village was completed just as Pearl Harbor drew the U.S. into World War II. In spite of increasing cost of operation and maintenance, the project has continued to show that careful planning is a good investment. The community, built by a private housing company, was purchased in 1949 by the New England Mutual Life Insurance Company. This organization believes that good housing is a sound long-term investment.

As a fitting conclusion to the book, the author sets forth a series of considerations which should be taken into account by the planners of New Towns of the future. These include: (1) increasing leisure time with more hours about the home and community; (2) increasing equality of opportunity with our ever

Greenbelt Resettlement Program

increasing standard of living calling for better homes and better neighborhoods; (3) increasing mechanization with the resulting potential of a more comfortable and carefree life; (4) disappearing domestic service, which calls for compact and careful home planning to minimize household chores; and (5) expanding population with the rapid growth of urban and suburban areas.

the "new town" idea

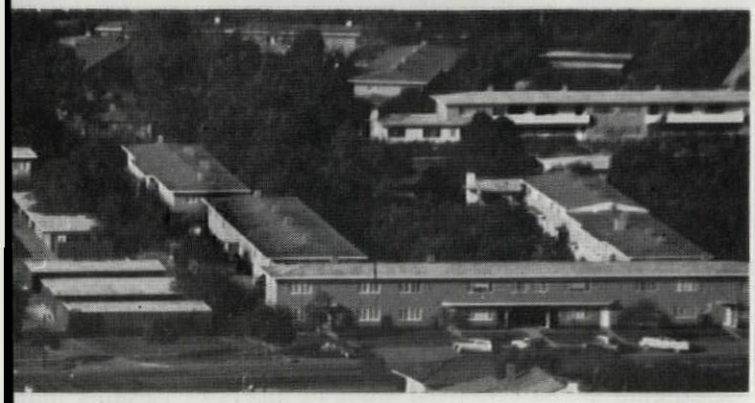
It is now common knowledge that the population of the U.S. will increase rapidly during the next twenty to thirty years. There is every indication that the greater portion of this population will live in our metropolitan regions and primarily in the suburban areas of our large cities. The question before us, then, is what pattern of community living shall we plan for? Shall we continue merely to expand the urban sprawl with all of its insurmountable problems or shall we

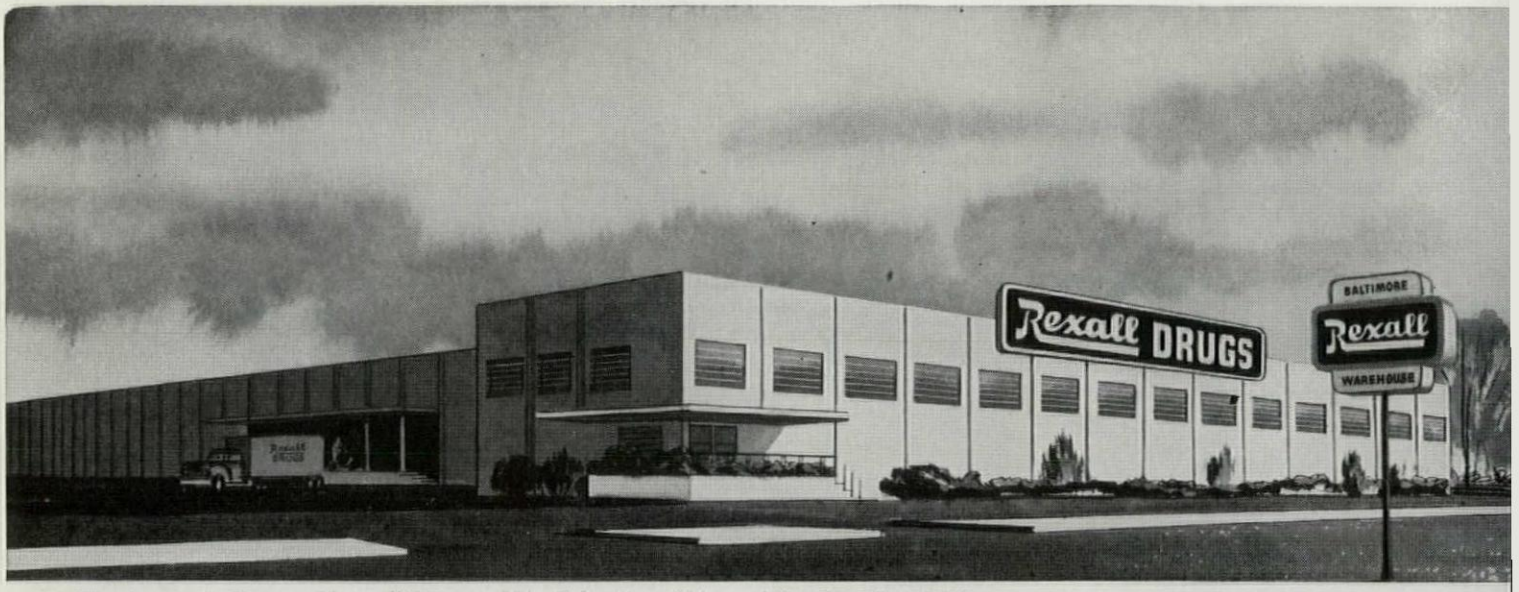
Baldwin Hills Village

try to seek new patterns for community development—patterns which will be more livable and attractive?

This book by Clarence Stein clearly sets forth in word and picture the success of several experiments in community design. These experiments should be but indications of what might and should be accomplished if we put ourselves to the task.

Student, architect, planner, investor, builder — all should find this volume a worthwhile reference.



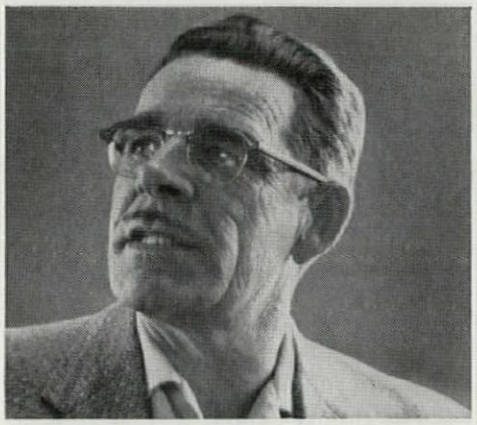


Warehouses in Boston, Mass., Baltimore, Md., Columbus, Ohio, and San Leandro, Calif., contain over 365,000 sq. ft. of 24-gage Tufcor.

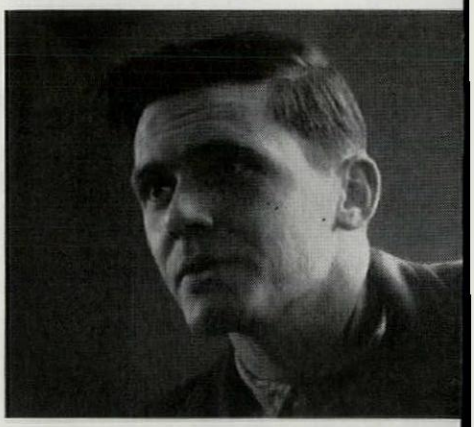
Why Rexall chose 8½ acres of TUFCOR®

EXPANDING to give better service, handle more volume and cut marketing cost, Rexall Drug Co. is now erecting a series of spacious one-story warehouses across the U. S. The roof system chosen for four of these new buildings is Tufcor tough-temper steel deck and lightweight insulating concrete with a built-up roof. Why Tufcor? Because galvanized Tufcor offers a strong structural deck for insulating concrete, is quickly and easily applied, makes possible a ligh weight, low-cost roof system with positive vapor barrier an maximum fire safety. Read what members of Rexall's buil ing team say about this modern roof system. In their com ments below, you will find many reasons why Tufcor may b the one right roof system for your next job. Like more informa tion? Mail coupon at right for free Tufcor product manua

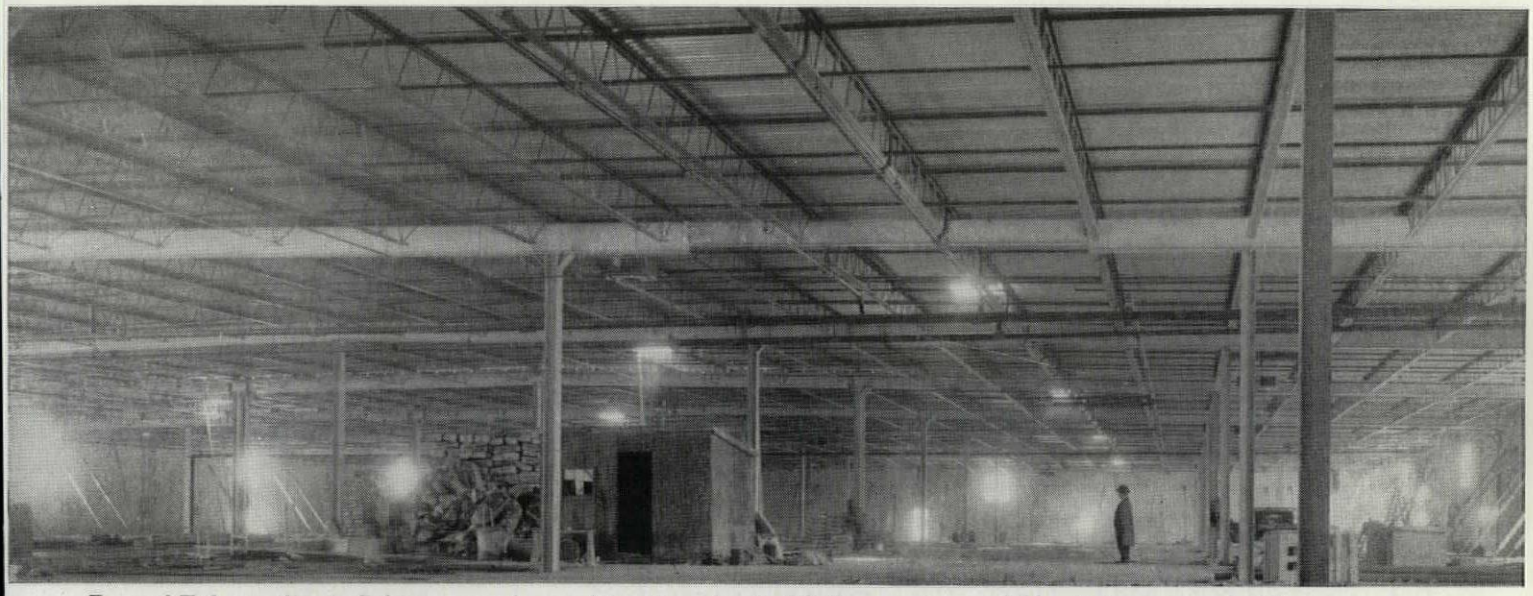
REXALL CHIEF ENGINEER J. E. Deal says, "The positive fire resistance of Tufcor with insulating concrete means savings on sprinkler heads. We also save several thousand dollars on each job by not having to paint the galvanized underside of Tufcor. Sheet corrugations fit together nicely, which means placing is fast and easy. Tough-temper steel makes Tufcor flexible yet strong. Availability of Tufcor is also good. Two weeks from the day I ordered sheets, they were on the way! On the Columbus job, we placed and welded 98,200 sq. ft. of Tufcor in just 7 work days."



ARCHITECT-CONTRACTOR REPRESENTATIVE on the Baltimore job, E. L. Wieringa of Indenco, Inc., says, "Tufcor installation is fast. Sheets are light and easy to handle. Square-foot coverage is good. By covering two spans with a 14′ sheet, we were able to weld a sheet to 3 joists at one time. Spot welding is a snap and Tufcor is safe to walk around on. These sheets hold the entire building together. They transfer thrust, give a lot of lateral strength and develop a good diaphragm. You notice it the minute you weld sheets down. Tufcor strength is a wonderful safety factor."

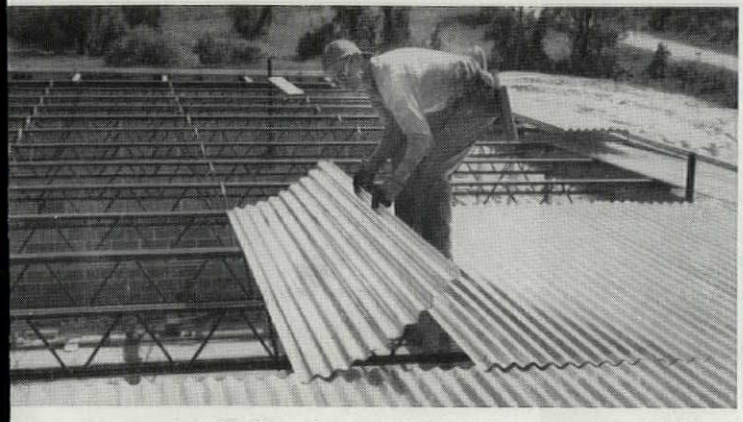


CONCRETE APPLICATOR on Baltimore jo R. C. Bollinger of EVA, Inc., says, "This wa our first experience with Tufcor but in couple of days my crew was operating eff ciently. Tufcor is easy to place and weld. W got 12,000 sq. ft. per day from a four-ma crew. Sheets are cut to fit building fram We eliminated double handling by placin them directly from a mobile buggy. Wit Tufcor, you walk around as freely as you d on the ground—no planking is needed. We' poured insulating concrete over other systen but Tufcor is easier and structurally stronge helps keep labor costs down."



Exposed Tufcor ceiling in Baltimore warehouse. Attractive galvanized Tufcor requires no field painting, assures building permanence.

roof system for new warehouses



EASY TO PLACE. Tufcor sheets arrive at the job site bundled and cut to fit framing. No measuring or cutting is needed! After sheets are plug-welded in place, they provide a strong structural deck and a convenient work platform for trades. In the finished roof system, Tufcor acts as a vapor barrier, keeps insulating concrete dry so it maintains its insulating properties, saves on costly fuel bills.

EFFECTIVE INSULATION. Inert insulating concrete is one of the most permanent, desirable types of roof insulation. Rigidity of Tufcor system provides a firm base for built-up roof. Low dead load of finished Tufcor system is 4 to 6 psf less than most types of roof construction, requires less structural steel. Permanence, low maintenance of system plus low insurance premiums assure savings to owners.

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College Housing. American Institute of Architects, 1735 New York Ave., Washington 6, D. C., 1956. 40 pp., $1

Watercolor Painting Step by Step. Arthur L. Guptill. Watson-Guptill Publications, Inc., 24 W. 40 St., New York 18, N. Y., 1956. 127 pp., illus., $5.75

American Planning and Civic Annual. Edited by Harlean James. American Planning and Civic Assoc., 901 Union Trust Bldg., Washington, D. C., 1955. 201 pp., $3

The Landscape Painter's Manual. Harry Leith-Ross. Watson-Guptill Publications, Inc., 24 W. 40 St., New York 18, N. Y., 1956. 64 pp., illus., $3.95

An Encyclopaedia of the Iron and Steel Industry. A. K. Osborne. Philosophical Library, Inc., 15 E. 40 St., New York 16, N. Y., 1956. 558 pp., illus., $25

Engineering Structural Failures. Rolt Hammond. Philosophical Library, Inc., 15 E. 40 St., New York 16, N. Y., 1956. 224 pp., illus., $12

Housing, Building, Planning: An International Film Catalogue. United Nations, Dept. of Economic and Social Affairs, New York, N. Y., 1956. 246 pp., $2.50 or equivalent

American Painting Today. Nathaniel Pousette-Dart. Hastings House, Publishers, Inc., 41 E. 50 St., New York 22, N. Y., 1957. 127 pp., illus., $8.50

The Modular Number Pattern. Ezra Ehrenkrantz. Alec Tiranti Ltd., 72 Charlotte St., London W. 1, England, 1957. 82 pp., with Plastic Number Pattern, 25s

Planning Facilities for Health, Physical Education and Recreation. Revised edition. The Athletic Institute, Inc., 209 S. State St., Chicago 4, Ill., 1956. 154 pp., illus., $2.50

Course in Pencil Sketching. Book 2. Ernest Watson. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y., 1957. 57 pp., illus., $2.50

an era of dynamic fusion

English Country Houses. Mid-Georgian: 1760-1800. *Christopher Hussey. Distributed in the U. S. A. by Essential Books, Fairlawn, N. J., 1956. 255 pp., illus., $20.20*

Mid-Georgian architecture, embellishing the exciting years between 1760 and 1800, is unquestionably one of the truly great periods in English architecture; and Christopher Hussey's review of that period is, perhaps, the best that has yet appeared in a single, comprehensive volume.

During these 40 years, England was to lose her 13 original American colonies; but her maritime, commercial, and colonial successes elsewhere far outweighed the losses. Agriculture was becoming profitable, having gone beyond the mere subsistence stage; wages were higher than any time in the three centuries before; coal was being ferried to Manches-

(Continued on page 292)

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provide 100% electrical flexibility

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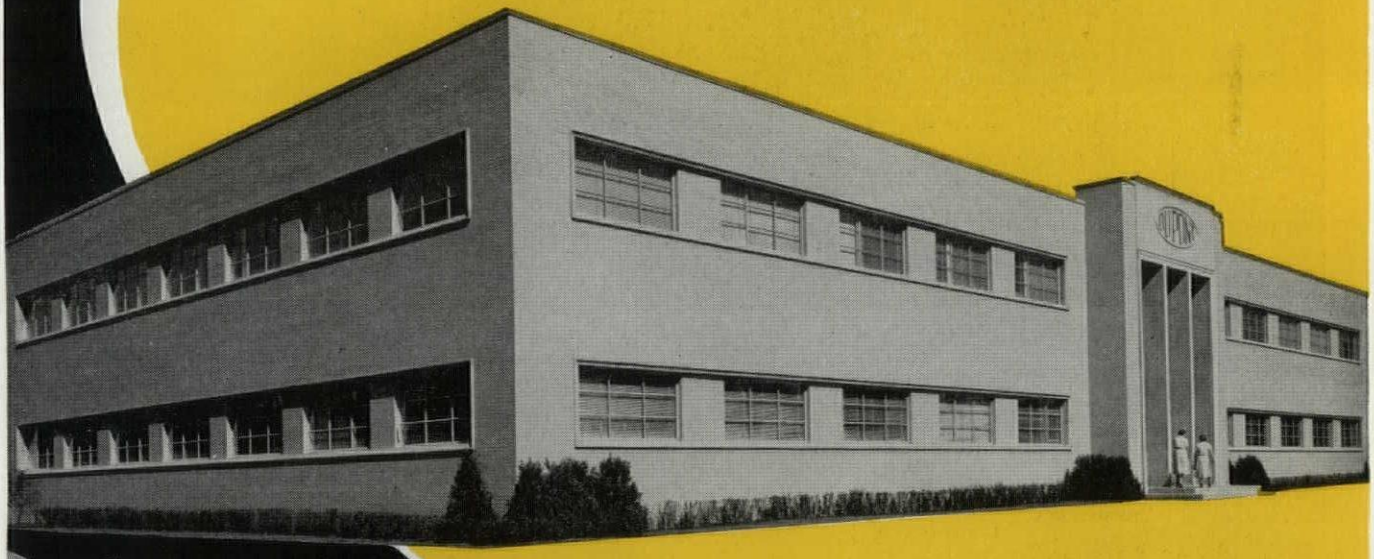
R/C Duct Floors (electrified concrete joist floors) provide the management and personnel of the new E. I. du Pont de Nemours and Company (Finishes Division)* with a *complete* network of underfloor electrical outlets for power, light, telephone, and intercom systems—at a new low cost. Additional outlets can be connected to convenient risers in minutes. There is no ripping up or drilling through floors and ducts. R/C Duct Floors, which meet all building code requirements, consist of *standard* steel electrical distribution ducts set in the *structural* slab of reinforced concrete joist floors . . . no expensive fill or topping is needed. Cost studies show that R/C Duct Floors average 19% less than cellular steel floors. Furthermore, reinforced concrete buildings start quicker and are completed sooner.



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* Location	7250 North Cicero Ave. Lincolnwood, Illinois (Suburb of Chicago)
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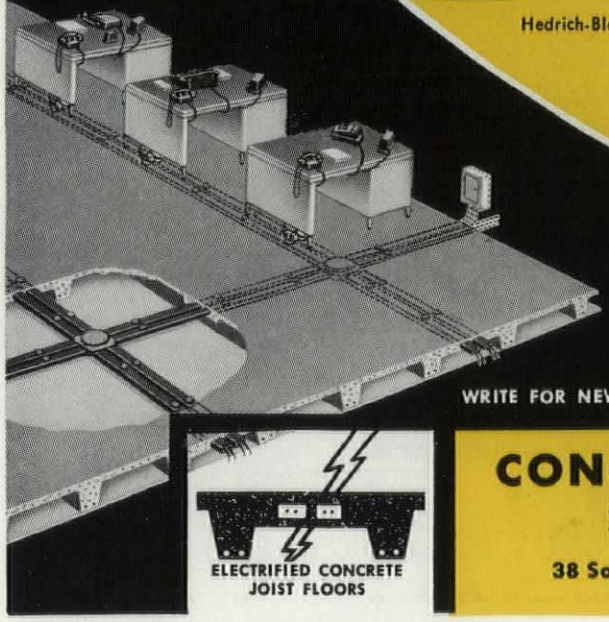
Contractor	Joseph T. Carp, Inc. Chicago, Illinois



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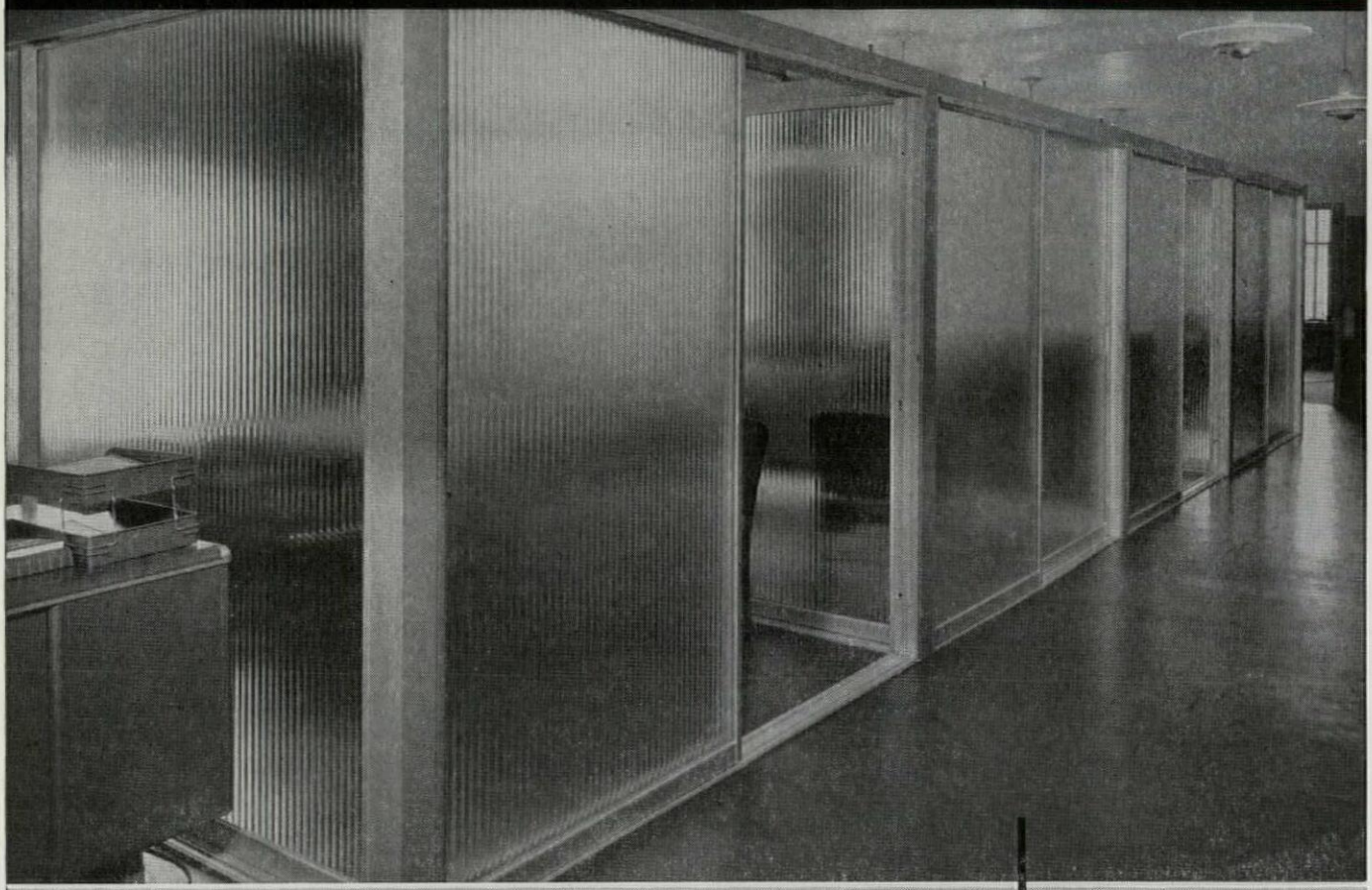
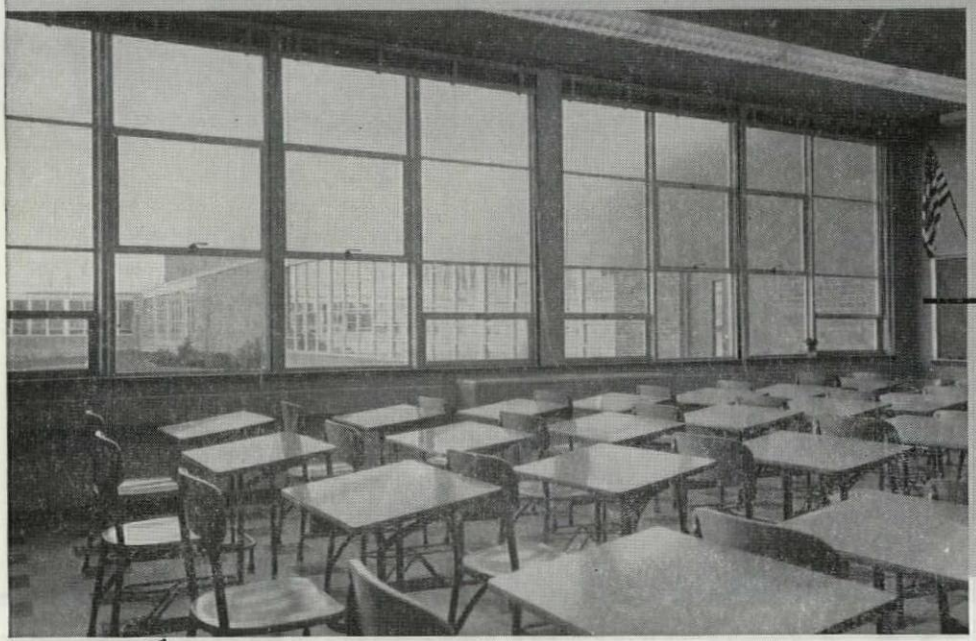
FIGURED GLASS MAKES . .



Used on all sides of these cheery offices of W. P. Fuller & Co., San Francisco, lustrous Mississippi Broadlite glass wraps them in a wall of living light . . . floods adjoining areas with richer, softer illumination. Sliding doors of Broadlite complete the bright, modern look.

Architects: H. F. Everett & Associates.
Contractor: Coopersmith Bros., Inc.
Glazier: Pittsburgh Plate Glass Co.



Even the students farthest from the windows enjoy the benefits of conditioned daylight in the Quakerstown High School, Quakerstown, Pennsylvania. Installed in the upper two rows of sash, figured glass transmits eye-easy, natural illumination deep within the rooms. Note absence of sharp, shadows and harsh contrasts.

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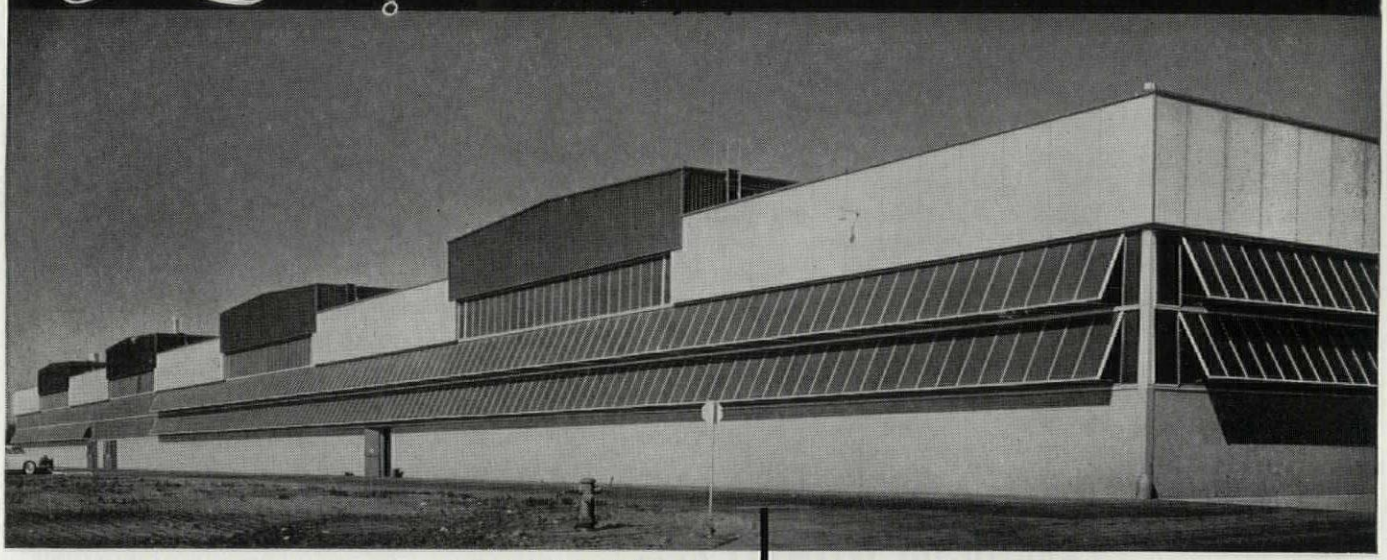

Architects: Smith, Powell & Morgridge

Installed in top hinged windows, heat absorbing, glare reducing glass floods this factory with conditioned daylight. Diffusing light deep into the plant, it reduces contrasts that tend to cause costly visual errors, absorbs up to 50% of solar heat rays to keep interiors more comfortable. Employees see better, feel better, work better.

The property of light diffusion in figured glass is one of the most useful tools available to the architect and engineer. By its means rooms can be adequately daylighted far from windows, small skylight areas can cover a large expanse of floor with shadowless daylight, privacy can be secured, light can be controlled. Achieve better daylighting with translucent, light diffusing glass by Mississippi. Available through leading distributors in a wide variety of patterns and surface finishes to meet every requirement.

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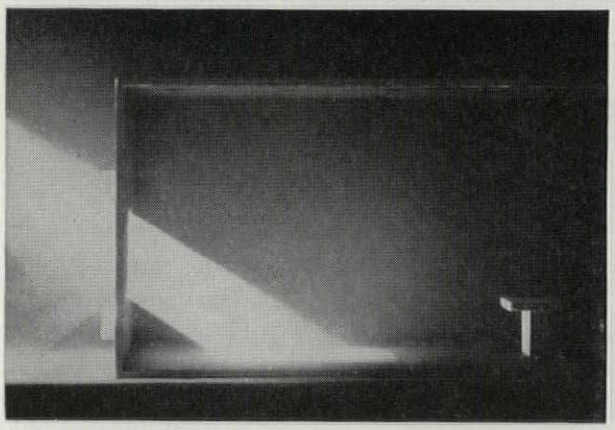
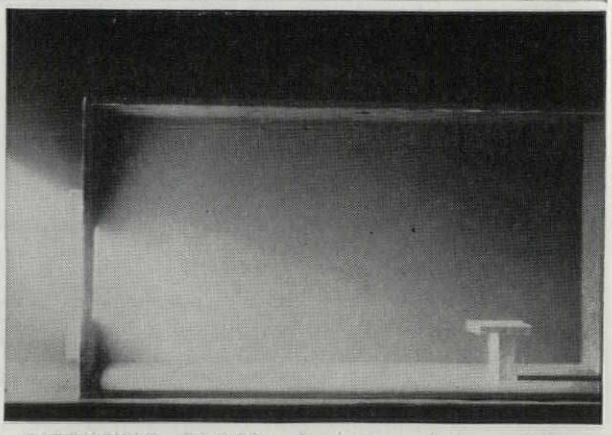
Smoke Box Photos Prove Light Distribution Qualities of MISSISSIPPI GLASS



CLEAR GLASS — Actual photograph of "smoke box room" with its window glazed with clear glass. Note high concentration of light near window.



DIFFUSING GLASS — Smoke box photo — window glazed with diffusing glass. Note uniformity of lighting and its distribution to far side of room.

In these photographs the box is built to a scale of 1″ = 1′ to represent a room 12′ high, 12′ wide and 24′ deep. The "window", centered in one end, is 4′ square, 3′ above the floor.

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ROLLED, FIGURED AND WIRED GLASS

(Continued from page 288)

ter; Watt had begun to experiment with steam; iron was becoming commercial; commerce was booming; the Industrial Revolution was well under way.

Intellectually, the English had bargained with the French: offering Hume, Newton, Locke, Mandeville, Pope, Shaftesbury, Addison, Richardson and, in return, adopting the rococo, Voltaire, the romantic doctrines of Rousseau, the rationalism of Diderot and the *Encyclopédie*, the "Comédie Sentimentale," the *Essai sur l'Architecture* of the Abbé Laugier. From Italy they borrowed Piranesi's romantic depiction of the dark grandeur of Rome—and the shade of Palladio was still to play a part in the English countryside. The northern "spirit" was evoked in Ossian and a re-examination of Gothic architecture. Researches in Greek and Roman architecture were being made; buried Roman cities were being uncovered. At no other time in European history was there so much going on, so much fusion, so much interchange; and, perhaps, at no other time, either before or since, was Europe so intellectually united.

Neo-Classicism was becoming scholarly in the modern sense of the word. For really the first time, England became acutely conscious of the separation of past and present; and, as elsewhere in Europe, England became modern. The past could now be looked upon with critical detachment (e.g., Gibbon's *Decline and Fall of the Roman Empire*), with an archeological eye, and be used accordingly. Contemporary taste and much of the new wealth were to be colored by the new ideas; and, at the same time, of course, George III wished to sustain the old values in politics and the reactionaries, who were many, responded with force.

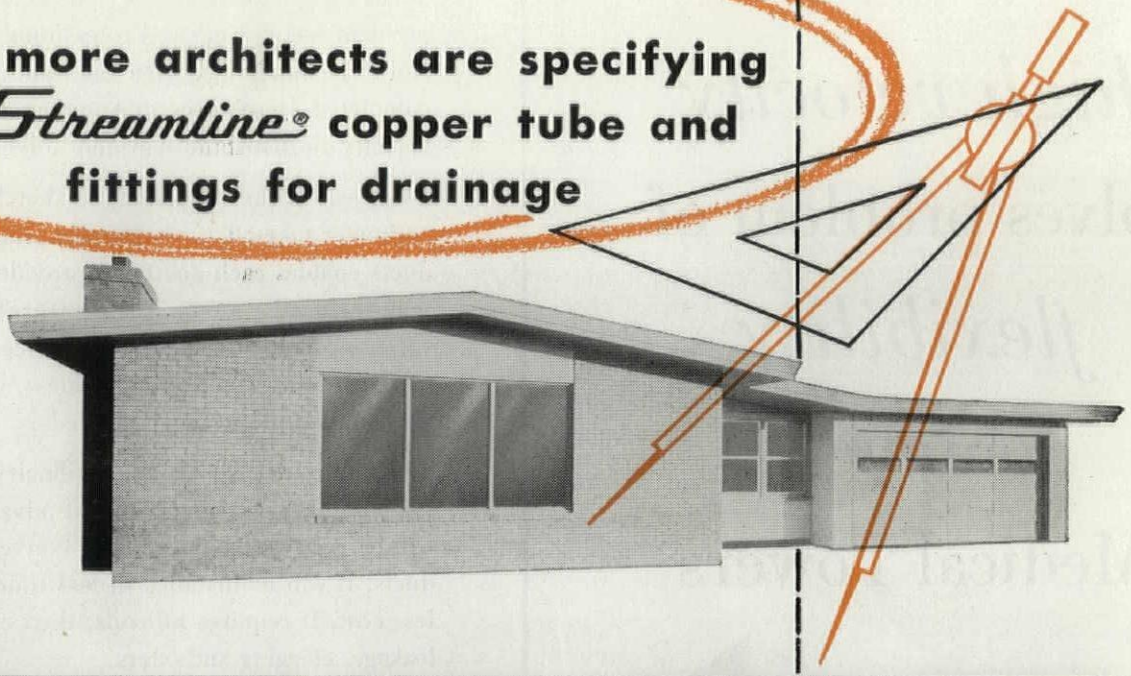
Esthetic values and classical architecture were put to the test of 18th Century rationalism. Burke, in his *Enquiry on the Sublime and the Beautiful* insisted that beauty had nothing to do with proportion, harmony, and geometry which, he said, were qualities essentially associated with the intellect. The Classical architectural system was being dismembered and a synthesis was to take place.

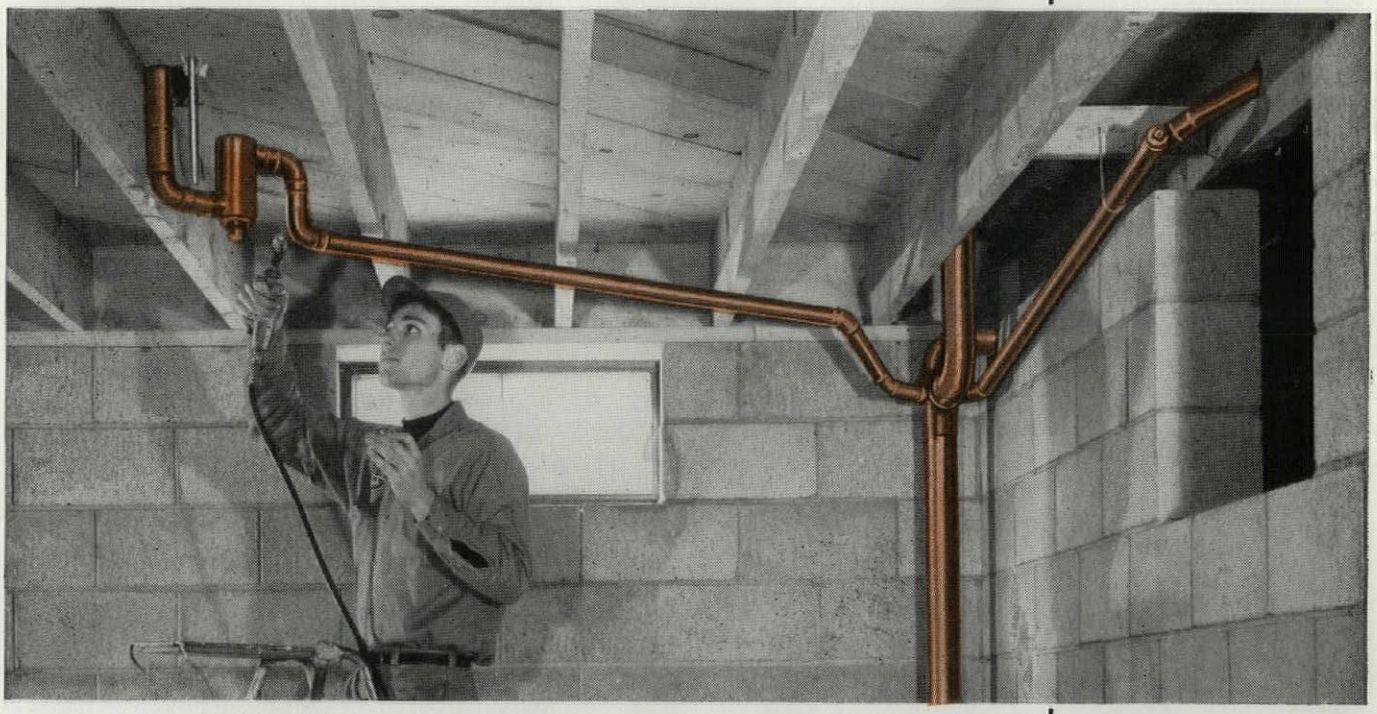
In architecture, after the first Georgian period (c. 1715-60), the great name is that of Adam. Correctly estimating the taste of the aristocrats and the new-rich for the current ideas, Robert Adam synthesized the new revolutionary elements with a novel restatement of classical values into a "romantic and scientific classicism". The synthesis happened almost suddenly and has been properly called the "Adam phenomenon."

The new Adam style sought to focus such divers elements as Renais-

(Continued on page 296)

why more architects are specifying *Streamline*® copper tube and fittings for drainage





200-A

In designing a home, you, as an architect, consider every component with great care. That's why we'd like to point out that by specifying Streamline copper tube and solder-type fittings for drainage, you add still greater merit to your most sound architectural design. With Streamline copper tube and fittings, for example, there are no caulked joints to leak . . . no rust to impair the building's beauty and utility. In addition, compact Streamline stacks fit into standard 2" x 4" partitions . . . increasing useable house space and affording greater flexibility of design. The net result is a modern corrosion-resistant drainage system that will last for the life of the building.

It costs a little more, but the extra cost of a drainage system of copper is negligible when you compute its practical advantages.* When Streamline tube and fittings are used, it means a trouble-free future for your client's home.

Remember—the advantage of an all-copper Streamline drainage system far outweighs the small extra cost. Write today for information Kit No. 15 containing the detailed story of using copper for drainage.

⁂ Joseph F. Fehrenbach, licensed master plumber of Bridgeport, Michigan, installed the plumbing in the home shown here. He chose Streamline tube and fittings for drainage because it gave him an attractive, trouble-free installation for only $14.23 more than other competitive materials. He was able to do the job much quicker, too.

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How *high velocity* solves problem of *flexibility* in the Medical Towers

When the new Medical Towers Building in Houston, Texas was planned, the key air conditioning problem was flexibility. Professional office areas had to be subdivided *after* the building was completed. Here's how an Anemostat dual duct high velocity air distribution system solved the problem.

As shown in the diagrammatic sketch, a system of perimeter take-offs from the hot and cold ducts enables each doctor to provide the exact temperature he wants. Temperatures in the various rooms of each suite of offices can be varied. Air distribution is draftless, comfortable, perfectly suited to tenants' needs.

The Anemostat All-Air High Velocity distribution system offers further important advantages. It can be used with smaller than conventional ducts. It can be installed in less time and at less cost. It requires no coils, thus eliminates leakage, clogging and odors.

ARCHITECTS—Attention Please:
Anemostat round, square and straightline diffusers with high velocity units are adaptable to a wide variety of architectural designs.

Architects: Golemon and Rolfe, AIA, Houston
Consulting Architects: Skidmore, Owings and Merrill, New York
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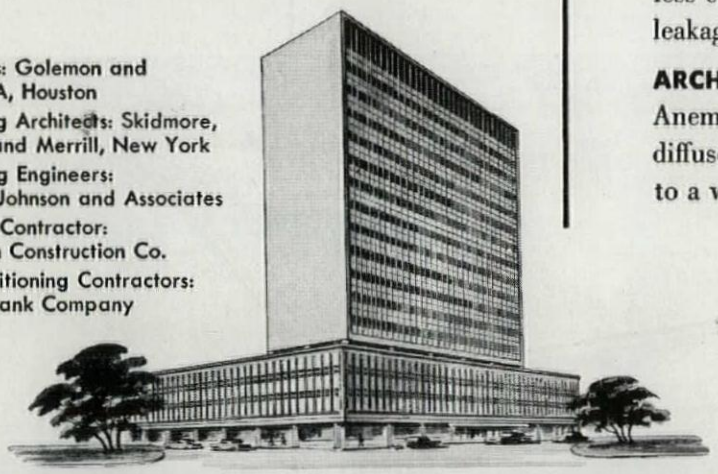
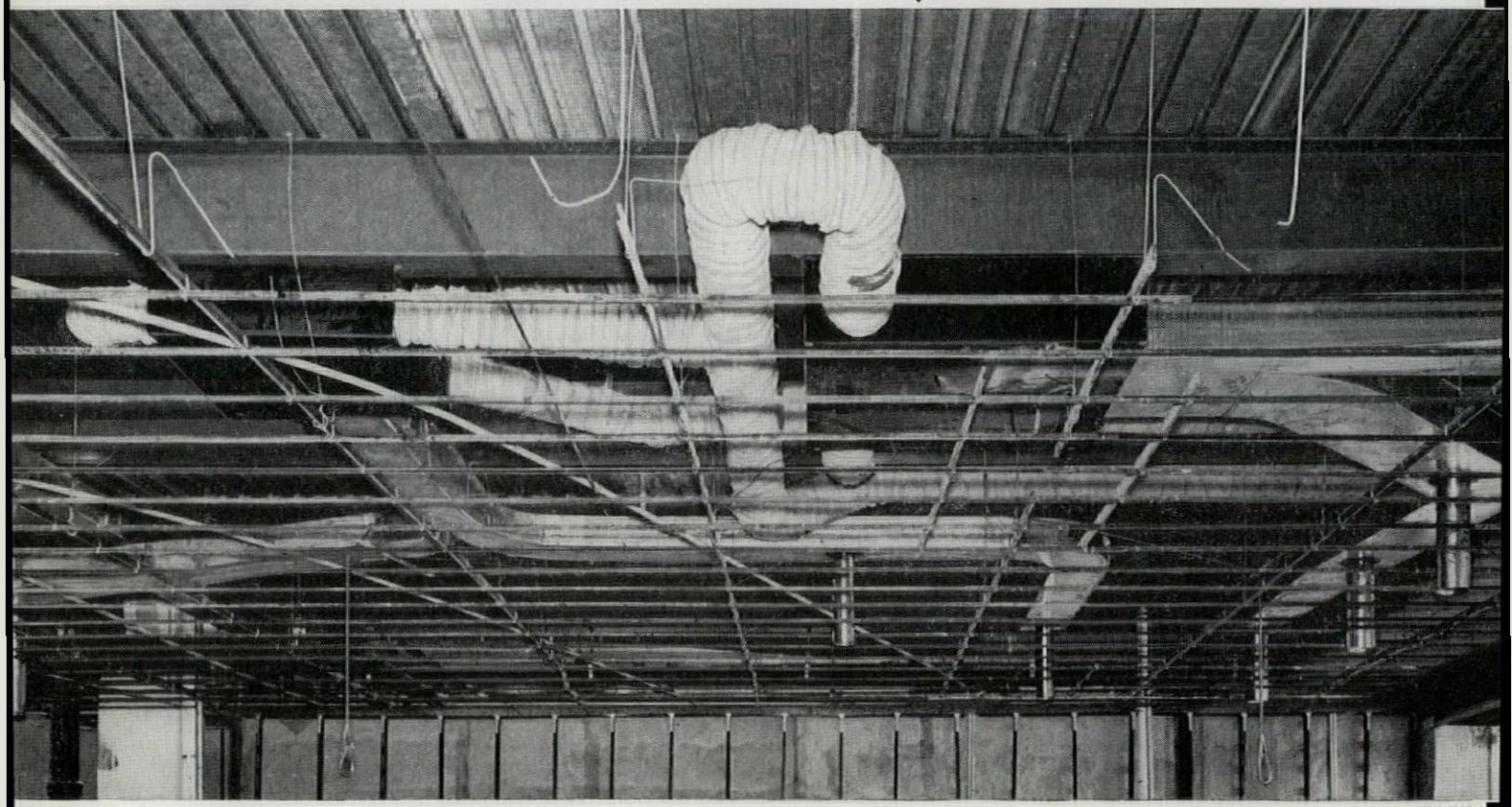


Anemostat HPE units and duct connections installed in office before construction of ceiling and walls



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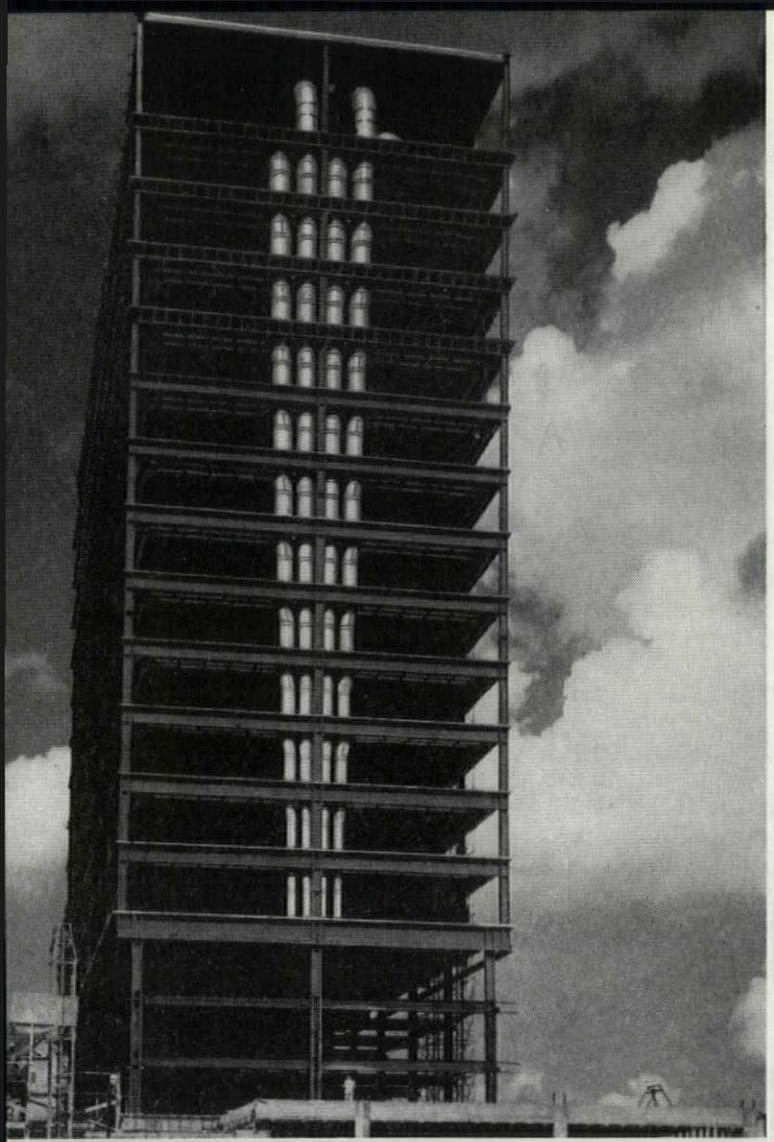
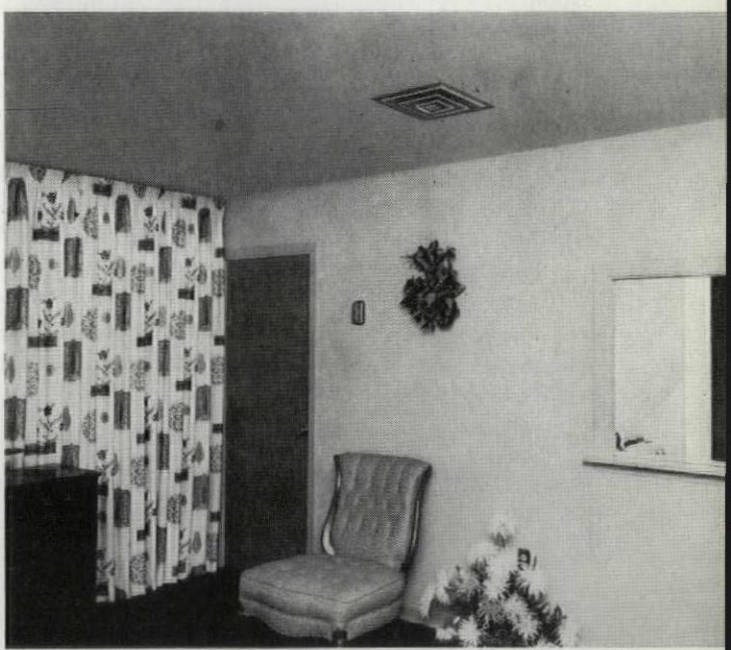
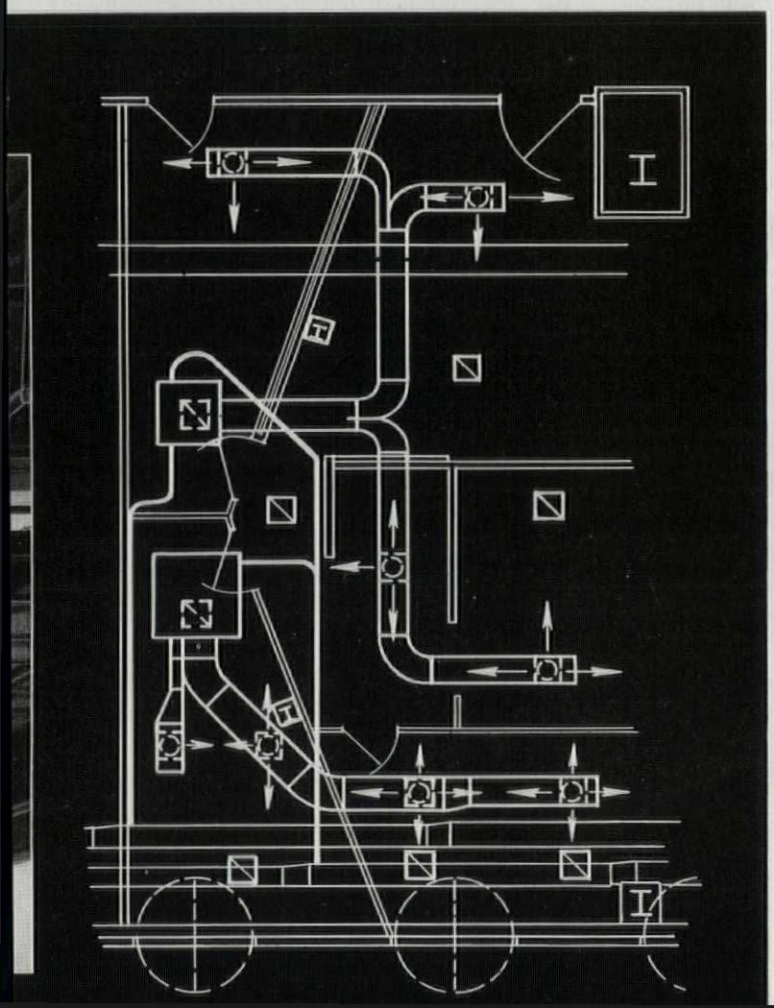


◀ Note how locating of hot and cold ducts saves space in new Medical Towers Building, Houston, Texas

View of lobby showing Anemostat Air Diffusers



View of professional reception room



◀ Layout of typical suite

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ANEMOSTAT: The pioneer of All-Air High Velocity Systems

reviews

(Continued from page 292)

sance "grottesche," the grandeur of Roman architecture, French planning and furnishing, the decor found by the excavators of Roman and Etruscan ruins. Adam was not a mere eclectic collector of styles; his talent was to adopt many familiar and new elements and recreate them into a sum that is too often remarkable, accurately reflecting the luxurious taste of his patron, the Prince Regent. Also in the variety of new materials and processes, which he borrowed from contemporary industry, he showed himself to be contemporary with his own time.

To be sure, the entire taste of the nation was not to follow that of Adam. The reactionaries opposed what seemed to them the superfluous quality of Adam's work. And so, Sir R. Taylor and James Paine were to be leaders in the academic reaction, continuing the Palladian tradition. James Wyatt, much opposed to Adam, brought forth buildings of simple, proportioned, restrained (that key word) Classicism. And there were John Carr, Henry Holland, Charles Cameron, George Dance.

English eccentricity had also to have its place in this extraordinary era of productivity. The combination of Classic and Romantic could not always be represented by Adam. The combination would also necessarily produce that which might be described as bizarre, or more properly, picturesque: e.g., Francis Sandy's "Ickworth."

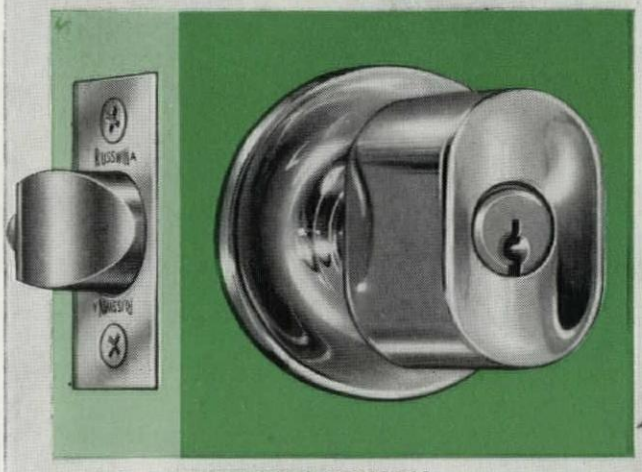
What the present volume emphasizes, happily, is the architectural continuity of the epoch as a whole; Hussey has, Adam-like, synthesized all the divers elements and talents into a single volume.

Hussey finds that Georgian domestic architecture is perhaps best expressed by concise accounts of the most notable *country* houses of the period. 29 houses are shown here, almost half of which are generally un-

(Continued on page 302)

New Russwin Designs

in doorware fashioned to fit the hand



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an interesting departure from the conventional knob styling. The Era knob is not only pleasing to the eye and easy to grasp, but also unusually easy to turn.

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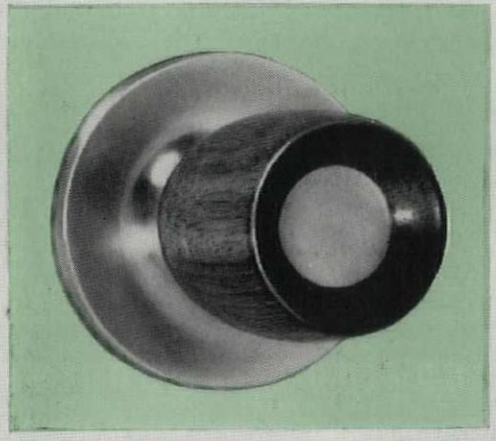
a delightful creation that form-fits the palm of the hand. This design is not only available with knobs and roses of beautifully-finished metals, but also in an exciting new combination of knobs in rare woods and ceramics with roses in metal.



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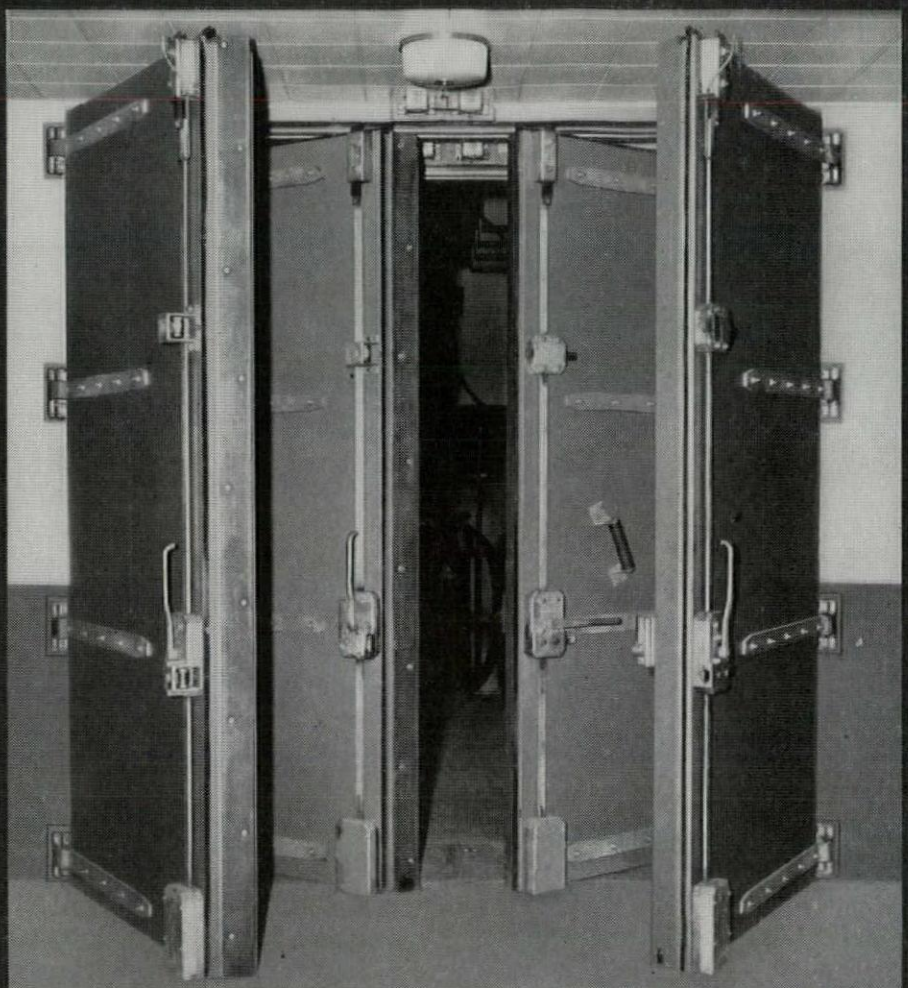

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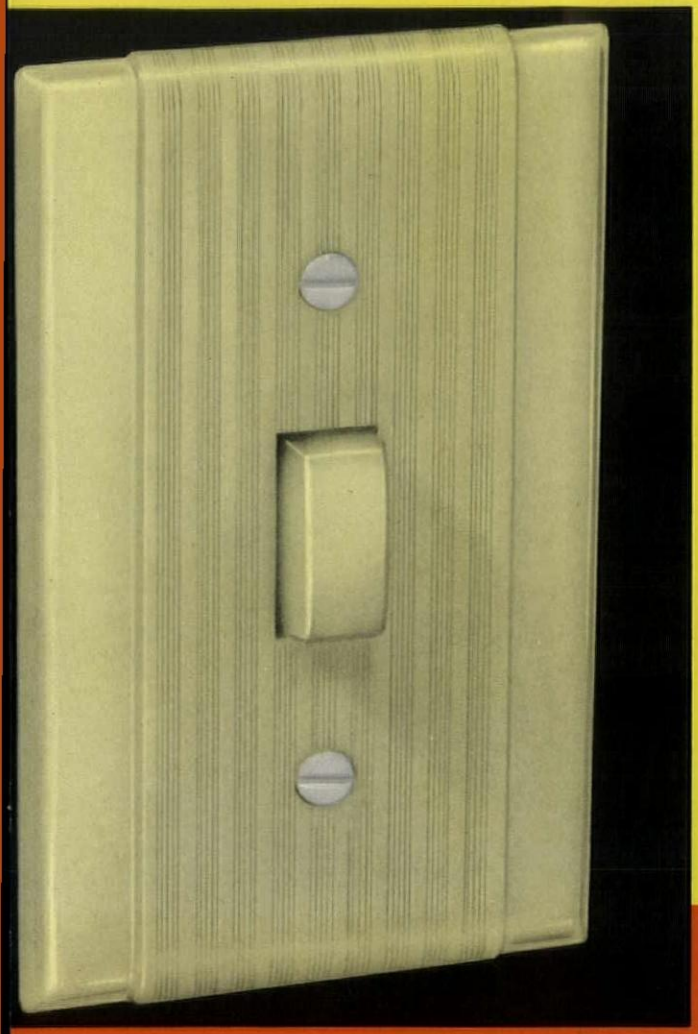

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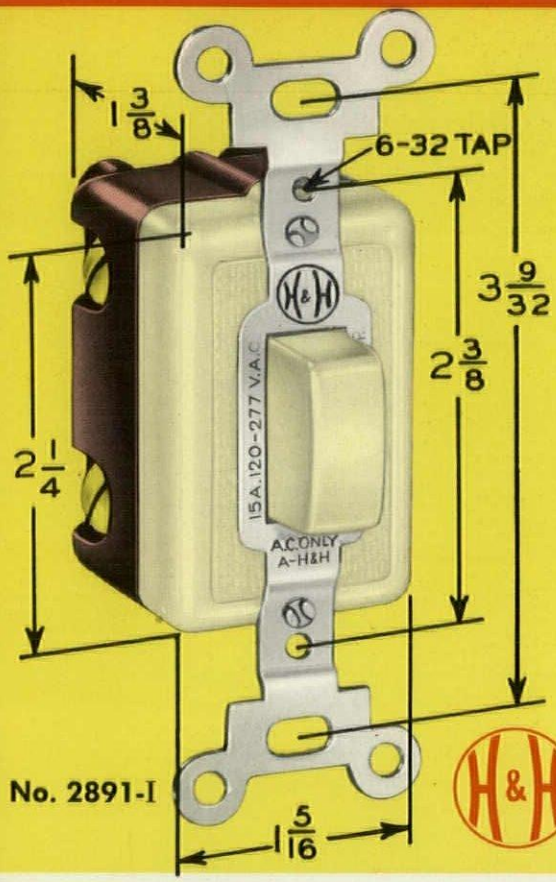

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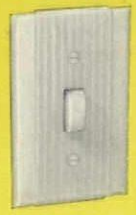

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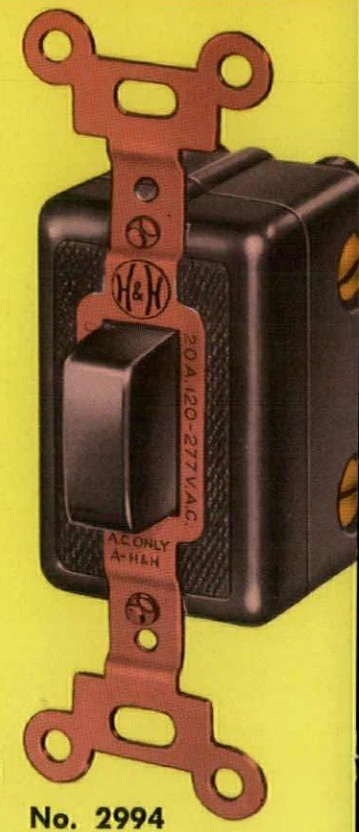

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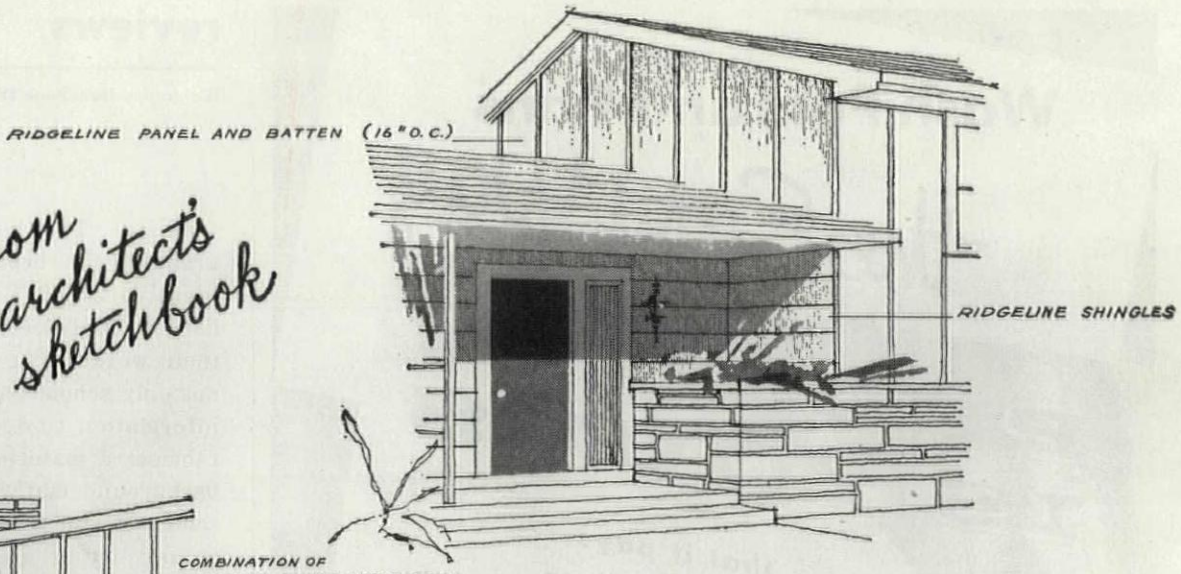
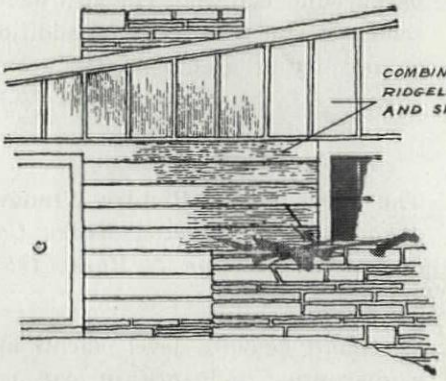
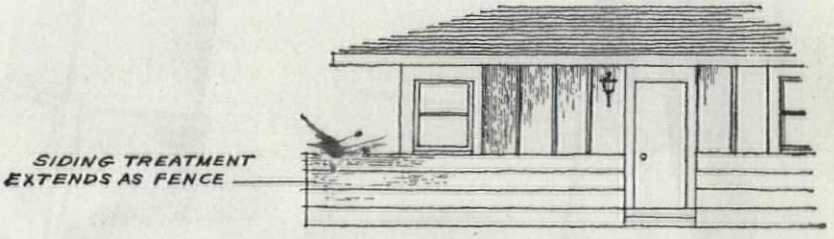
Notes from an architect's sketchbook



Battens every 16 inches over 4-foot-wide panels add bright new interest to gables. Ridgeline shingles offer an economical approach to a traditionally pleasing wall pattern.



Here, Ridgeline panels with battens cooperate with Ridgeline siding, (texture running horizontally). The result is unusually handsome.



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reviews

(Continued from page 296)

familiar. The hundreds of photographs have been all chosen with great care and a valuable appendix lists the mid-Georgian architects and their works. The present volume is not only scholarly, giving much new information (e.g., on the use of prefabricated materials) and important background material, but also handsome. It will be a welcome addition to any art or architectural library.

F.J.S.H.

an American problem

The Crack in the Picture Window. *John Keats. Houghton Mifflin Co., 2 Park St., Boston 7, Mass., 1957. 196 pp., illus., $3*

"I submit housing developments are a disruptive influence in our national life . . . pose many clear and present dangers to us all."

As a result of such thoughts, the author wants us to face up to the nothing-down plan of home purchase; to the human problems stemming from the Government-sponsored, inhuman plan or plot (as some view it).

For his purposes he dissects and analyzes the emotions, experiences, disappointments of an imaginary family, the Drones: all evolving from their purported purchase of a house in a housing development. With the rest of their lives to pay off the mortgage, they practically pay with their lives—a little at a time. It is impossible to say how typical of all development dwellers is their case: it is possible to say that all their case is typical of many.

The picture of the denizens of the developments is painted in deep, dark, dire tones: personal tensions, financial trials, structural troubles—endless and hopeless. The mighty mass of these is ascribed to two sad sources: the bumbling GI bureaus; and the unprecedented concentration of young people of the same "age,

(Continued on page 308)

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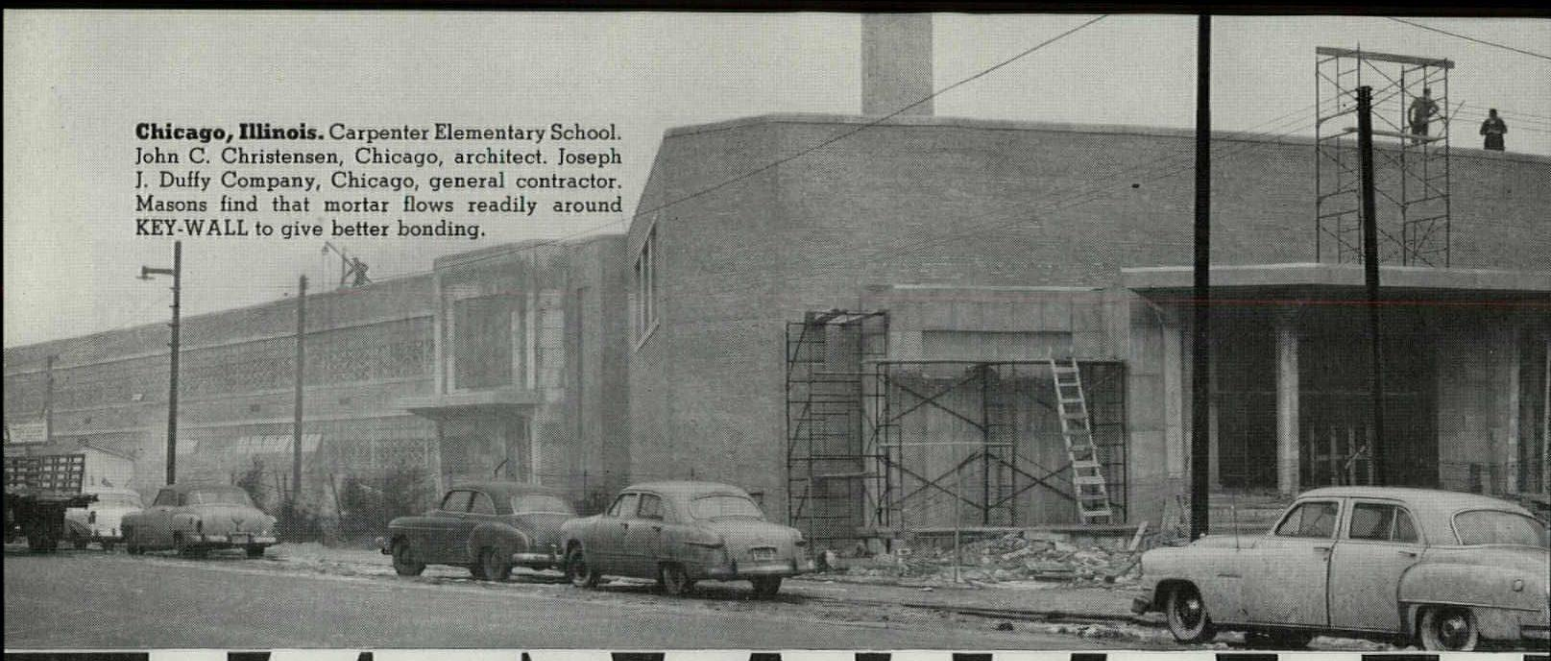

Chicago, Illinois. Carpenter Elementary School. John C. Christensen, Chicago, architect. Joseph J. Duffy Company, Chicago, general contractor. Masons find that mortar flows readily around KEY-WALL to give better bonding.

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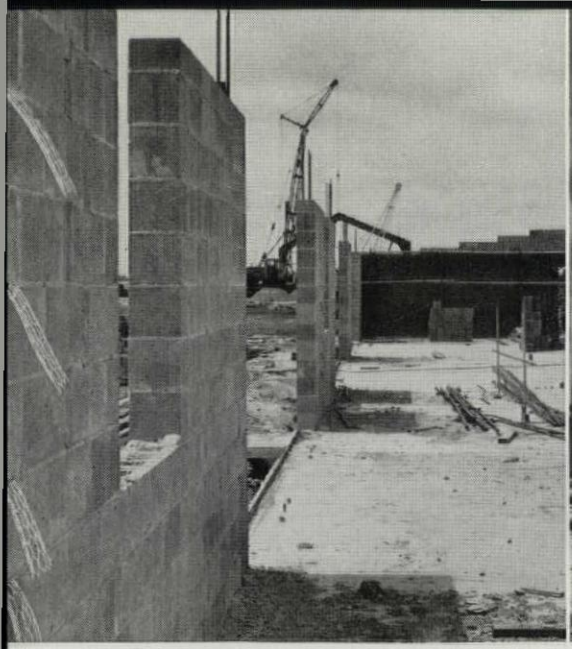
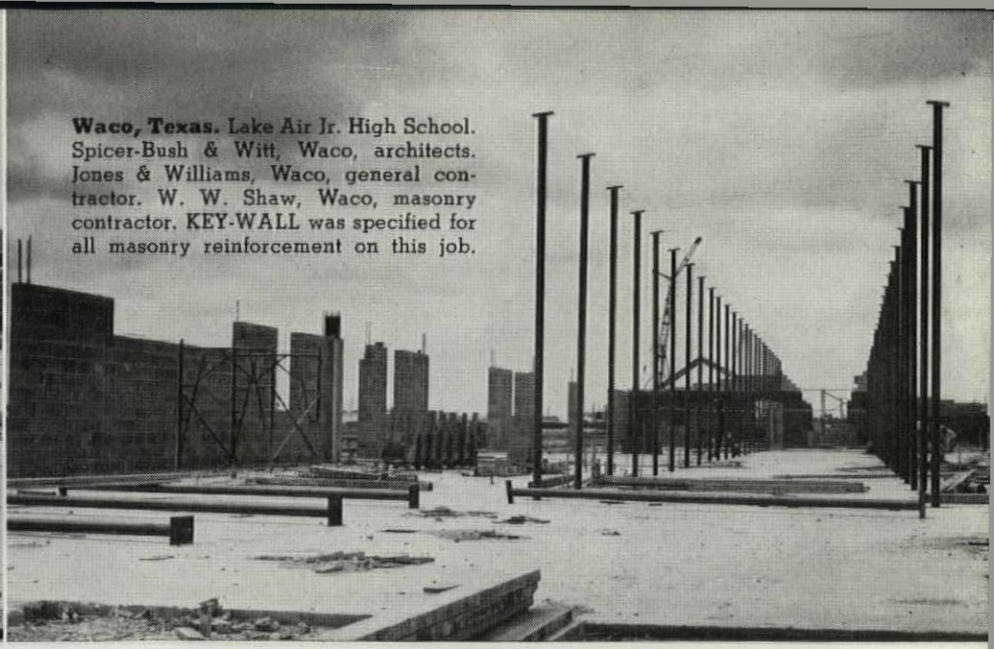
galvanized masonry reinforcement





Waco, Texas. Lake Air Jr. High School. Spicer-Bush & Witt, Waco, architects. Jones & Williams, Waco, general contractor. W. W. Shaw, Waco, masonry contractor. KEY-WALL was specified for all masonry reinforcement on this job.

s adding trength o buildings everywhere

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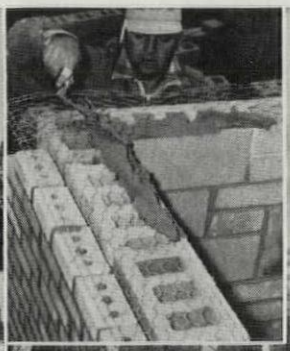
ton Rouge, Louisiana. Broadmoor Village Shopping Center. chard C. Coney, Jackson, Miss., architect. Howie Construction mpany, Jackson, general contractor. A. L. Falls, Jackson, masonry ntractor. KEY-WALL is being used in every other course in the tside walls and in every course of the partitions.



Bellevue, Nebraska. St. Mary's Catholic Church. Willis Regier, Omaha, architect. Korshoj Construction Company, Inc., Blair, general contractor. Masonry superintendent, Leonard Rieple, likes the way KEY-WALL is easily lapped to tie brick facing to the concrete masonry.

eoria, Illinois. First Baptist Church. arold E. Wagoner, Philadelphia, archi- ct. Jamieson & Harrison, Peoria, asso- ate architects. C. Iber & Sons, Peoria, neral contractor. One of a number of urches designed by Mr. Wagoner on hich he has specified KEY-WALL.

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New Orleans, La.

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Architects	Favrot, Reed, Mathes and Bergman, New Orleans
Consulting Engineers	de Laureal & Moses, New Orleans
General Contractor	R. P. Farnsworth & Company, Inc.
Mechanical Contractor	Emile M. Babst Company, New Orleans
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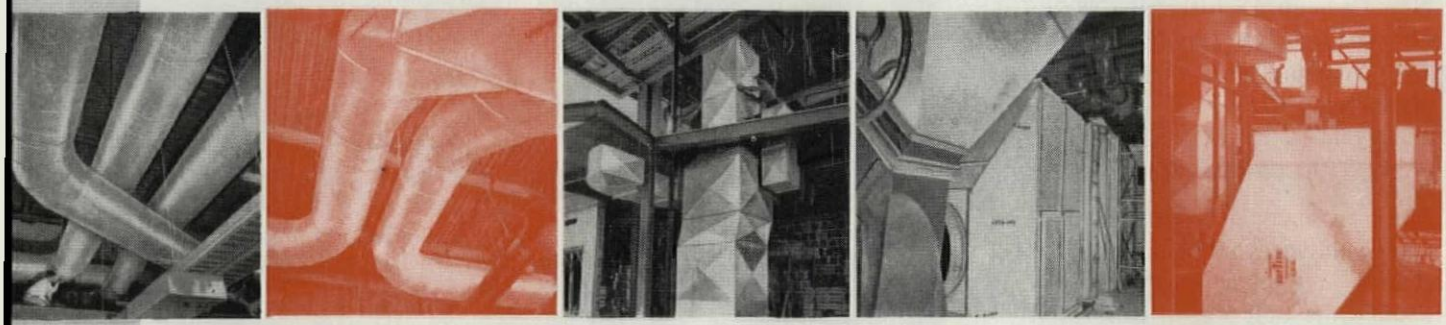

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52 vertical ducts distribute 100,000 cfm of fresh air to 1,122 perimeter units. All ducts made of Wheeling SOFTITE *Cop-R-Loy Galvanized Sheets.*

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(Continued from page 302)

income, number of children, problems, habits, conversation, dress, possessions, and perhaps even blood type," under impossible, impacted conditions.

The author's method can be ruthlessly realistic: "Today's development houses are uniformly substandard and overpriced in all price brackets." His claims are not without foundation; his approach not without skill and not without humor.

LAWRENCE E. MAWN

contemporary developments

New German Architecture. *Selected by Gerd Hatje, Hubert Hoffmann, Karl Kaspar. Translated by H. J. Montague. Frederick A. Praeger, Inc., 150 E. 52 St., New York 22, N. Y., 1956. 220 pp., illus., $11.50*

Since so many excellent books have been published on building in Italy, Brazil, and other countries, it was about time that we, in this country, should get acquainted with postwar building in Germany, more thoroughly than by occasional articles in architectural periodicals. After all, Italy and Germany are the two European countries where the most promising starts for a new contemporary architecture were made and where, at the same time, the sheer quantity of new building after the destruction of World War II is most striking.

New German Architecture is presented with both English and German captions in a volume in which layout, quality of reproduction, and the brief analytical introduction by Hubert Hoffmann, a former *Bauhaus* student, are well balanced. Despite his training, Hoffmann is broad-minded enough to include in his anthology works of all leading German architects, independent of their adherence to any specific school. Examples and their captions are arranged corresponding to categories, from private houses to hotels, from schools to churches, from department stores to factories, etc.

The specific needs of cities and small towns in Germany after the war destruction are analyzed, as are the new creative possibilities resulting from these. The mere exigencies for providing housing and places of business were so urgent immediately after the war that the newly erected buildings grew "without imagination or feeling" in ugly conformity, comparable to the worst periods of late Victorian eclecticism, though without its frills. It should not be denied that some excellent structures, especially office buildings and department stores, also were built then, often reproduced in this country in professional magazines—but after all, those were exceptions. However, the very bulk of buildings of the (then) usual kind was tremendous, but fortunately is now receding compared with the well organized creations of the last five or six years.

(Continued on page 310)

MODERN DOOR CONTROL BY *LCN*

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Architect

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Construction Details on Opposite Page

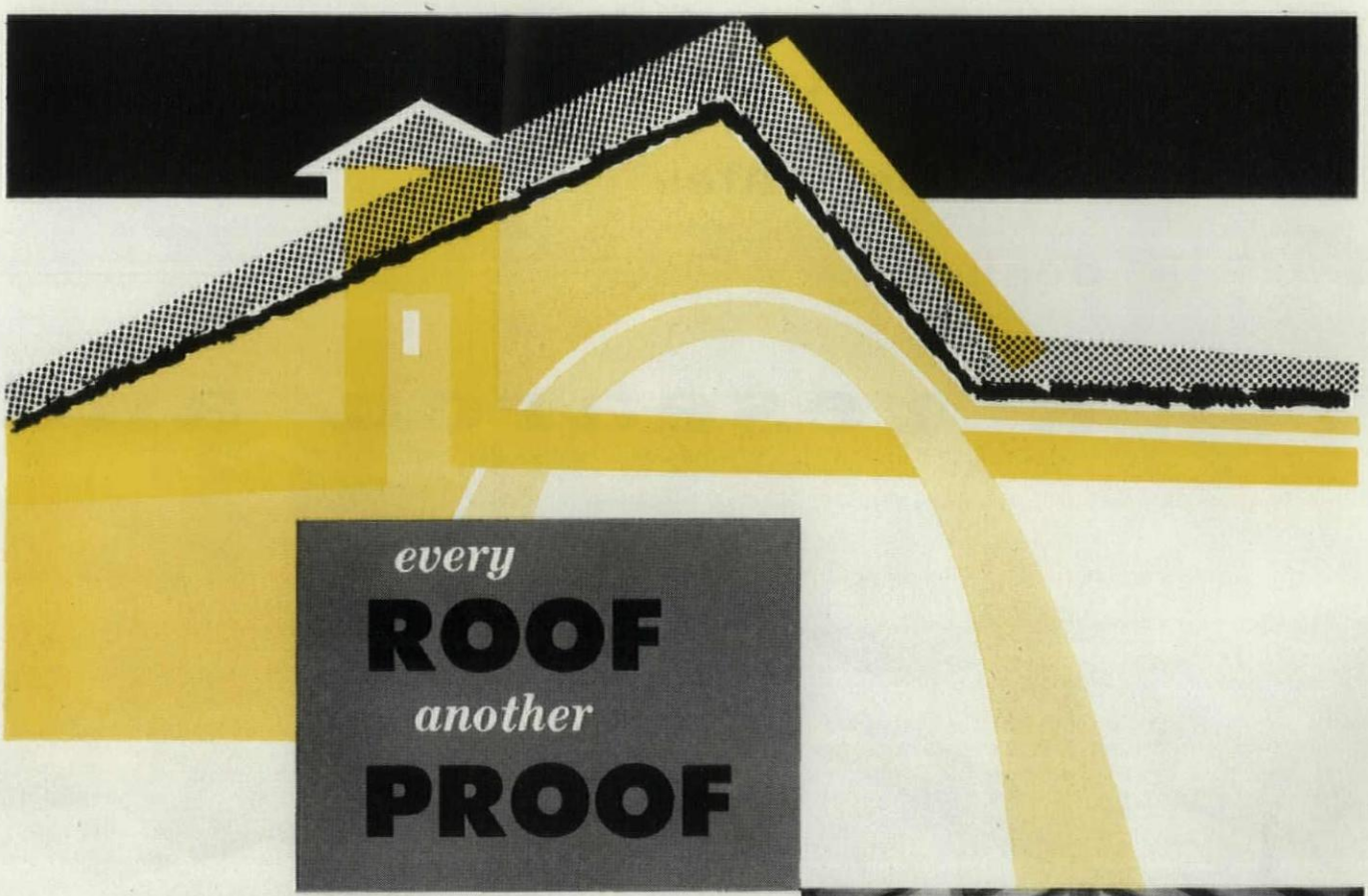
reviews

(Continued from page 308)

The author recognizes in Germany's architecture of today the influence of many factors, of the *Jugendstil* as it was crystallized especially in the architecture of Van de Velde, Endell, and the Viennese Otto Wagner; and of the succeeding *Werkbund* of whose members Poelzig, Tessenow, and Peter Behrens are probably best known here. This movement receded before World War I and afterward the *Bauhaus* ruled to a gradually increasing extent until World War II. Foreign influences, the impact of the French Auguste Perret, of the Dutch *De Stijl* movement, and last, but not least, of Frank Lloyd Wright, are not overlooked: These movements and influences were potent up to about 1933, when everything in Germany became dominated by Hitler's dictatorial psuedo-classicism. So almost 15 years elapsed before new ideas could develop. The unique opportunity not only to re-erect demolished buildings but also to reorganize whole new quarters in bombed-out towns gave an impetus and an intensity to building activities, certainly not possible during the lifetime of the last three generations. Buildings by American architects in Germany, especially those by Skidmore, Owings & Merrill, proved a further stimulating influence, as did certain city-planning ideas of CIAM and the examples of Scandinavian countries.

It would be meaningless to list and evaluate here the individual works of architects whose names probably are not yet known in this country. It would probably make more sense to outline clearly recognizable, general traits in present-day German architecture. To be honest about it: it cannot be done. The various works are too individualistic to be summarized with a common denominator. The only common denominator which exists is of *international* character, namely the use of new materials and new techniques. There is a prefer-

(Continued on page 314)



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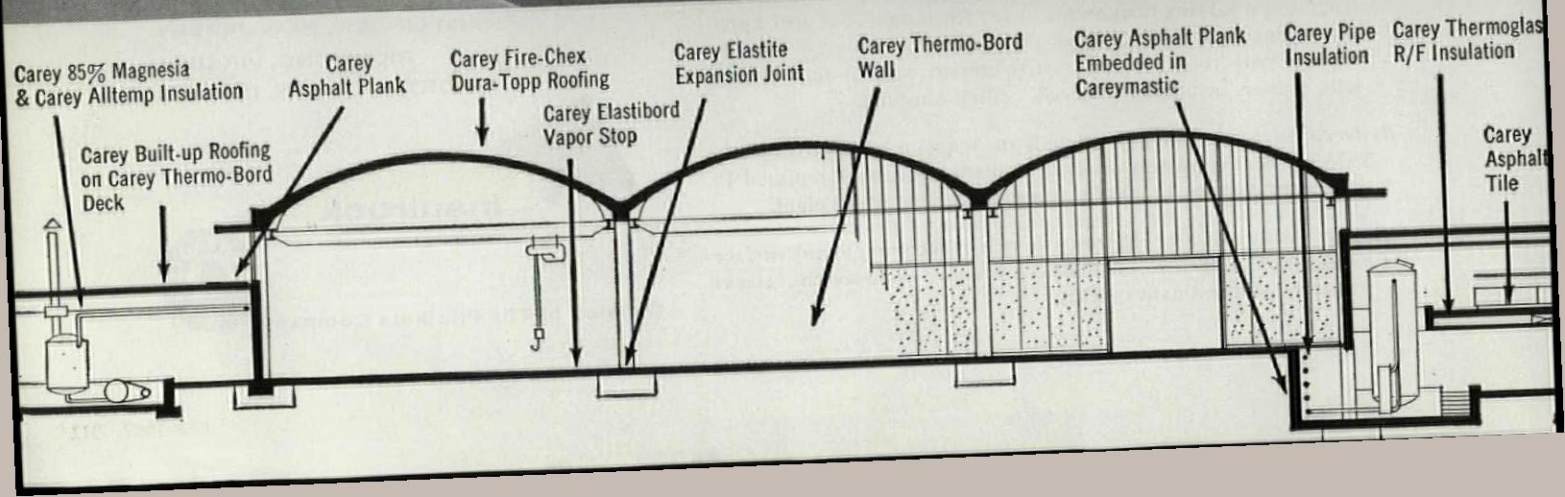
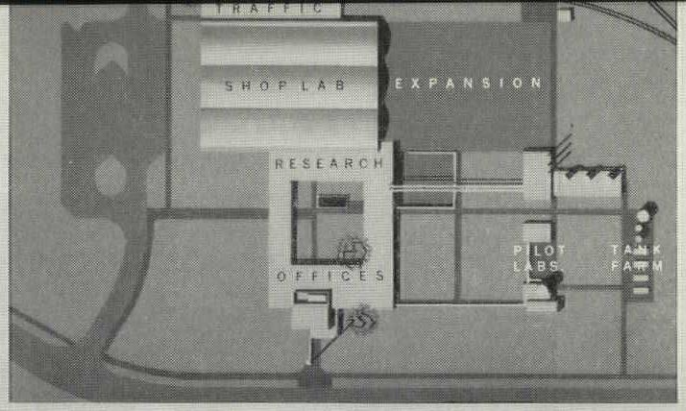
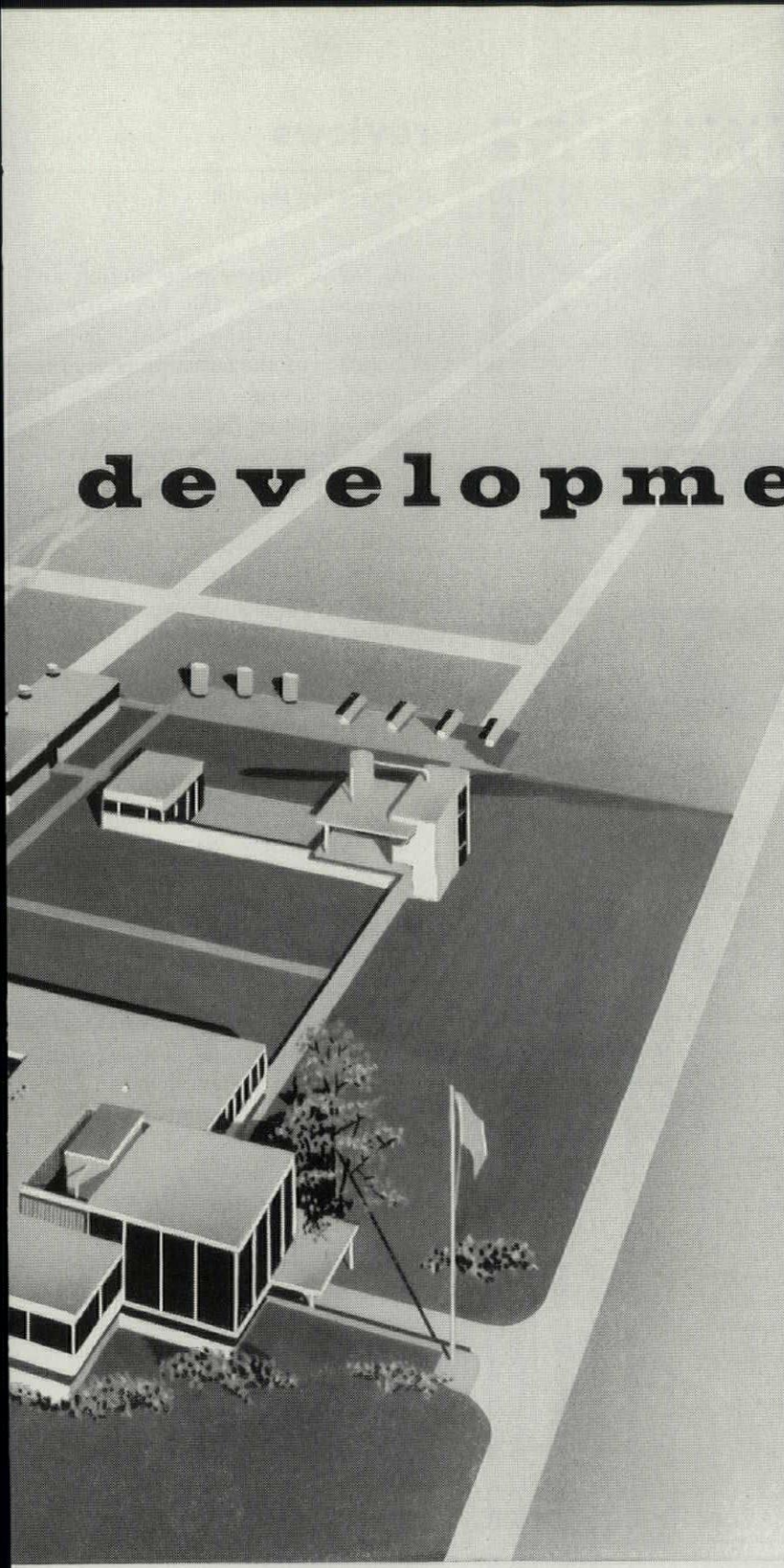




development plant



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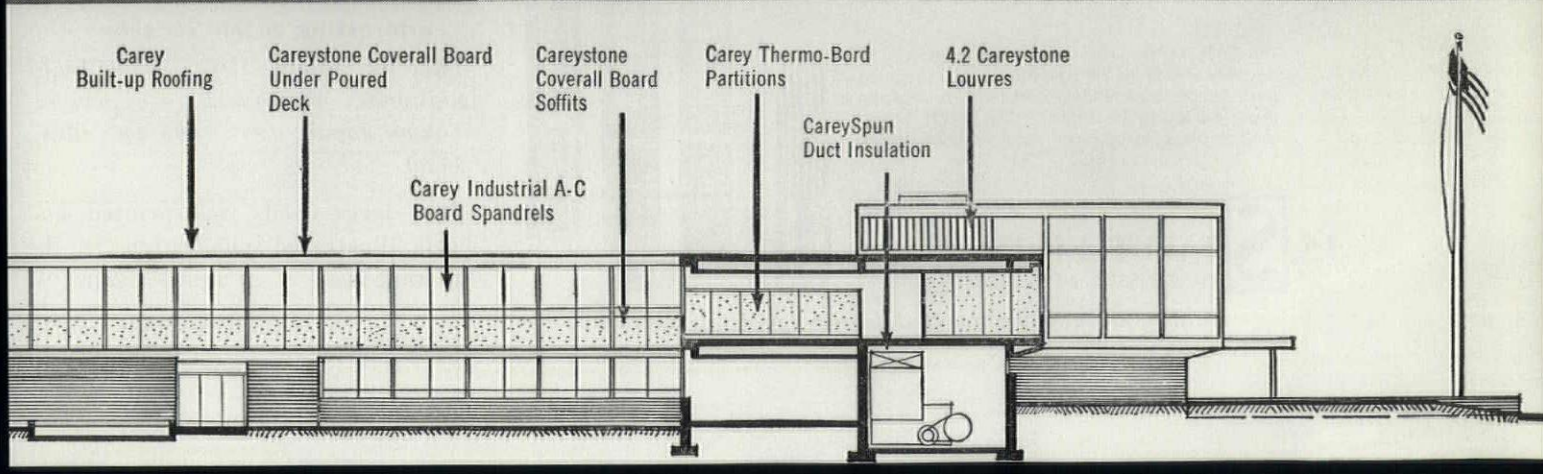


reviews

(Continued from page 310)

ence for cantilever construction and suspended roofs, the flexibility of inner walls and the almost complete dissolution of the outer walls, leading in private houses and schools to the fusion of indoor-outdoor living, and in office buildings to nearly total absence of closed surfaces. The same flexibility is apparent also in the loosening-up of the layout and the free-flowing organization of space.

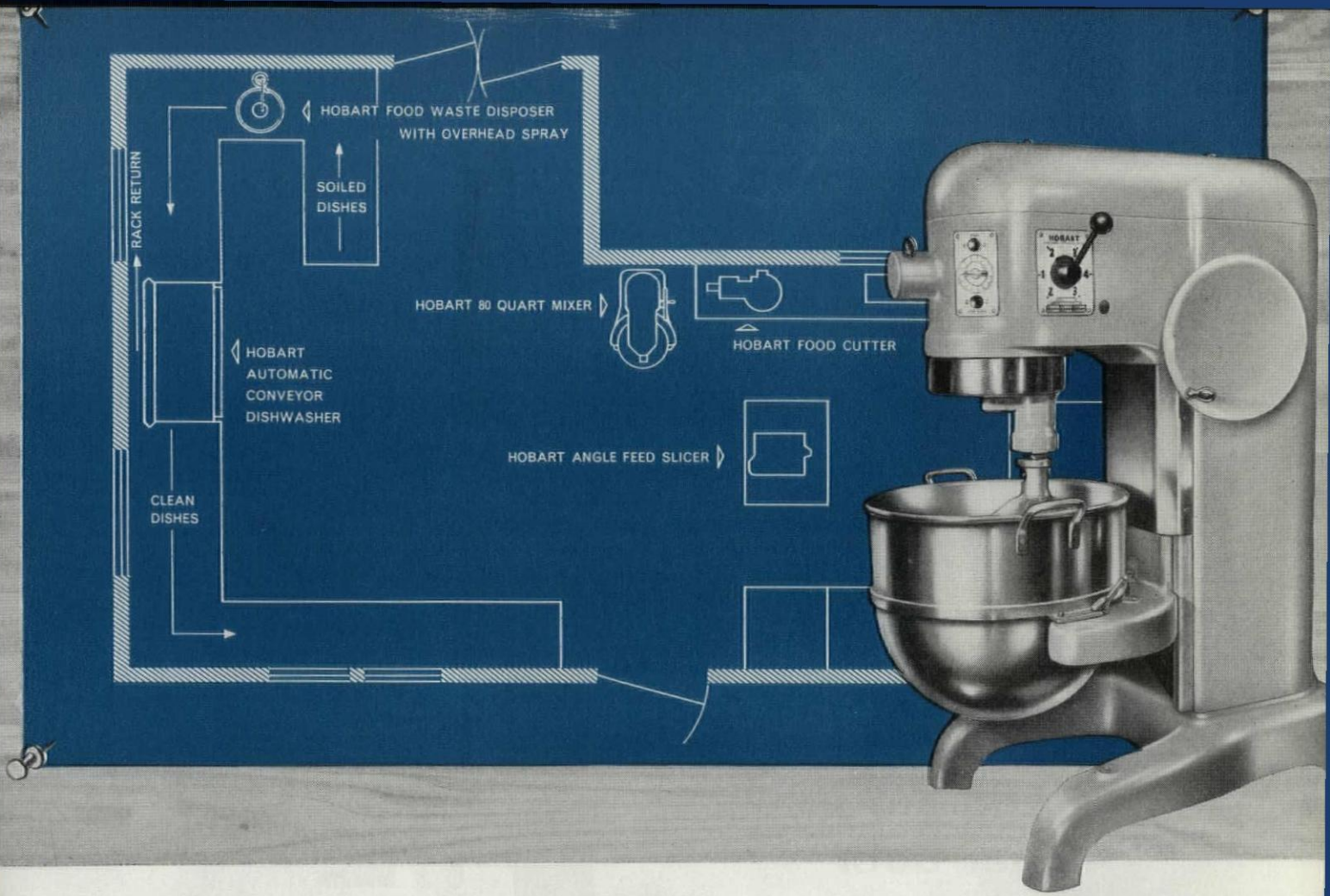
However, all these characteristics are *international*. What distinguishes German architecture after 1950 from American building? This can be answered only by a comparative analysis of German and American solutions within an identical field which would surpass the limits of such brief review. With all necessary caution, it may be stated that the old German tendency toward imposing monumentality still marks some of these solutions, somewhat more solemn and severe—in spite of the above-mentioned general qualities—than corresponding achievements here. Even the fact that in the U. S., for instance, the individual one-family house, if economically feasible, is greatly preferred to the one-family row houses liked so much in Germany, proves that the underlying awareness of space is different here and there; just as the lesser and more reticent use of color in architecture here is still a subconscious remainder from the Victorian-Puritan inheritance, compared with the freer employment of color in Germany. But these and other differences are more those of degree than of principle. PAUL ZUCKER

interesting within its scope

This is Japan 1957. *The Asahi Shimbun, Yarakucho, Chiyoda-ku, Tokyo, Japan, 1957. 395 pp., illus., $6.50*

This large-sized, well printed and well illustrated publication is the current issue of an annual magazine.

(Continued on page 320)



reminder to an architect planning a food service kitchen

Model L-800, 80-quart all-purpose mix with Timed Mixing Control.

Kitchen layout will only be as efficient as the mixers that are specified...highest possible standards of sanitation must be met... can't afford to gamble on mixer performance...source of supply must be able to provide any size mixer-volume demands of the client...service must be readily available whenever needed.

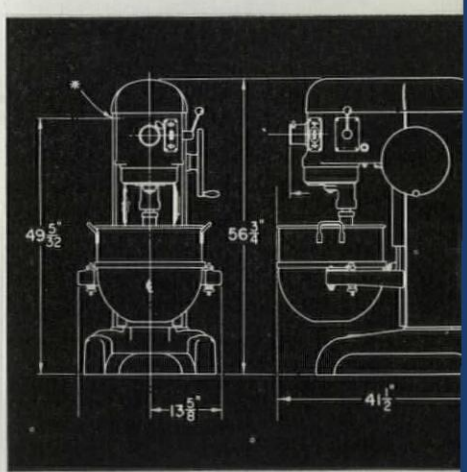
You may not have realized, Mr. Architect, but the above paragraph boiled down to one sentence says, "I'd better contact Hobart."

Performance of Hobart kitchen, food and dishwashing machines has been proved by over 60 years of service to the food industry. Bakers and chefs *know* and *trust* Hobart quality and performance.

In the full line of Hobart mixers (nine models) for kitchens there is a model that is engineered to handle any volume from five quarts (bench type) to 140 quarts (floor type). All are designed to save space while increasing efficiency and production. Each is designed with Hobart planetary mixing action that gets positive results every time. Timed mixing control and other advanced features are available on many models.

Hobart bakery mixers are built for superior sanitation. Streamlined housings and open-rim bowl design make them easy to clean and keep clean.

Check Sweet's Architectural File for complete specifications and capacities on all Hobart machines, or send in the coupon.



Hobart

Hobart machines

World's Largest Manufacturer of Food, Kitchen and Dishwashing Machines

The Hobart Manufacturing Co., Dept. HPA, Troy, Ohio

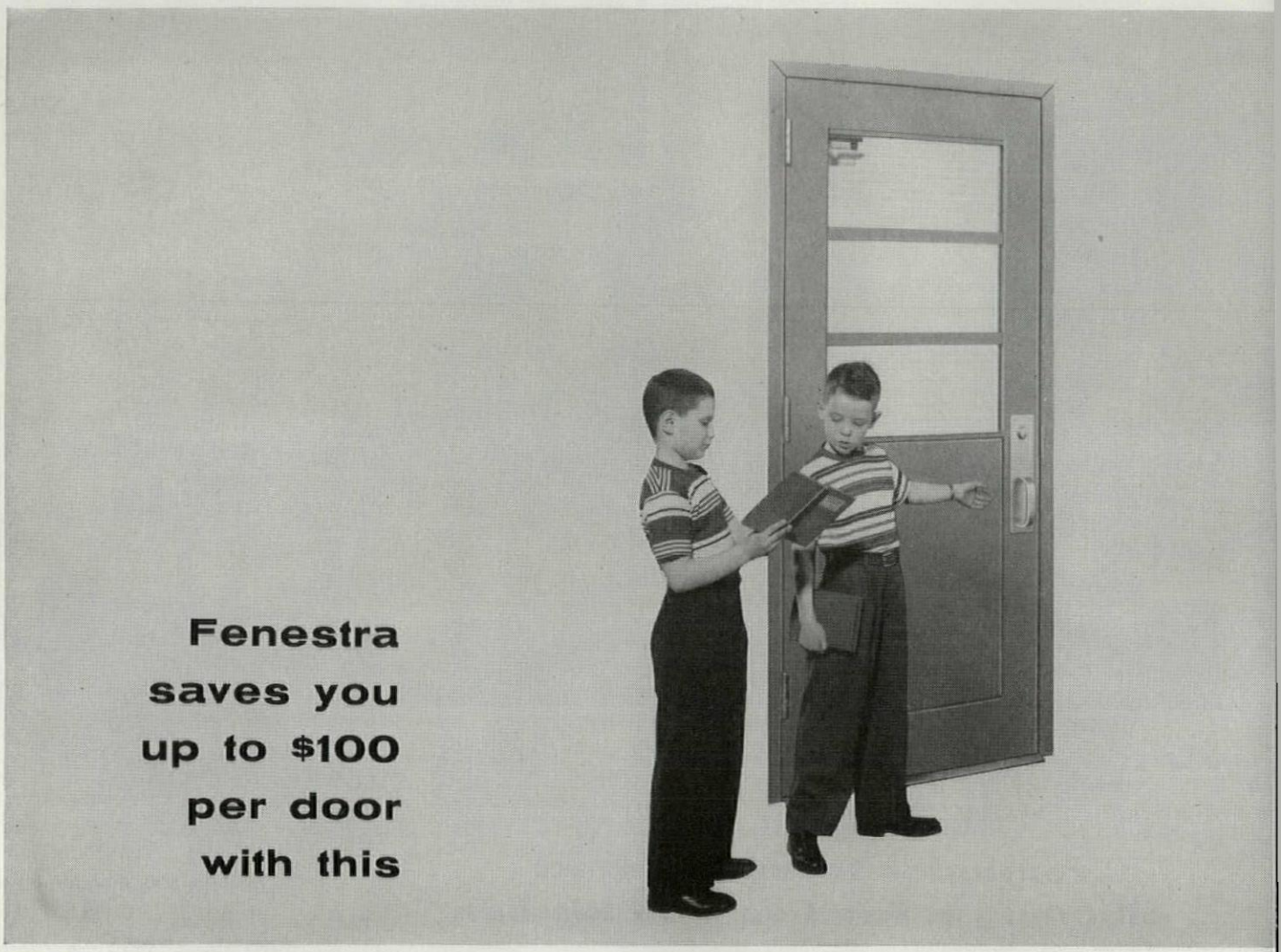
Please send information and specifications on Hobart bench model mixers ☐. On floor model mixers ☐. On the complete line ☐. Please have representative call ☐.

Firm name.....

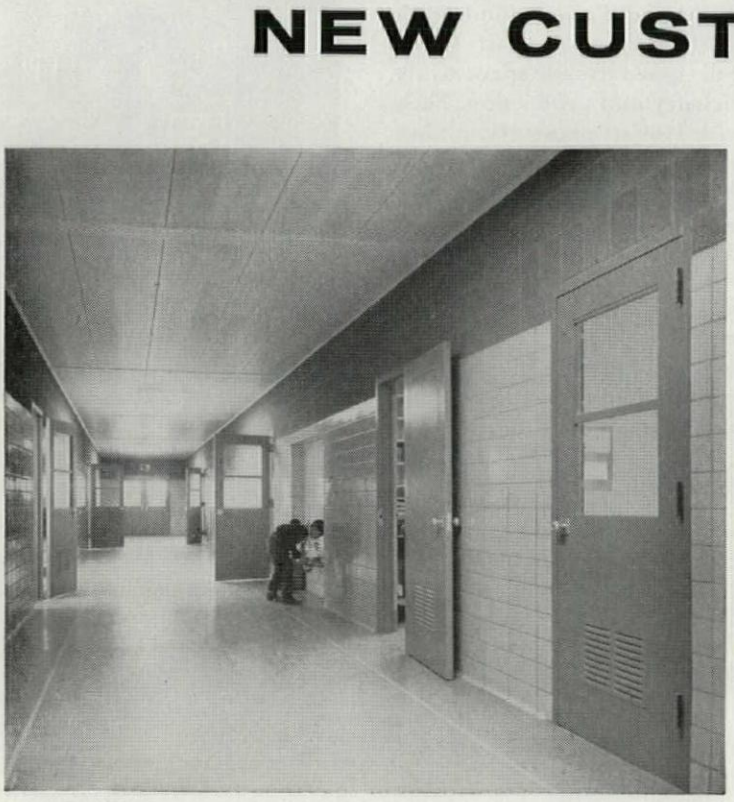
My name.....

Address.....

City.....*Zone*.....*State*.....



NEW CUSTOM DESIGNED



Here's a door designed especially for school classrooms. It looks expensive, but it isn't. It's a stock door by Fenestra®—with an installed cost about $100 less per opening than you'd expect to pay.

What's outstanding about this door? First, the hardware. The new anodized aluminum pull-push plate makes it easy to open for even the smallest child. It's locked from the outside with a key. A thumb turn on the inside will open the door if a child should be locked in by mistake. An automatic door closer and inside kick plate are also included. Now, look at the glazing. Two panes of patterned glass with one pane of clear glass gives classroom privacy with a view window at eye level.

Architect Glen Drew, Poplar Bluff, Missouri, uses Fenestra Hollow Metal Door-Frame-Hardware Units for custom quality at stock door costs. O'Neal School, Poplar Bluff, Missouri, has 42 Fenestra Flush Doors. *Contractor:* George H. Gassman Construction Co., Poplar Bluff, Missouri.

SCHOOLROOM DOOR

The door itself is a Fenestra Hollow Metal Flush Door that can't warp, swell, stick or splinter. It always swings open smoothly and closes quietly. Thousands of these doors are in use in schools all over the country.

This classroom door costs you less to buy and install because Fenestra mass produces them on special jigs that save expensive labor. Then the doors, complete with frames and hardware, are delivered to your school ready to install. You don't have to cut, fit, mortise, drill or tap a Fenestra Door. It's factory machined for all hardware, either template or surface mounted. *One man with a screw driver can install it in minutes!*

Before you choose the doors for your next school, call your local Fenestra Representative—listed in the Yellow Pages—for complete information on this New Fenestra Classroom Door, or mail the coupon below.

Fenestra
INCORPORATED

HOLLOW METAL
DOOR-FRAME-
HARDWARE UNITS

Your Single Source of Supply for
DOORS • WINDOWS • BUILDING PANELS

Fenestra Incorporated
PA-6, 3409 Griffin Street
Detroit 11, Michigan
Please send me complete information on Fenestra Hollow Metal Door-Frame-Hardware Units for schools.

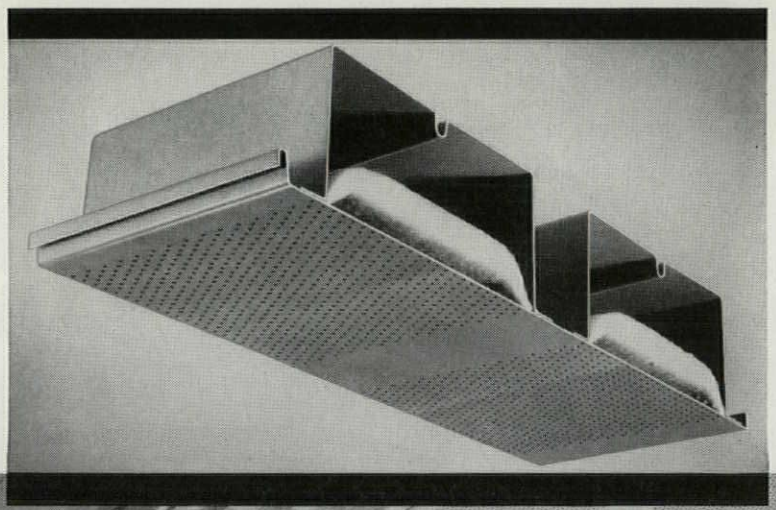
NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

Fenestra Acoustical "D" Panel
with exclusive arched glass fiber acoustical batt†.
Width—24". Depths—1½"-7½".



School officials at Littleton High School, Littleton, Colorado, report that the simplified construction of Fenestra Building Panels reduced building costs and definitely speeded up completion. They also say, "We are very pleased with the appearance and acoustical efficiency of the panels and feel sure that our maintenance costs will be much lower than with other materials." Littleton High School is designed to accommodate 650 students under ideal educational conditions. It is capable of housing 750 students, if necessary, and is designed for economical future expansion. A large auditorium and separate gymnasium are included in addition to specialized classroom facilities for a complete high school curriculum. The total cost for the finished building was only $12.79 per square foot including mechanical and equipment costs.

Architect: Earl C. Morris, Denver, Colorado.
Contractor: Mead & Mount Construction Co., Denver, Colorado.

Fenestra
SCHOOL DESIGN NEWS

How Fenestra Building Panels . . .*

CUT ACOUSTICAL COSTS FOR SCHOOLS

Quieter schools at lower cost! That's the experience of school boards and architects who take advantage of the design and construction economies of Fenestra Acoustical-Structural Building Panels.

These lightweight, high-strength steel panels form the structural roof and the finished interior ceiling with *"built-in" acoustical treatment.* They replace *five* different materials—usually requiring extra labor and cost—with *one* metal building unit, erected in *one* operation, by only *one* trade.

The flat bottom surface of the panels is perforated for the acoustical ceiling. An exclusive Fenestra preformed, arched, sound-absorbing batt† is enclosed *inside the panels.* It cannot be harmed by painting or cleaning with soap and water. There is no "stuck-on" material to discolor or fall off and require replacement. Room-to-room noise flow is prevented by sound transmission barriers incorporated in the panel design.

And, because this ceiling plate is a part of the structural panel, it is made of 16-gauge steel—4 times thicker than usual metal pan ceilings. This assures extra resistance to damage by objects thrown against the ceiling or other impacts—an especially important feature for gymnasiums, corridors, etc.

The cellular design of Fenestra Building Panels combines light weight with great strength. Under normal roof loads they span up to 31 feet. Their width—24 inches—fits perfectly with modular design techniques. This speeds up construction and eliminates cutting and fitting of panels and other materials on the job.

A combination of plain and acoustical panels may be used to lower costs in areas that do not require complete sound control. The panels may be supported by masonry bearing walls, structural steel or other framing designs.

If you are now planning a new school building, you should get complete details on Fenestra Acoustical-Structural Building Panels. The New 1957 Fenestra Building Panel Catalog gives you complete information. Mail the coupon below, today, for your FREE copy or call your Fenestra representative.

*Trademark
†Patent Pending

Fenestra
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METAL BUILDING PANELS

YOUR SINGLE SOURCE OF SUPPLY FOR BUILDING PANELS • DOORS • WINDOWS

Fenestra Incorporated
Dept. PA-6, 3409 Griffin Street
Detroit 11, Michigan

Please send me FREE copy of New 1957 Fenestra Building Panel Catalog including details on Fenestra Acoustical-Structural Building Panels for schools.

Name_____

Firm_____

Address_____

City_____ State_____

reviews

(Continued from page 314)

Its prime purpose is palpably and patently promotional: its effort to interest the English-reading world in the assets, attractions, and accomplishments of Japan is greater than its show of modesty; its editors cannot be charged with reticence in extolling these features. Any treatment of a wide variety of subjects such as are here assembled to demonstrate Japanese progress in many fields—arts, science, industry, and commerce—becomes necessarily brief and inevitably inadequate. This is especially true in the discussion of current Japanese architecture: it is not fair to assume that the few included exhibits of architectural work are representative of the architectural quality and quantity of the past year.

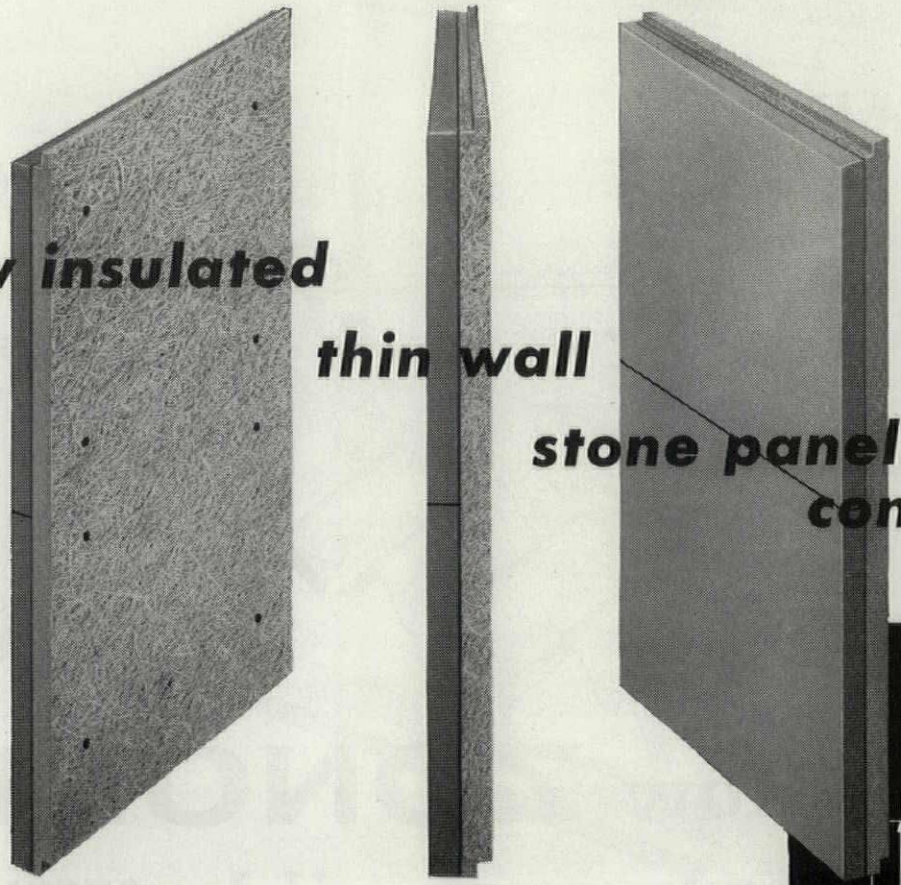
This issue is as voluminous as its predecessors, with advertisements of endless Japanese business enterprises; and is generally interesting within the restricted limits of its scope. LAWRENCE E. MAWN

handbook praised

American Civil Engineering Practice. *Robert W. Abbett. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1956. Vol. I, 1036 pp., illus., $15; Vol. II, 937 pp., illus., $15*

This splendid new master reference fills a great need. Specifically, it replaces *American Civil Engineers' Handbook,* originally published in 1910 with Prof. Mansfield Merriman as Editor-in-Chief. This older work, familiar to most architects and engineers, was a compilation of facts, tables, and methods, and was a guidepost to the profession through many revisions until about 1950 when it was considered largely obsolete due to the rapidly changing aspect of modern planning. The new book in far more comprehensive fashion, and closely related to modern needs, embraces all divisions of large engineering works, both public and private.

(Continued on page 326)

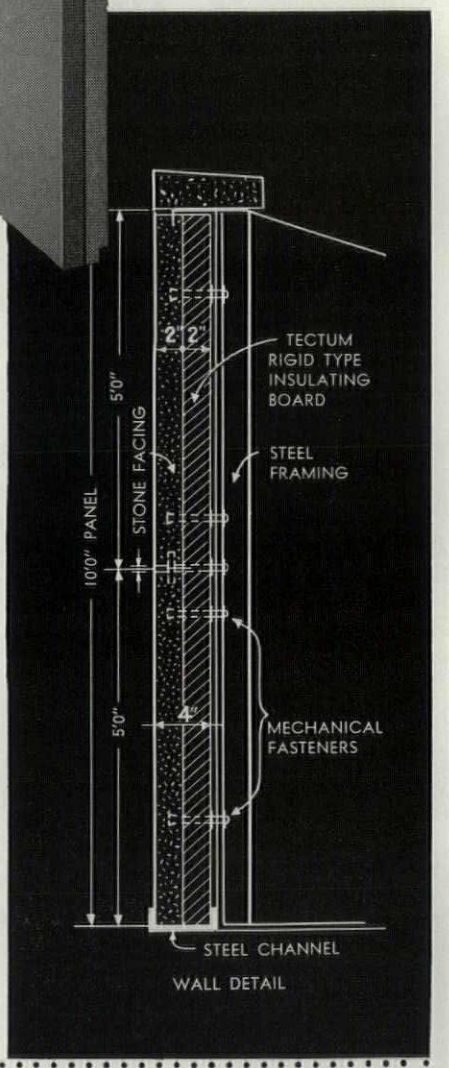


new insulated thin wall stone panel construction

. . . for curtain wall construction applied to structural steel or masonry

This new stone panel construction using two or three pieces of stone as a unit can be quickly fastened by strap anchors or dowels into the wall. Thickness: two inches Indiana Limestone and two inches light weight, rigid type insulating board. Uniform panels permit erection at record speeds — up to 1200 square feet per day being achieved on one recent project.

Mail coupon today for complete information.



WALL DETAIL

INDIANA LIMESTONE INSTITUTE
BEDFORD, INDIANA
Founded 1932 as a service organization for the Architect and Contractor.

INDIANA LIMESTONE INSTITUTE
Dept. PA-67, Bedford, Indiana
Please send illustrated bulletin on new thin wall stone panel construction.

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FIRM _____
ADDRESS _____
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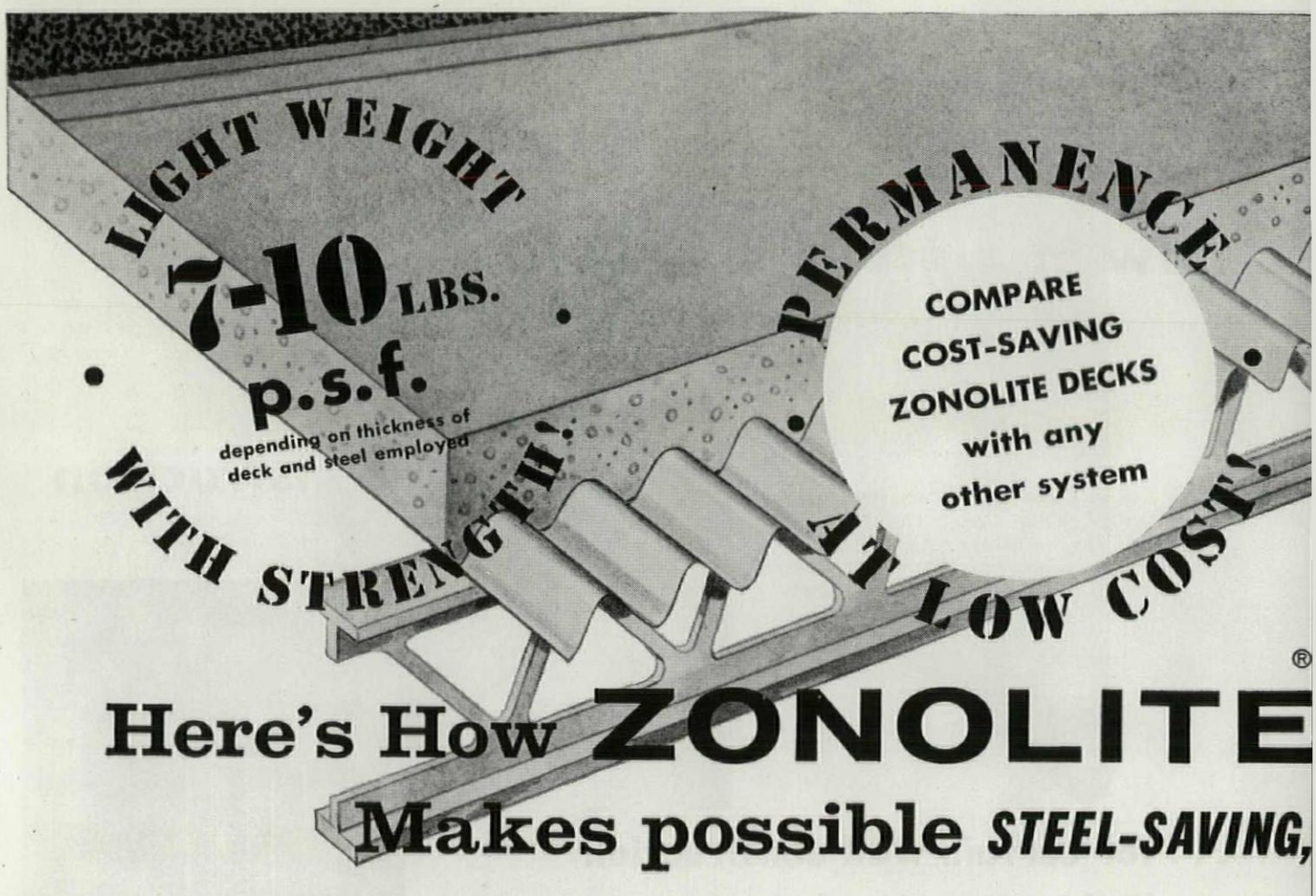
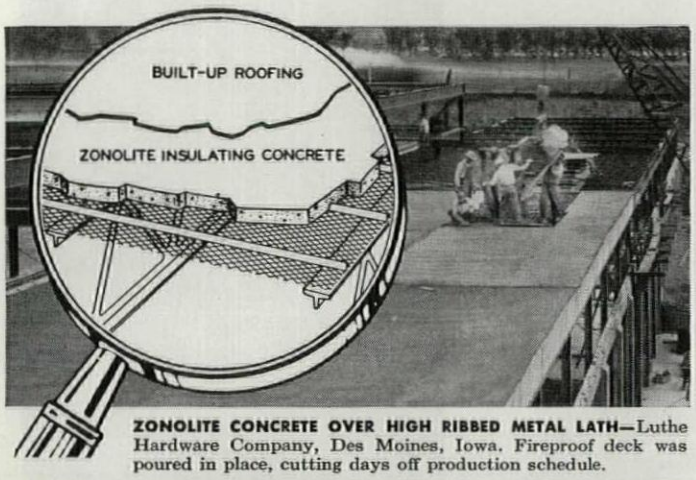
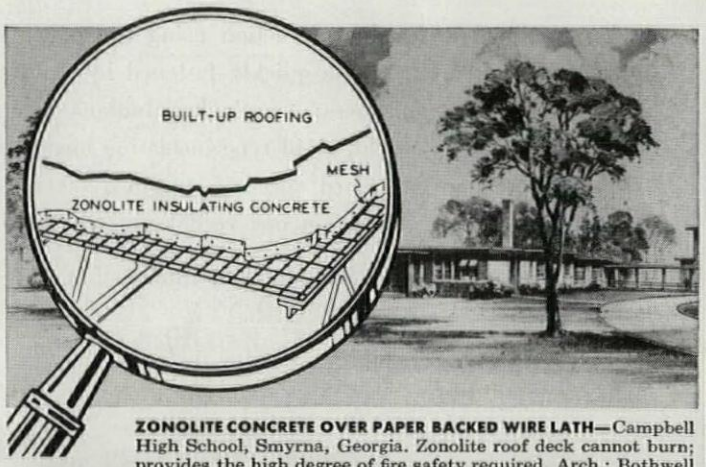


Here's How ZONOLITE® Makes possible *STEEL-SAVING,*



ZONOLITE CONCRETE OVER HIGH RIBBED METAL LATH—Luthe Hardware Company, Des Moines, Iowa. Fireproof deck was poured in place, cutting days off production schedule.



ZONOLITE CONCRETE OVER PAPER BACKED WIRE LATH—Campbell High School, Smyrna, Georgia. Zonolite roof deck cannot burn; provides the high degree of fire safety required. Arch.: Bothwell and Nash.

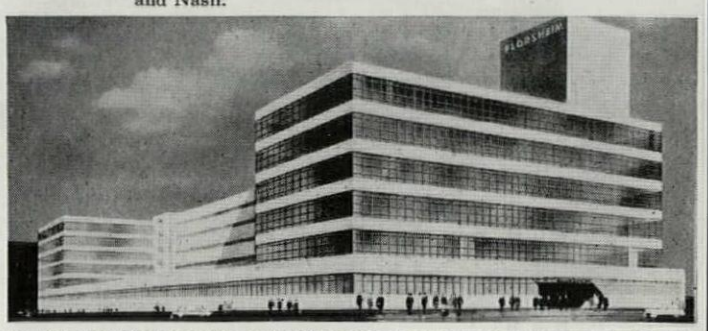
TIME SAVER! COST SAVER!

pre-cast

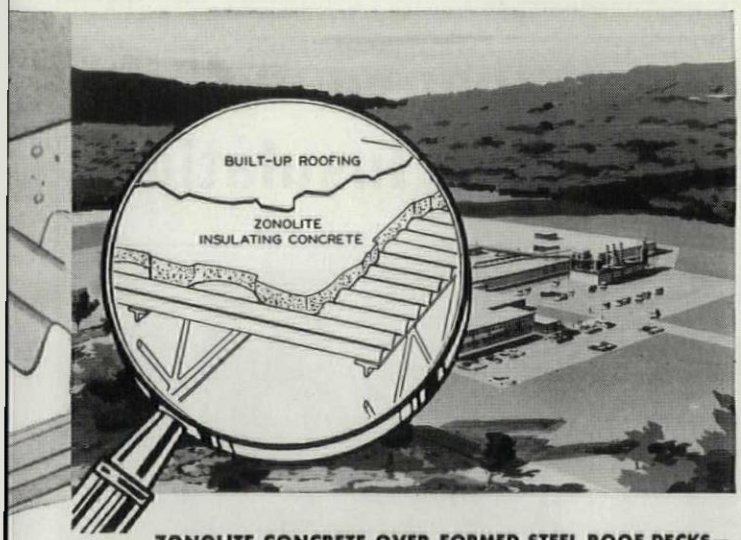
ZONATILE®

the all-in-one roof slab!

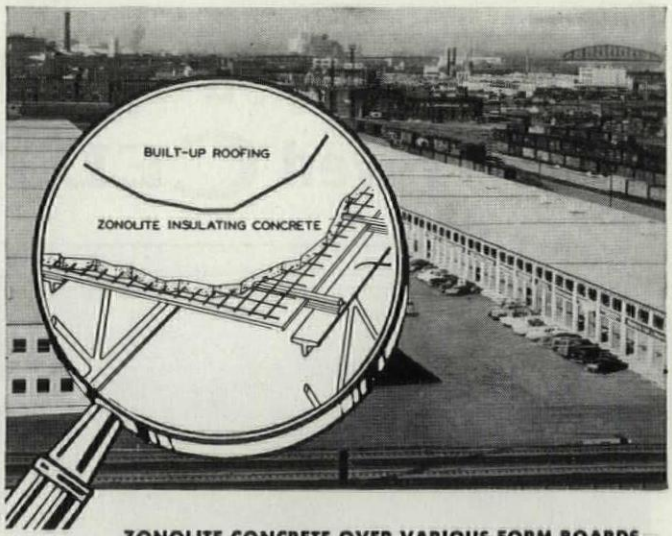
Here's the new, short-span concrete slab one man can handle with ease. Zonatile saws like wood. Goes into place fast—in any weather. Reduces dead weight. Cuts time and costs.



EASY WAY TO PROVIDE SUPER-INSULATION! ZONOLITE INSULATING CONCRETE POURED OVER STRUCTURAL CONCRETE DECK—Florsheim Shoe Company office building, Chicago. Used as roof fill, ZONOLITE provides added valuable insulation, monolithic, no heat leaks. Arch.: Shaw, Metz & Dolio.



ZONOLITE CONCRETE OVER FORMED STEEL ROOF DECKS— Eberhard Faber Pencil Co., Wilkes-Barre, Penn. Another *big* structure with a permanent monolithic roof that weighs less, is strong, insulating, fire-safe. Arch.: Eyerman-Hoban & Sincavage, A.I.A., Wilkes-Barre, Penn.



ZONOLITE CONCRETE OVER VARIOUS FORM BOARDS— Commission Row Produce Market, St. Louis, Missouri. 326,000 sq. ft. poured for this seamless, permanent roof deck. High insulating value. Arch.: L. Roy Brown & Assoc., St. Louis.

..Adaptable to any Roof Design...

VEIGHT-SAVING, COST-SAVING Roof Systems

With ALL the Extra Benefits of

- **FIRE-SAFETY**
- **INSURANCE SAVINGS**
- **INSULATION**
- **FASTER CONSTRUCTION**
- **PERMANENCE**

onolite vermiculite Concrete is designed to heet any combination of requirements for any oof design—over formed steel, form board, netal lath, paper backed wire lath and struc-ural concrete—with maximum benefits for rchitect, builder, and owner. Not only do onolite roof deck systems contribute lifetime enefits, but they are a sure way to solve mmediate budgeting problems.

Network of Skilled Applicators All Over America to Help You!

se this exclusive Zonolite service extra. Trained and highly killed applicators are on call all over the country, qualified nd ready to help you solve your roof problems quicker, ore efficiently, at lower cost.

MAIL COUPON TODAY ➡

You can count on Zonolite vermiculite Concrete to provide:

1. Lightweight... low as 25 lbs. per cubic foot!
2. High insulation value... 1" is equal to 12" to 16" of ordinary concrete!
3. 100% Fire Safety... Zonolite Concrete is incombustible.
4. Permanent... good for the life of the building!
5. Economical... as attested by its use in over *half a billion* board feet of roof and floor area!

SEND FOR THIS FREE BOOK!

Get the full details of many roof systems... including design data, section drawings, ratings and other valuable and helpful information FREE. There's no obligation, just mail the coupon, today.

ZONOLITE COMPANY, Dept. PA-67
135 S. La Salle St., Chicago 3, Ill.

Please send me your new booklet, CA-19, "Systems of Lightweight Roof And Floor Construction."

*Name*_____

*Firm Name*_____

*Address*_____

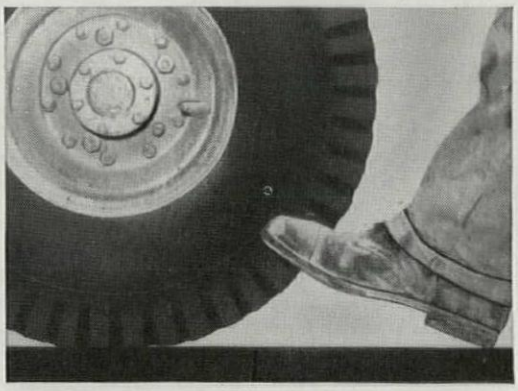
*City*_____ *Zone*____ *State*_____

☐ *Architect* ☐ *Builder* *Other*_____

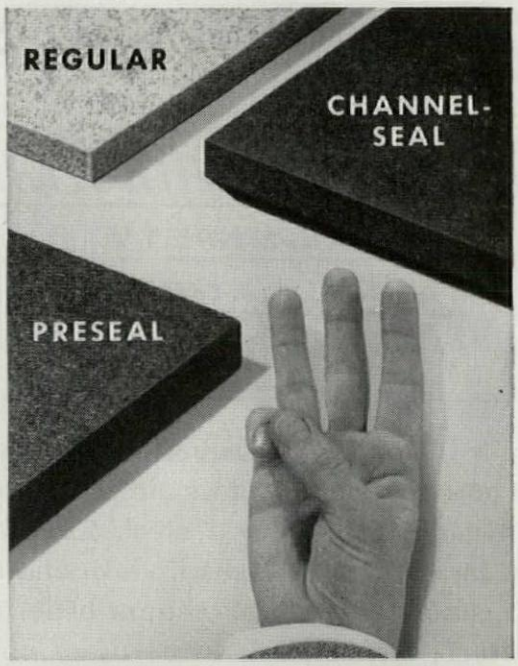
Get what you specify "and then some" in Job-Proved CELOTEX Roof Insulation

Permanently efficient insulation. . . plus important on-the-job advantages: Rugged, hard-to-damage. Lightweight, easy to handle and apply. Clean-cut, snug-fitting edges insure flush contact at joints. A smooth, solid base for roofing felts. Ideal mopping surface, excellent bond. Exclusive Ferox® treatment protects effectively against dry rot.

Performance-predictable. In Celotex Roof Insulation, you get what you specify—*and then some!* You get the assurance of dependable performance—*job-proved* ability to stand up to time, wear, weather. Billions of feet have been used on buildings of all types, all over the country. Many of these installations have been in service for twenty to twenty-five years and are as sound and efficient as when applied. And, thanks to continued research and manufacturing advances, the improved product made today is better than ever.



Wheeling and heeling hold no terrors. Celotex Roof Insulation takes heavy job and maintenance traffic in stride. Strong, rigid, crush-resistant, uniform density and thickness. Compresses only about 1% under load of 700 lbs. per sq. ft. No worry about punctures, breaks or depressions that become hidden weak spots under roofing.



A type for every job requirement. PRESEAL: Asphalt-coated on both faces and edges for greater protection against moisture pick-up. CHANNEL-SEAL: Bevels on deck-side form network of channels for equalization of air and vapor pressure, providing extra protection against blistering and separation of felt and insulation, asphalt-coated. REGULAR: Uncoated Celotex board. Recognized standard where lowest cost insulation is required. All in a variety of thicknesses.

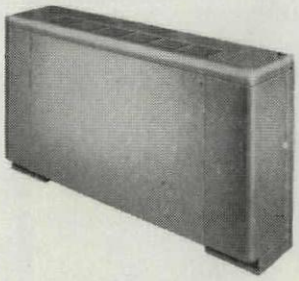
See 1957 Sweet's Architectural File, catalog 10a Ce.

FOR SPECIFICATIONS, SAMPLES, INFORMATION MANUAL, WRITE THE CELOTEX CORPORATION, 120 S. LA SALLE ST., CHICAGO 3, ILLINOIS

1,245 MARLO SEAZONAIRES HEAT AND COOL MASSIVE NEW WASHINGTON APARTMENTS

Here's beauty, comfort and luxury in a big handsome package—the new 4000 Massachusetts Avenue Apartments, Washington, D. C., with ultra-modern accommodations in 452 apartments. Owner, 4000 Massachusetts Avenue, Inc., Washington, D. C.

Air Conditioned? Of course! And Corning and Moore, architects for the project, approved Marlo Seazonaire Room Air Conditioning Units, Remote Type—1,245 of them —to provide year-round comfort in each suite. Two Marlo Ceiling Type Air Handling Units were also specified for larger areas of the building. Total cooling capacity of all Marlo equipment is 900 tons!



In the complete line of Marlo quality equipment you'll find the answer to every air conditioning need. Write us today for further information.

See Our Bulletin in SWEET'S

General Contractor: Standard Construction Co., Inc., Washington, D. C.

Consulting Engineers: General Engineering Associates, Washington, D. C.

Mechanical Contractor: W. G. Cornell Company, Washington, D. C.

MARLO coil co.

SAINT LOUIS 10, MISSOURI

Quality Air Conditioning and Heat Transfer Equipment Since 1925

reviews

(Continued from page 320)

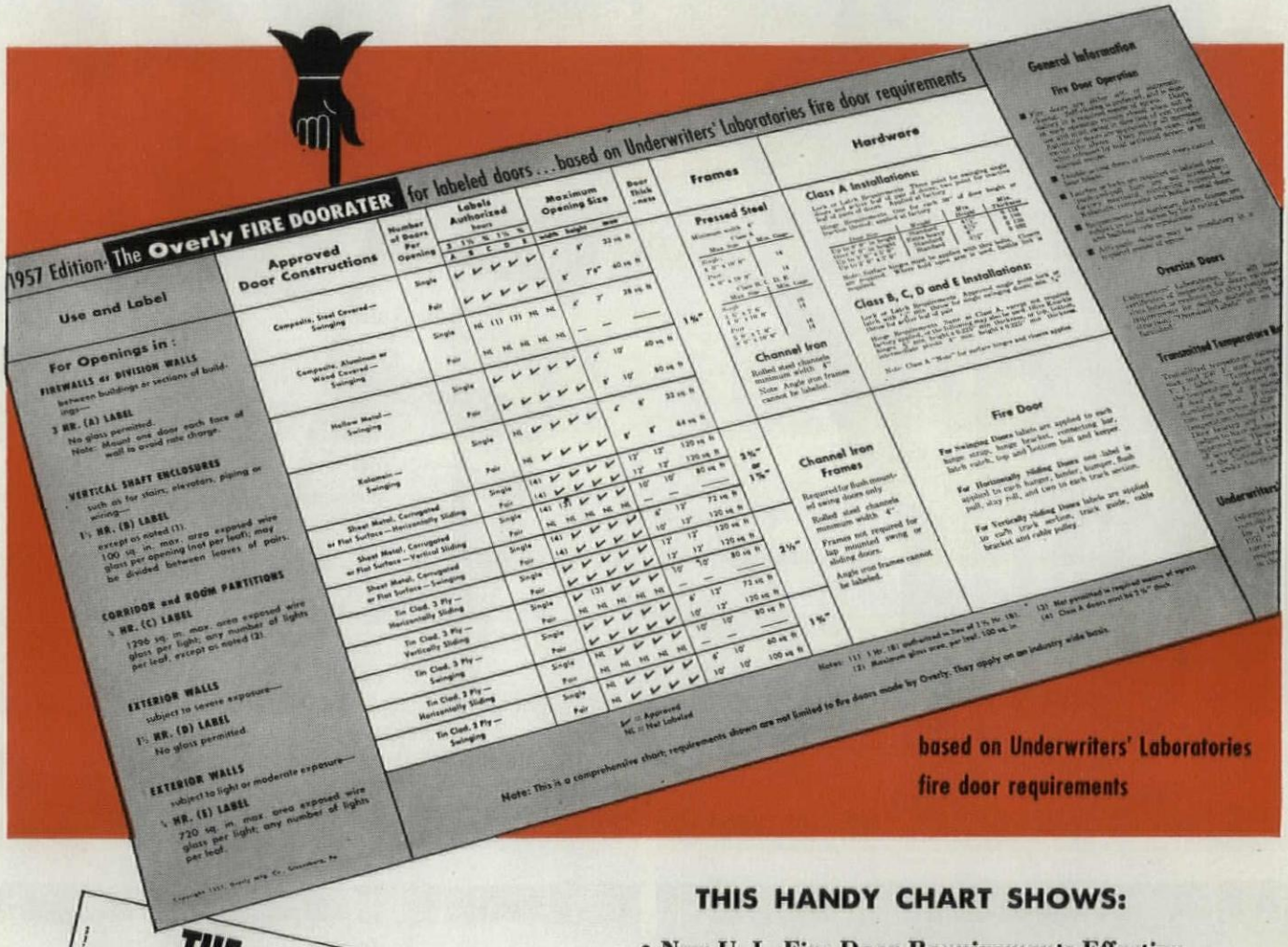
Cities in the United States have grown so rapidly, often without adequate planning or control, that planners and all responsible officials feel the need for foresight in regional planning and in the development of all the necessary facilities such as transportation, water supply, sewage handling, control of rivers, harbors, soil erosion, and protection against the ravages of nature such as earthquakes. Already a great strengthening of planning procedures is apparent in all phases of national life. Zoning and planning boards have sprung up, existing public works departments in cities have been granted greater scope and national bureaus are determined to aid in providing the necessary foresight and advice to prevent the unsatisfactory conditions that have often developed through overcrowding in communities which sometimes became quaint but seldom efficient. Planning boards in cities have found that more architects and consulting engineers, specializing in planning, are available to help them. Colleges of engineering and architecture have added curricula in planning, usually in their graduate schools. National contests for the redevelopment of cities and parts of cities have stirred the imagination of professionals and students who have participated in them. From the knotty problems of existing confusion, professionals look forward to better things in new areas. *American Civil Engineering Practice* should be a valuable reference to all of these people who will direct the orderly solution of problems that will arise in an era of fast expansion of population and rapidly developing technology.

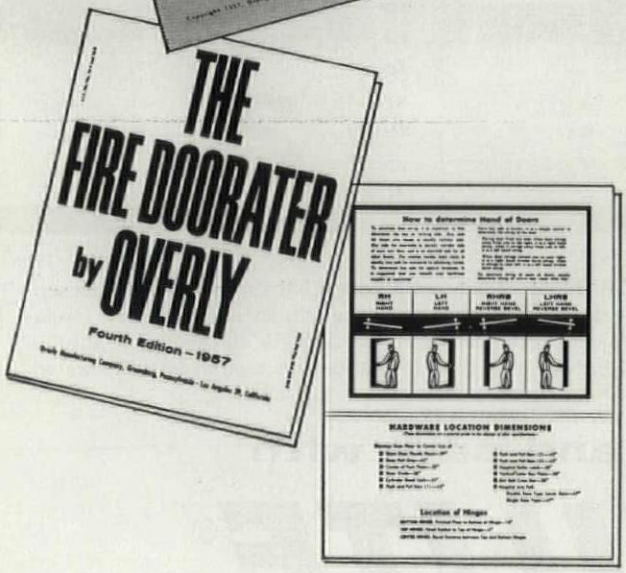
To the civil engineer, in particular, the one book is a library. Under the able direction of Abbett, more than 50 highly qualified and nationally known experts have developed their specialties in understandable and complete form. The list is formida-

(Continued on page 330)

By Architectural Demand!

The NEW 1957 FIRE DOORATER by Overly is here! Fourth Edition





THIS HANDY CHART SHOWS:

- New U. L. Fire Door Requirements Effective 1/1/57
- Data on Transmitted Temperature Ratings
- How to Determine Hand of Doors
- Hardware Location Dimensions

The FIRE DOORATER by Overly is recognized as the most complete condensation of fire door rating data ever produced. It now includes the new U. L. technique of labeling, which combines hourly ratings with letter designation of location. This new architectural tool is now ready for your desk.

Address . . .

OVERLY MANUFACTURING COMPANY
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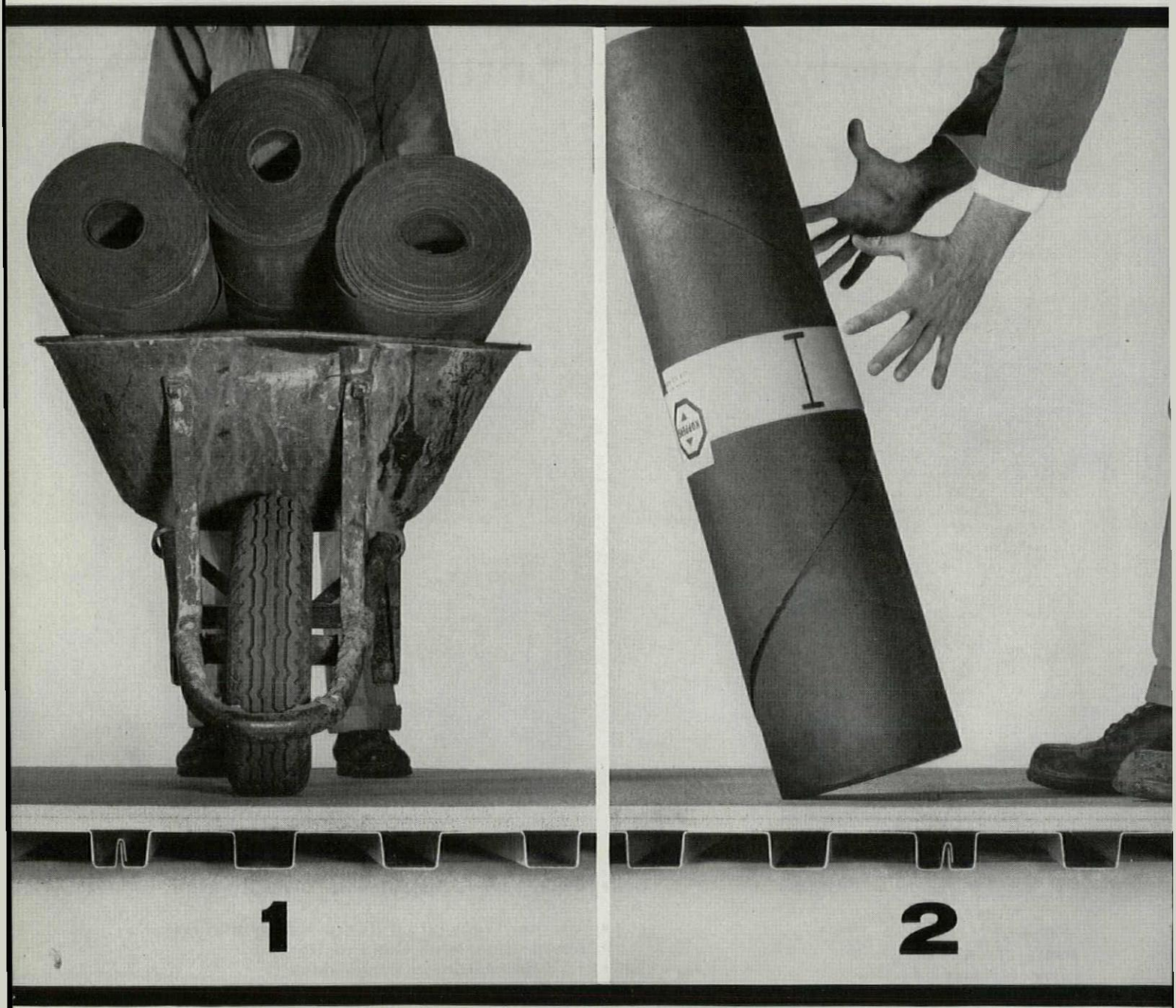
Send today for your FREE COPY!

3 tests of strength



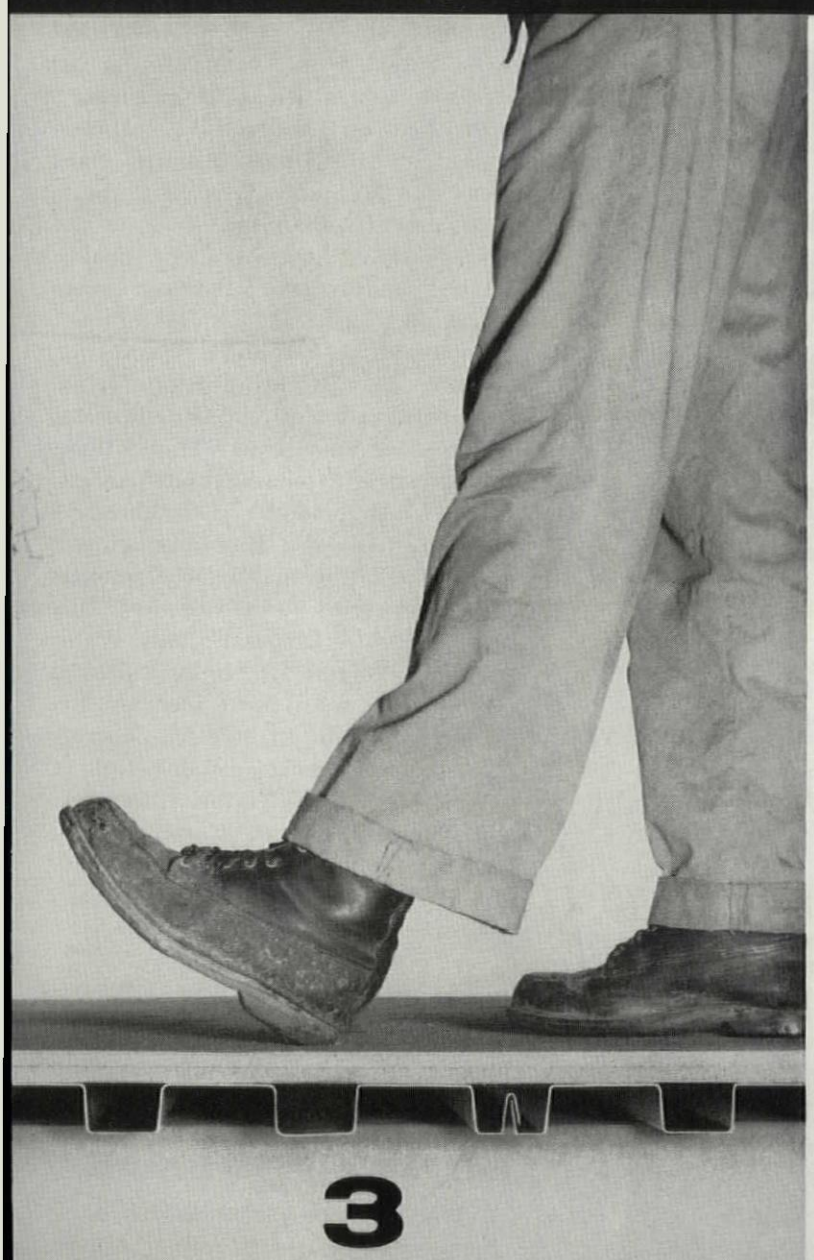
These tests can be made at any roof job: **1.** BARROW TEST. Run heavily loaded barrow on line between support surfaces. **2.** DROP TEST. From height of 12 inches, drop wrapped roll of roofing felt, letting edge strike insulation. **3.** HEEL TEST. Kick the insulation sharply, at any point between flat support surfaces. In these tests, Insulite Roof Insulation will not crack, crush or break through. 1-inch Insulite Roof Insulation was used in tests illustrated.

build better and save with

INSULITE®

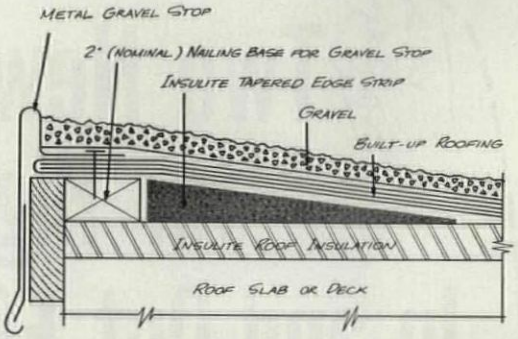
INSULITE, *made of hardy Northern wood,* Insulite Division of Minnesota and Ontario Paper Company, Minneapolis 2, Minn.

in roof insulation

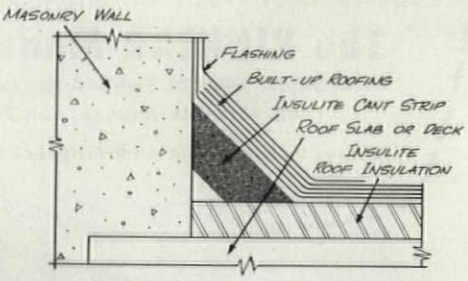


3

For better roofs, specify these accessories



Announcing . . . Insulite Tapered Edge Strip! Here is a valuable new product—an important "finishing touch" to make roofs more perfect than ever before. Insulite Tapered Edge Strip is bevel-cut from Graylite Roof Insulation. Used at outer edges of flat roofs, it underlies felt layers, eliminates sharp angles where cracks often develop, carries felt smoothly over edge nailing member. May also be used at any point on flat roof area to channel drainage. Tapered Edge Strip measures 1⅝" at thick edge, tapering to ⅛". Width is 12". Strips are delivered in 4′ lengths.



Insulite Cant Strips have long been accepted as the ideal angle-breakers at points where roof surface meets any vertical surface. Made in two sizes, 3"x3" and 4"x4".

Here is practical proof of Insulite's superior strength . . . and the news about Insulite Tapered Edge Strip

For the architect who does not have time to study newest detailed technical data on built-up roofing, one simple fact may be most helpful: *today, more than ever before, a sound, trouble-free roof demands insulation with high transverse and compressive strengths.*

These strength properties are needed to resist cracking, crushing, flexing—especially with heavy rooftop equipment now in use.

To demonstrate, in the simplest possible way, the high strength of Insulite Roof Insulation, we suggest the three simple tests illustrated in the photos above. Obviously, any material that can withstand such punishment can be trusted to handle severe blows and heavy loads.

With Insulite on the deck . . . and Insulite's new Tapered Edge Strips and cant strips in place . . . a fine, long-lasting roof is well begun. Want information? Write us—Insulite, Minneapolis 2, Minnesota.

reviews

(Continued from page 326)

ble; it includes consulting engineers, professors, and engineers in public service; Hardy Cross on "Concrete," Abbett on "Harbor Engineering," Ole Singstad on "Tunnels," General Stratton on "River Engineering," Dr. Feld on "Foundations," Harold Hauf on "Buildings," Admiral Mack on "Soil Mechanics," De Pasciuto on "Community Planning."

Liberally illustrated with charts, tables, and diagrams the book covers a wide scope. Volume I includes: Community Planning, Surveying, Traffic and Highway Engineering, Airport and Railroad Engineering, Soil Mechanics and Foundations, Earthwork, Dredging and Tunnels. Volume II includes: Hydraulics and Dams, River and Harbor Engineering, Irrigation and Land Drainage, Hydroelectric Power, Sewage Disposal, Refuse Disposal, Public Water Supply. Volume III (to be published later this year) will include: Reinforced- and Prestressed-Concrete Structures, Footings and Retaining Walls, Steel and Reinforced-Concrete Bridges, Buildings, Towers, Bins, Silos, Timber Structures, Earthquake-resistant Design.

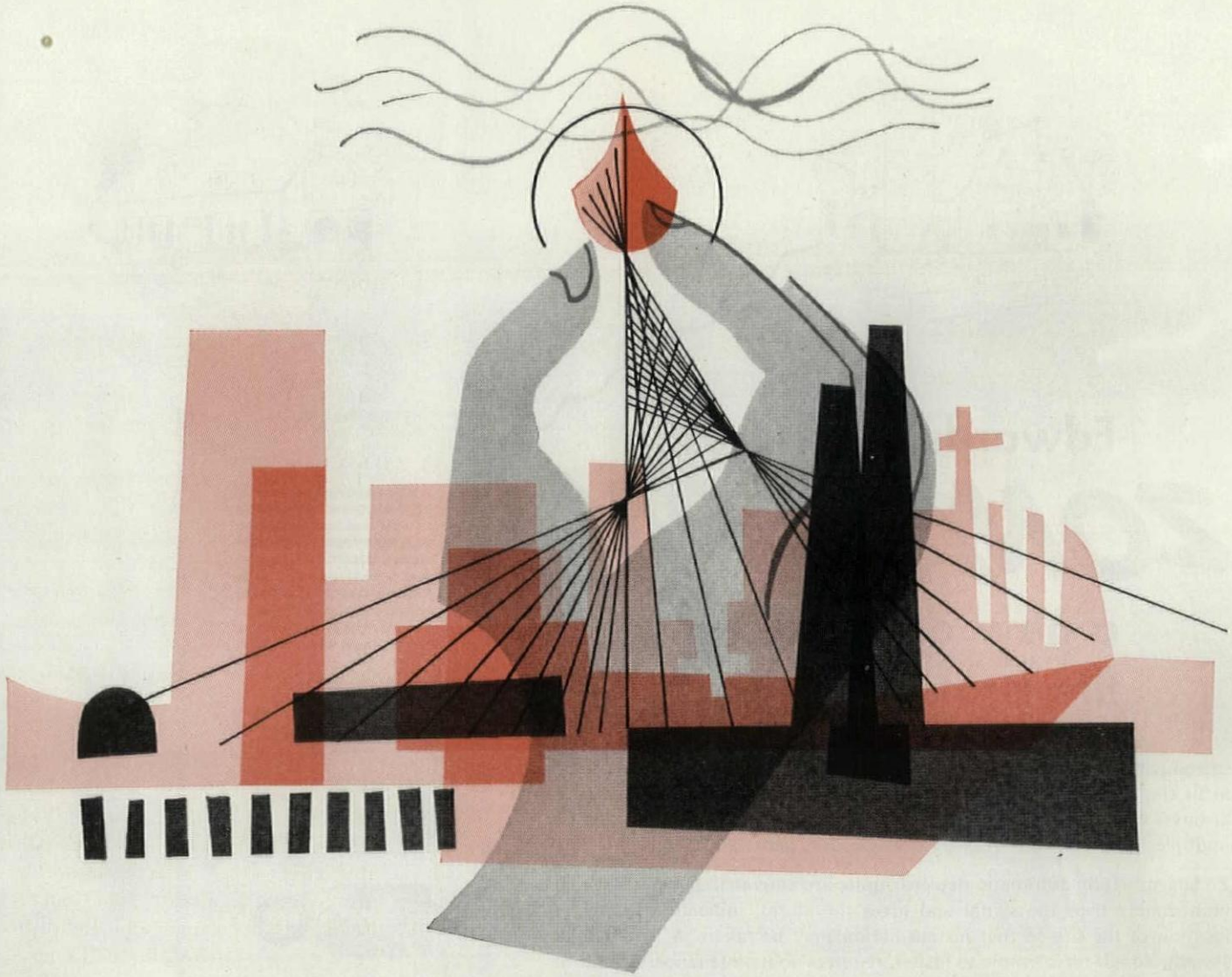
WILLIAM J. McGUINNESS

helpful guide

Applied Structural Design of Buildings. *2nd Ed. Thomas H. McKaig. F. W. Dodge Corp., 119 W. 40 St., New York 18, N. Y., 1956. 444 pp., illus., $12.50*

While tutoring architects and engineers for state licensing exams, Thomas McKaig drew upon his own experience as a consulting engineer to compile for his students a handbook on structural design, privately published in 1949. Since that time, changes in building technology—such as the 1951 revision of the ACI Code for reinforced concrete—and suggestions from users of the book prompted the author to prepare a revised second edition.

(Continued on page 336)

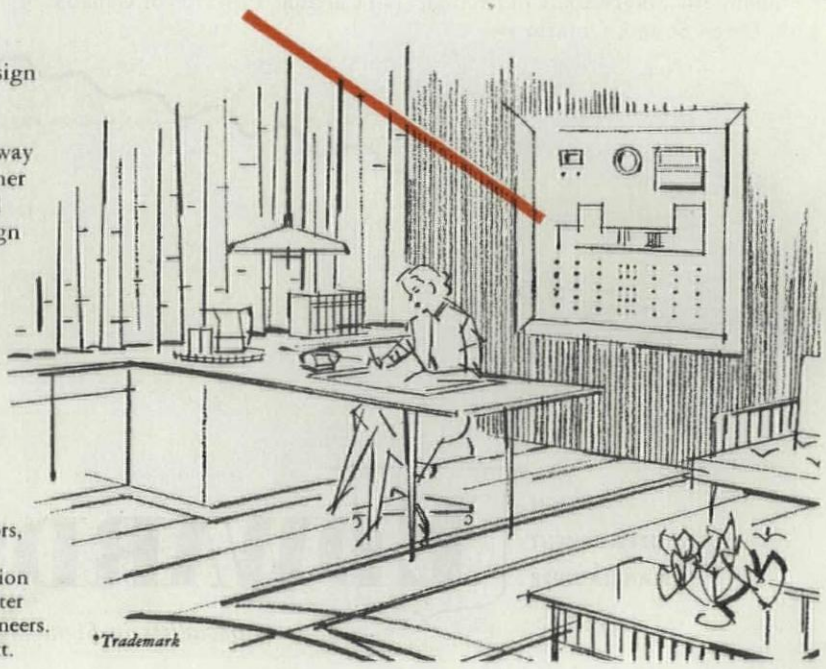


SUPERVISORY DATACENTER*

First step toward centralized automation in buildings

NEW IDEAS of major significance to building design are rare indeed. The Supervisory DataCenter panel is perhaps one of these. For by completely centralizing air conditioning control, it points the way to similar economies in the integration of many other mechanical functions. Conception, placement and installation of the DataCenter involve creative design factors that are of first concern to the architect. Your local Honeywell man has full details.

Minneapolis-Honeywell Regulator Company



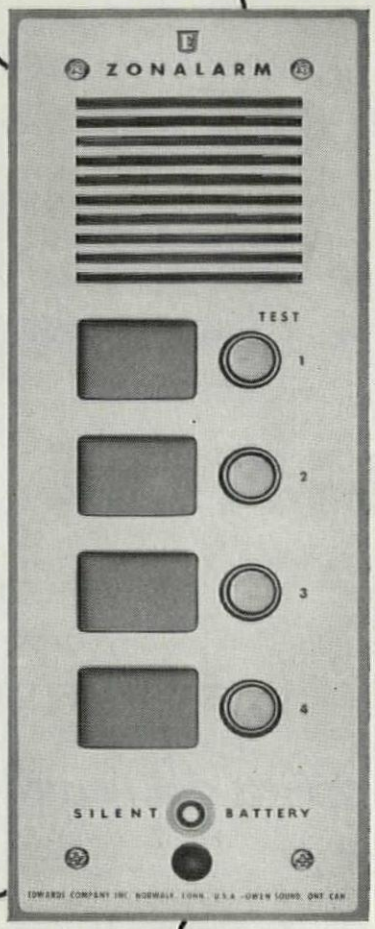
Rendering at right shows how a non-technical receptionist, even while taking calls and receiving visitors, can oversee comfort in a building when Supervisory DataCenter is installed. A similar installation is in operation at the Hillyard Chemical Co., St. Joseph, Mo. DataCenter there designed by: Turnbull-Novak, Inc., Consulting Engineers. Project supervised by Harlen E. Rathbun, AIA, Architect.

*Trademark

Edwards introduces

ZONALARM

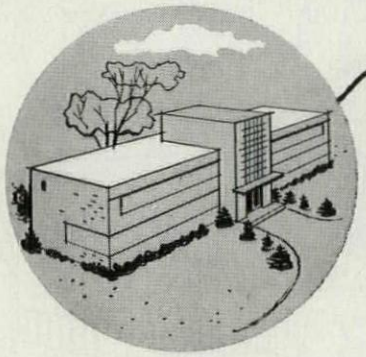
a new dimension in fire protection



Introducing Zonalarm . . . the new fire locating system designed and priced to fit the specific needs of larger homes, farms, small institutions and business establishments. Completely automatic, it permits protection of multiple buildings and areas by a single, inexpensive system.

Zonalarm's fully automatic detector units are activated at 140° F which immediately trips the signal and gives the alarm, indicating the exact location of the fire so that instant action may be taken. A low-voltage system, Zonalarm is simple to install, requires no maintenance. A built-in test button permits Zonalarm to be tested at any time . . . gives assurance that the system is always in perfect order. In case of power failure unit automatically switches to battery operation. Zonalarm is the first full-scale automatic fire alarm system designed to sell for under $200 installed.

For complete information about Zonalarm write Dept. PA-6, Edwards Company Inc., Norwalk, Connecticut. (In Canada: Edwards of Canada, Ltd., Owen Sound, Ontario.)



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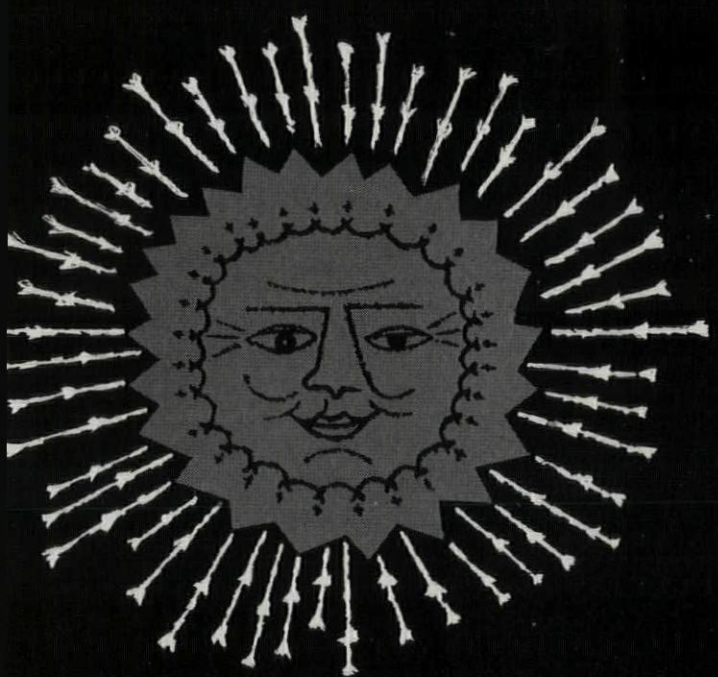

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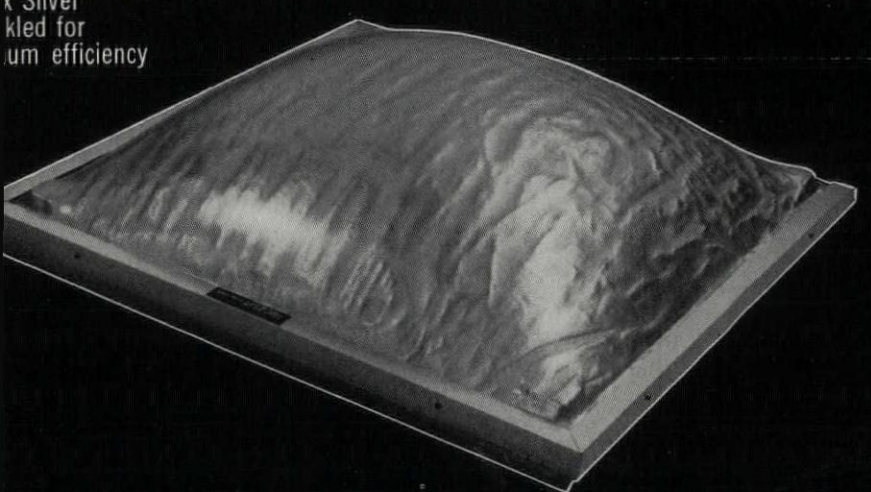

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Bay State Road, Cambridge 38, Massachusetts
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the skydome that does all 3
reduces heat . . . eliminates glare . . . controls daylight

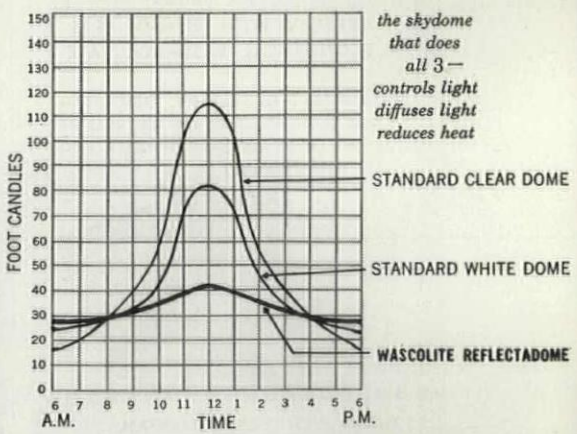
After years of development and research Wasco Products, the company that originated Skydomes, now offers you a revolutionary new overhead daylighting unit. It's Reflectadome, the one dome that reduces objectionable solar heat gain, eliminates glare and controls daylight —without supplementary light control fixtures.

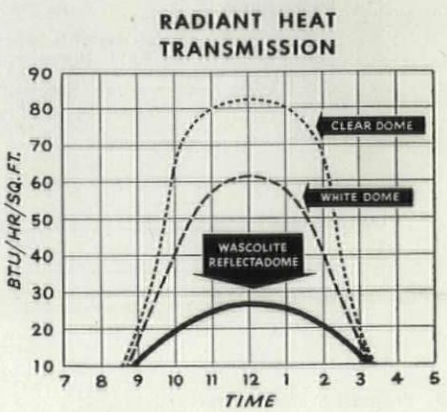
Reflectadome's secret is Solatex Silver, a special material embedded (not laminated) right into the acrylic dome. Reflectadome produces a remarkably level lighting curve to keep interiors evenly illuminated throughout the daylight hours for top visual performance.

Naturally, Wascolite Reflectadome features all the improved functional advantages of the Wascolite Skydome. Solatex Silver embedments are available only from Wasco, so specify Wascolite Reflectadome by name.

Write immediately for full details on exciting new Reflectadome, the one Skydome that does all 3! — reduces heat . . . eliminates glare . . . controls daylight.

*Trademark of Wasco Products, Inc.





reviews

(Continued from page 330)

This is basically a handbook on structural design, rather than a textbook on statics or strength of materials. (However, enough review of theory is included to refresh the memory of any reader in need of it.) It assembles into one convenient office manual the standard material for working problems of structural design — formulas, design methods, and the most frequently used tables.

Because the general principles of structural design are reviewed, this handbook will be an extremely helpful guide for those studying for licensing exams. It covers simple stresses, elastic theory, moment diagrams, and deflection formulas before proceeding to the design of steel, concrete, timber, and truss systems. With the addition of data on design loads, selection of the structural system, check list for structural drawings, and material on costs, this volume becomes equally valuable for the architect's or engineer's office. LOIS GREULICH

notices

new offices

BANNON & ANTINOZZI, Architects, 191 Franklin Turnpike, Hohokus, N. J.

DESIGN DYNAMICS, INC., new firm in industrial design field, LaSalle-Wacker Bldg., 221 N. LaSalle St., Chicago 1, Ill.

KENT BARKER, Architect-Planning Consultant, 723A Bayview Ave., Toronto 17, Ontario, Canada.

WALTER H. SOBEL and J. STEWART STEIN, Architects - Engineers, announce a new branch office at 10011 West Grand Ave., Franklin Park, Ill.

WALLACE HOLM, Architects & Associates, 321 Webster St., Monterey, Calif.

(Continued on page 344)

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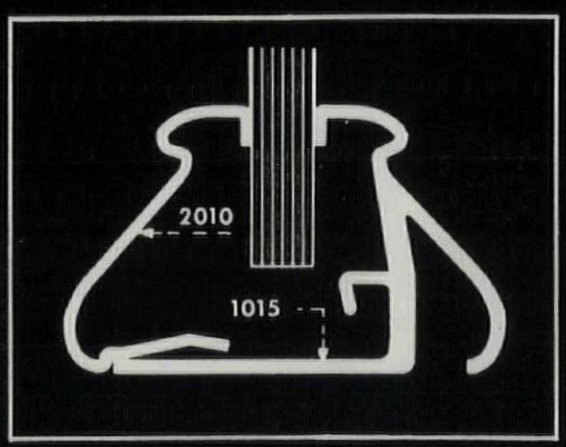
Whether you desire sash with gently curving contours, like this, or sash with rigid, angular outlines, you can find it in the complete line of Pittco Metal Products. For full information, consult your Pittco Store Front Metal Representative.



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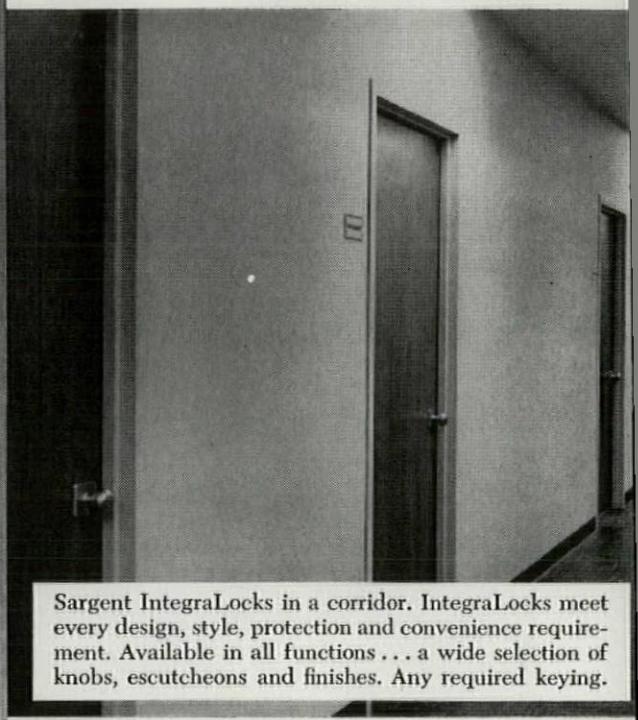
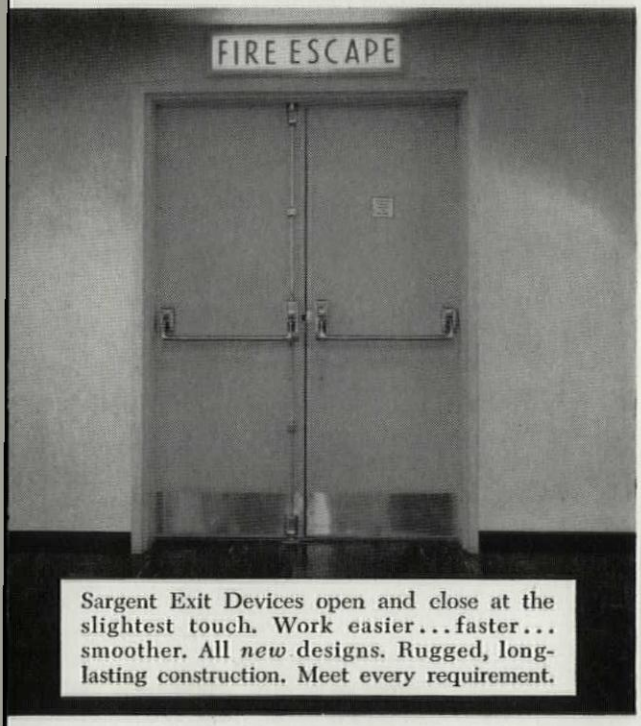
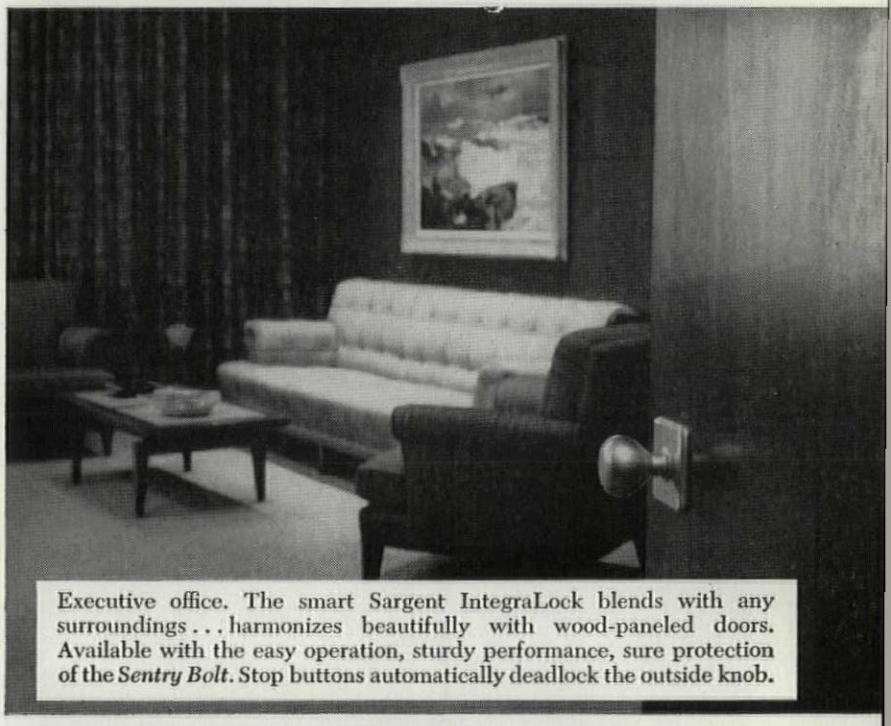


Sargent IntegraLocks in a corridor. IntegraLocks meet every design, style, protection and convenience requirement. Available in all functions . . . a wide selection of knobs, escutcheons and finishes. Any required keying.

selected by PRUDENTIAL



Sargent Exit Devices open and close at the slightest touch. Work easier... faster... smoother. All *new* designs. Rugged, long-lasting construction. Meet every requirement.



Executive office. The smart Sargent IntegraLock blends with any surroundings... harmonizes beautifully with wood-paneled doors. Available with the easy operation, sturdy performance, sure protection of the *Sentry Bolt*. Stop buttons automatically deadlock the outside knob.

New Chicago building completely equipped with Sargent IntegraLocks ...Sargent Door Closers... Sargent Exit Devices

A building moves on its hardware!

That's why The Prudential Insurance Company of America took such pains in selecting locks and hardware it can rely on for its magnificent new MID-AMERICA headquarters in Chicago.

That's why The Prudential tested builders' hardware *part by part... in a laboratory.* For quality construction ... and durability. *And then specified Sargent Locks, Door Closers and Exit Devices!*

You'll find that Sargent Contract Hardware will meet all of your specifications... in quality... appearance ... durability... ease of maintenance... and price.

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"...sign of long-lasting construction"

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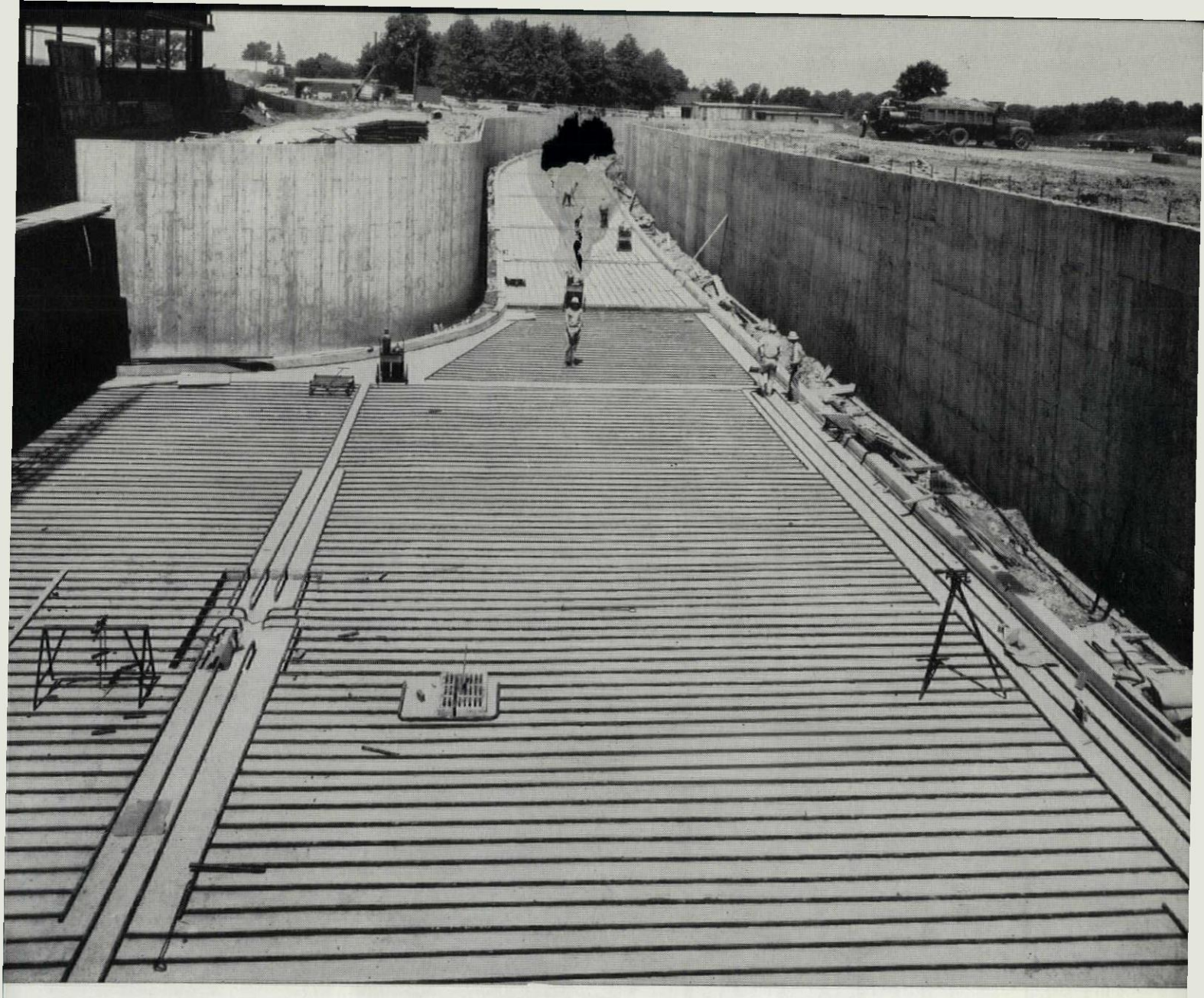

Built-in snow removal called for piping dependability —they used Wrought Iron

Not just snow melting—but *dependable* snow melting—was the leading design objective for this access ramp.

That's why designers of the new Connecticut General Life Insurance Company office building gave such careful consideration to material selection for this access ramp. Four major factors supported the use of wrought iron for this job: its corrosion-resistance—rugged strength—low coefficient of expansion with concrete—ease of fabrication.

In addition to snow melting service, wrought iron pipe was also installed for well water and cold water lines, chilled water mains, and well water piping in the heating and cooling system. Our booklet, "Byers Wrought Iron for Snow Melting Systems," offers case-history support for wrought iron's reliability in this service. Write for a copy.

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Engineer: Syska & Hennessy, Inc., New York, N.Y.

Contractors: Turner Construction Company, New York, N.Y. (General Contractors)
Cobra Pipe and Coil Company, Elmwood, Conn. (Snow Melting)
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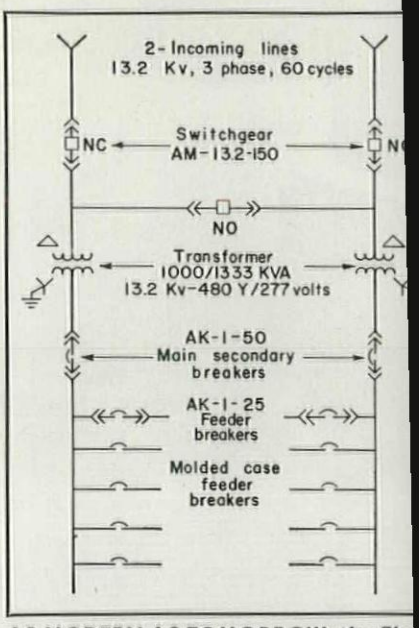

AS MODERN AS TOMORROW, the She
ton Hotel combines this highly effici
480Y/277-volt electrical distribution s
tem with forward-looking constructi

INCOMING SERVICE AT 13.2 KV is re
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metal-clad vertical lift switchgear.

SAFER G-E panelboards with molded-cas
circuit breakers are designed to occup
little space, permit easy wiring. They ar
installed in wiring closets.

General Electric 480Y/277-Volt Distribution System Permits $50,000 Savings at New Sheraton Hotel

MODERN HOTEL COMBINES FLEXIBLE LOAD CENTER SYSTEM, HIGH VOLTAGE LIGHTING TO CUT EQUIPMENT, INSTALLATION COSTS

Rising 22 floors above Philadelphia's Penn Center, the ultra modern Sheraton Hotel combines the latest in construction details with an efficient high voltage electrical power distribution system which is currently being installed in many commercial buildings.

Designed to provide maximum comfort and services for hotel guests, the new Philadelphia Sheraton Hotel has incorporated a General Electric 480Y/277-volt electrical system which permitted savings of $50,000. To design this modern system, G-E engineers worked closely with consultants Slocum and Fuller; and architects Perry, Shaw, Hepburn, and Dean. The electrical contractor was Keystone Engineering Corporation. One feature of the system is the installation of G.E.'s new quiet, dry-type, general purpose transformers. These low-noise-level transformers add further comfort for Sheraton Hotel guests.

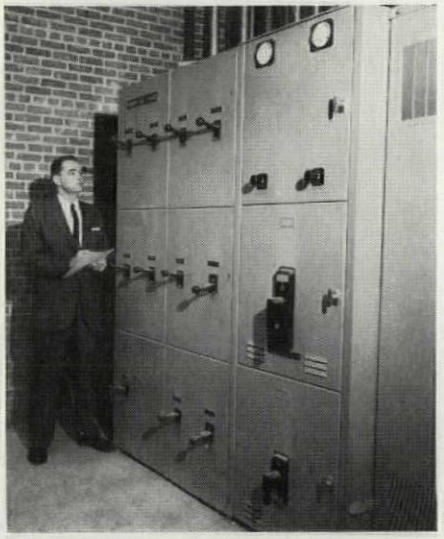
From primary switchgear at the incoming line through secondary distribution and protective apparatus, General Electric system-engineered equipment provides highly reliable power at the Sheraton.

To see how General Electric can help you achieve significant savings with a 480Y/277-volt electrical distribution system, consult your nearest G-E Apparatus Sales Office or write to General Electric Company, Section 680-11, Schenectady, N. Y.

Engineered Electrical Systems for Commercial Buildings

GENERAL ELECTRIC

FLEXIBLE double-ended load center unit substation with integrated units furnishes highly dependable power close to load.



COMPACT low voltage switchgear and distribution switchboard protect low voltage side of "packaged power" system.

QUIET General Electric dry-type transformers, with low-noise-level characteristics, help improve sleeping comfort for Sheraton guests.

DECORATIVE LIGHTING enhances main ballroom. High voltage lighting in many areas of hotel permits low-cost use of combined light and power system.

COORDINATING THE PROJECT were M. Savitt of Slocum and Fuller, H. Cohen and L. Evelev of Keystone, T. S. Duff of Slocum and Fuller and A. M. Cook, G.E.

notices

(Continued from page 336)

p/a congratulates . . .

E. F. KELLY, elected President, and Treasurer PHILLIP D. PRYNE, elected Vice-President of PRYNE & CO., INC., Pomona, Calif.

L. D. SHANK, newly appointed Representative of NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION to the Commercial-Institutional Task Group of the Plan Committee of NATIONAL ADEQUATE WIRING BUREAU.

JOHN MONTEITH GATES, Architect and Vice-President of STEUBEN GLASS, INC., newly appointed Director of Design for CORNING GLASS WORKS, Corning, N. Y.

WALTER W. UNDERWOOD, appointed Executive Director of NATIONAL CONCRETE MASONRY ASSOCIATION, Chicago, Ill.

J. E. HUNT, named Vice-President and Controller of DUO-BED CORPORATION, 4153 Redwood Ave., Los Angeles, Calif.

ARTHUR H. CAMPBELL, recently named Sales Promotion Manager, Contract Hardware Division, C. HAGER & SONS HINGE MFG. COMPANY, St. Louis, Mo.

EDWARD R. GARDNER, appointed Assistant Sales Manager, Erie, Pa., District, THE RUBEROID CO.

FREDERICK J. CLOSE, named Manager of the new Residential Building Products Program of ALUMINUM COMPANY OF AMERICA, Pittsburgh, Pa.

F. C. NICHOLAS, appointed Vice-President and National Sales Manager, PANELFAB PRODUCTS, INC., North Miami, Fla.

T. RAY JOHNSON, newly appointed Vice-President in charge of Sales and ROBERT G. STILLING, as the new General Sales Manager, W. R. MEADOWS, INC., Elgin, Ill.

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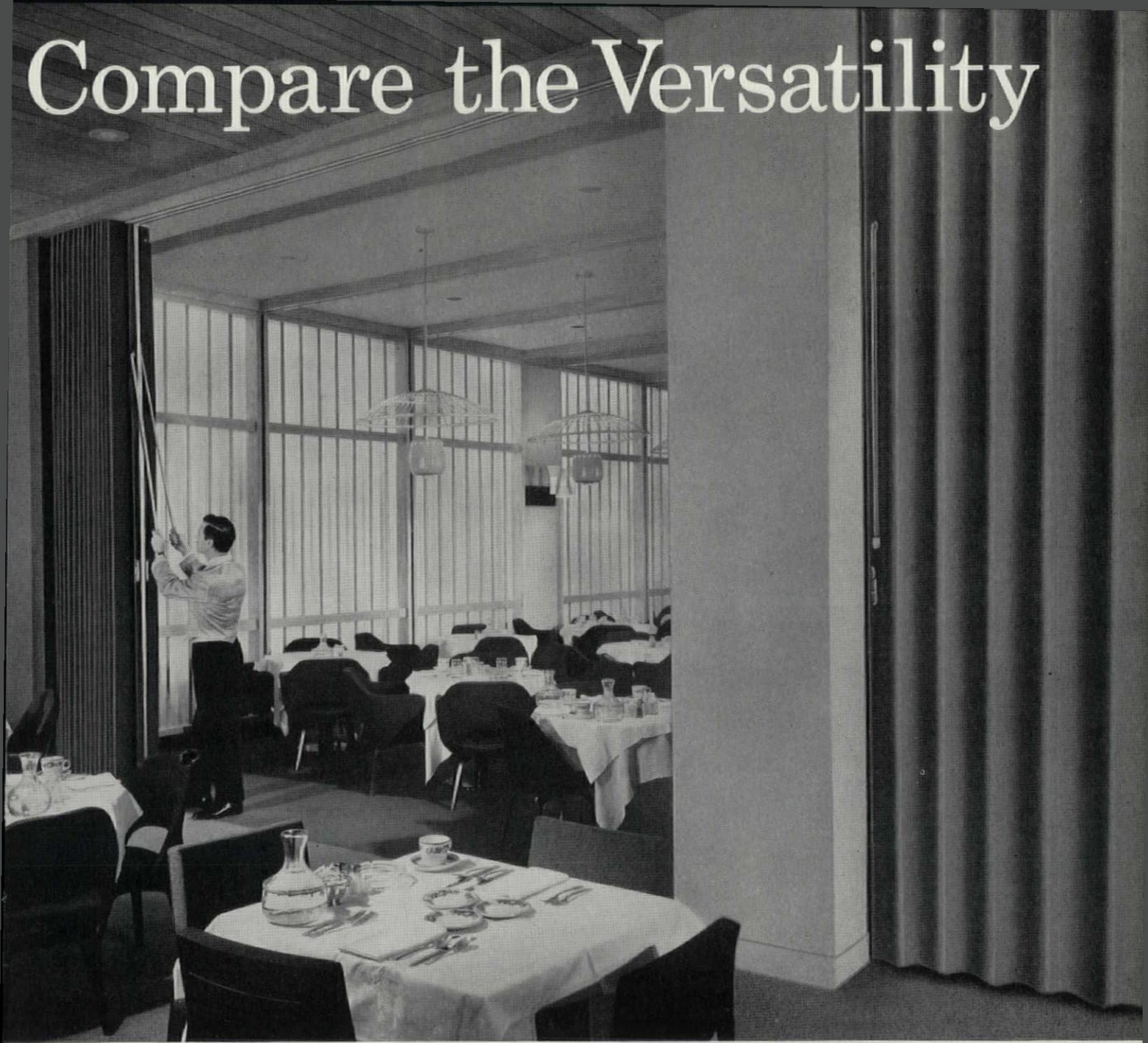

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or creating space...or for saving space in homes, commercial installa-ons and institutions, there's no other folding door that can measure up o MODERNFOLD for versatility.

Anytime you specify MODERNFOLD, you are specifying the finest for our clients. Because of MODERNFOLD's inner framework of double-trength steel it lasts a lifetime. And its beautiful, sturdy vinyl fabric eeds only soap and water to keep it clean. Not only that, but you can pecify almost anything you want in a MODERNFOLD from the world's ost complete selection of colors, finishes, sizes, tracks and switches. ou'll find out why, in detail, when you refer to Sweet's Catalogue.

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Vinyl covered, wide range of colors. Easily washed while in place. Inconspicuous overhead track needs no unsightly cornice. Double strength, all-steel framework. Available in standard or custom sizes.

MODERNFOLD DOORS HAVE BEEN USED BY 97% OF ALL ARCHITECTS

"Spacemaster" Line..."Custom" Line

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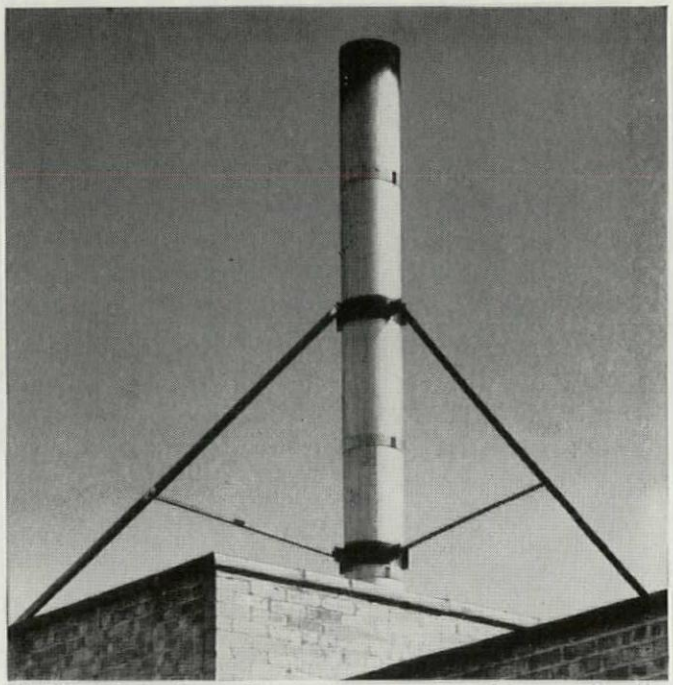
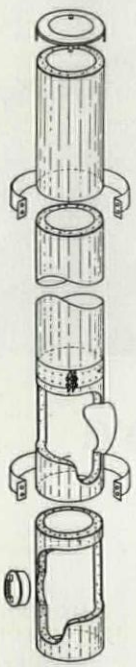


The Van-Packer is a cylindrical stack of 3-foot long centrifugally-cast refractory sections, cemented one on top of another and secured with draw-up joint bands. Sections are constructed of refractory material with aluminum outer jacket.

Van-Packer Refractory Stack provides permanence and high draft, costs 2/3rds less than brick stack



Low Cost — Factory-produced Van-Packer Stack costs an average of 2/3rds less than comparable brick stack, 1/2 less than comparable tile-lined concrete block stack, about the same as comparable steel stack.

Permanence—Refractory sections of Van-Packer Stack provide permanence of masonry, last an average of 3 times longer than steel.

High Draft—Tests prove Van-Packer Stack furnishes same high draft as comparable brick stack, substantially more draft than comparable steel stack, because insulated sections prevent excessive heat loss through stack walls.

No Maintenance—Aluminum jacket eliminates maintenance and requires no painting.

7 diameters from 10" I.D. to 30" I.D. in 2 types of stack sections: *Standard,* for flue gas temperatures up to 800°F. for continuous exposure and *Hi-Temp,* for flue gas temperatures up to 2000°F for continuous exposure. Van-Packer Stack handles all fuels; can be used for boilers, furnaces, incinerators.

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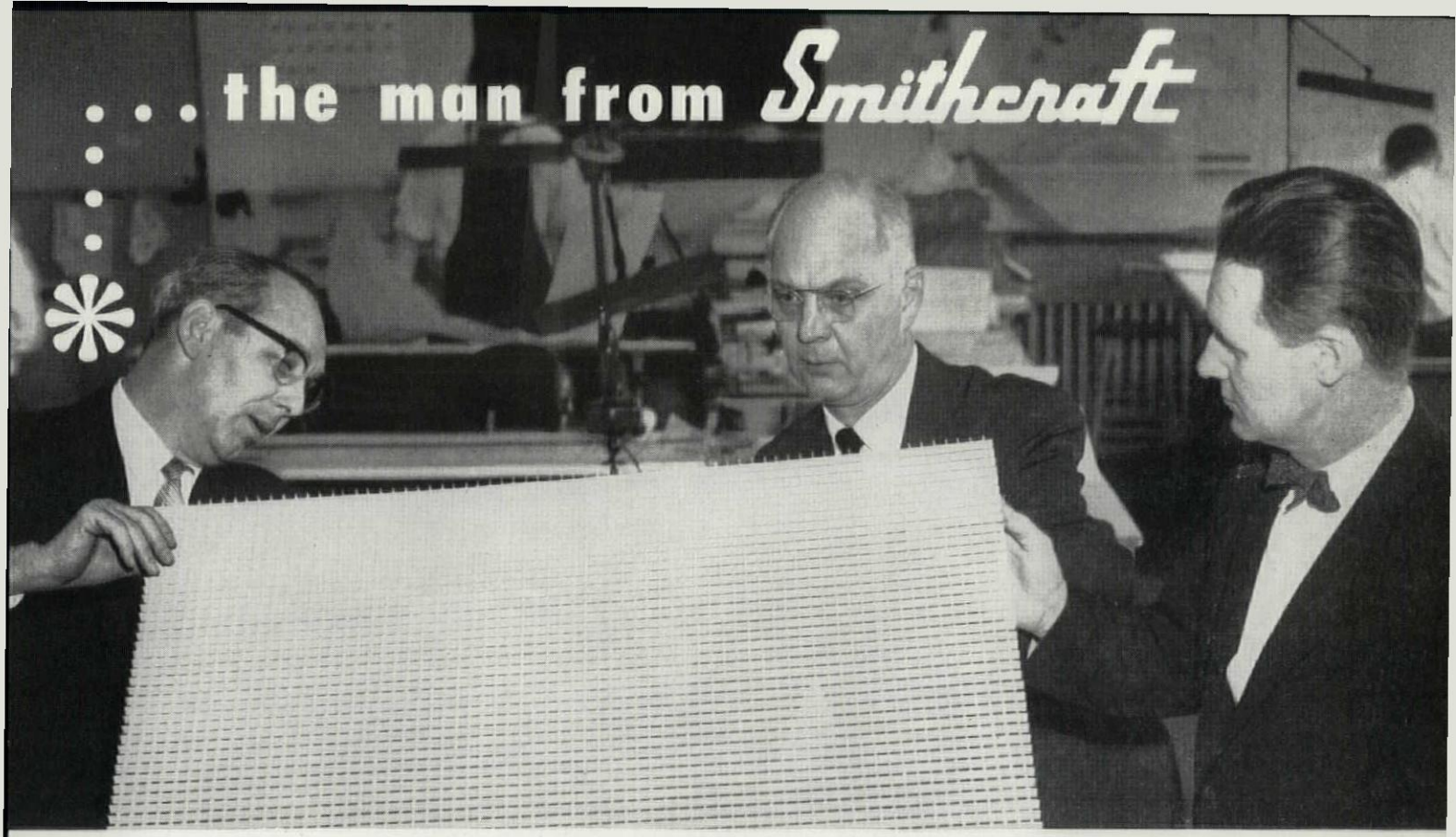

*John E. Artopoeus of Artopoeus-Smith Company, Northern Ohio representatives, one of Smithcraft's nationwide sales-engineer organization.

Whether he's in your office to bring you up-to-date on the newest development in shielding or out on the job to survey lighting requirements, his primary concern is to help you get the most out of every dollar ear marked for lighting! You can depend on his judgement because his reputation in the industry has been built on talking facts to men like yourself who want and need straight answers about lighting. You'll find it pays to call him!

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EXECUTIVE

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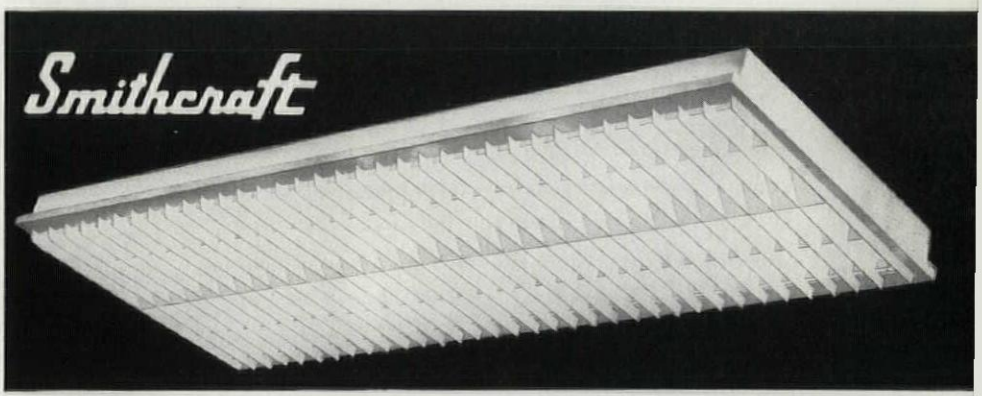

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New Dayton Daily News Building Gets Life-time Wiring Protection With

YOUNGSTOWN "BUCKEYE" STEEL CONDUIT

Electrical wiring system in the new Dayton Daily News Building will be permanently safe from damaging elements such as water, moisture, vapor, dust and dirt because Youngstown's Full Weight Rigid Steel "Buckeye Conduit is on the job 24 hours a day—every day.

If the safe and efficient operation of your electrcial systems—in any location— poses a problem, then Youngstown "Buckeye" Conduit should be your specification. Field reports relate: "It's easier to bend and thread—easier to fish wires through and because of its superior corrosion resistance, provides a much longer, trouble-free service life."

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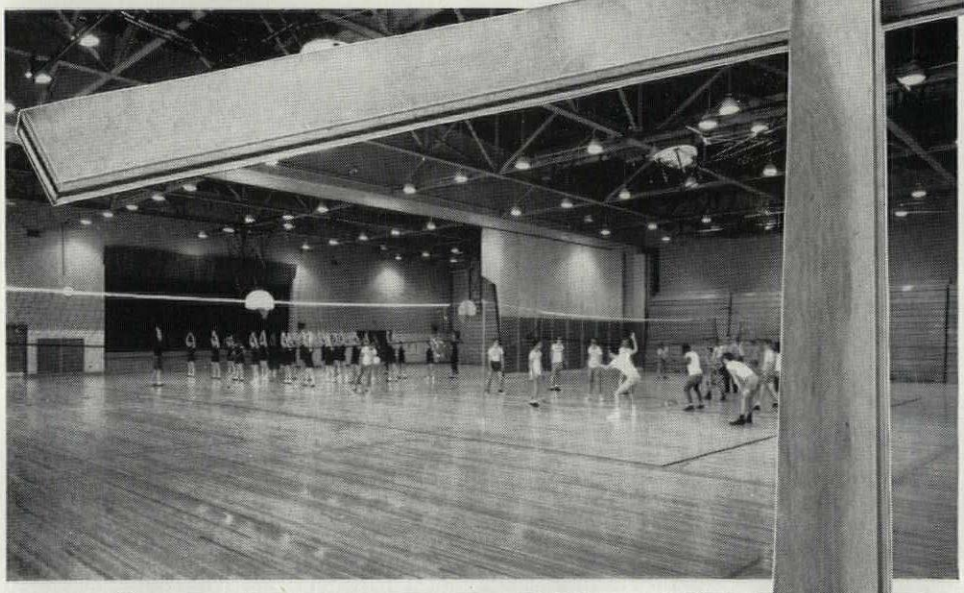
Above:
Hyde Park School, Waukegan, Illinois. Architects, Ganster & Hennighausen, Waukegan. Photo by Bill Hedrich, Hedrich-Blessing, Chicago.

Below:
Commercial High School, North Chicago, Ill. Architect, Warren S. Holmes Co., Lansing, Mich. Photo by Hube Henry, Hedrich-Blessing, Chicago.



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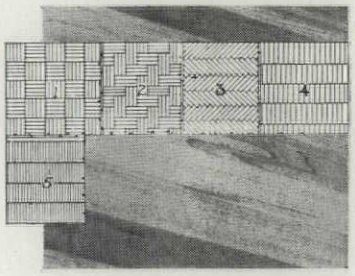

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(Continued on page 356)

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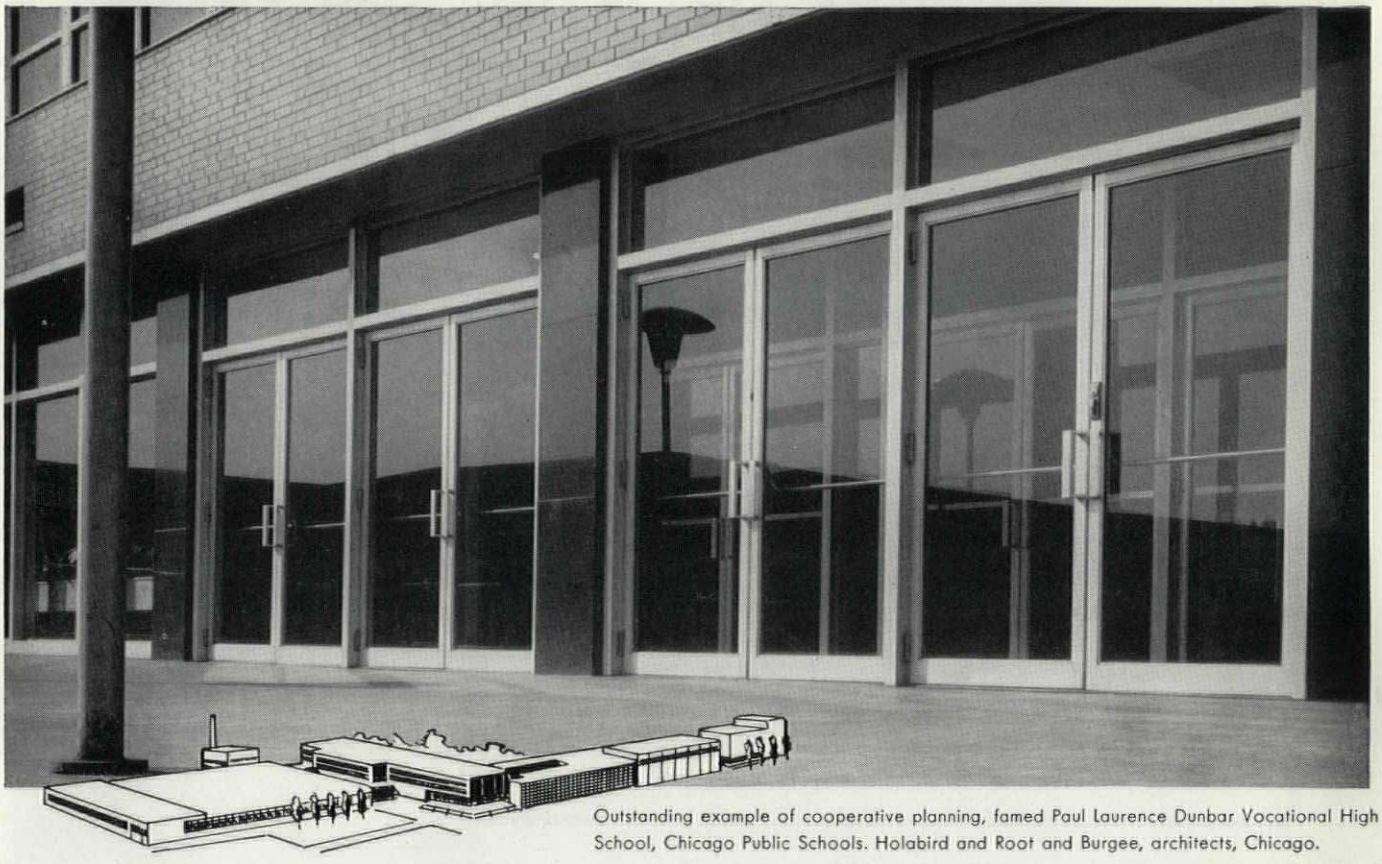

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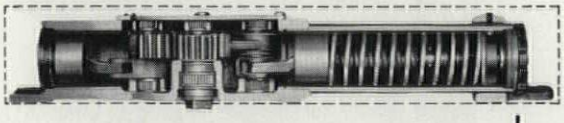

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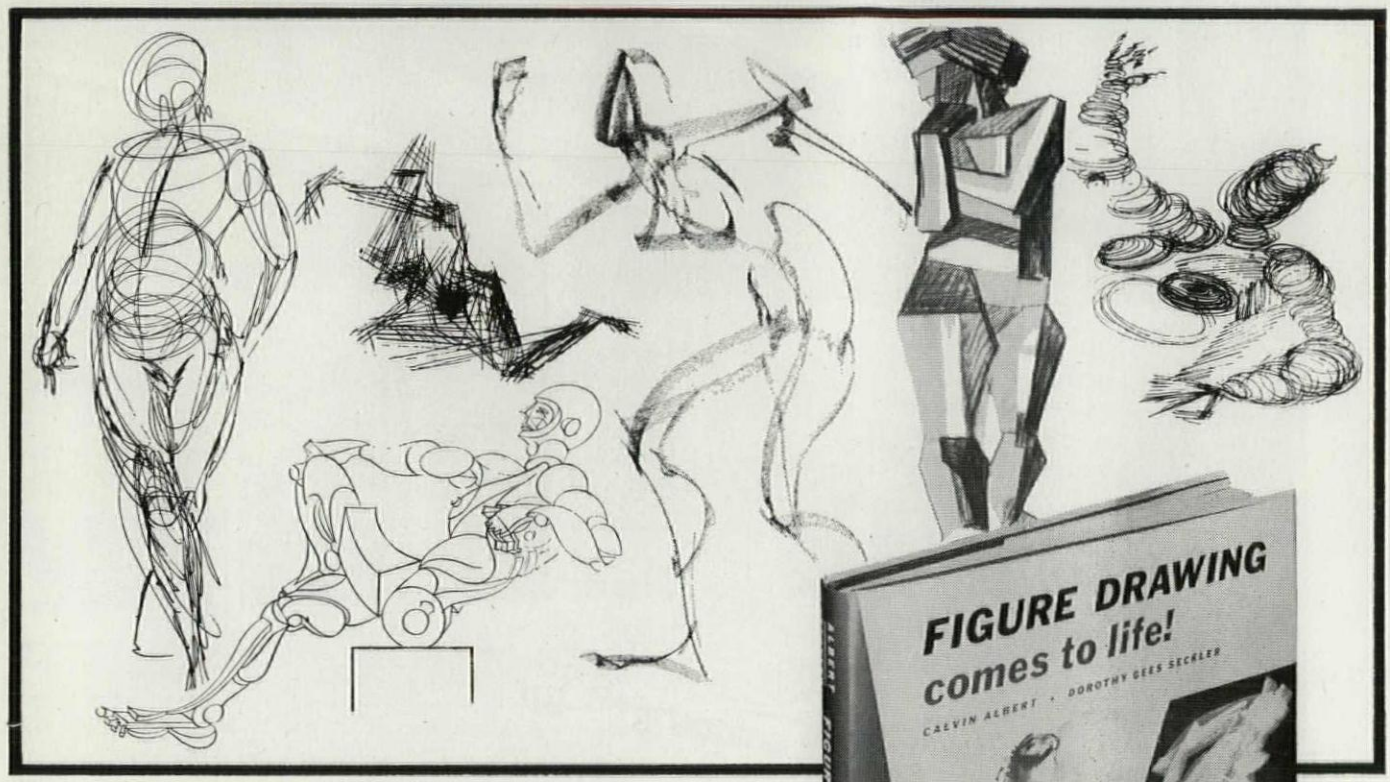

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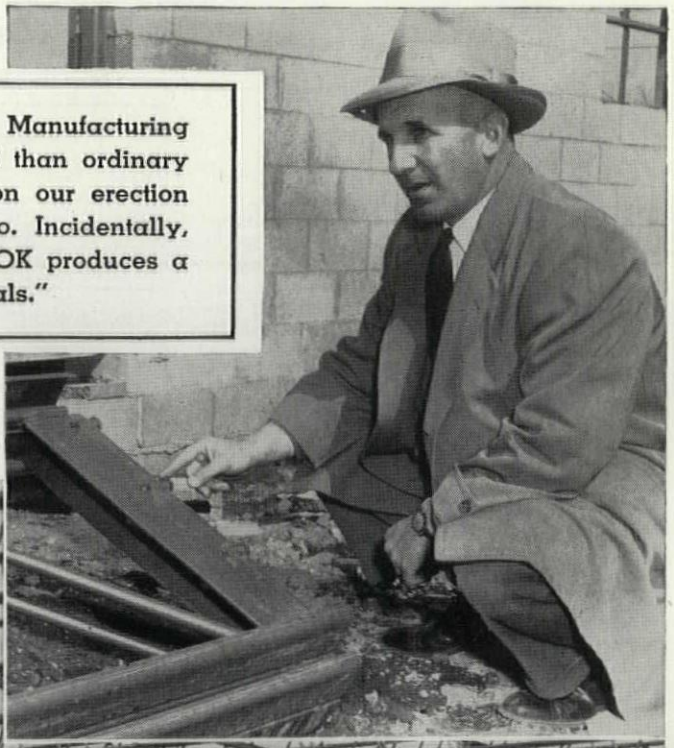

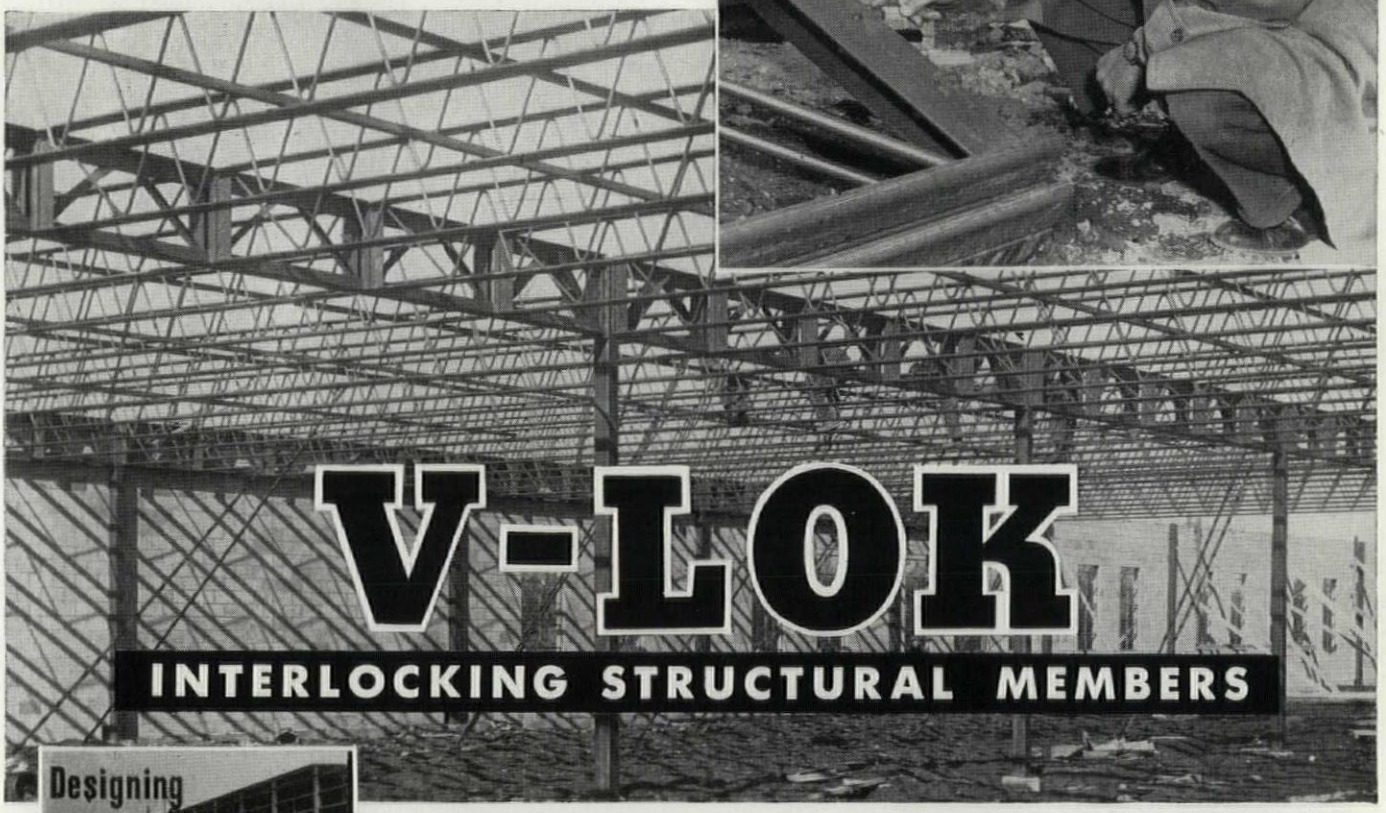

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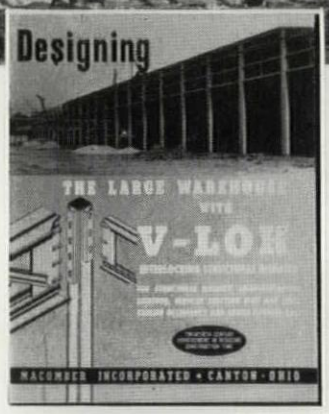

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(Continued from page 352)

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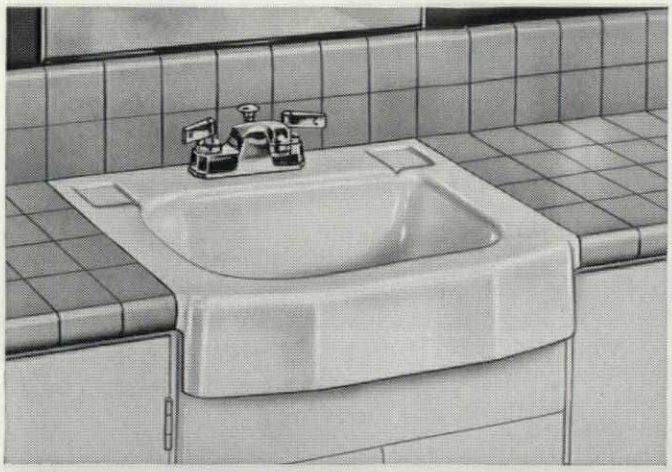
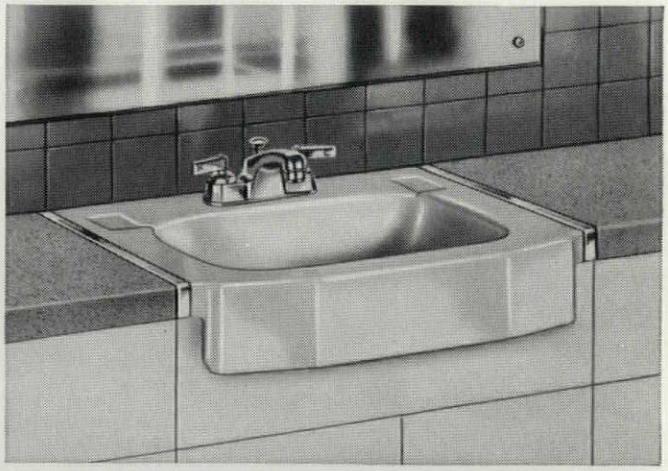
(Continued on page 365)

Vilas, *K-2835-C, of enameled iron, 20 x 18"*



Piedmont, *K-1850-C, of vitreous china, 20 x 18"*



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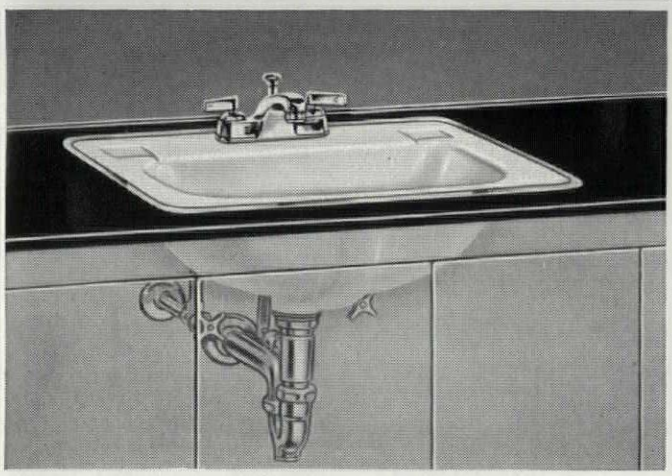
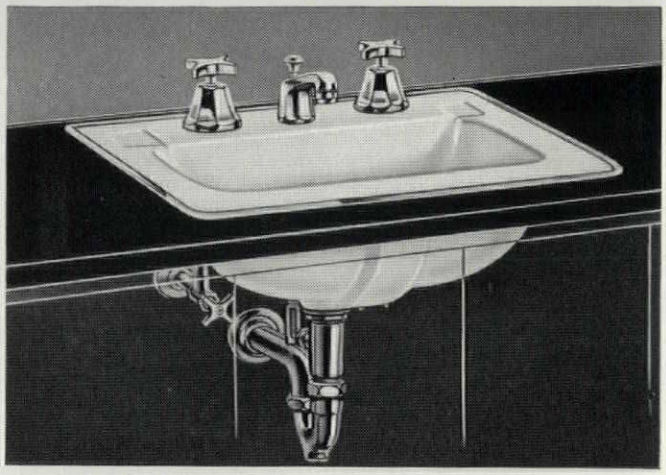


Tahoe, *K-2841-C, of enameled iron, 20 x 18", 24 x 18"*



Arrowhead, *K-1892-F, of vitreous china, 20 x 18", 24 x 18"*

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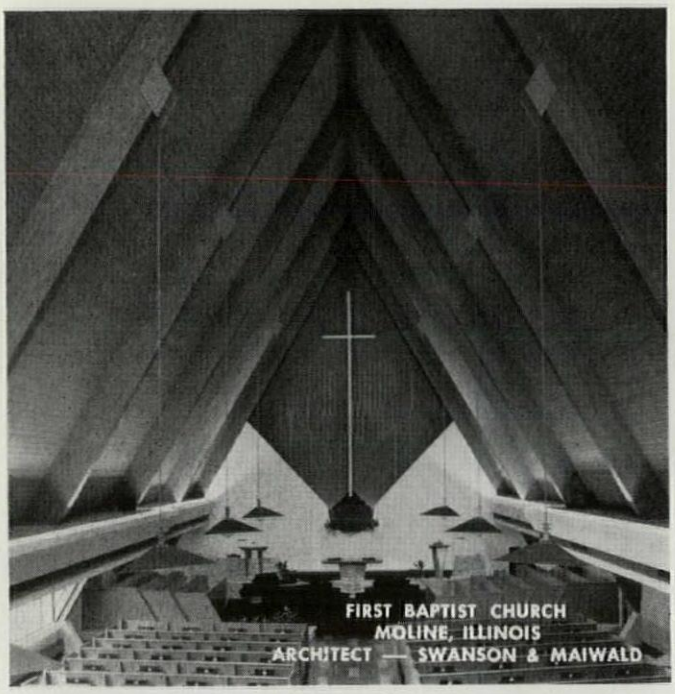

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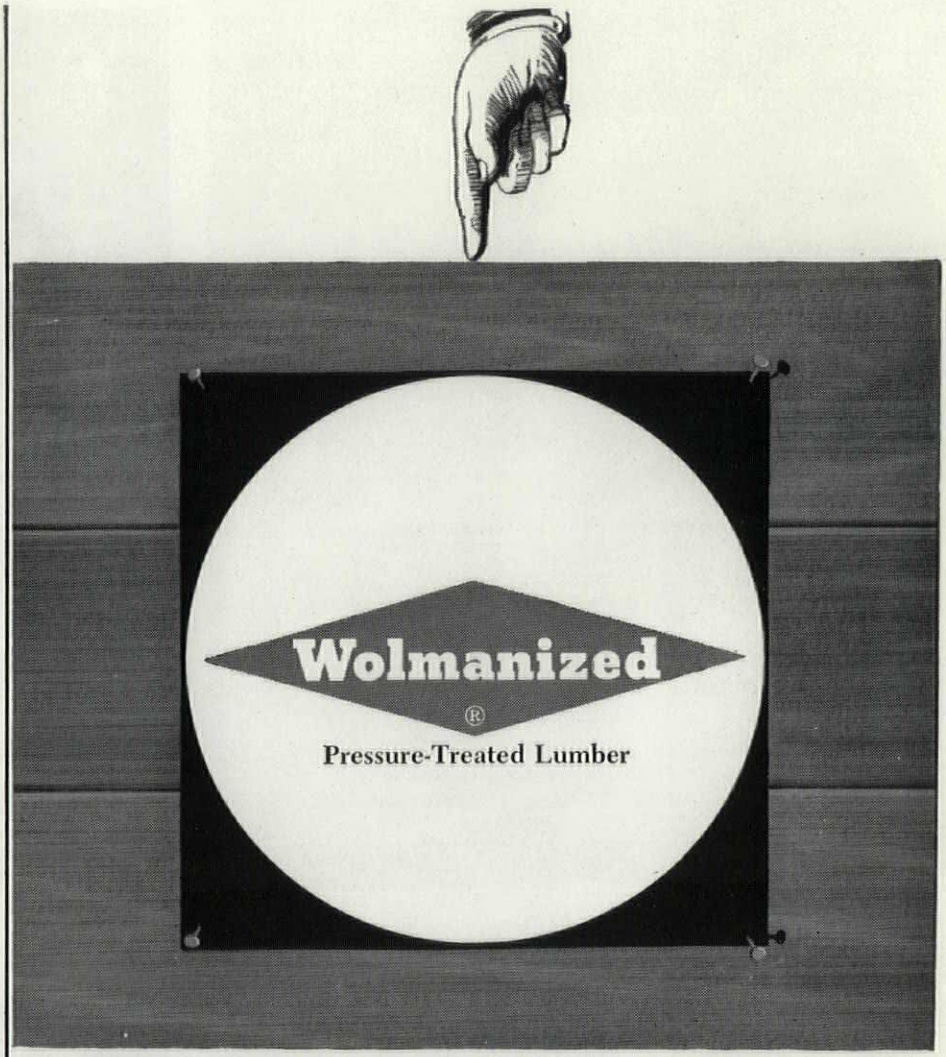

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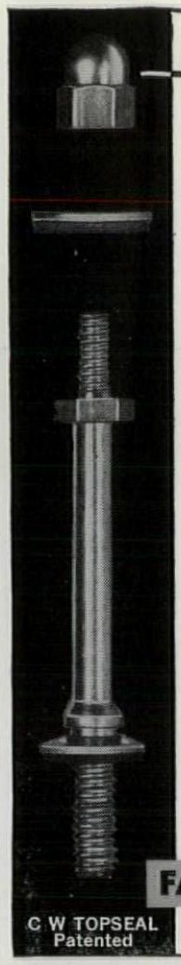

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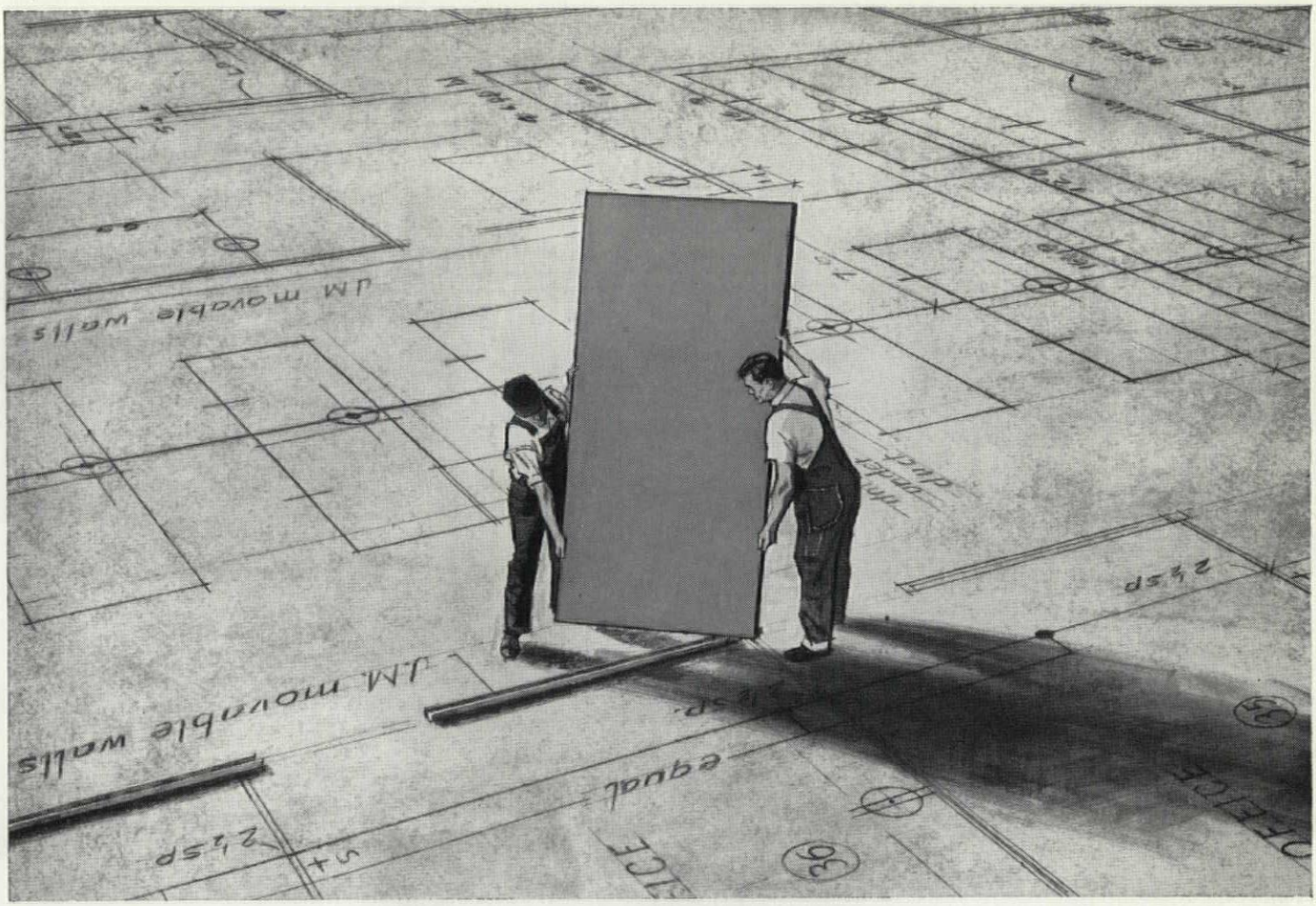

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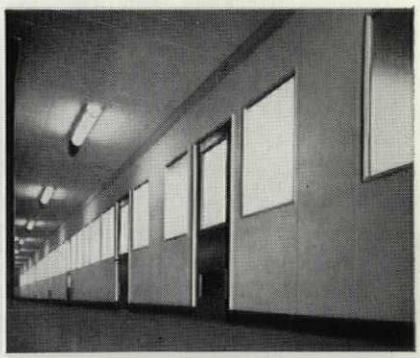

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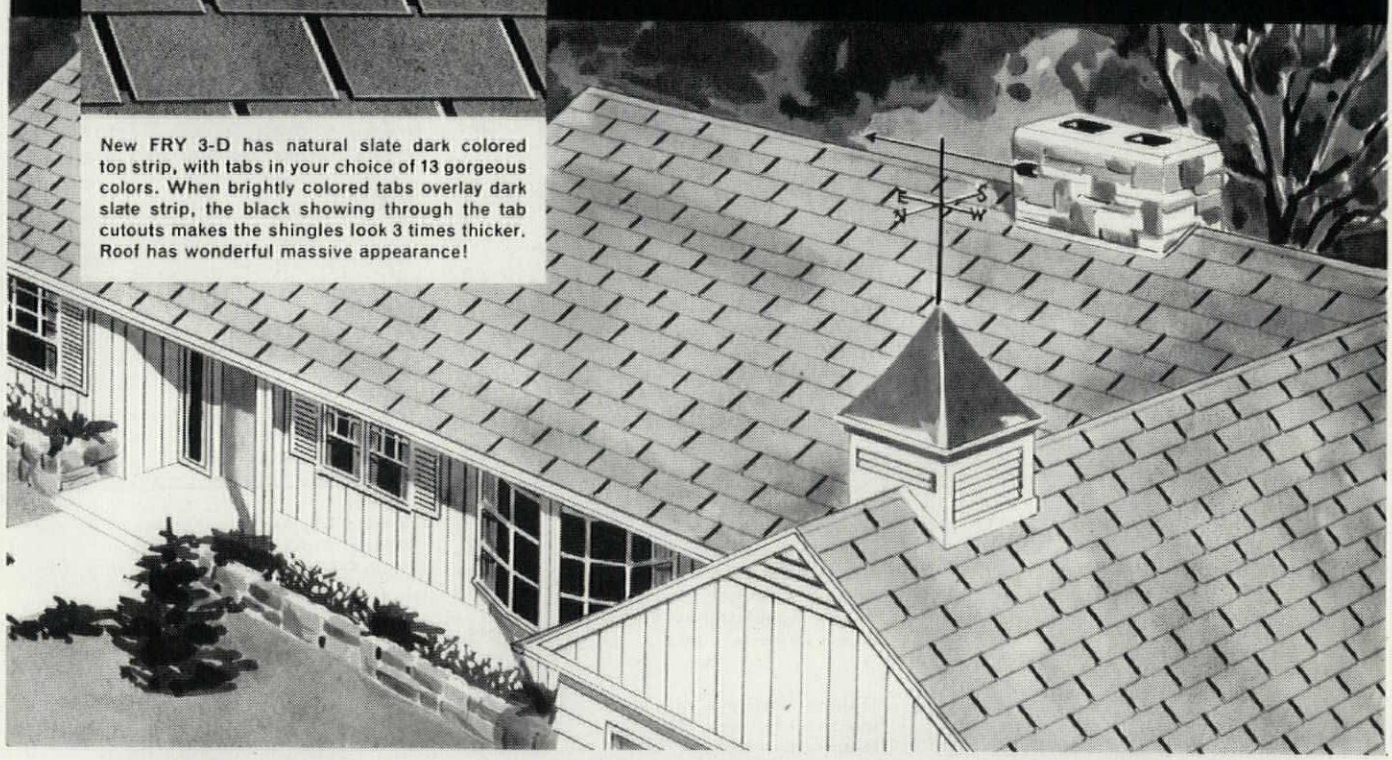

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(Continued from page 356)

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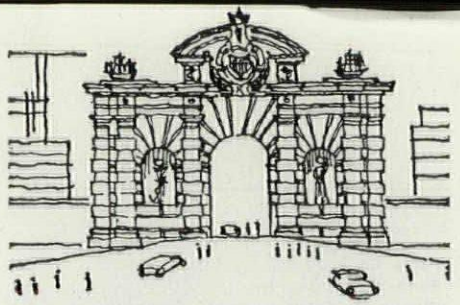

Monumental Entrance for Brooklyn Navy Yard. *A "Grand Design" drawing by John Barrington Bayley. Henry Hope Reed, Jr., writes that it ". . . is carried out in heroic rustication. The Constitution and Constellation ride under full sail in the stony seas on the side piers."*

This being a very down-to-earth issue of P/A, loaded with statistical data and how-to-do-it articles, a postscript on more abstract matters may be in order. I realize that a large part of the practicing profession has little time to read literature which might relate the work-in-hand to current discussion of, let's say, the philosophy of esthetics. This is probably a good thing: specific projects on the boards have no likelihood of being confused by abstracts. The office building for the XYZ Company would never get out of the drafting room if the project manager was torn, philosophically, between the principles of New Brutalism and those of Grand Design.

You don't know what those two movements are? My goodness, if you aren't familiar with the Far Left and the Extreme Right of current speculation about the future of architecture, how can you hope to understand the variations and permutations between them? I will grant you that neither of these schools of thought has anything to do with architecture as now practiced, or with *trends* now visible within the work of practicing architects. They are, rather, crusades whose spokesmen say, "This is what we *should* do." In that sense they are schools of criticism, rather than schools of design.

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New Brutalism is the baby of a group of younger English architects led by the very articulate Smithsons, A&P, which received notice through an article published in *The Architectural Review,* by the critic Reyner Banham. *Architectural Design* in its April issue carried an interesting discussion of it by "an anonymous panel," and I have just had a questionnaire sent me by a U. S. student group preparing a thesis paper on the subject.

Its principles are difficult to define because its protagonists keep shifting ground, but (in general) it believes in clear exhibition of structure inside and out; valuation and use of materials "as found"; a unified concept leaving a "memorable experience" with the beholder—a sort of *Gestalt,* as I understand it. Originally there was a belief in classic symmetry, but this has apparently been discarded in favor of a topological, or a-formal, approach to planning. It also insists on the morality of leaving pipes and ducts exposed; the Smithsons declare: "its essence is ethical."

This seems to be essentially a restating of first principles of the modern movement of our century and an almost angry rejection of any softening of those principles. What makes it exclusive and, to my mind, precious, is such a demand for roughness, crudity—Brutalism, in short, or what Banham called "bloody-mindedness"—that no work so far accomplished is admitted to be a sufficiently Brutalist building. The Smithsons' Hunstanton School was, for a time, the sole example; it lost out in the shift from formalism to a-formalism. Lou Kahn's Fine Arts Center at Yale has been considered for membership, but rejected as too "suave"—stairs and handrails are too carefully detailed. I have a suspicion that no one is going to pin these people down ("the objectives and esthetic techniques of a real architecture . . . must be in constant change," the Smithsons were recently quoted as saying) to a point where their beliefs would help guide pencil on tracing paper.

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Grand Design leaves no doubt in one's mind as to the intent of its inventor, Henry Hope Reed, Jr. Reed has been writing and lecturing in many respected outlets this past year. I suggest that we examine his most recent piece, in *Harper's Magazine* for May, since this was published with an editorial introduction which said it was "for the American Institute of Architects centennial."

His theme is expressed in the first sentence: "The architecture that we know as Modern—the scrubbed and unadorned structure of glass and steel—has, I believe, run its course." Reed never makes clear whether the unscrubbed and often adorned architecture that some other people know as modern (without quotes or caps)—let's say, that of Wright, Belluschi, Stone, Yamasaki—or whether the modern structures of concrete, stone, wood, or brick, as well as those of glass and steel—let's say, the architecture of Corbu's Ronchamps Chapel—is also "finished." One can only assume that it is, because he does include Wright with "the Modern architects."

His next move (as it has been in his other articles) is to attack Viollet-le-Duc and his "false interpretation of Gothic structure" as the source of all Modern evils, although he patronizingly remarks, "few architects are aware of who in the past has most influenced their work." Thank goodness Mr. Reed is here to tell us and to redirect our inspiration! Otherwise we would really be lost, because, as he says, "It is now apparent that Modern architects do not know where to turn." Reed is prepared to let us know the proper direction for design to take: it must "return to the Classical tradition and carry it forward." Not in the abstract sense of principles; in the real, concrete sense of details; we need not "shrink from the 'laughing acanthus' . . . or from grotesques, arabesques, garlands, masks, *trompe-l'oeil* . . ."

Reed's argument behind all this is that we have lost richness and delight, which can be found only in the Classical tradition, and the way to re-find them is by a return to "the study of the Five Orders." The aim will be "democratic pomp and glory" and it will be achieved "in the Classical tradition and in the grand manner."

•

Here you have two extremes: on the one hand, *trompe-l'oeil* and a blatant appeal to structural deceit; on the other, a "bloody-minded" insistence on the ethics of clearly exhibited structure. Nevertheless, both New Brutalism and Grand Design seem to me to be reactionary theses, in the sense that they would take us backward in attitude, as retrogressions to former policies. While the conservatives follow the accepted conservative pattern of adopting, adapting, developing, continuing, and thus building minor Lever Houses (soon Seagram Houses) all over the world; while the progressives seem to be searching for a new exuberance and a new plasticity within the modern idioms; while the radicals (also according to pattern) are exploring various brand new attitudes from which the progressives will benefit and which the conservatives will ultimately imitate; here we have two strong reactionary appeals to turn the clock back. Reed would return us all the way to Greece and Rome and the Smithsons only to the earlier years of our own century (or perhaps, to give Reed his due, to the moralistic rationalism of Viollet-le-Duc), but the direction is the same even if the termini differ. In a period when progress is difficult, conservatism is always tempting and reaction has a strong intellectual appeal. It will be interesting to see whether they can win followers among the practitioners.

Thomas H. Creighton