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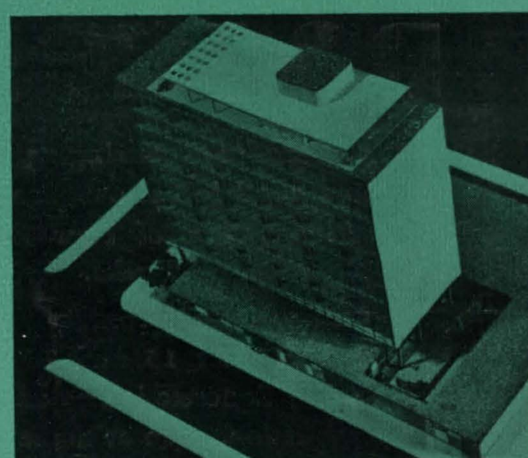
PROGRESSIVE ARCHITECTURE

M. I. T. laboratory

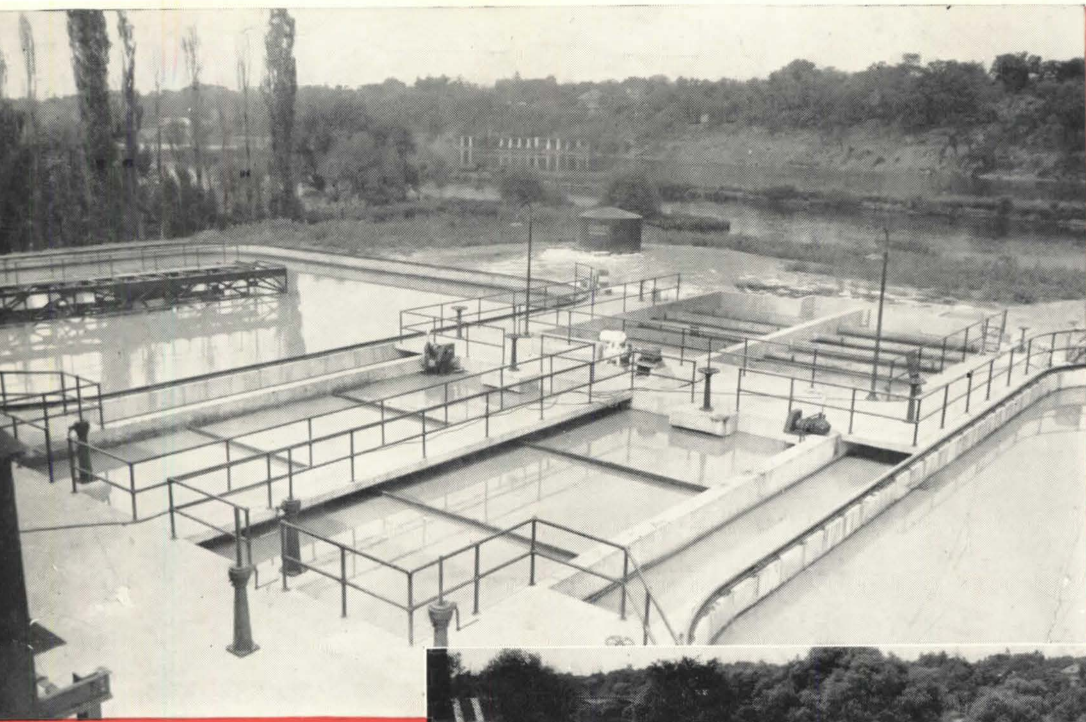


10

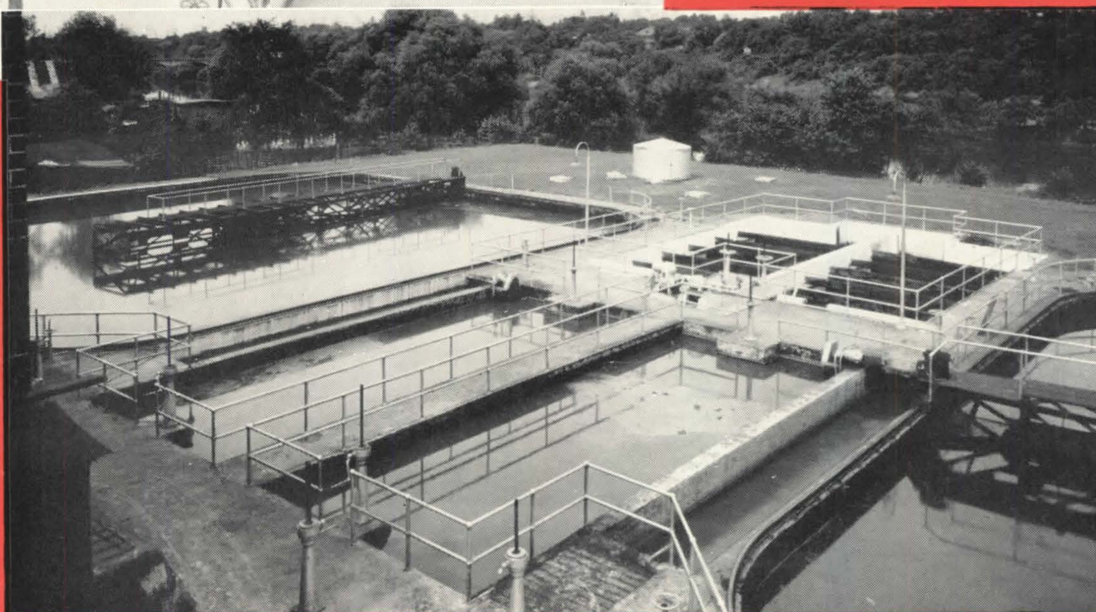
october 1953

metal curtain walls

largest architectural circulation in the world



1936



1953

Upper And Lower Photos Show New Brunswick, N. J. Sewage Treatment Plant Just After Construction And Now.

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PROGRESSIVE ARCHITECTURE

October 1953

research laboratories for Westinghouse

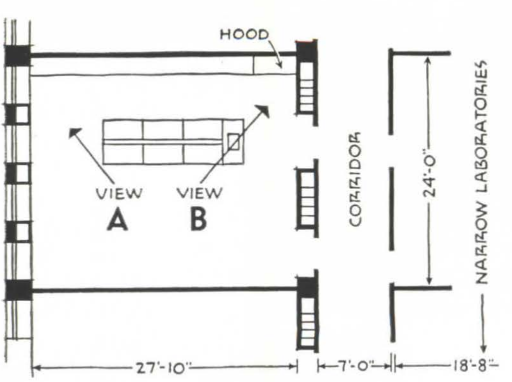
Modular planning was the key to the design of the new Westinghouse Research Laboratories to be built at Churchill Boro, Pennsylvania, as developed over the past nine months by Voorhees, Walker, Foley & Smith, architects-engineers, of New York. The module, 6′ along the window wall and 19′ or 25′ in depth as required by various functions of scientific research, is "the smallest repetitive unit of space that is completely equipped with laboratory and building services." The modules are combined to form laboratories 12′ 18′, and 24′, all with ceiling height of 10′-4″ under the beams. Each module has its own artifical and natural illumination, heat, laboratory service facilities, and telephone.

Accessibility of services for maintenance and modification, without interruption of activities in adjoining laboratories, was a prime consideration. Branches of the laboratory services, fume hoods, etc., are readily installed as dictated by varying arrangements of laboratory units. Even circuit breakers are located at alternate piers, to make one or more available for each laboratory.

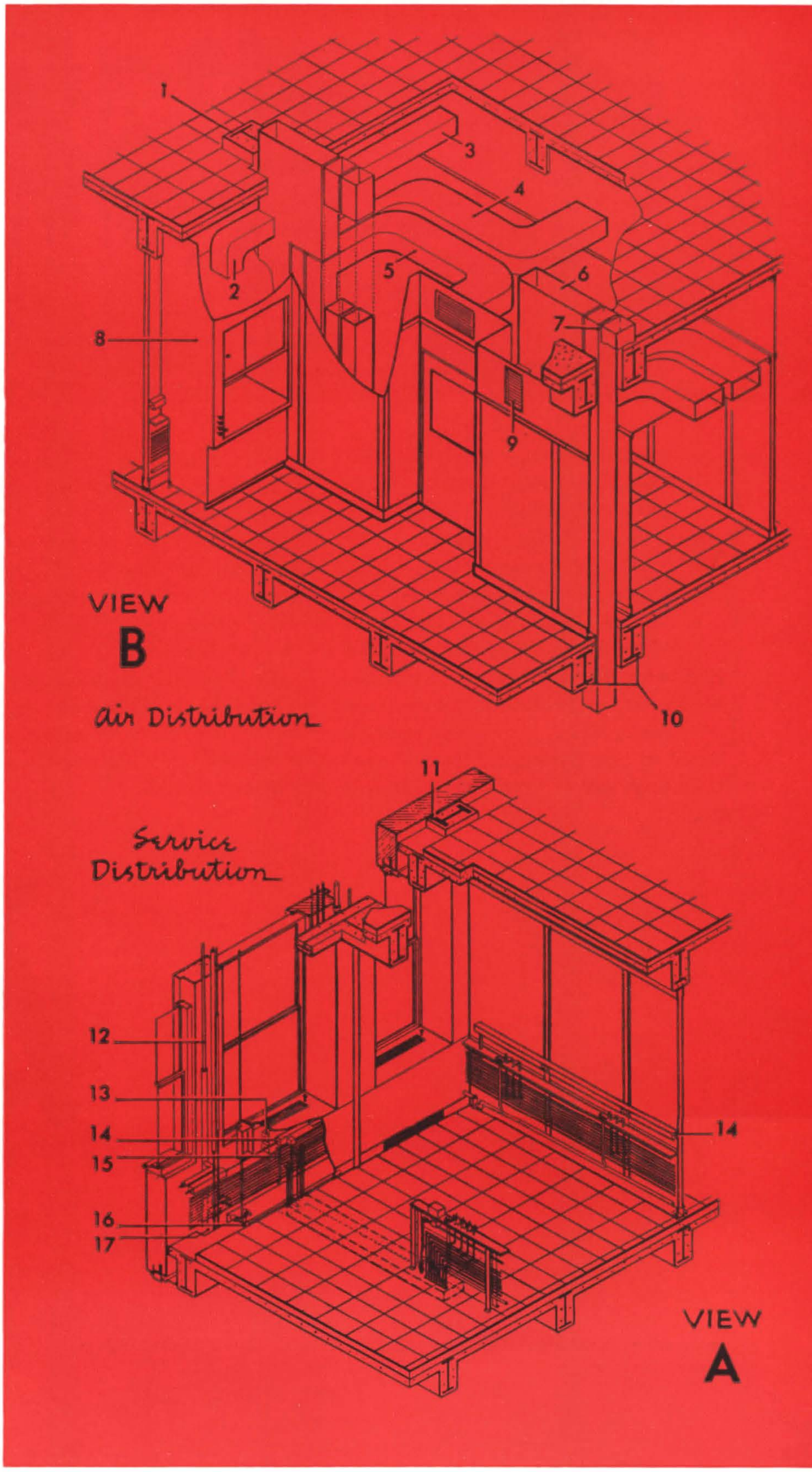
In wings projecting from the main block of laboratories are the secondary areas—offices, drafting rooms, conference rooms,

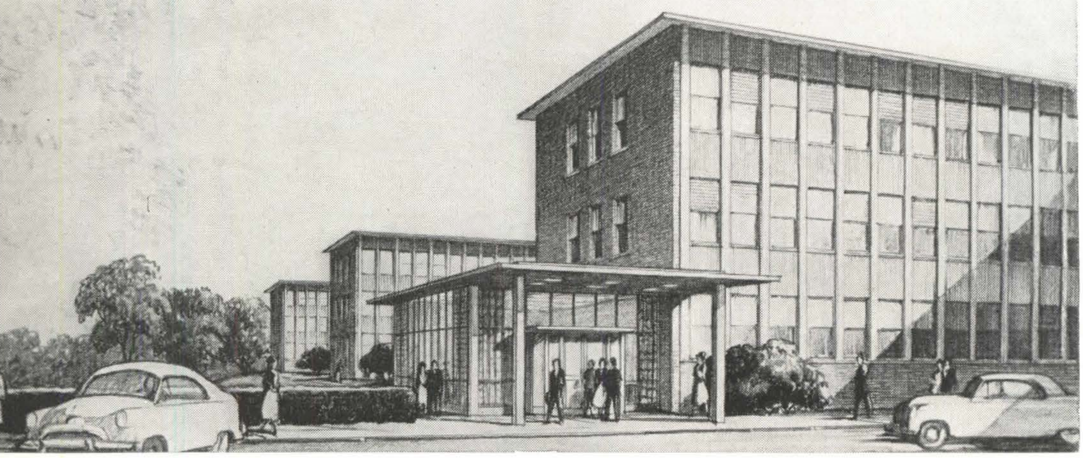
Legend for Modular Laboratories

1 structural column, center of building
2 exhaust
3 exhaust from narrow lab
4 supply to narrow lab
5 supply
6 exhaust
7 supply
8 hood
9 alternate hood location
10 double girder
11 structural column
12 heating
13 convectors
14 power
15 mechanical services
16 drain
17 pipe shaft



Typical Lab Plan





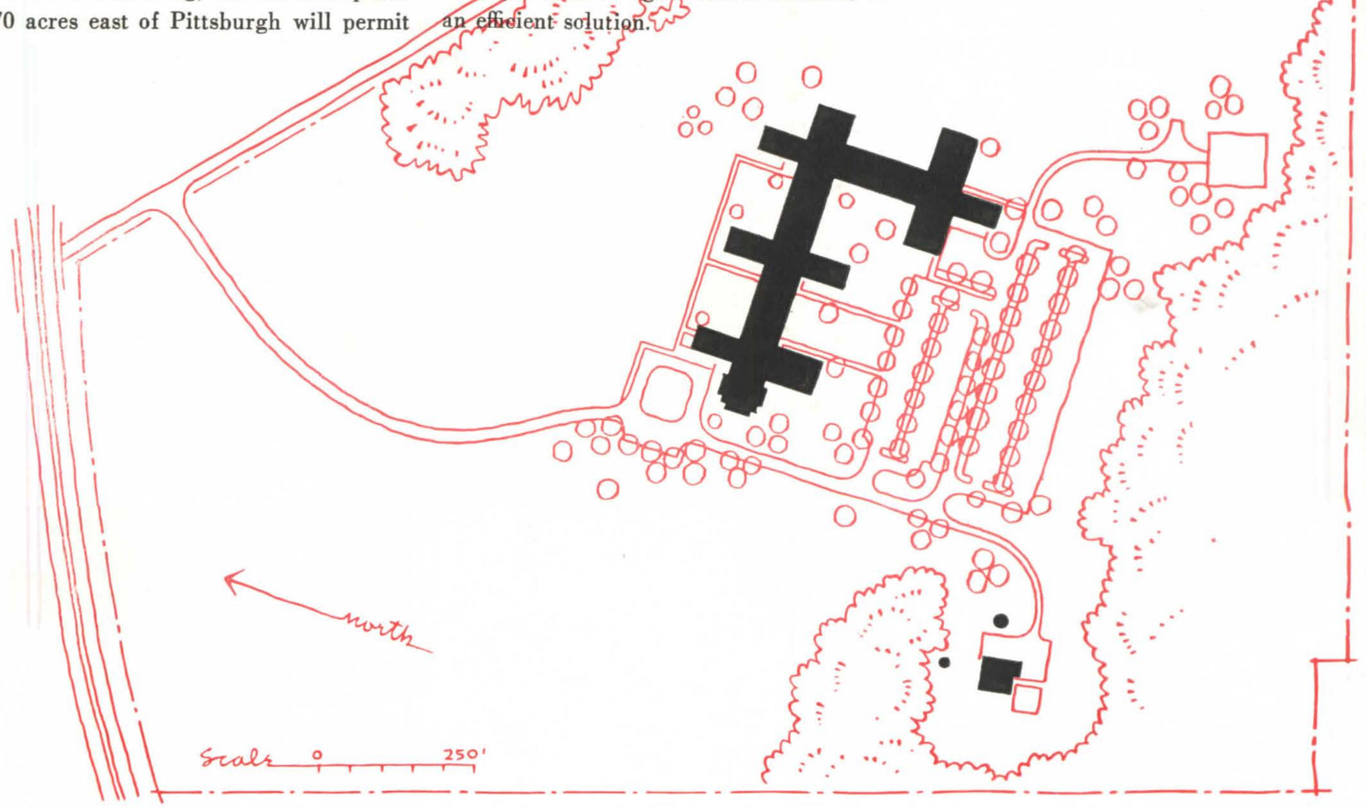
One of the studies of the main entrance, on brow of hill overlooking Penn-Lincoln Parkway.

Rendering: Chester B. Price

etc.—which do not require such concentration of services or such heavy floor loads. For these areas, a module of 5′x14′ with ceiling height of approximately 9′ was used. This module permitted a wide selection of room sizes as needed.

In addition, the plan provides for a cafeteria to seat 200 to 250 persons, an auditorium to seat 250 to 300 persons, a technical library, and unpretentious entrance and reception facilities. Provision is made for future air conditioning, and the hilltop site of 70 acres east of Pittsburgh will permit future expansion of the laboratories.

The desire for extreme flexibility of laboratory equipment and services was the major point of the client's program. Familiarity with the famed Bell Telephone Laboratories Building No. 2, Murray Hill, New Jersey, designed by Voorhees, Walker, Foley & Smith (*See August 1942 New* PENCIL POINTS), suggested this primary program. In the most recent studies, for this structure, the advantages of the modular system have again lent themselves to an efficient solution.



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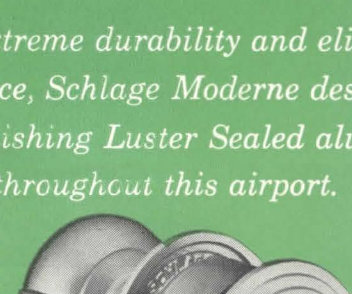

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housing in mild climates

By Richard J. Neutra

The economic unification of the globe may be badly lagging. but its technological unification on the basis of planetary traffic, transport. and industrialization, has markedly progressed in recent decades. And truly cosmopolitan views on planning and design have been increasingly forced upon organizations concerned with these vital subjects. As an instance, while CIAM started as a cohesive group of forward-looking Europeans, its membership and the scope of its research have become worldwide during the last quarter of a century.

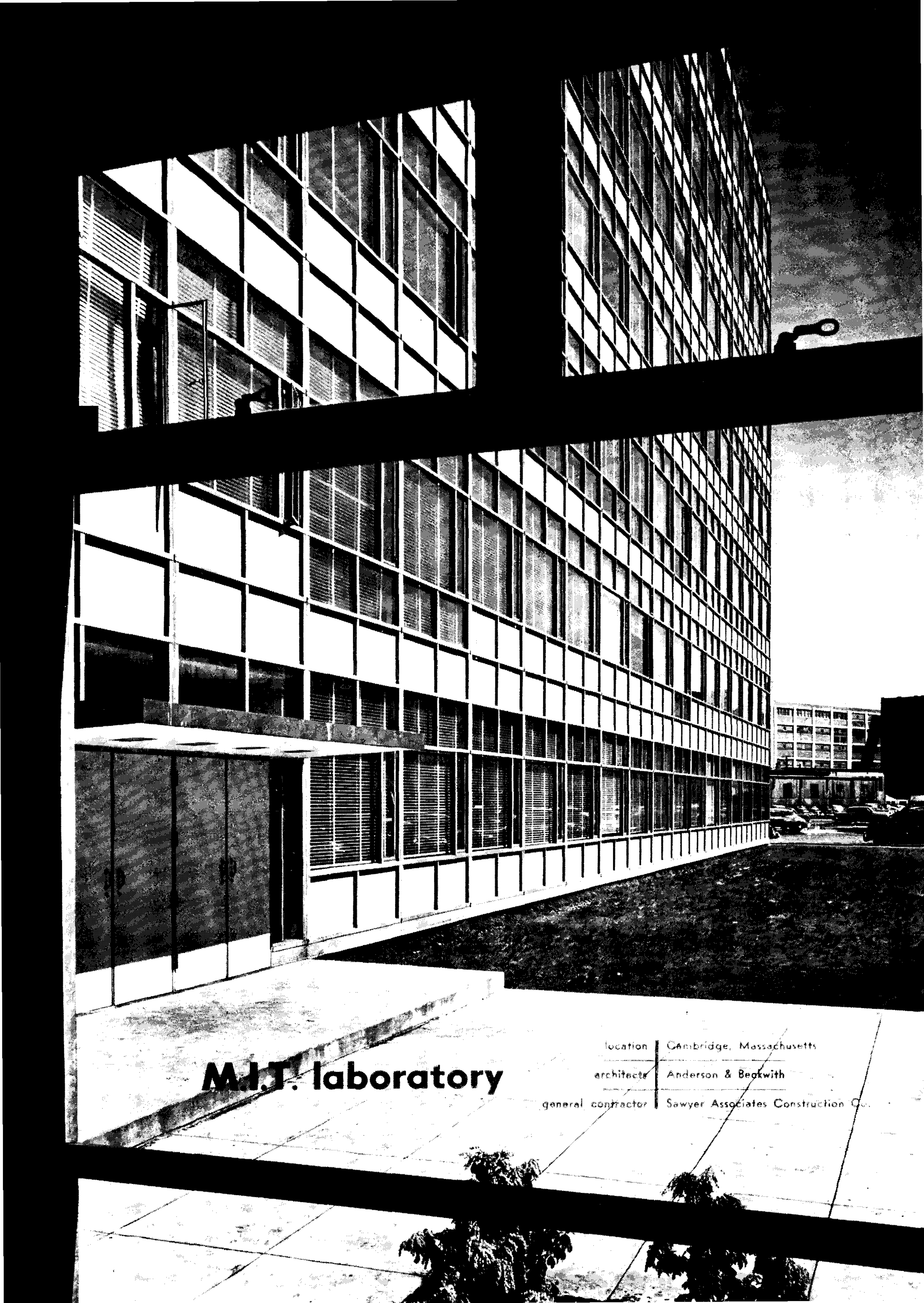
It is now assumed that civilization has geographically and psychologically a mild climatic origin. Even the earliest defined communities in rigorous weather areas—such as the glacial cave city of Monte Castillo near Santander — represented only the result of a forced shift of already cultured populations from a milder habitat where cataclysmic changes of climate had occurred. The high art and mental stage of "man in the cave," which Giedion has studied and so impressively pictured, was an *import* from places where shelter and protection had been less necessary.

The "One World" now expressed by CIAM or UNESCO is not really new, but was truly the stage set for the human species, since for billions of years water bodies and the ocean of the air formed one continuum with fluid exchanges through the seasons. Climatology now has information on periodic changes — changes over periods immensely longer than seasons of one year—which have occurred in the basic conditions underlying organic and social life. And corresponding oscillations of human habitat and cultural topology have accompanied those physical changes.

Also, in historical time, the warm countries of Mesopotamia, Egypt, and Hellas were cradle to an architectural and planning culture which long has dominated the thinking of design, even after Nordic successors had taken the lead. Today, the tropics and subtropics are recovering politically from colonial suppression and torpor, to at least an awareness of industrialized civilization, which their peoples wish to control and extend. In the northern hemisphere, for example, the Zone of "North Easterly Trades," to express it climatologically, is clearly in the ascendant at present and begins to compete with the zone of higher latitude under the "Circumpolar Whirl."

Housing can therefore no longer be based on Nordic standards: the naiveté of Dutch Batavia or Spanish San Juan, in the tropics of Indonesia or the Carribean, is superseded, and tropical and subtropical housing are no longer merely "colonial" subjects.

(Continued on page 20)



M.I.T. laboratory

location	Cambridge, Massachusetts
architects	Anderson & Beckwith
general contractor	Sawyer Associates Construction Co.

M.I.T. laboratory: structural engineering

The Dorrance Laboratory of Biology and Food Technology was named in memory of an M.I.T. alumnus, John Thompson Dorrance, the former president of the Campbell Soup Company. Made possible through a grant from the company of $1 million (half the total cost), the building consists of eight floors of research and teaching laboratories—the lower three devoted to food technology; the upper five, to biology. The facilities are used for both graduate and undergraduate work.

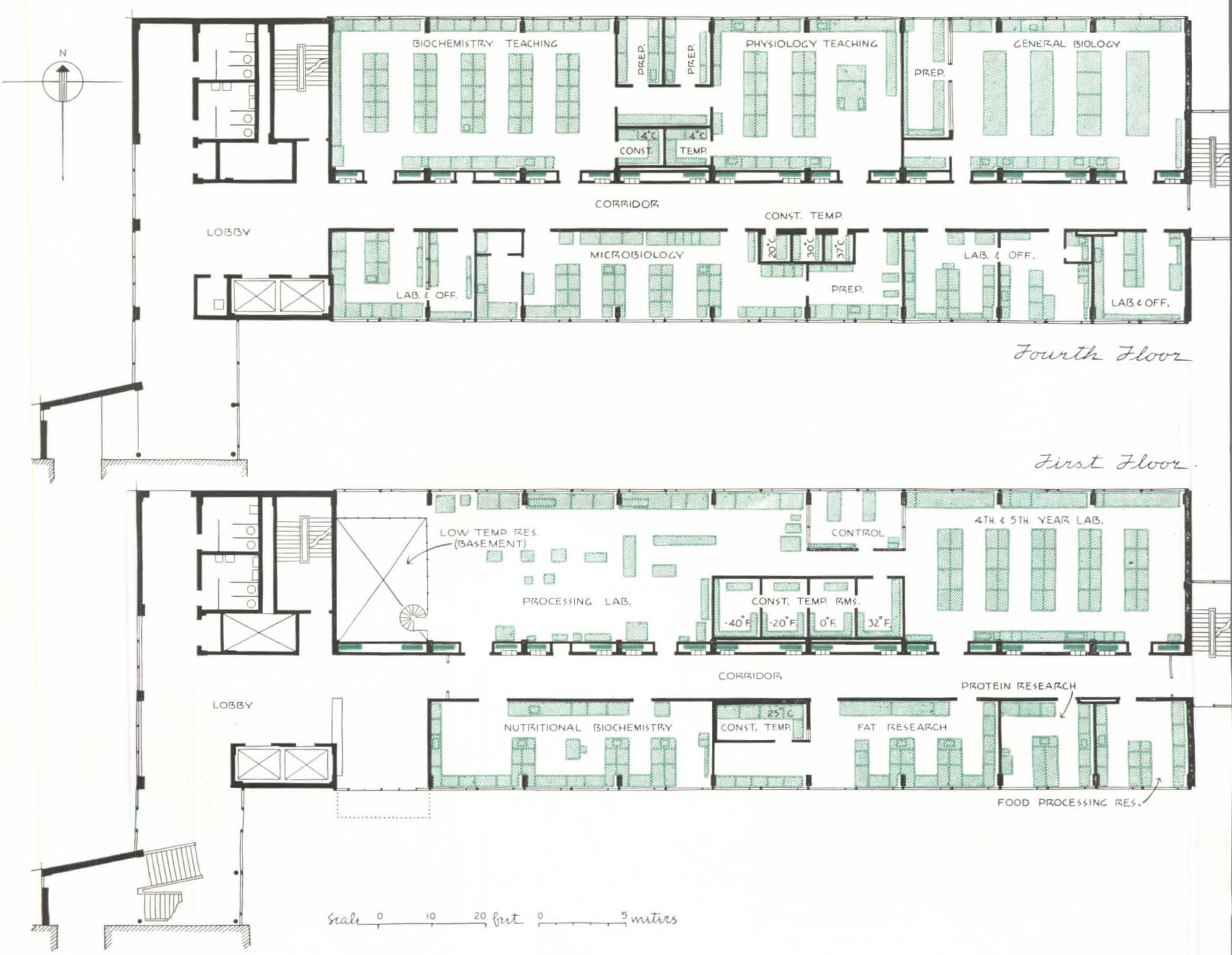
As a study of typical plans and the section make clear, the elements of plan, structure, and mechanical services are so exceptionally inter-related that it is almost impossible to analyze one without considering all the others. Initial decisions included adoption of a basic north-south orientation, with major labs along the north wall and smaller rooms—research labs, professors' offices, seminar rooms, etc.—on the south. This quickly led to a narrow, rectangular plan with an offset corridor—and a two-bay structural scheme—to provide deep bays to the north for the main labs, the corridor and lesser rooms utilizing the south half of the building depth.

Longitudinally, the columns are placed 18′ on centers, forming a module that may readily be halved, providing 9′ spaces that are adequate for small research labs and offices, or (when used in multiples) large classrooms or teaching laboratories.

An essential was a flexible and efficient arrangement of ventilation and exhaust ducts and the diverse laboratory plumbing services (hot and cold water, steam, compressed air, gas, and waste lines). And this, again, became an important determinant of the structural design. The longitudinal double girders *(see section)* are dropped below the transverse beams, providing between them continuous, vertical chases from basement to penthouse, for exhaust ducts and other services. This system also permits ventilating ducts, piping, etc., to branch off at the ceiling line.

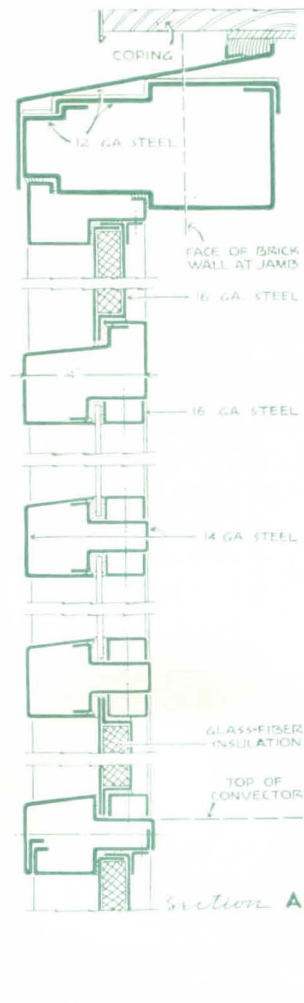
The mains run above the dropped corridor ceilings and are so designed that branches can be taken off at 9′ intervals, on either side. Sleeve branches are provided on a 9′ module to make services available at all window and corridor walls and in the centers of the large north laboratories. Thus the plan, the structure, and the flow of essential services are all intermeshed in a modular grid, providing a high degree of flexibility in use.

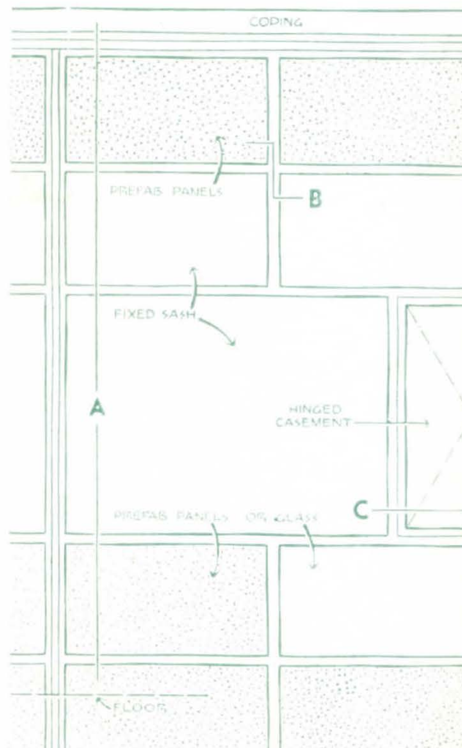
Yet another element developed to give



flexibility, depending on particular uses of different areas, is the steel-framed glass/prefabricated-panel curtain wall on both long walls of the building. The space between the floor line and lower horizontal mullion may be either a pane of glass or filled with an insulated-metal panel. Thus, the sill height in different rooms, or in different parts of a single room *(photo right)* may be varied—to accommodate a laboratory work-surface height, or to extend down to the floor.

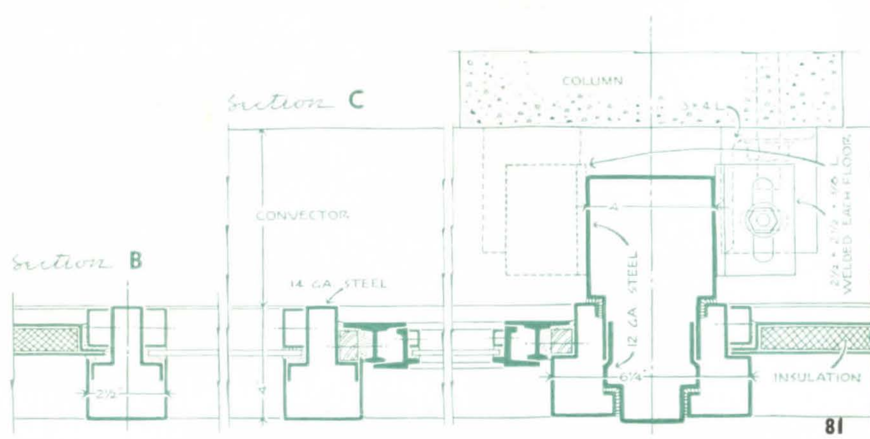
A concrete frame was selected for structural economy. The exterior is enclosed by brick and the steel-glass/insulated-metal-panel complex. Interior partitions are exposed cinder block, painted. The floors are exposed, granolithic concrete except in the first floor lobby (terrazzo) and in toilet rooms (ceramic tile).





Similar units (250) make up the north and south curtain walls, with specially-designed pressed-metal subframes and casement windows; openings, filled with glass or prefab insulated-metal panels.

Photos: Gottscho-Schleisner



M.I.T. laboratory: mechanical engineering

by John Edmund York*

heating system

Steam at 185 psi is supplied to a header in the mechanical equipment room at the east end of the basement *(Figure 1)*. Two pressure-reducing valves with by-pass connections and having capacities of approximately 14,000 and 7,000 lb of steam per hour, respectively, supply steam at 65 psi to an intermediate vertical header. Steam at 65 psi can also be supplied directly to this header in case of failure of the 185 psi supply through a branch main from the 65 psi header serving nearby buildings.

From the 65 psi header a supply main is run overhead in the basement corridor to a riser in the main duct shaft in the tower section to supply steam to coil surface on the 9th and 10th floors.

At each floor, branch connections are provided above the corridor ceiling to supply steam to individual pressure-reducing valves as required for each laboratory.

A pressure-reducing valve with a by-pass connection and having a capacity of approximately 9000 lb of steam per hour is provided in the fan room to supply steam at 5 psi to snow-melting coils at the bottom of the fresh-air intake well, nonfreeze tempering coils in the fresh-air intakes, heating coils in the fresh-air plenum chamber for the branch fresh-air supply ducts *(Figure 2)*, and for heating surface in the air-conditioning and ventilating equipment *(Figure 3)* which serves the animal rooms on the 8th floor.

Approximately 500 lb of steam per hour is supplied from the 65 psi header through a combination pressure-reducing and temperature-regulating valve to a domestic hot-water heater located in the mechanical equipment room in the basement.

Two pressure-reducing valves with by-pass connections and having capacities of 3600 and 600 lb of steam per hour, respectively, supply steam from the 65 psi header at 25 psi to two thermostatically-controlled valves connected in parallel in the steam supply to a high-pressure converter in the same room.

Condensate from the high-pressure converter is flashed to steam at 2 psi for reuse in a low-pressure converter located immediately below the high-pressure converter.

The converters serve the hot-water heating system for the building and the greenhouse on the roof. The low-pressure converter is designed to reheat the water from 201 to 202.3 F and the high-pressure converter to further raise the temperature to 227 F.

Two hot-water circulating pumps, each having a capacity of 325 gpm and equipped with a 5 hp, 1750 rpm motor, circulate the hot water through the system.

Supply and return hot-water mains are run overhead through the corridors *(Figures 4 and 8)*, with supply and return risers concealed in the pipe space between the double walls and branch connections exposed along the face of the beams to finned-type radiators with solid front covers below the windows *(Figure 5)*.

ventilation system

Two similar fan rooms, located one above the other in the tower section, house tempering coils, filters, and fans for the fresh-air supply system *(Figure 6)*.

Air is supplied to the fan rooms by means of a vertical shaft from the roof. Heating coils and a pan with a drain are provided at the bottom of the shaft for melting snow and removal of the water.

Operating louvers and nonfreeze-type steam coils are provided at the opening from the shaft to each fan room. The steam coils are supplied with steam at 5 psi and heat the entering air from —10 F or above to 35 F.

Combined electrostatic and waterproof dry-type filters are provided to clean the entering air.

The electric filter is provided with a built-in system of spray nozzles supplied with hot water which can be turned on from outside the filter chamber to wash down particles collected on the terminals of the electrostatic filter and the dry filters.

Access to the room in which the electrostatic filters are located can only be obtained through a special door equipped with a time-delay system on the lock, which makes it impossible to open the door until the power is off and sufficient time has

* *Registered Professional Engineer, Massachusetts and New York*

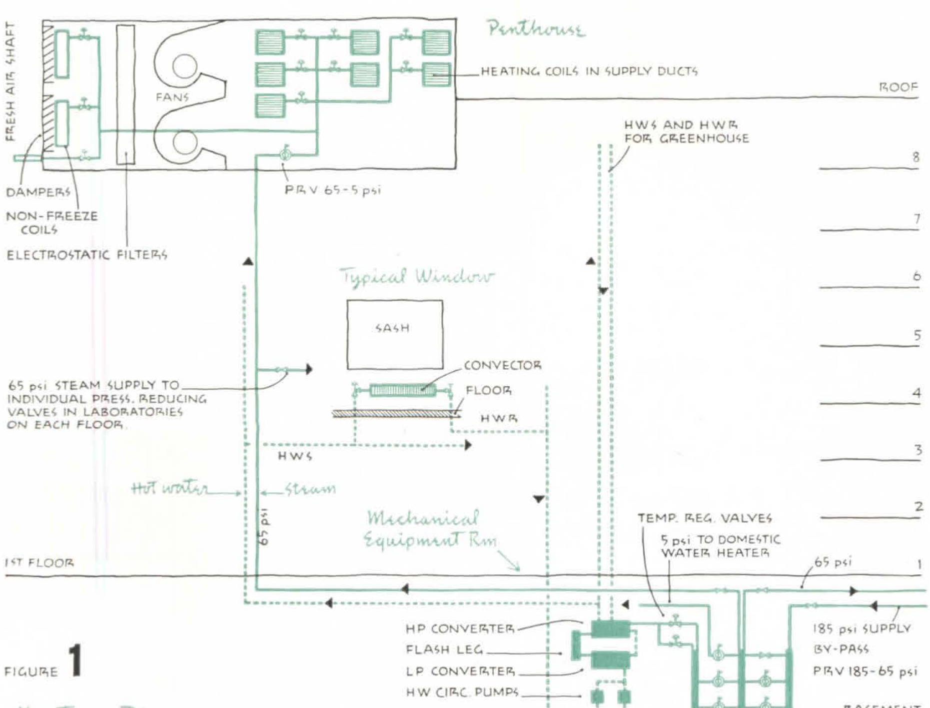
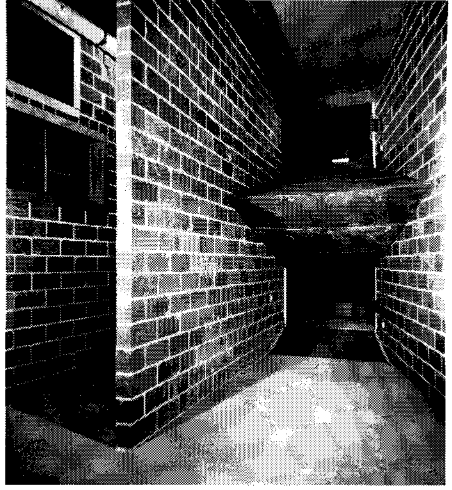
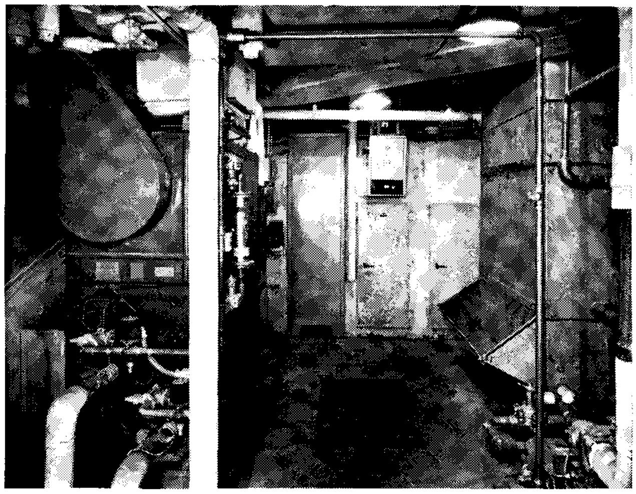


FIGURE 1
Heating Diagram



elapsed to permit the static charge on the electrodes to dissipate.

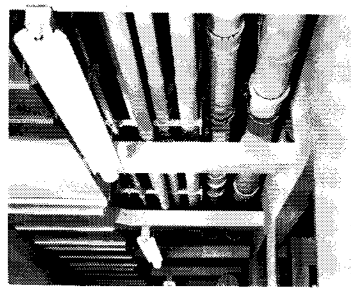
Two top horizontal double-width, double-inlet, belt-driven fans with backward-curved blades, each having a capacity of 35,000 cfm at 1½ in. S.P., deliver the air to a plenum chamber. Automatic vari-pitch drives provide means for changing the capacities of the fans for summer and winter requirements.



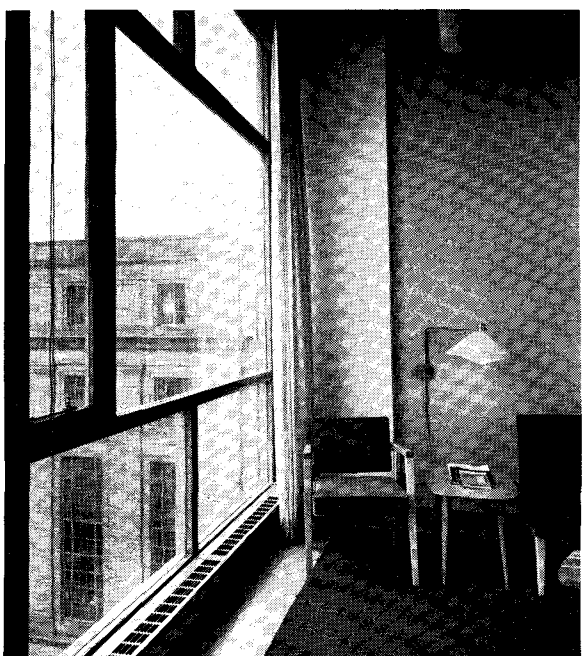
Reheating coils of varying sizes, supplied with steam at 5 psi, raise the temperature of the air from 30 F to 125 F and the air is then discharged through separate vertical ducts in the duct shaft to branch ducts above the corridor ceiling on each floor. These horizontal branch ducts are located on each side of the corridor to permit short branch connections to supply air to the adjacent rooms *(transverse section page 81)*.

Double-deflection grills are provided for control of the volume and distribution of the air at each supply inlet.

The supply ducts are insulated with fiberglass block insulation approximately 1 in. thick for ducts having a perimeter of 6 ft or over and 2 in. thick for ducts having a perimeter of less than 6 ft *(Figure 8)*.



Exhaust ducts from fume and canopy hoods in the laboratories and exhaust grills in rooms where there are no hoods connect into lead-coated vertical copper ducts concealed in the double wall at one side of the corridor. These ducts are in turn connected to exhaust fans in a penthouse *(Figure 7)*. The fans and their driving motors are mounted on antivibration bases and have neoprene connections to the duct work to prevent transmission of noise and vibration to the duct work.



Fans which handle ether fumes are of sparkproof construction and fans used for fumes which are definitely corrosive have the inside surfaces and the fan wheels rubber-coated. Each fan discharges independently to the outdoors and pneumatically-operated dampers which close when the fan is not operating are provided in each fan discharge. A separate exhaust fan is provided for the toilet room ventilation.

Canopy-type hoods are provided over apparatus which release heated vapors.

air conditioning

The animal rooms, which are located on the 8th floor, are air conditioned to maintain constant temperatures and humidities. Nearby rooms have special ventilation.

A vertical air-conditioning unit with cooling surface to cool approximately 3000 cfm of outside air, during the hot weather, from 92 FDB and 78 FWB to 52.8 FDB and 52.5 FWB supplies the air to the animal rooms through individual ducts to each room with ceiling-type diffuser inlets. Reheating coils designed to reheat the air from the conditioning unit from 30 F to 120 F during the heating season with steam at 5 psi pressure are provided in each branch duct from the unit.

A vertical heating and ventilating unit located adjacent to the air-conditioning unit and equipped with coil surface to heat approximately 1500 cfm of air from 30 F to 120 F supplies other portions of the 8th floor laboratory through a single supply duct with ceiling-type diffuser inlets in each room.

All air from the animal rooms and other rooms is exhausted to the outdoors by fans located in the penthouse above. Outside air is supplied to the air-conditioning unit and the heating and ventilating unit through a duct from the bottom of the fresh-air shaft supplying the main fans. Nonfreeze-type heating coils are provided in the fresh-air intake to heat the entering air during the cold weather from —10 F to 35 F and an electrostatic filter cleans the entering air.

A 25-ton Freon compressor with a 30-hp motor and automatic capacity reduction, mounted on a vibration-eliminator base and operating at 35 F suction temperature and 105 F condensing temperature, provides the necessary refrigeration during the summer months for the air-conditioning unit.

In order to conserve water, an evaporative condenser of 26.4-ton capacity at 105 F condensing temperature and 78 F entering wet bulb temperature, is located adjacent to the compressor.

Fresh-air intake and discharge connections to supply 5900 cfm of air are provided for the evaporative condenser and a 2-hp fan mounted on a vibration eliminator base is used for circulating this air.

On the 5th floor, air conditioning is provided for the electron microscope to prevent flashover from the high-tension connections, due to excessive humidity. A horizontal overhead air-conditioning unit with direct expansion Freon cooling coils, having a cooling capacity of 1250 cfm of air from 80 F to 66 FDB with 45 F refrigerant suction temperature is located in an adjacent room and connected through suitable duct work to supply and return grills in the rooms housing the electron microscope and other equipment. The air-conditioning unit is suspended from the ceiling above with vibration isolators.

A 6-ton water-cooled Freon condensing unit, with a 3-hp motor and using 5-gpm of water at 75 F supplies the necessary refrigeration for the system.

The fan for the air-conditioning unit is manually controlled and the refrigerating unit is thermostatically controlled.

Similar equipment is provided for laboratories on the 7th floor used for optical experiments, ultraviolet microscopy, ultraviolet microspectrophotometry, and for the infrared spectroscopy room to prevent excess humidity which may seriously affect the salt and potassium bromide windows of the instrument.

Constant temperature rooms on several floors have their own air-conditioning equipment to maintain the required temperatures and humidities in these rooms.

temperature and humidity control

A combined, pneumatic, electric-control system is provided to function as follows:

(1) The steam supply to the hot-water converters, which provide the hot water for radiators throughout the building, is controlled by two motorized valves between the pressure-reducing valves and the converters. These motorized valves are actuated by an immersion thermostat in the discharge from the converters, which is reset by an outdoor thermostat to maintain the proper water temperature to heat the building at an even temperature as the outside temperature, wind, and sun vary.

An auxiliary switch stops the circulating pumps as the pressure-reducing valve nears its minimum position to prevent overheating. Thermostats and automatic valves are provided to throttle the water supply to the radiators and to act as high limits.

(2) The steam to the heating coils for each of the main-building air zones is controlled by a modulating steam valve operated by a duct controller in the duct for the corresponding zone. Each duct controller is reset by an outdoor controller to maintain even temperatures in the building as outdoor temperature, wind, and sun vary. A reset relay reduces the total variation of the control condition as the load on the steam coil varies from a minimum to a maximum, to 10 percent of the set dif-

ferential.

The steam to the preheat coils in the main buildings and penthouse system is controlled by modulating steam valves under control of a thermostat in each intake section to maintain a minimum of 35 F for the air entering the filters.

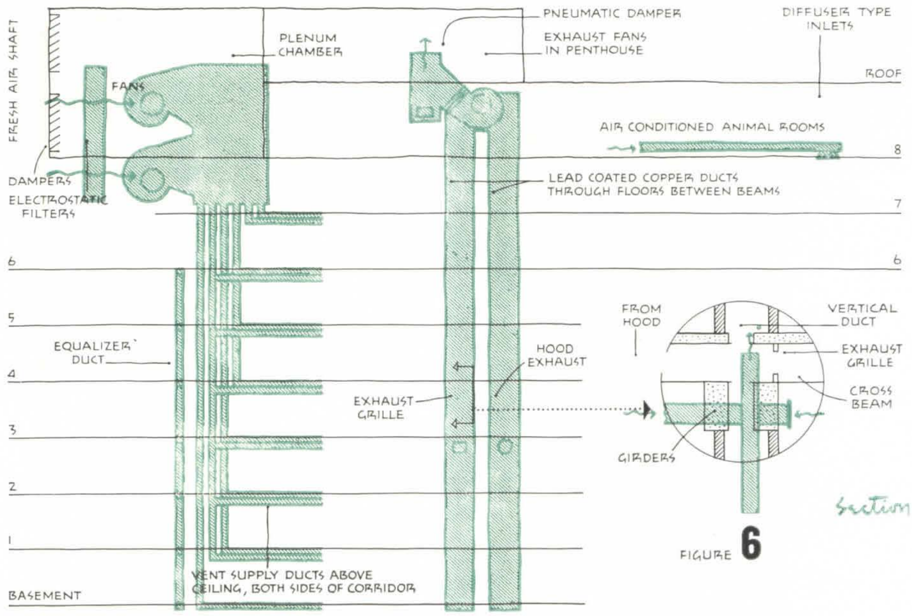
(3) Steam to the heating and ventilating unit supplying the penthouse zone is controlled by a modulating steam valve under control of a room thermostat.

(4) Pressure switches stop the supply fans and units, if steam is not available on the heating coils.

(5) A three-way valve in the return line to the circulating pumps for the greenhouse radiation is set by a controller in the water supply to the radiation. A room thermostat resets the control point of this controller to maintain even temperatures in the greenhouse, with varying outdoor temperature, wind, and sun.

(6) Each of the animal rooms has a modulating thermostat arranged to control a steam valve on the reheat coil to each room or to open a solenoid valve on the refrigerant liquid line to the cooling coil, as required to maintain the desired room temperature. An animal-membrane type humidostat is also provided in each room to open the solenoid valve in case of rises in the relative humidity.

(7) An electronic night-thermostat and electronic cycler-panel control night temperatures in the building by starting and stopping the hot-water pump. The cycler panel has an adjustable minimum cycle period. A seven-day program clock bypasses the cycler panel during the day. A pneumatic, motorized valve in the hot-water supply line opens and closes, as the pump starts and stops.



Ventilation Diagram

Figure 7—exhaust fans in penthouse (left).

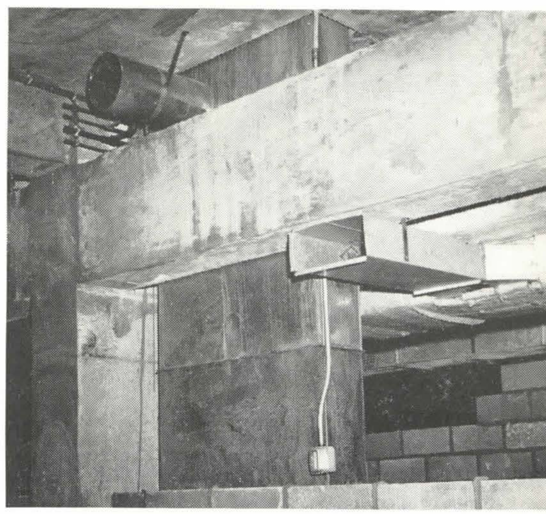


Figure 8—covered main supply duct above corridor ceiling with branch connection for exhaust grill in laboratory (right above).

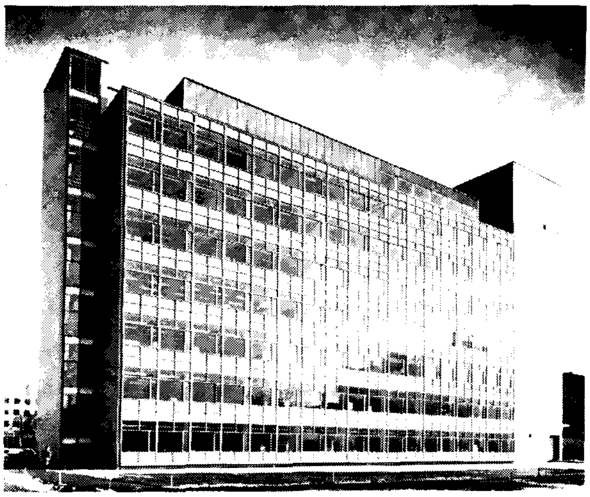
Figure 9—fume and canopy hoods with exhaust connections in laboratory (right below).

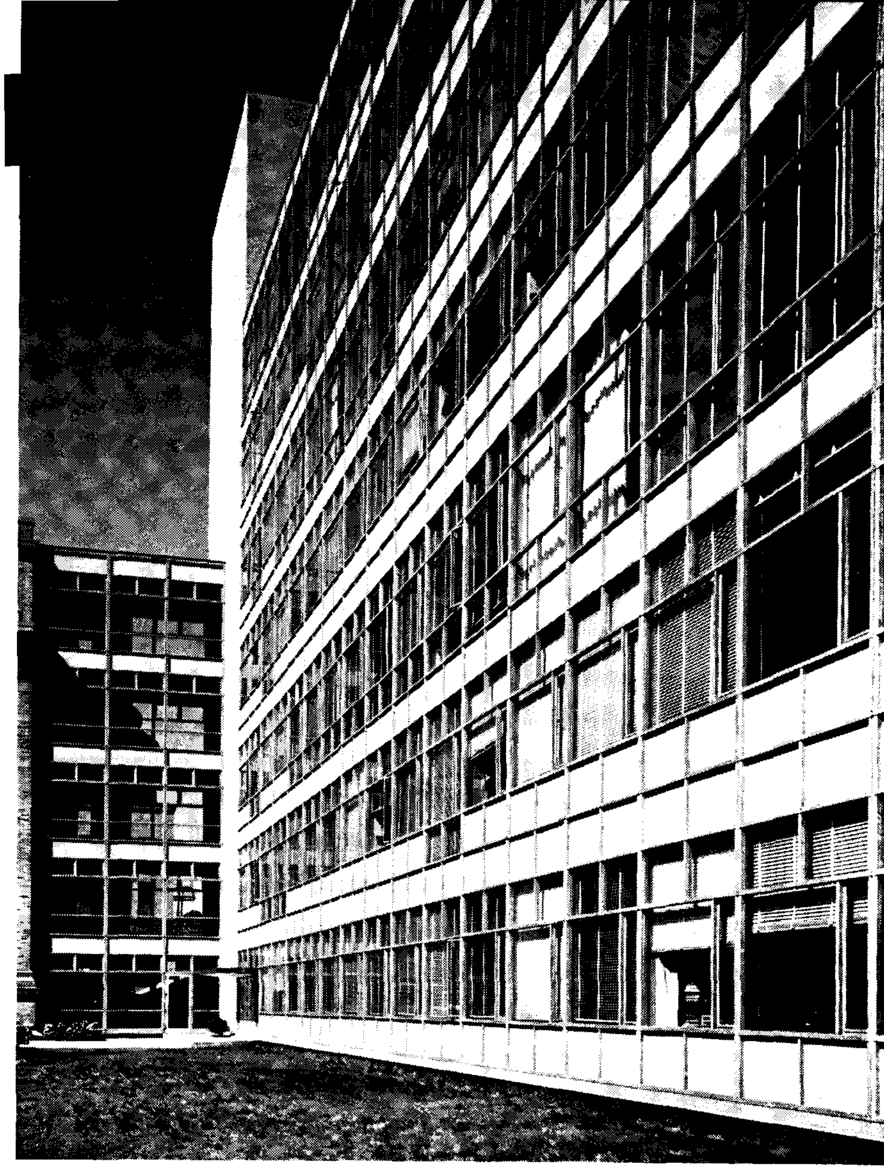
Figure 10—construction photo (below) documents integration of structural and mechanical engineering.

M.I.T. laboratory

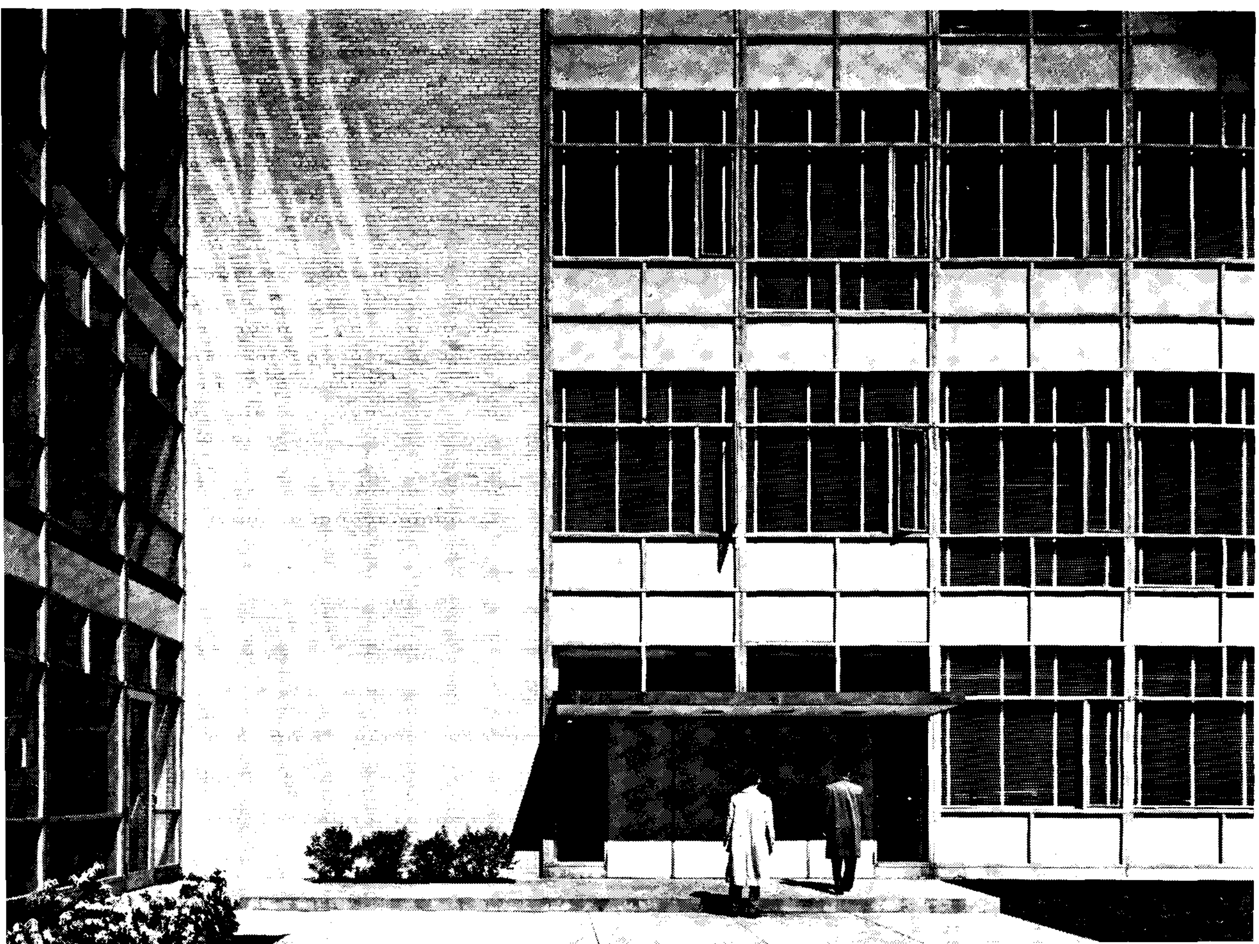
The new lab is connected with the older M.I.T. group at a point near the existing physics and chemistry departments. The stair hall (right) occurs in a five-story, glazed element that joins the new and old buildings.

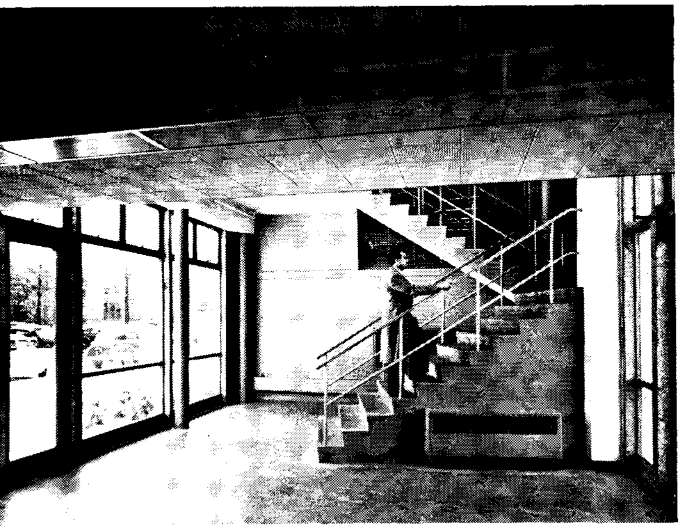
the building

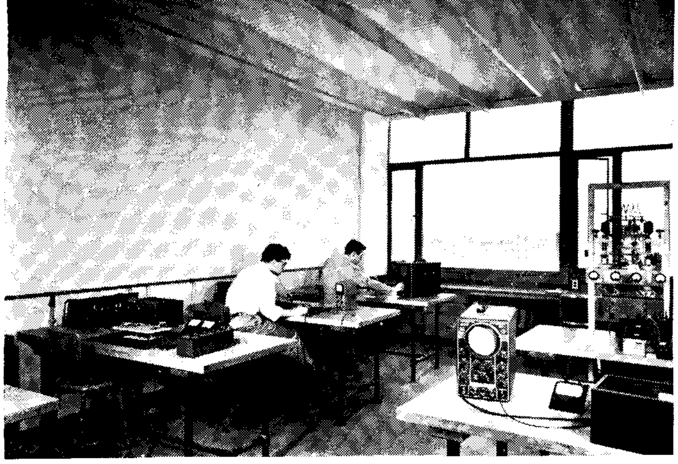




Treatment of the north side of the building (above) *is almost identical to that of the south* (right). *Window frames and metal panels are painted gray. both inside and out—the gray tone being repeated for the metal door-bucks and interior-wall base. The main lab entrance* (below) *occurs near the west end of the south wall of the building.*

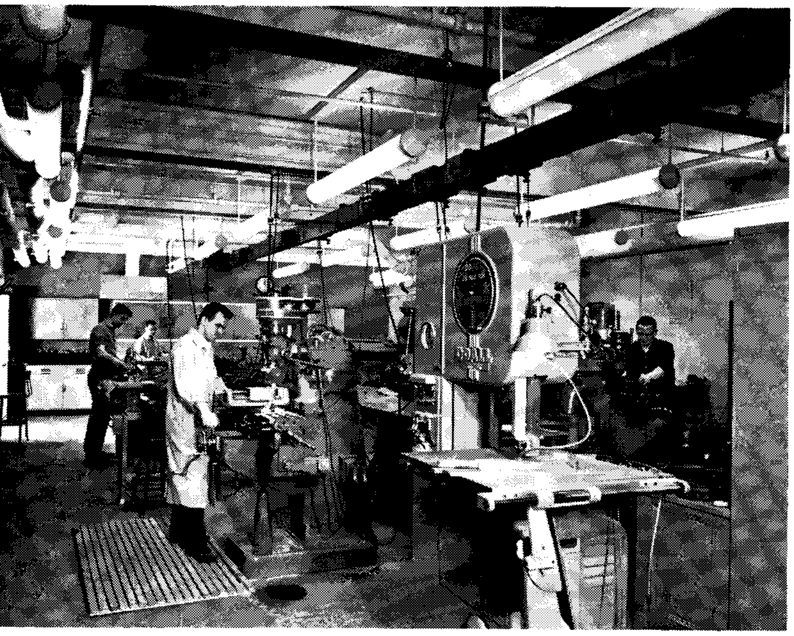


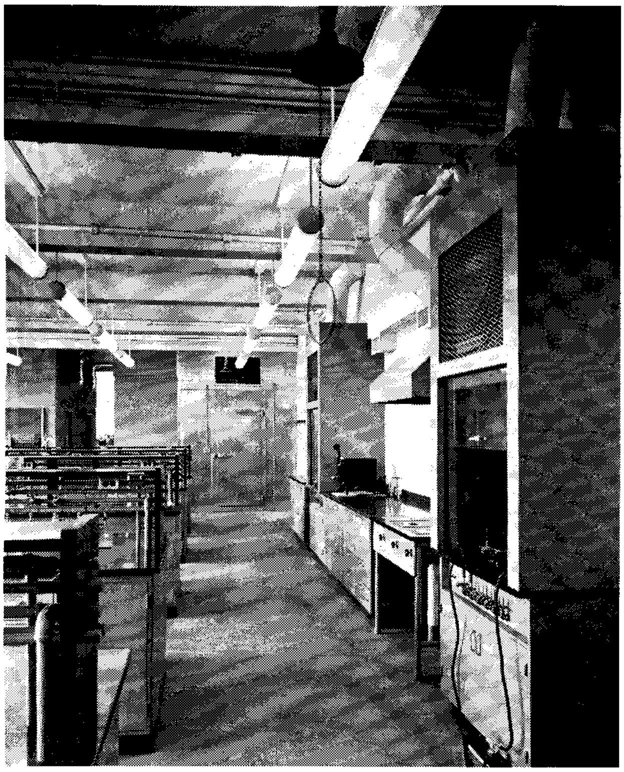


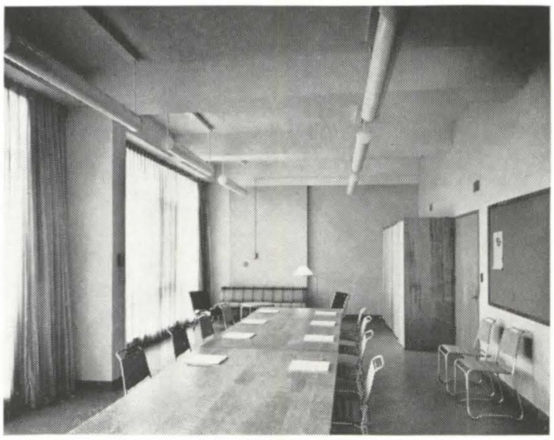


In certain rooms, such as a physics research lab (left) and a large classroom (below), luminous ceilings provide high-level illumination.

The biochemistry teaching laboratory on the north side of the fourth floor (left) [illegible] long, occupying three full bays. Through the passage at the far end is the physiology teaching lab. The architects report that the amount of effort that went into selection and organization of lab equipment was at least equal to that expended on all other architectural work.





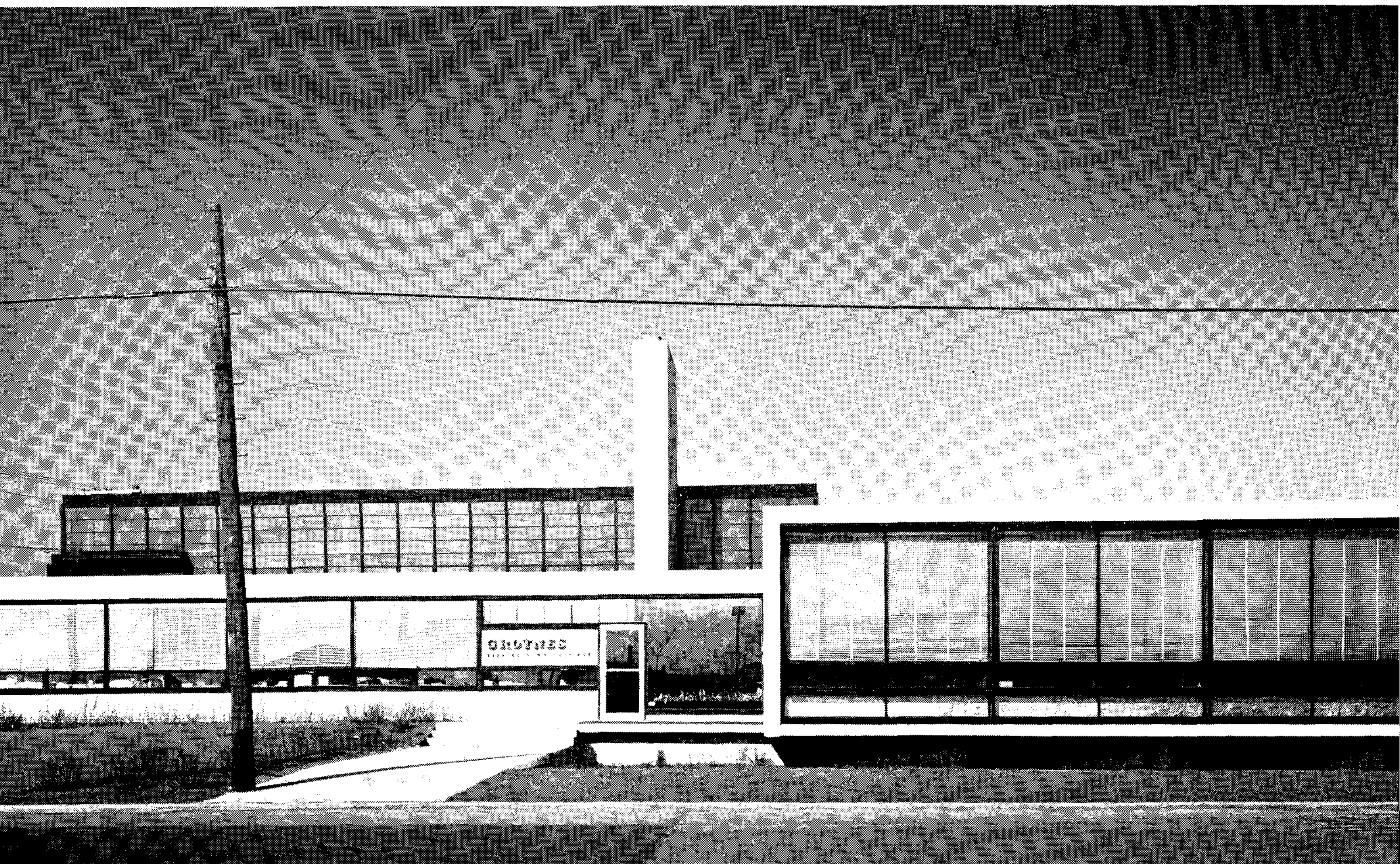


construction

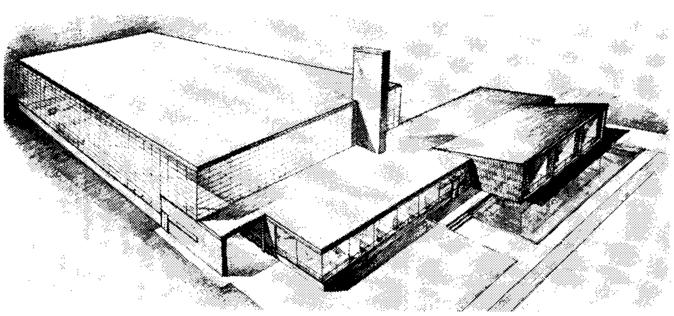
Foundation, floor, roof, framing: caissons—Raymond Concrete Pile Co.; reinforced-concrete frame, floors, and roof—Concrete Steel Co. **Wall surfacing:** exterior: brick—Hanley Co., Inc.; interior: cinder block; rest rooms, toilets: glazed ceramic tile—American-Olean Tile Co. **Floor surfacing:** granolithic concrete. **Ceiling surfacing:** exposed painted-concrete in laboratories; corridors and lobby area: accoustical tile—The Celotex Corporation; classrooms: acrylic plastic. **Roof surfacing:** builtup 5-ply tar and gravel—Koppers Company, Inc. **Waterproofing and damp-proofing:** iron-oxide and cement-plaster coat—A. C. Horn Company, Inc. **Insulation:** thermal: perlite concrete. **Roof drainage:** drains—Barrett Division, Allied Chemical & Dye Corporation. **Partitions:** interior: cinder block; toilet: metal—Henry Weis Mfg. Co., Inc. **Windows:** sash—Hope's Windows, Inc.; plate and heavy-sheet glass—Pittsburgh Plate Glass Company; greenhouse—Lord & Burnham Division, Burnham Corp. **Doors:** flush plywood interior—Roddis Plywood Corporation; overhead—Cornell Iron Works, Inc.; hollow metal entrance—Williamsburg Steel Products Co. **Hardware:** locksets and door closers—Yale & Towne Mfg. Co.; hinges—The Stanley Works; small hardware—Glynn-Johnson Corporation. **Paint and stain:** exterior—E. I. du Pont de Nemours & Co. (Inc.); interior—Carpenter Morton Co., Martin Senour Co., Breinig Bros., Inc.

equipment

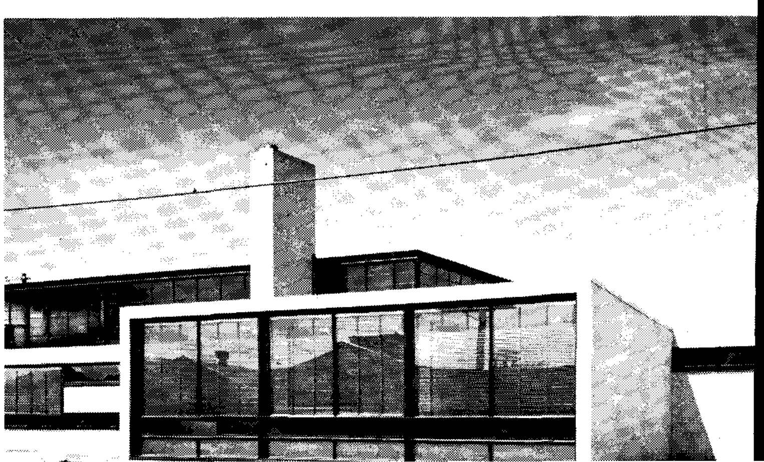
Laboratories: furniture—A. B. Stanley Co., John E. Sjöström Company. **Elevators:** cabs—Otis Elevator Company. **Lighting fixtures:** laboratories, some classrooms, offices: cylindrical-plastic fluorescents—Day-Brite Lighting, Inc.; classroom, seminar, and research areas: luminous acrylic-plastic ceiling—The F. W. Wakefield Brass Co.; greenhouse and 8th floor: slimline fixtures—Gruber Brothers, Inc; corridors: single-strip fluorescents with louvers—Metallic Arts of New England, Inc. **Electrical distribution:** service entrance switch, panelboards, multibreaker—Westinghouse Electric Corporation; duct system—Walker Brothers; cable—General Cable Corp., Simplex Wire & Cable Co.; galvanized conduit; R H and T W wiring devices. **Plumbing and sanitation:** water closets and lavatories—Kohler Co.; toilet seats—C. F. Church Mfg. Co.; water heater—Patterson-Kelly Co., Inc.; flush valves—Sloan Valve Company; incinerator—Brule Incinerator Corp.; pipe—The Duriron Company, Inc.; copper tube—The American Brass Company; sprinklers—Rockwood Sprinkler Co.; emergency shower—Speakman Co.; pneumatic pump—Ingersoll-Rand Co. **Heating and air conditioning:** forced hot-water and tempered-air system; steam from M. I. T. central plant; fin-type convectors, linovector cover—The Vulcan Radiator Co.; air handling—American Blower Corporation; air-conditioning unit—Carrier Corporation; Freon 12 refrigerant; compressor and cooling coils—Carrier Corporation; grills—Tuttle & Bailey, Inc.; blowers—The New York Blower Co.; electrostatic filters—Trion, Inc.; controls—The Powers Regulator Company.

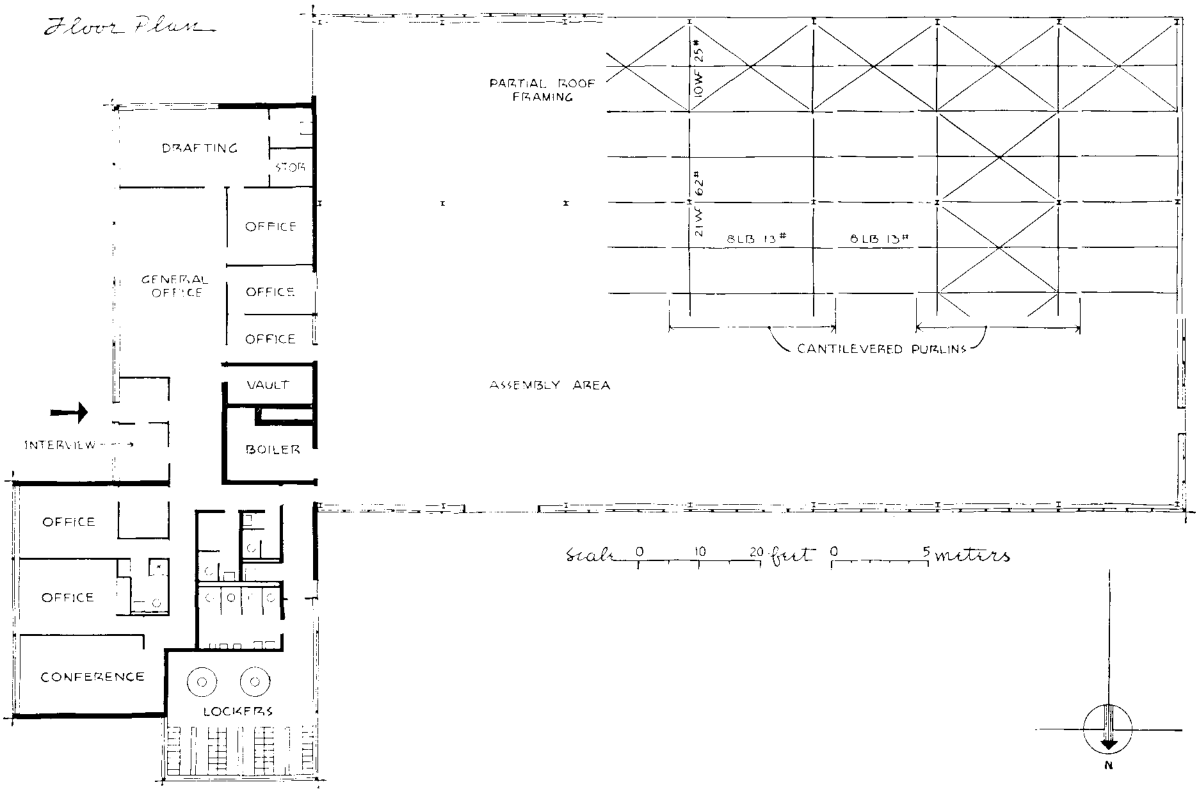


machine works



location	Chicago, Illinois
architects	Barancik, Conte & Associates
structural engineers	Frank J. Kornacker & Associates
general contractor	Continental Construction Co.

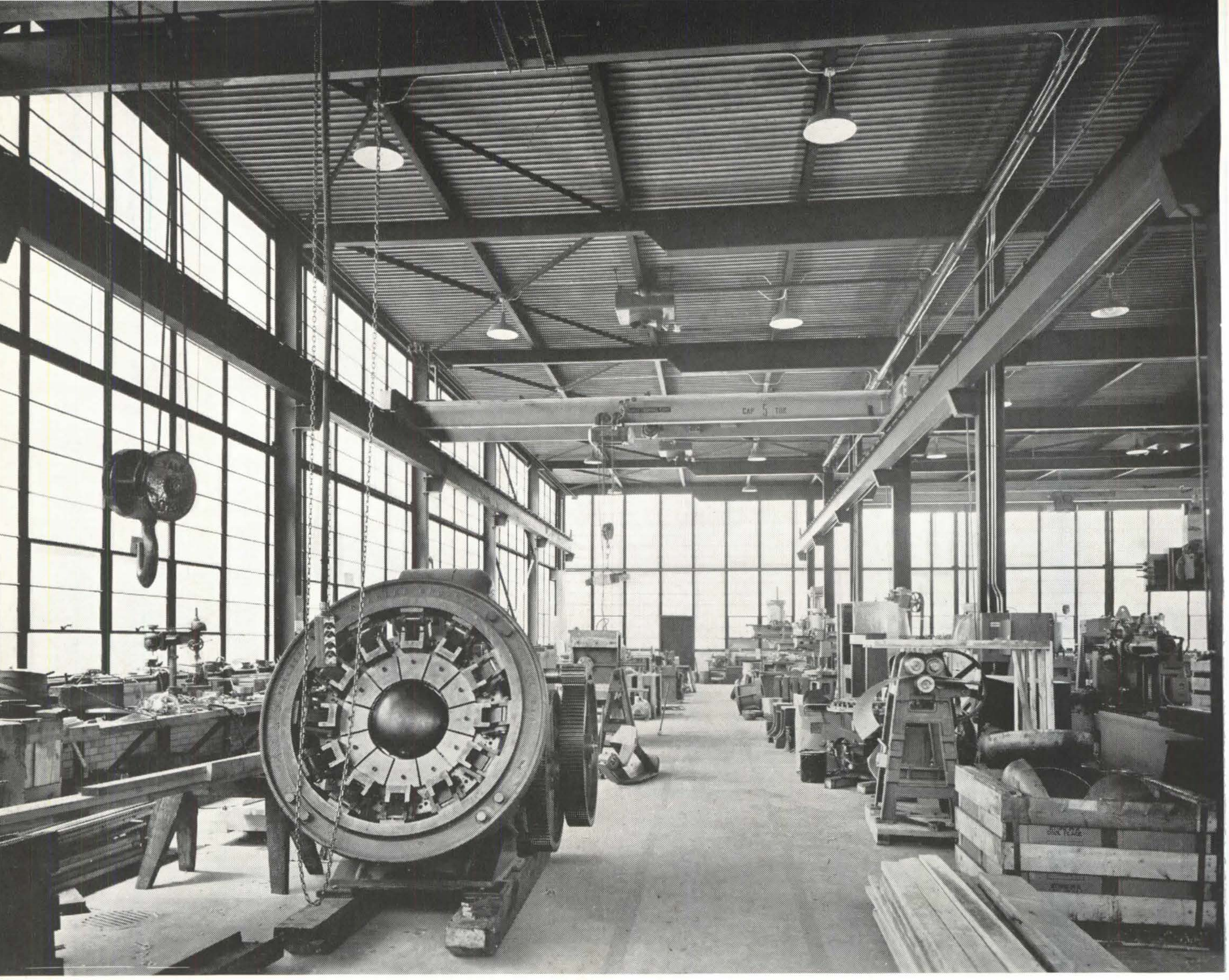




This drum-making machinery plant . . . its assembly area an envelope of blue, glare-absorbing glass . . . uniquely conserves steel. Its architects believe good factory design recruits and retains employes . . . and a factory need not be "Gibraltar-like."

This subsidiary of a Dutch concern, the Midwest's first plant manufacturing machinery to expand metal drums, required a 17,000-sq-ft building. Located on a level site in a suburban area, it is the initial project of a multistage development program. Within are machine shops, assembly areas, and the general and executive offices.

Limited by a steel shortage and a restricted budget, the architects planned an expandable, well-lighted, low-maintenance structure. By using a framing technique designed to conserve steel, members are cantilevered one sixth of their span. The balance of positive and negative bending moments which then resulted reduced steel tonnage 15 percent. For maximum light and the most complete external flexibility, the assembly area was designed as a glass shell resting upon a three-foot brick base.



machine works

Throughout the factory, materials are used in efficient and ingenious ways. Window sills are wide-flange beams laid on their sides, filled with concrete, and finished with red terrazzo. The assembly-area structural system cantilevers steel beams and purlins. For the industrial sash, steel muntins are welded together and fitted with blue, glare-absorbing glass.

The executive wing projects over a sunken planting area. For insulation and privacy, its window wall up to sill height is of thin sheets of glass with a layer of tinfoil between. Steam unit heaters are spotted in the machinery area. Offices have radiant floor slabs, acoustic-tile soundproofing, and fluorescent lighting. Black terrazzo and light tan asphalt-tile floor finishes provide unique contrasts against limestone and buff-colored face brick. All of the exposed steel is painted black—setting off the glass skin. *Photos: Hedrich-Blessing*

office organization

by Clinton H. Cowgill*

In Chicago, there is an architect with neither partners nor employes, who undertakes quite large projects. I have been told that he accepts but one project at a time, and that he takes a vacation after the completion of each project. Much lost motion is saved by this procedure, but he could hardly satisfy a client who was in a hurry.

The A.I.A. Commission to Survey Architectural Education and Registration found that in 1950 the average architect's organization consisted of 7½ individuals. It is necessary, of course, that some firms be large enough to handle very large projects—and large firms, in order to have a continuous flow of commissions, so as to maintain their organizations, must be able to keep several large jobs on the boards. Since the average architectural firm has grown to the size it has, and since many firms are truly large organizations, it is necessary to pay careful attention to office organization. It is the purpose of this paper to discuss briefly the principal divisions of responsibility and work in an architect's office, and two primary methods of office organization.

It will be seen (Chart No. I) that there are three functional phases of work, coming under the general heading of Operation—Production, Development, and Administration. Since architects are receptive to visual explanations, this chart has been prepared to illustrate graphically the definition of terms used.

production

By production, we mean everything that goes into design, preparation of working drawings, and preparation of specifications. Most architects are probably especially interested in what they call *design*, and few would dispute that the ability to design is the most essential of the qualifications of an architect. Design generally is taken to mean the whole process by which the arrangement, shape, construction, and equipment of buildings is determined, and decisions regarding design in this broad sense are frequently made during the production of working drawings and specifications. However, it is less confusing—certainly for this discussion—to include in the definition of the design process only investigation and research leading to programming, sketches, preliminary estimates, and preliminary engineering decisions.

Hence, we have these three principal office functions—design, working drawings, specifications—included in the production process, and reflected that way, as we shall see, in the usual office organization.

development

Of the three divisions of operation, the first to be encountered chronologically is development. An architect must get a commission before he can proceed with it. Specific job development is therefore of great importance, but what is called on the chart *general development* may be even more so. This includes civic activities, publicity, and public relations; the more effective this type of general development becomes, the less effort need be given to individual job development activities. If the job comes to the architect, the architect does not have to go after the job.

administration

For lack of a better term, the word *administration* is used to designate supervision and maintenance, and all service to clients other than production. While the production of contract documents is a major service to the architect's clients, getting the building built is equally important. Despite the fact that the general public seems to think that architects merely "draw blueprints," drawings and specifications are primarily tools, by means of which the architect achieves the final result for which he has been commissioned.

Supervision, either with or without superintendence, together with the taking of bids and the awarding of contracts, are the usual major activities in the administrative function. Some architects, however, have broadened their service to include consultation (without the use of drawings or specifications) and some other professional services, such as continuing advice relative to building maintenance.

management

Over all the operating functions in an architect's office, and taking care of the various nonoperation activities, is management. This is mentioned last, despite its prominent position on the chart, because it is probably the division of architectural practice that is least appealing to many architects who are most competent professionally. Some may consider management a necessary evil, but it *is* necessary. The more it is neglected, the more time it probably will eventually require. Management of an architectural organization of average size, if done efficiently, should not be a burden. The smaller the organization, the less management required, of course, and vice versa.

The principal nonoperation activities which require the direct attention of management may be divided into legal and financial matters. The preparation and revision of partnership agreements, defense against threats of unfair liability suits, and moves to protect the legal rights of the firm are among activities of a legal nature, separate from client service. The collection of fees, provision for reserves, and the wise investment of surplus are typical financial matters requiring management's attention.

organization

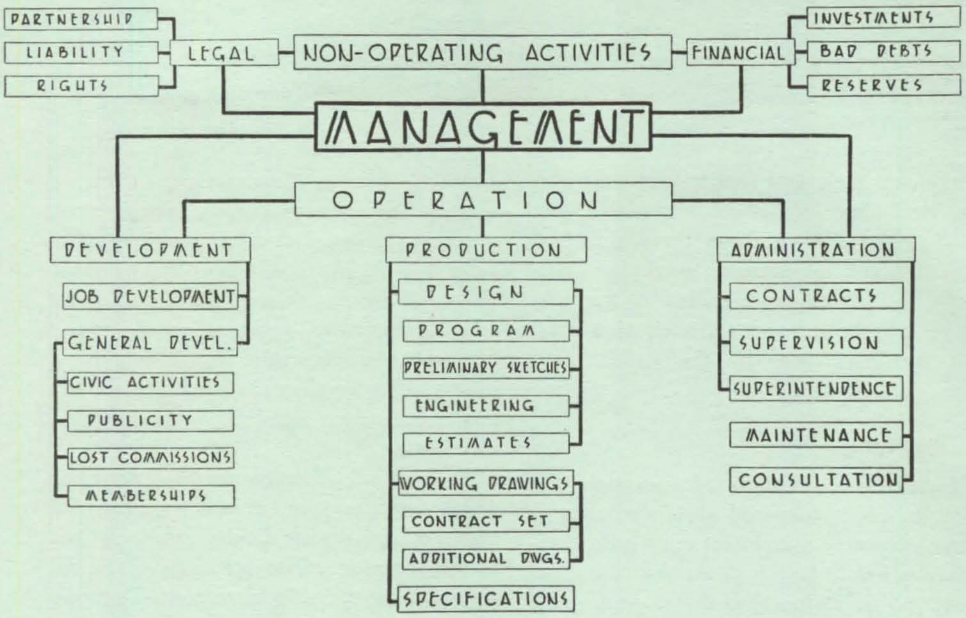
Large architectural organizations are frequently tempted to employ factory methods in an effort to reduce costs. Some specialization is necessary, of course, because the skill, knowledge, and judgment required in the various branches of practice are seldom found in great quantities in a single individual. The organizations which do the best work, though, are those in which a large proportion of the workers are broadly educated and trained. At least 30 percent of all employes should be in training for architectural practice, and, incidentally, a third of these could well be recent graduates.

For the majority of architectural firms, organization is no great problem, often developing naturally in accordance with the abilities of the various members of a firm. When an architect practicing alone as a single principal finds that he has acquired a useful worker, either as a partner or as an employe, appropriate duties may be taken by this added person—and this procedure may be repeated as the organization grows.

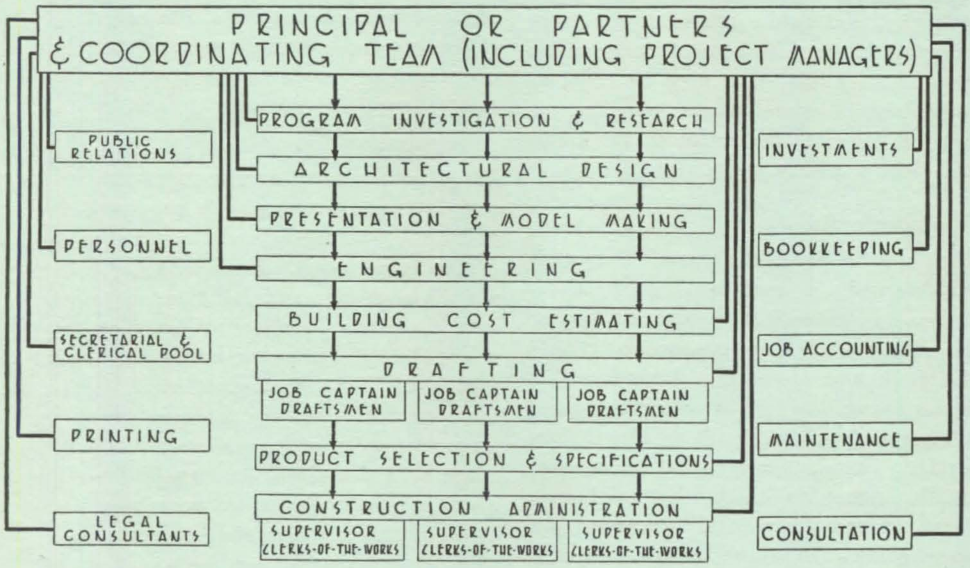
Up to a certain point, each principal or partner may have the comfortable feeling that comes from being able to follow each project closely enough to take direct responsibility for all of the work of the firm. While each principal must continue to take full *legal* responsibility, as the organization becomes larger, more and more of this responsibility must be assumed indirectly, through faith in another partner, employe,

* *Head, Dept. of Architecture, Virginia Polytechnic Institute*

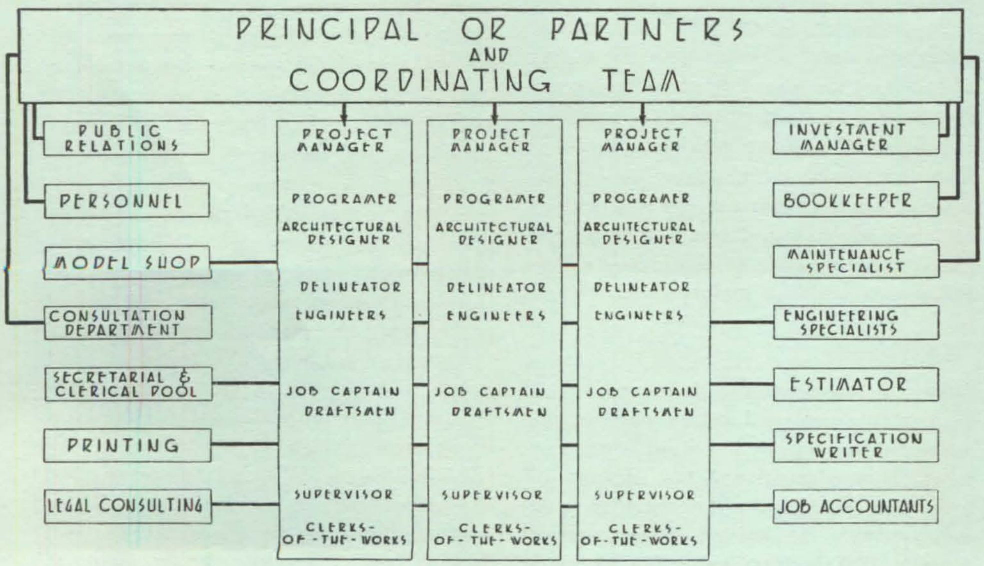
1. office function



2. horizontal organization



3. vertical organization



or consultant. Such faith, however, justified through long association, must be tested occasionally by checking the work of each person to whom responsibility is delegated.

When the size of the permanent organization, including partners and employes, is such that the combined salaries are, let us say, $100,000 a year or more, it becomes necessary to keep a minimum amount of work on the boards continuously. Then—and particularly if projects of great magnitude are included in the work of the office—a decision may have to be made between two basic types of organization. One might be called horizontal, and the other vertical. Modifications of both of these patterns might be appropriate for smaller organizations.

The charts and thoughts regarding these two organizational methods are based upon material prepared by Walter T. Rolfe, Houston, Texas, architect, a member of the Survey Commission referred to earlier. (See also OFFICE PRACTICE article in November 1948 P/A.)

horizontal organization

In the horizontal organization (Chart No. 2) the architectural office becomes departmentalized in accordance with certain functions and specialties, rather than by projects. These specialties usually include the production activities: program investigation and research, architectural design, presentation and model making, engineering, estimating, drafting, product selection, and specification; administrative activities such as supervision, superintendence, job accounts, bookkeeping, contracts, maintenance, consultation services; development activities including public relations; and management functions such as legal problems and investments. A secretarial and clerical pool and a printing department might be included, in some of the very large offices.

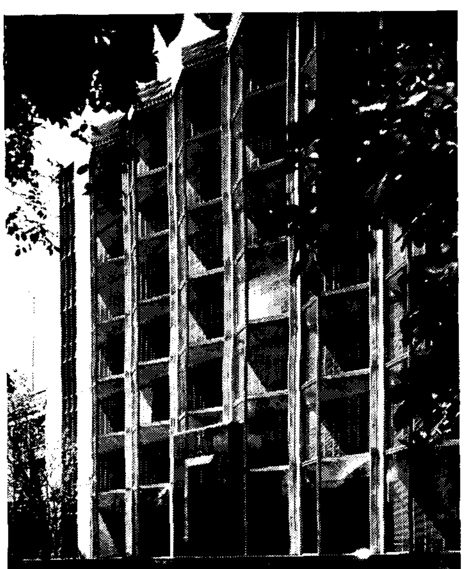
In this type of organization only the drafting and administrative departments would be subdivided vertically—that is, by projects—each job on the boards being in charge of a job-captain, whose duty it would be to co-ordinate the production of working drawings under the supervision of the chief draftsman; and each large job under construction being in charge of a supervisor or clerk-of-the-works. Project managers, one in charge of each project, would cut across departments, engaging the services of any of the departments needed. Each project might also come under the special care of one of the partners. At frequent intervals, conferences

(Continued on page 190)

design data for CURTAIN WALLS
ALUMINUM AND STAINLESS STEEL

Although the use of metals for elements of exterior walls has increased sharply during the last 25 years, the most significant technological advances in metal curtain-wall construction have occurred since World War II. Metal panels are lightweight, can be quickly erected, are permanent and easily maintained, and when combined with insulation they provide a curtain wall that, in terms of reducing heat loss and preventing vapor transmission, has not been surpassed. As aluminum is now generally available for architectural use, this metal is being specified for an increasing number of multistory buildings. In the first half of the discussion appearing on the following pages, the Reynolds Metals Company and the Editors of P/A present design data for "Aluminum Curtain-Wall Construction" and detail drawings of the three related basic construction systems.

Stainless-steel curtain-wall construction has had an equally remarkable growth and all evidence points toward its continuing. To develop data most useful for architects engaged in stainless-steel curtain-wall construction and design, Princeton University's School of Architecture has recently been awarded a grant from the Committee of Stainless Steel Producers of the American Iron and Steel Institute. Although Type 302 stainless steel containing nickel is no longer available, due to government restrictions, Type 430 has been found to be an acceptable substitute for exterior walls. In the second half of this presentation, the discussion, "Type 430 Stainless Steel for Building Panels," has been prepared by the United States Steel Corporation.



Two early examples of metal curtain-wall construction designed by Architects Holabird & Root & Burgee, Chicago. A. O. Smith, Corporation Science Building, Milwaukee, Wisconsin (left) *erected in 1928 is enclosed by fixed-glass lights, held in an aluminum grillage. Monroe-Dearborn Building* (right, above) *1935 is enclosed by stainless steel, backed with laminated-plastic spandrels and glass set in stainless steel.* Photos: Hedrich-Blessing

aluminum curtain-wall construction

by R. F. Seery*

Curtain-wall construction today demands a more functional design and lower cost than ever before. The problem is to build a light nonloadbearing wall to protect the building interior from the elements of weather and provide a safe enclosure for the occupancy with regard to its location.

Many architects have been extremely successful in achieving new expression for the building façade while providing new methods to solve this basic problem. Architects, builders, and suppliers have all contributed to these developments. The large market gained by aluminum in the building industry in recent years has evidenced its usefulness. Curtain-wall construction is now looked upon as one of the most promising uses for aluminum; its natural advantages and low cost make this possible.

The intent of this article is to present information about materials and methods for aluminum curtain walls. Code or fire regulations are not discussed, but the designer will be given the basic information from which aluminum designing should begin.

advantages

Aluminum has important natural advantages that are present in every aluminum alloy. Its weight, only one-third that of steel, allows larger single sections to be fabricated and erected, thus effecting economies in construction not possible with other materials. Larger fabricated sections mean fewer joints and less possibility of leaky walls.

Weather-resistant aluminum has proven itself for architectural and structural applications. Its affinity for oxygen and natural build-up of a colorless protective surface coating assure this desirable characteristic. Electrochemical processes of anodic finishing provide a thicker protective coating, thereby increasing the inherent corrosion resistance and providing a tougher finish.

The appearance of aluminum can be altered to provide many desirable finishes. The surface can be etched, wire-brushed, or polished, and an additional anodic coating can be applied. For years, castings were the only form of aluminum to present a slate-gray weather appearance. Now, slate-gray finishes are available as extrusions in silicon alloys and as sheet in clad materials. This development has opened new possibilities for aluminum on the building façade, by providing contrasting surface finishes.

Aluminum's workability assures easy forming and fabrication into finished products. Additional economies are effected due to the lower labor cost. There are many instances in architectural design where experience has shown that it costs the same or less to do a job with aluminum, although material costs may be higher. The excellent workability of aluminum holds manufacturing costs down so that the finished cost is lower.

material and alloys

The many alloys and temper designations of aluminum have led to some confusion in the building industry. The numbering system for wrought-aluminum alloys is broken into two parts—for example, the designation 3S-H14. The symbol 3S designates the alloy, while the symbol H14 designates the temper.

The first series of numbers is a guide to the major alloying ingredient *(Table I)*. There may be as many as five other alloying elements in some of these alloys, but these groupings form a convenient system of classification.

The second number designates one of the two temper types. The *non*heat-treatable types, designated by H, are given increased strength by cold working. The heat-treatable type, designated by T, gains in strength by heating and quenching. Each alloy will show its type by the temper designation following its alloy number, unless it has been fully annealed and designated by O; 3S-H14, for example, is a nonheat-treatable manganese alloy and 14S-T6 a heat-treatable copper alloy. The numbers following H and T indicate the degree of temper obtained during processing and the method by which that temper was achieved.

When designing curtain walls, there are three forms of aluminum from which planning should start. They are sheet, extrusions, and castings.

Sheet

Plain, embossed, or clad sheet is available in many sizes and alloys. For the most part, aluminum sheet can be confined to 3S alloy. This manganese alloy is work-hardened to temper and has excellent mechanical properties. 3S has good corrosion resistance and it can take severe bending operations during forming. 3S alloy sheet may also be obtained clad with 43S or 44S alloys. This clad material is used when a special finish is desired. When higher me-

**Architectural and Construction Market, Reynolds Metals Company, Louisville, Ky.*

chanical properties are desired, 52S alloy is recommended *(Table II)*.

Extrusions

These have few restrictions and a great variety of expressions can be achieved with proper planning. Die costs are low. Sizes are normally limited to shapes whose cross sections can be inscribed within a 12-in. circle. As larger presses become available, this diameter will be increased. This size limit can sometimes be increased by a novel method: certain extruded shapes can be extruded as a folded shape meeting the limitations of the 12-in. inscribed circle. The folded shape can then be flattened to provide the desired shape.

Extruded shapes in 63S alloy are best suited for architectural applications. High mechanical properties can be obtained by heat treating 63S, and costs are relatively low. When a slate-gray finish is desired, the extrusion alloy 43S should be used. Strength characteristics similar to structural steel are available with 61S alloy in the T6 temper. 61S-T6 is an economical structural alloy to attain higher properties and maintain high corrosion resistance for structural purposes, but the finish differs from 63S *(Table III)*.

Castings

Castings are used when a three-dimensional surface design or a rough-textured material is desired. Casting alloy designations do not follow the numbering system used for the wrought alloys. The letter S is omitted. For general purposes, 43 alloy, an aluminum silicon casting alloy, is used. If an anodic finish is desired and the casting must match a 63S alloy extrusion, then 214 alloy should be used. Castings requiring strength higher than 43 should use 356, which is also an aluminum silicon alloy of the heat-treatable type *(Table IV)*.

methods

The designers' choice of curtain-wall sections will depend largely upon the job the wall must perform. A consideration of fenestration and fire safety must first be concluded. From a construction standpoint, aluminum curtain walls can be classified as prefabricated, facings, or mullion types. Each particular type has its design and functional limitations which must be weighed during planning.

Prefab Panels

These wall panels are composed of an exterior facing and an interior facing, usually with insulation in between. The panel is received completely finished and need only be attached to the structural frame of the building to make the installation. Good standard aluminum designs are merchandised by several manufacturers including Detroit Steel Products, H. H. Robertson, R. C. Mahon, Seaporcel Metals, Steelcraft, and U. S. Plywood. If special design considerations are involved, custom-built units can be obtained from aluminum fabricators and installed on the same basis. Although most prefab panels are constructed from sheet materials, they need not be limited to sheet. Extrusions or castings can be prefabricated in much the same manner.

Architects Ervin & Berne, Denver, Colorado, have incorporated custom prefab aluminum spandrels in their design for the Denver Club Building *(Figure 1)*. These

Table I: Wrought-Aluminum Alloys

Ranges	Principal alloying constituent	Examples
2S	commercially pure alum.	2S
3- 9S	manganese	3S
10-29S	copper	14S
30-49S	silicon	43S
50-69S	magnesium	63S
70-79S	zinc	75S

Table II: Mechanical Properties Comparison for Sheet Aluminum

Alloy	Yield strength
3S-H14	20,000 psi
52S-H14	31,000 psi

Table III: Mechanical Properties Comparison for Aluminum Extrusions

Alloy	Yield strength
61S-T6	40,000 psi
63S-T6	30,000 psi

Table IV: Mechanical Properties Comparison for Aluminum Sand Castings

Alloy	Yield strength
43	9,000 psi
214	12,000 psi
356-T6 (Heat-treatable)	24,000 psi

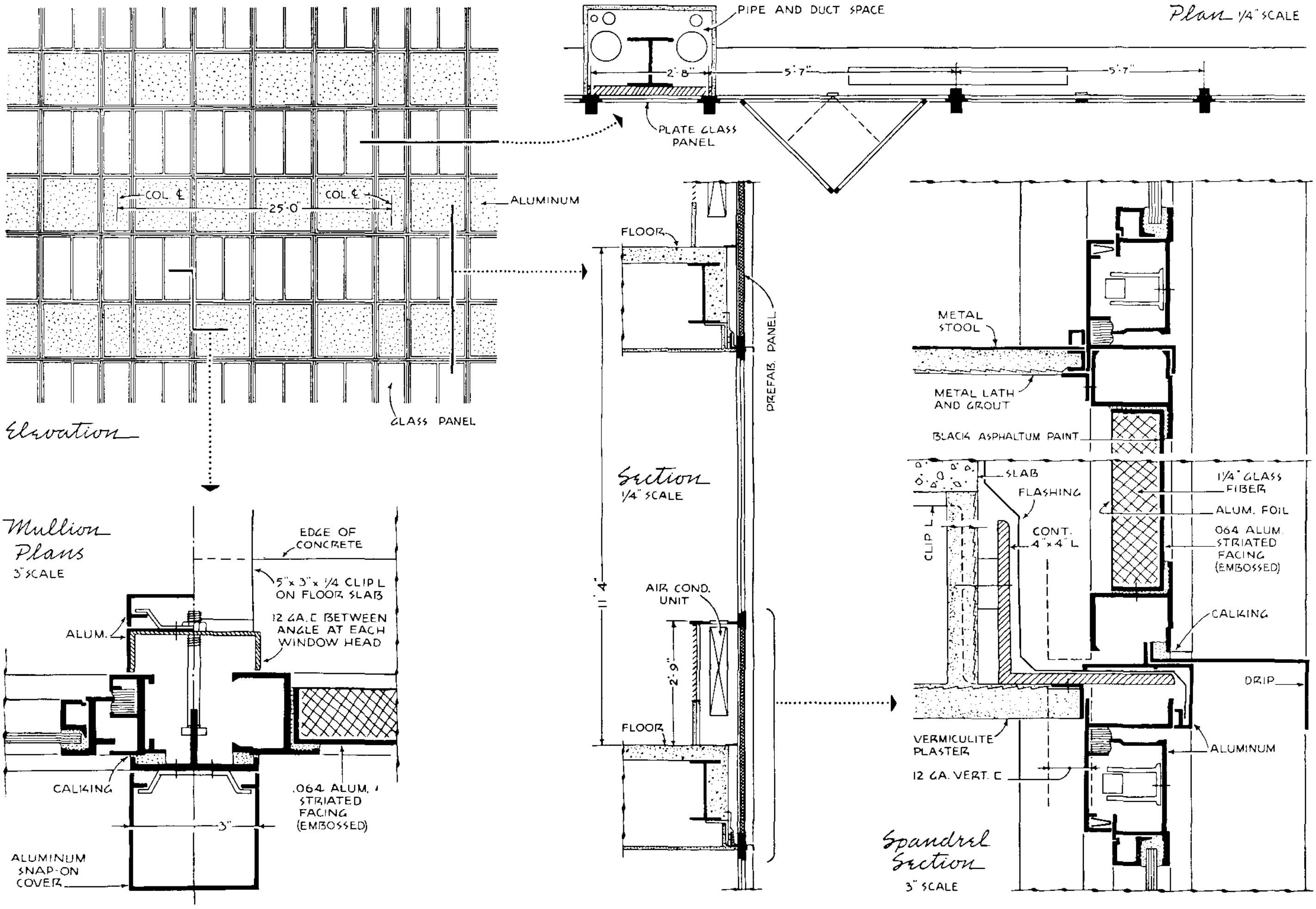


Figure 1—details of aluminum prefab panel construction in the Denver Club Building, Denver, Colo.: Ervin & Berne, Architects.

spandrels, which have a U factor of 0.12, are composed of striated, embossed-aluminum sheet laminated to a glass-fiber insulation backing; the sheet will be treated to provide a satin finish. Flue-type windows containing heat-absorbent glass are made of anodized aluminum. This wall will be erected by the use of clip angles attached to brackets welded to the structural steel frame; each sash with its spandrel below will be placed as a unit.

The Simms Building, designed by Architects Flatow & Moore, Albuquerque, New Mexico, is framed in reinforced concrete and the floor slabs are cantilevered four feet beyond the exterior columns *(Figure 2)*. Spandrels and sash are held in place by 5 I 10 beams bolted vertically to the concrete floor slab at five foot intervals *(see details)*. The spandrels are prefabricated and consist of factory-glazed aluminum-sheet facing with an integral glass-fiber insulation back-up. Vertically-pivoted window units have been specified.

Facings

Sometimes called skin-type spandrels, these facings are classified as those which fasten to or form a part of an adjacent curtain-wall construction. This spandrel type has usually performed a decorative function; however, recent developments in this type classify it as a weather-resisting surface. Facing materials can be any one of the three forms of aluminum previously mentioned; each has been used. Some structures employ these basic forms in combinations to achieve a contrasting effect.

Aluminum castings, long a standard

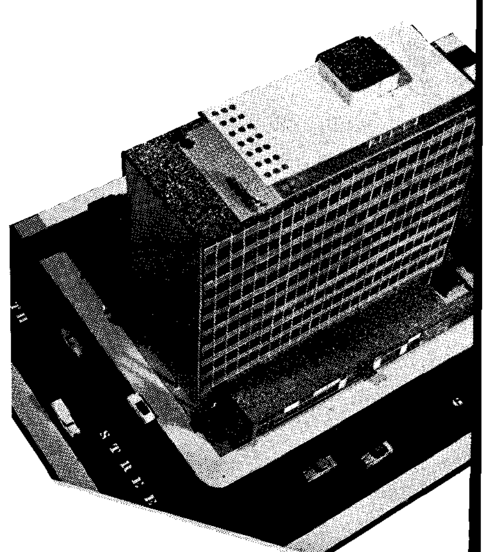
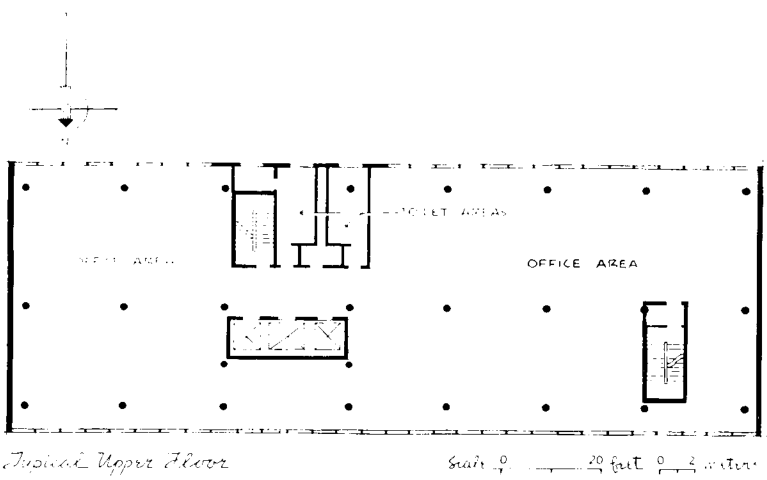
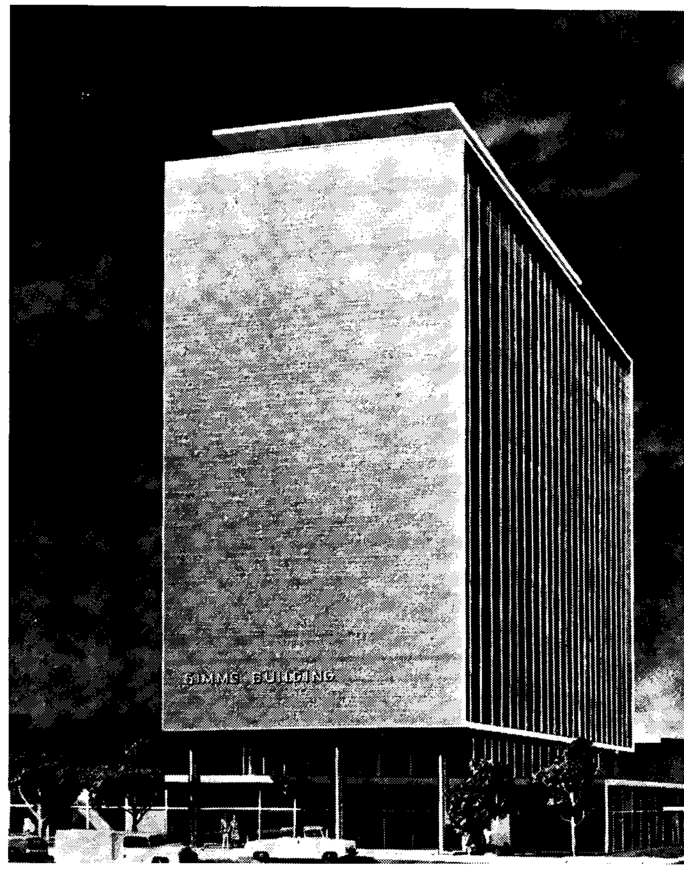
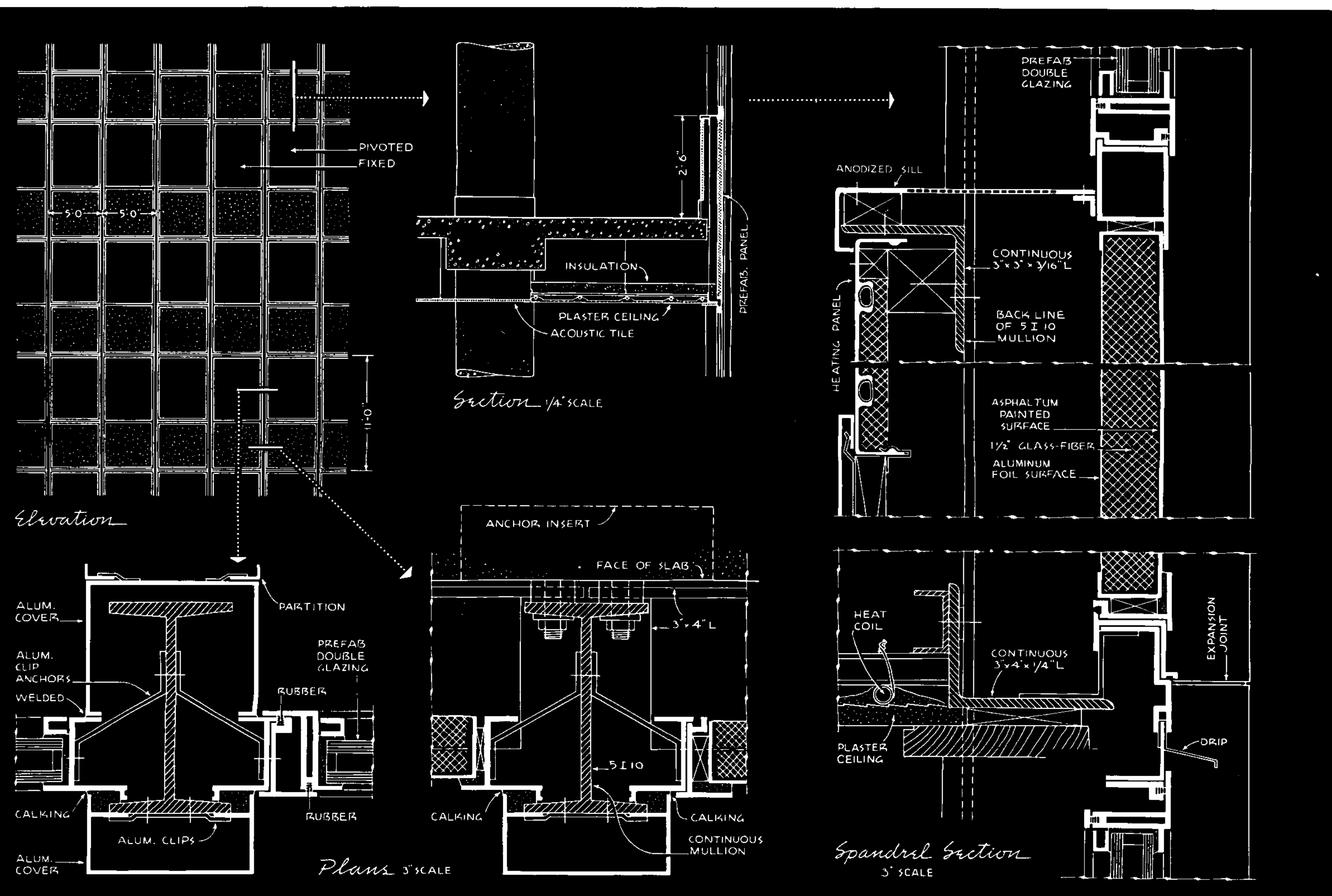


Figure 2—model of the Simms Building, Albuquerque, N. Mex. (right and acrosspage below): *Flatow & Moore, Architects. Typical floor plan and details of aluminum prefab panel construction* (below).







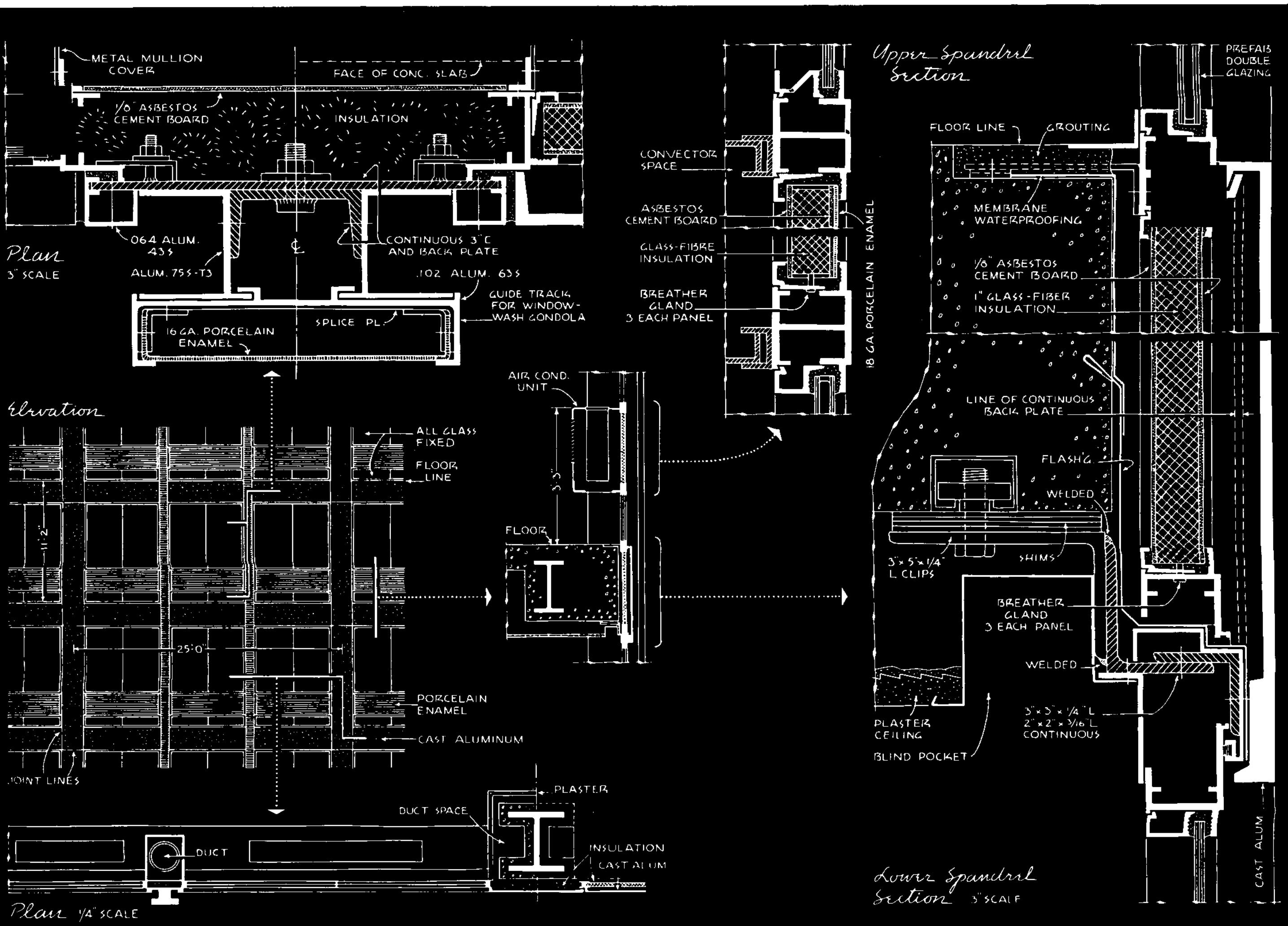
spandrel material, are being incorporated by Webb & Knapp, Inc., New York, in their design for the 1700 Broadway Building in Denver, Colorado. The cast-aluminum facings protect spandrels, columns, and act as guide rails for window washing equipment *(Figure 3)*. Insulated, structural porcelain-enamel panels on the exterior wall support elements of the peripheral air-conditioning system which is encased 12″ above the floor level. Behind the aluminum spandrel facings insulated asbestos-cement panels will be installed.

Skin-type panels have been employed by Emery Roth & Sons, New York Architects, in their design for the 99 Park Avenue Building now nearing completion in New York *(Figure 4)*. Approximately 1800 die-pressed wall and window panels were bolted to the building's framework in 6½ days. Although the 10-gage panels are one-story high, they were welded together at the window heads to form two-story lengths. Extruded members between panels extend the full two-story length. As at the Alcoa Building in Pittsburgh (August 1952 P/A) the prefab panels were installed from the inside so that outside scaffolding was eliminated.

Mullion-Type Construction

On the UN Secretariat Building, New York, for which Wallace K. Harrison was Director of Planning, aluminum extrusions were used as facings for the structural-steel mullions *(Figure 5)*. These extrusions were designed in three pieces—one on each side of the double-channel mullions and a facing piece. Side pieces have a natural finish while the facing piece has a con-

Figure 3—details of aluminum castings for the 1700 Broadway Building, Denver, Colo.: Webb & Knapp, Inc., Architects.



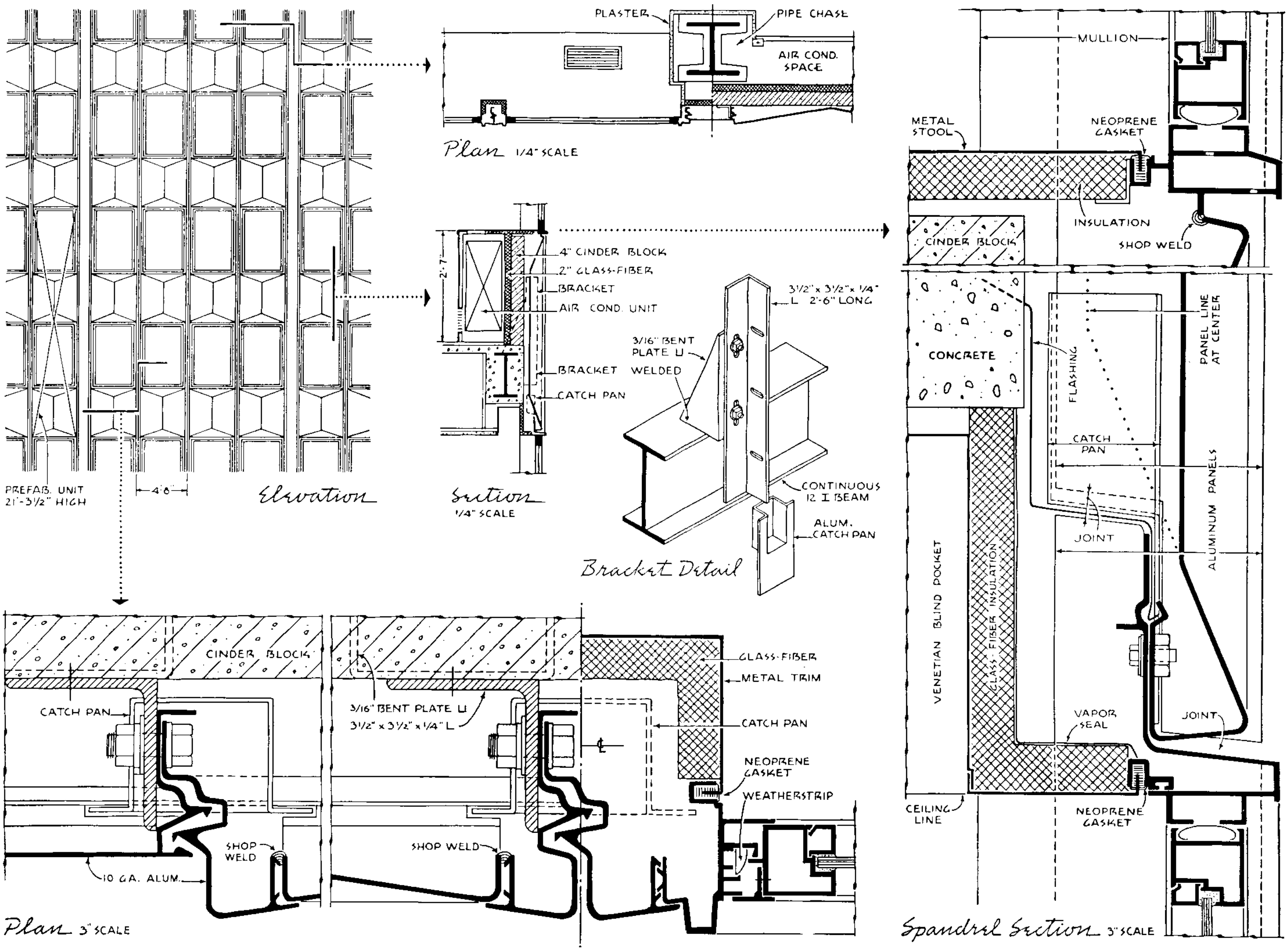


Figure 4—details of aluminum skin-type panels for the 99 Park Avenue Building, New York: Emery Roth & Sons, Architects; Tishman Realty and Construction Co., Inc: owners and builders.

trasting dark finish. Where sides and facing meet, continuous aluminum angles were subsequently needed as corrective measures to make the structure weatherproof; expansion joint covers were also required.

Aluminum fins for the El Paso Natural Gas Building, El Paso, Texas, designed by Carroll & Daeuble, will be constructed of both sheet and extrusions *(Figure 6)*. The sides of the fins will be formed of sheet and the facing will be an extrusion with a dark finish. Spandrels used on this job will also be a combination of formed embossed sheet and matching extrusions.

finishes

Special finishes can be employed to enhance aluminum curtain walls. When finishes are used for this construction, they can be classified as mill, mechanical, chemical, electrolytic, or organic. Many other finishes for special applications can also be applied to aluminum surfaces.

Mill finish is the term used to describe sheet, extrusions, or structurals as received from the mill. A great amount of mill-finish metal is used for curtain walls because natural weathering tends to gray the metal to a uniform surface without special treatment.

Mechanical finishes—grinding, scratch brushing, or polishing—are used to change the surface appearance. Grinding is used principally for removing surface variations from castings. The operation is usually accomplished by means of a rotary grinder but is not in general use for decorative purposes.

Scratch brushing, polishing, or chemical

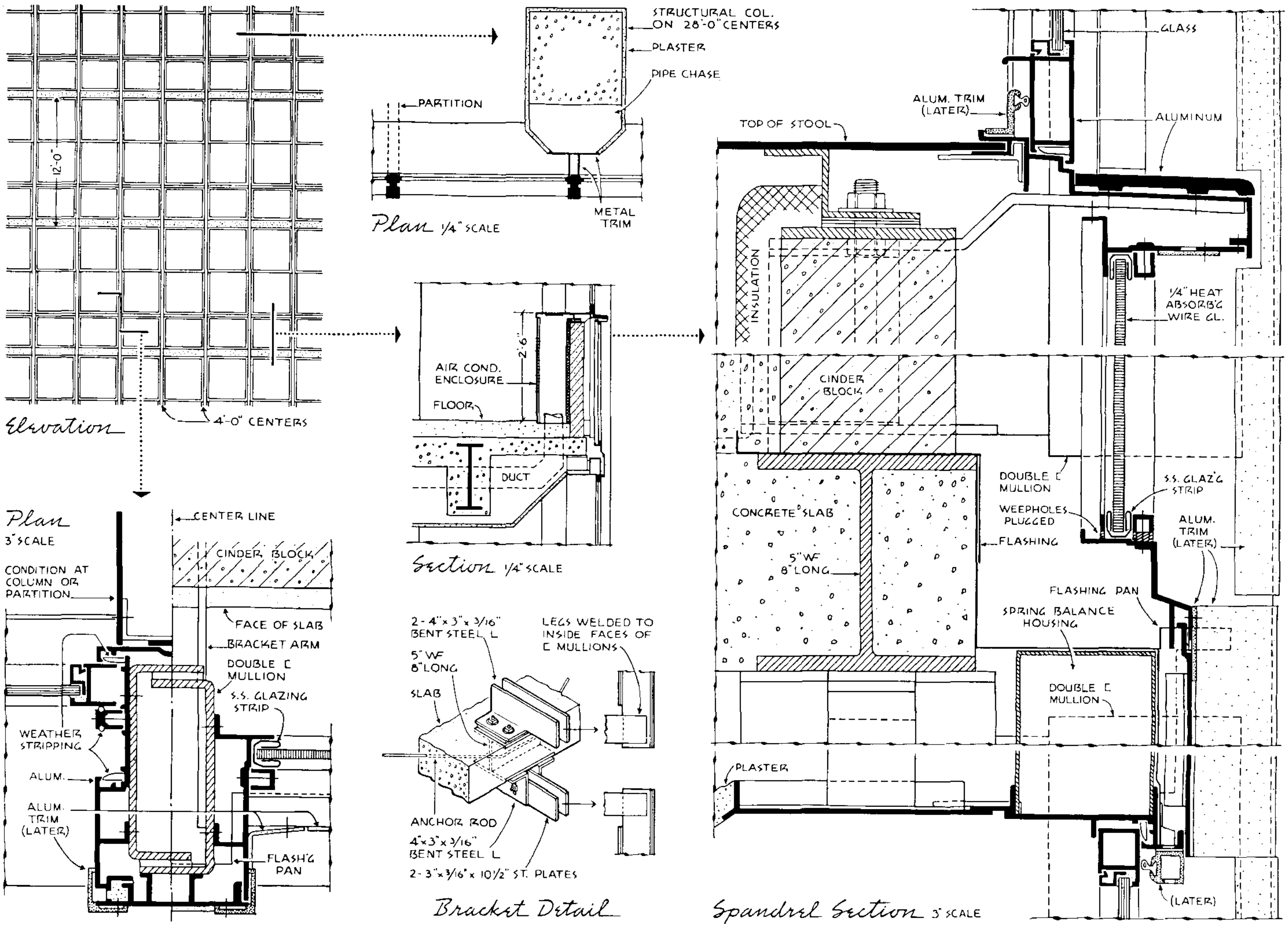


Figure 5—details of aluminum mullion-type construction in the UN Secretariat Building, New York: Wallace K. Harrison, Director of Planning.

etching can be employed when a special surface is desired. Various degrees of scratching or etching produce a wide variation in surface texture. The scratching operation is usually done by a power-driven rotating wire brush. Variations in the wire size produce the varying degree of scratching.

Most etching is done by immersing the aluminum in a heated solution of caustic soda for a period of time and then rinsing. Etched surfaces can be varied by changing the concentration of the caustic soda solution or the time of immersion.

Polishing is employed to remove any abrasive marks on the metal and is done with fine abrasives on wheels or belts. Aluminum is polished in much the same manner as other metals, but with lower wheel-to-metal pressures.

Electrolytic or anodized finishes are applied to aluminum to protect the existing surface or to achieve special coloring. The electrolytic process builds up the oxide surface on the aluminum and forms a hard shell to protect the surface from abrasion or corrosion.

Anodizing is accomplished by passing a current through aluminum suspended in a chrome or sulphuric acid solution. First, the metal is chemically cleaned, then anodized, rinsed, and sealed by a hot water bath. The oxide films built up on the surface by this process may vary from .00005" to .001" in thickness. Depth of the coating is a function of current density and time.

Organic coating processes involve preparation of the metal surface by an etching-type cleaner, prime, then paint. Most paint films used on aluminum are baked on and obtain very desirable and lasting surfaces. Many special finishes of vitreous enamels have proved successful with aluminum panels and offer a permanent finish.

construction

Architectural joining methods are generally confined to welding, riveting, and bolting. Most aluminum curtain-wall construction joined on the job has been done by bolting, mainly because of the ease of handling. Structural work employs riveting or welding. As a general rule, riveting and welding are shop procedures used for prefabricating the panels or facings.

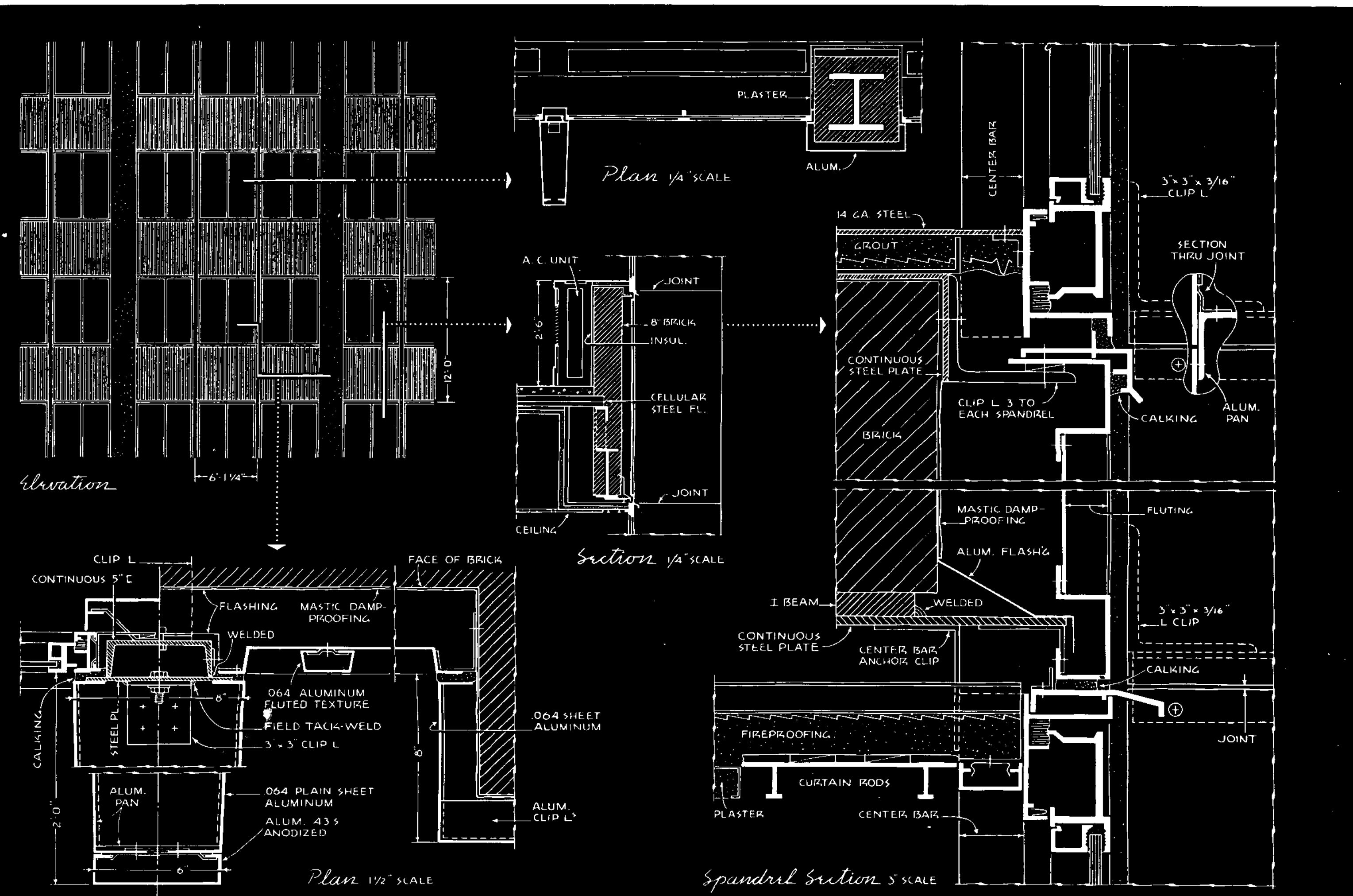
Under normal conditions, steel bolts, galvanized or cadmium plated, are satisfactory. Aluminum bolts should be used under more corrosive conditions. A wide range of aluminum rivets and bolts are currently on the market. When using aluminum bolts or rivets, 61S alloy is generally recommended.

When compensating for expansion and contraction, it must be borne in mind that aluminum has about twice the thermal expansion of ferrous metals. Expansion joints designed into the panels should allow about 3/8-inch for every 10 feet of space.

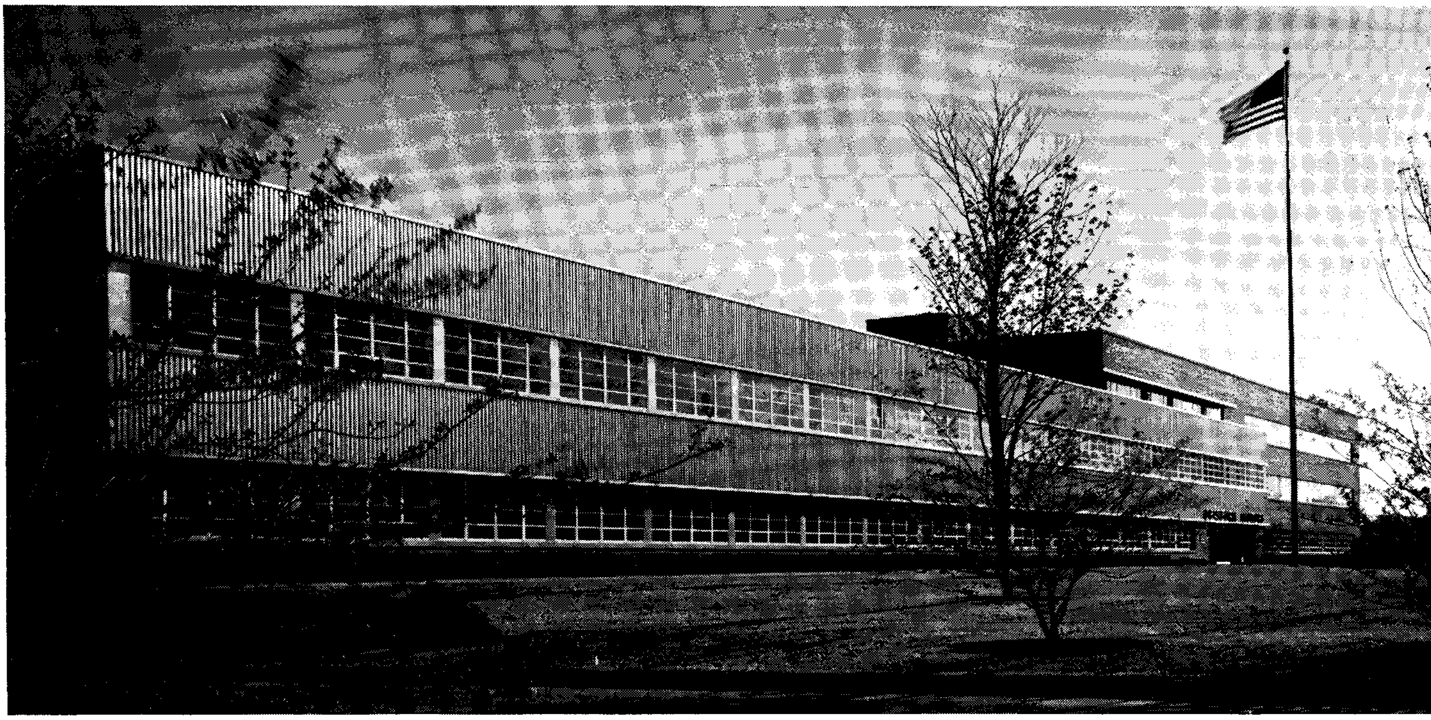
Minimum thickness of metal in extrusions and castings is governed by the process. Thickness of sheet must be sufficient to prevent buckling or oil canning. There is no "rule of thumb" or available data on recommended thicknesses as they depend on many factors including methods of forming and fabricating the wall, the area, and so on. The thicknesses shown on the details in this article are considered well chosen and so can be useful as a guide.

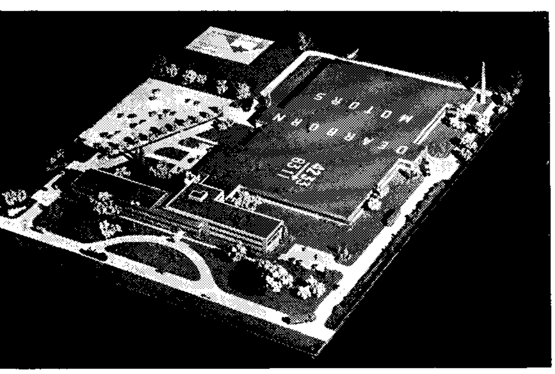
Contact with dissimilar metals can sometimes be damaging if moisture is present for any extended period and galvanic action begins. A coat of bituminous paint applied between the metals will prevent galvanic action.

Figure 6—detail of aluminum fins for the El Paso Gas Company Building, El Paso, Tex.: Carroll & Daeuble, Architects.



office and warehouse

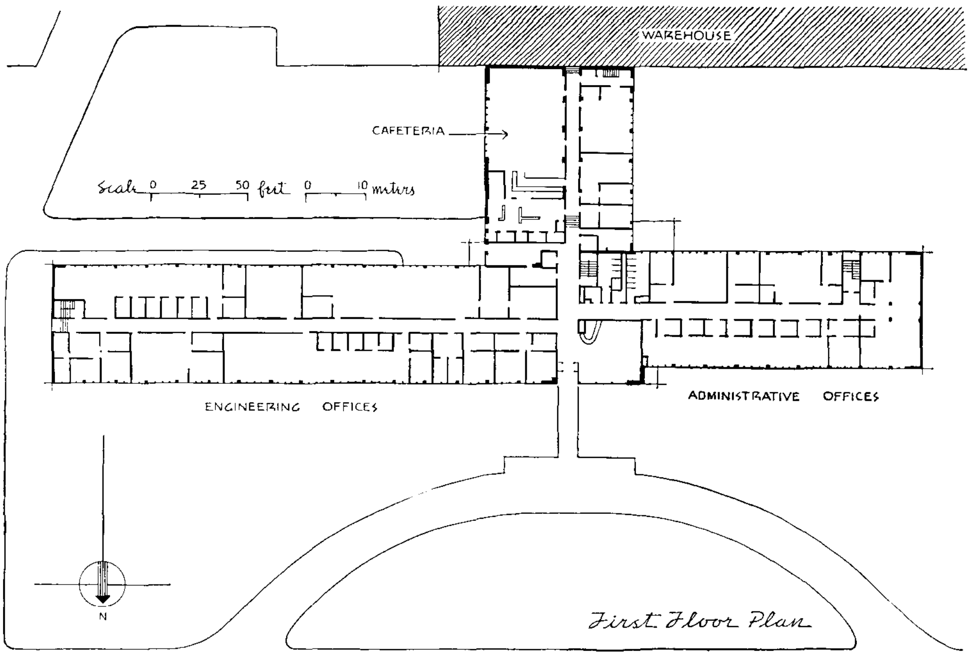


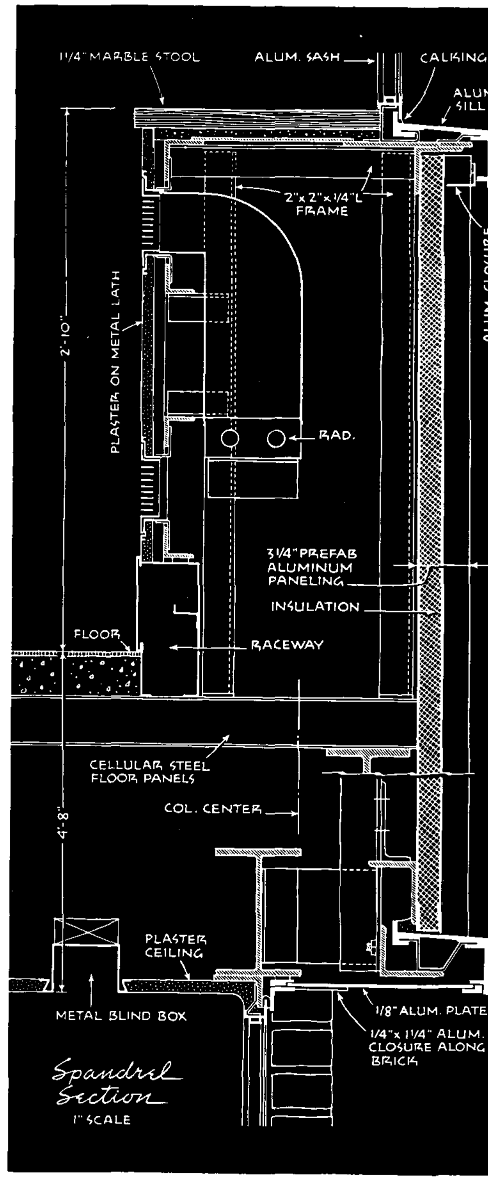


Office and warehouse buildings for the Dearborn Motors Corporation, national marketing organization for Ford tractors and Dearborn farm equipment, have been located on an 80-acre site at Birmingham, Michigan *(model at left)*. In meeting the requirements of the client, Giffels & Vallet, Inc.—L. Rossetti, Associated Engineers and Architects, Detroit, have designed a structure to house the business and executive offices of the company, with a connected warehouse for storage of tractor parts, also containing shops and labs.

The office building, a three-story reinforced-concrete structure with basement, provides 125,000 sq ft of usable space *(plan acrosspage)*. Its exterior walls are of face brick, with aluminum sash. The north and east elevations are of prefab insulated-aluminum curtain-wall construction. Possessing remarkably low heat transfer and vapor transmission characteristics, each of the cellular-aluminum panels in the curtain walls is approximately 7′ 0″ high and has an over-all thickness of 3¼″ that includes a 1½″ insulation backing *(section acrosspage)*. In the roof construction, precast-cement tiles are covered with a 20-year composition roof. Throughout the building, cellular-steel floors are covered with concrete-stone fill and surfaced with asphalt tile. Metal partitions permit maximum flexibility to meet the changing needs of the office space.

Linked to the office building by a cafeteria at ground level, the warehouse covers an area of 170,000 sq ft. Its walls are principally of brick sill construction with steel sash and aluminum siding. Insulated-metal roof decking tops the shops and warehouse areas. Floors are poured concrete while the cinder-block walls separate the various elements within the warehouse.





Reception room off main entrance of office building displays merchandise to be marketed (left). *Each of the prefab insulated-aluminum panels on north elevation is approximately 7' high. Conference room on third floor* (above) *has both flush-type fluorescent lighting and down lighting.* Photos: Lens-Art

type 430 stainless steel for building panels

by R. M. Stodgell*

The use of stainless steel for exteriors of insulated panels for buildings has spread rapidly in the years since the war and particularly in recent months. Acceptance of stainless steel for building panel construction—a natural complement to structural-steel framework—has been the result of many influences. And underlying them all is the remarkable success stainless steel has had in the architectural field during the past 25 years.

Basically, the idea of using a panel wall of lightweight material to construct "complete" building walls is not new. The increased interest and growing acceptance of stainless steel in panels has been based on practical necessity. High labor costs combined with many other factors have created a demand for a simple, permanent, virtually maintenance-free building wall material. Because of high land and building costs, the availability of more rentable, or usable interior space—made possible by this type of construction—has attracted many builders.

The use of insulated stainless-steel building panels offers all of the basic advantages inherent in modern curtain-wall design. An architect or builder can think in terms of thin-wall construction weighing only 5 to 8 psf (*Figures 1 and 2*). This results in savings and other economic gains all along the line—in reduced foundations, lighter structural framework, shorter erection time, earlier occupancy, and increased floor area.

In addition, stainless-steel panels are attractive, durable, and at the same time, extremely versatile. They are lightweight and can be installed quickly. They can also be dismantled readily and reused immediately. This versatility of stainless-steel panels, combined with their permanence, has made them attractive to both building owners and metal fabricators.

The use of stainless-steel panels is not restricted to any particular type of structure. This article, however, deals primarily with that large group of buildings, usually with low silhouettes, which includes power houses, laboratories, research and business offices, plant offices, and schools. Stainless-steel panels are also being used extensively for many other types of structures, including multistoried office buildings and large industrial buildings.

Stainless-steel panel construction generally consists of a formed sheet of stainless steel, a layer of insulating material, and a carbon or galvanized-steel backup sheet, the entire assembly usually being from 2″ to 4″ thick (*Figure 1*). Today, fabricators of panels are producing formed sections for modular construction ranging in widths from 12″ to 24″. The length of these panels varies greatly, depending on the design of the building involved.

Formerly, in architectural work, Type 302 stainless steel containing approximately 18 percent chromium and 8 percent

Stainless Steel Division, United States Steel Corporation, Pittsburgh, Pa.

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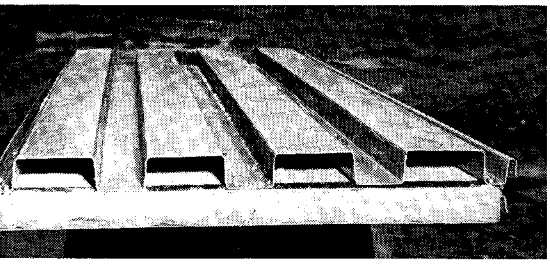

Typical panel (left) *has glass-fiber insulation between stainless-steel facing and galvanized-steel back-up sheet. A 14-sq-ft panel* (below left) *weighing but 98 lb can be easily carried by two men. Just before erection, workman calks joint flanges* (below right) *as proper sealing builds up vapor barrier over entire exterior of wall to reduce "U" factor. Two men bolt panel to structural steel at sill, in freezing weather* (right).

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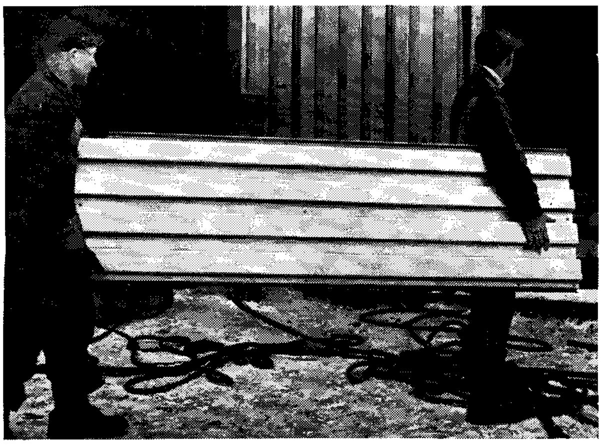

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nickel was usually specified. More recently, however, because the National Production Authority has prohibited the use of nickel-bearing stainless steels for curtain walls, architects have turned to Type 430 stainless, containing approximately 17 percent chromium and no nickel for exterior applications.

This straight chromium steel is similar to 18-8 in appearance, possesses adequate mechanical properties, and very effectively resists corrosion. Test corrosion samples of Type 302 and Type 430 exposed for 20 years on U. S. Steel's test rack installations in two separate, highly industrial atmospheres, have remained in excellent condition except for a normal accumulation of surface dirt.

Because of differences in chemical composition, Type 430 is inherently brighter or more reflective than Type 302 in the cold-rolled finishes. But, contrary to a general belief that stainless must always be a highly polished, bright, and reflective

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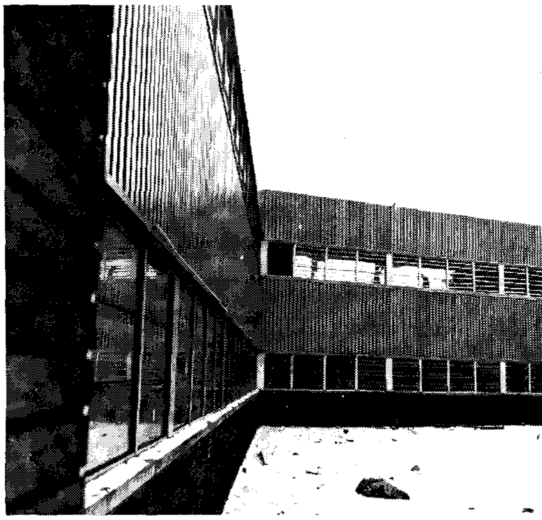

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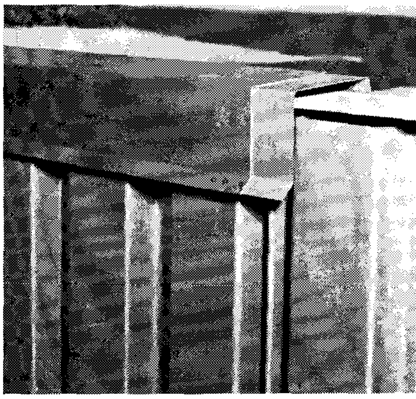

Wing of Technical Center, National Malleable and Steel Castings Company, Cleveland, Ohio (right above): *Dalton & Dalton Associates, Architects-Engineers. Type 430 (20 gage) stainless steel panels, 9000 sq ft total, were formed on a Yoder mill while parapet caps of the same material* (right below) *were formed on a break press.*

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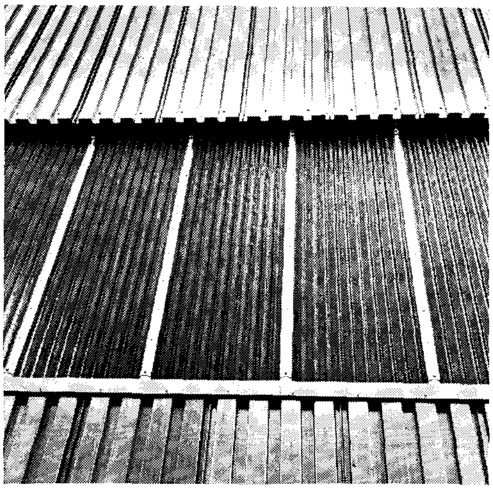

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Welding carbon-steel back-up sheet to structural girt of new building (left) *permits quickest method of erection. Three men can easily hoist and place panel in position before bolting or welding to girt* (above left). *Sill flashing, below fixed corrugated-glass windows, is Type 430 (20 gage) stainless steel* (right above).

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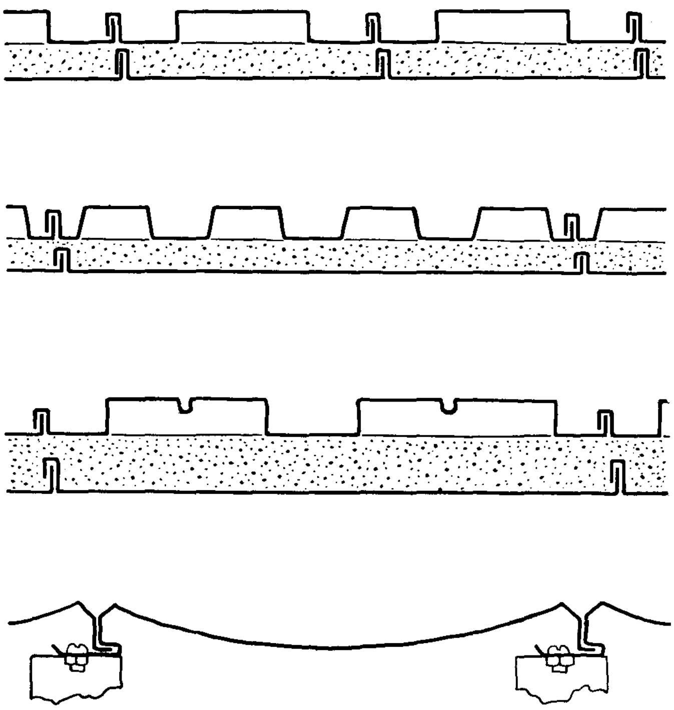

Typical stainless-steel panel sections. Section without insulation (bottom) *was recently used to surface exterior of the existing Heppenstall Building in Pittsburgh.*

material, a stainless finish has a cold-rolled surface which diffuses rather than reflects light falling upon it. It has the approximate density of the standard bright finish and yet it does not possess the "white pickled" appearance of the dull finished product. This finish is obtained by running the stainless-steel sheets through a set of rolls having surfaces that are roughened by grit or shot blasting.

This less-reflective finish requires no special handling or protection. Once in place, it weathers to a uniform dull gray. Type 430 stainless steel, with this special architectural finish, was used for the first time on the three Gateway Center Buildings in Pittsburgh *(page 109, November 1952 P/A)*, and more recently on the National Malleable and Steel Castings Company's laboratory office building in Cleveland *(Figure 9)*. On each of these buildings there are large areas of stainless steel where anything but a nonreflective surface would be a source of annoyance. This special architectural cold-rolled finish has also been used for four of the buildings at U. S. Steel's new Fairless Works in Morrisville, Pennsylvania. The general office, dispensary, metallurgical laboratory, and fire house are all completely surfaced with Type 430 stainless steel.

Certain design treatments which break up areas of bright reflection may, in some instances, permit the use of brighter finishes on large panels. The use of polished finishes on stainless steel is generally confined to entrance trim, fascias, soffits, and in some instances, to window sash. The Number 4 finish—a polished finish—is usually specified for such applications. But for large wall areas the polished finishes are usually objectionable since they are too reflective and are more costly.

The smooth, dense surface of this steel will, of course, minimize the adherence of airborne dirt, although stainless-steel walls—like any other walls—do require occasional cleaning. How often depends on atmospheric conditions in the area that the building is located. But in any event, the cleaning of stainless-steel walls is relatively simple.

modular panels

One of the important features of a stainless-steel panel is its modular construction which offers advantages from the very outset, from the drawing board where it reduces drafting-room time and simplifies detail, to actual construction, where wall and window erection is simplified. Doors and windows fall into line with modular design which eliminates much of the time lost by making cutouts and adjustments on the job.

The availability of stainless steel in both cut lengths and coils makes it possible to secure a wide range of panel lengths. Panels up to 18′ to 20′ long are readily obtainable and will, in many cases, eliminate the necessity for horizontal joints. Even longer panels can be obtained, if required.

proper design of stainless-steel skin

To keep panel construction competitive with other building methods, stainless-steel fabricators have kept the design of panels simple, yet flexible. Basically, the architect in designing and the panel manufacturer in fabricating stainless-steel panels must keep in mind the relationship between metal thickness and surface treatment. The fabricator's objective is to use a minimum thickness of stainless steel and yet obtain a maximum section modulus—or strength in section. But using stainless steel, a fabricator can consider lighter gages because of the steel's high mechanical properties and superior corrosion resistance.

The experience of several fabricators indicates that when using stainless sheets of 20 or 22 gage, it is important to restrict the width of flat surfaces to no more than four or five inches *(Figure 10)*. Lighter gage sheets should, of course, have even smaller areas of flat surface. Waviness will be evident if light-gage sheets are used for large areas having flat surfaces. Flat surface areas may, of course, be increased proportionately as thicker sheets are used. And by forming sheets in various patterns, flat areas are decreased in size and greater panel rigidity is obtained.

fabrication of type 430 for panels

Fabricating Type 430 stainless steel for a building panel's exterior skin has been accomplished satisfactorily. Stainless steel

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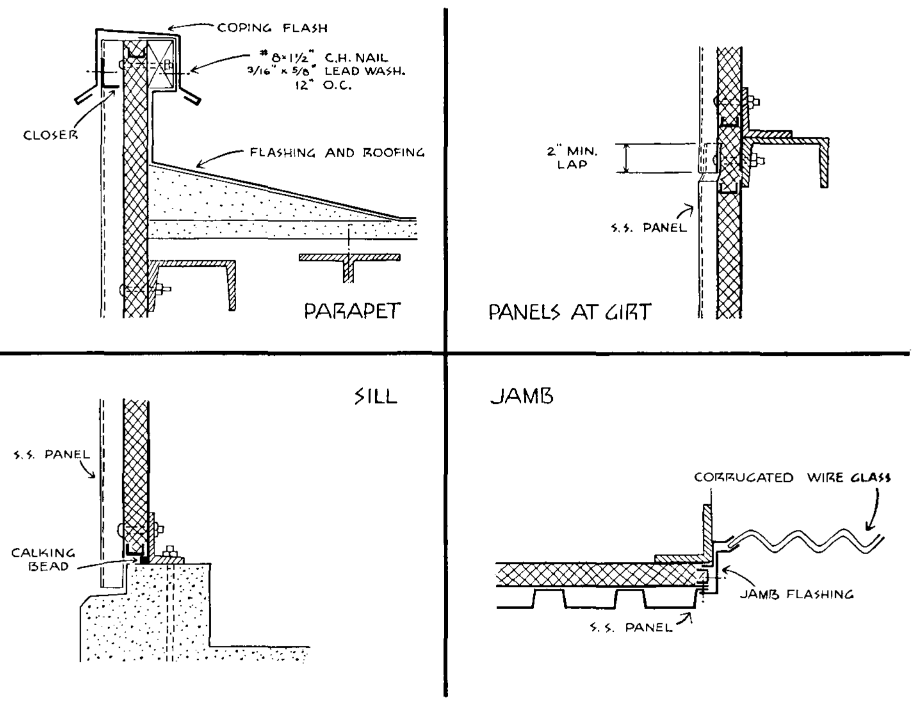


Recommended structural details for erection of panels. Type A #12 x ¾" stainless-steel screws are fastened 12" o.c.; bolts are ⅜" x 3" stainless-steel round heads, and washers.

for panels of the type discussed in this article has been successfully Yoder Mill formed to a depth of 1½" to 2". Flashing, sills, parapets, and fascia detail are all easily formed on a brake press *(Figure 8)*. However, when using stainless-steel sheets heavier than 18 gage it is important to design fairly generous corner radii into architectural products.

fabrication of panel

Fabrication of a complete panel unit begins with, first, a stainless-steel outer skin (20-22 gage, weighing 1¼ to 1½ psf); second, a 1½" to 2" core of incombustible insulating material; and third, a carbon steel or galvanized steel back-up sheet which completes the wall section and provides a flat, uniform interior surface suitable for painting. Carbon-steel channel stiffeners are usually used to connect exterior and interior panels.

panel joints

Panel joints and laps must be properly sealed. This can be accomplished by the use of male and female flanges at vertical joints and by swaged or die offset and sections to provide flush horizontal joints in the wall. Also, calking is frequently applied to vertical interior and exterior panel joints before erection *(Figure 3)*. Careful sealing not only guards against the possibility of moisture being entrapped at these points but also will help maintain the effective vapor barrier presented by the steel surfaces. In addition, the sealing of joints contributes to the reduction of the over-all heat transmission ("U" factor) of a panel wall. It is advisable, too, to have no through metal-to-metal contact which reduces a panel's insulation value.

insulation

A typical range of over-all "U" factors for a stainless-steel panel wall having 1½" of mineral or glass insulation would be from 0.25 to 0.15 Btu/hr/sq ft/degree F of temperature difference.

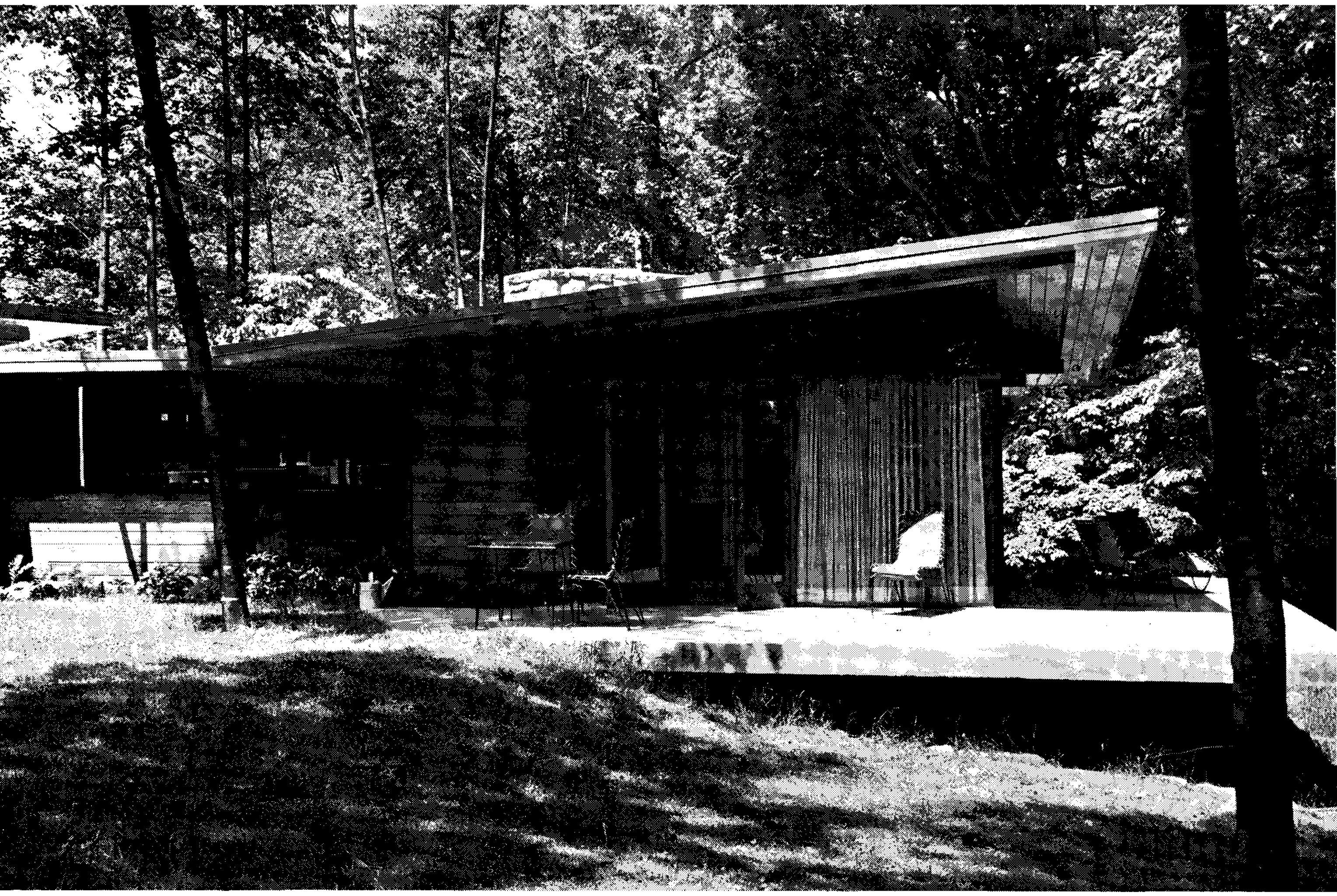
erection of panels

When the stainless-steel panels arrive at a building site, they are ready for erection as soon as they have been removed from the shipping crates. Paper protection for the stainless-steel surfaces, if it has been specified, can be removed and erection crews can quickly drill holes in the four corners of the panels if they are to be bolted to girts. Frequently, panels are tack-welded to the girts. In certain types of insulated panels calking beads are laid in the joints and the panels are then ready to be attached to the structural steel framework. *(Figures 3, 4, 5, 6, 7, and 8 illustrate various steps in the erection of stainless-steel panels; Figure 11 shows typical structural details.)*

During the past year several architects have taken advantage of the adaptability and attractiveness of stainless-steel panels by using them in combination with other building materials. One example is the National Malleable and Steel Castings Company's building mentioned above and another is the Edison Junior High School near Pittsburgh. On both of these buildings Type 430 stainless-steel panels, with architectural finish, have been used in combination with brick. The result has been colorful and attractive, as well as functional. Such material combinations are unlimited and offer the imaginative architect a type of construction which is desirable for many types of offices and institutional buildings.

conclusions

Finally, in review, the advantages of Type 430 stainless-steel panel construction include a *reduction in weight*—a possible reduction of wall weight per panel from 100-150 psf of brick-masonry construction to 5-8 psf of stainless-steel panels; *improved insulation*—the coefficient of thermal conductivity ("U" factor) of an insulated stainless-steel panel is approximately 0.15, the equivalent of a 10" masonry cavity wall with 1" of insulation and a plastered interior; *flexibility and versatility*—the original panels can be removed quickly and reused with little or no loss of material; *ease of erection*—experienced crews can erect panels in less than one-third the time required for conventional brick-masonry walls. All these advantages — and many others — have added to the growing popularity of panel construction, using Type 430 stainless steel. This kind of construction is not only attractive—it is economical and practical.



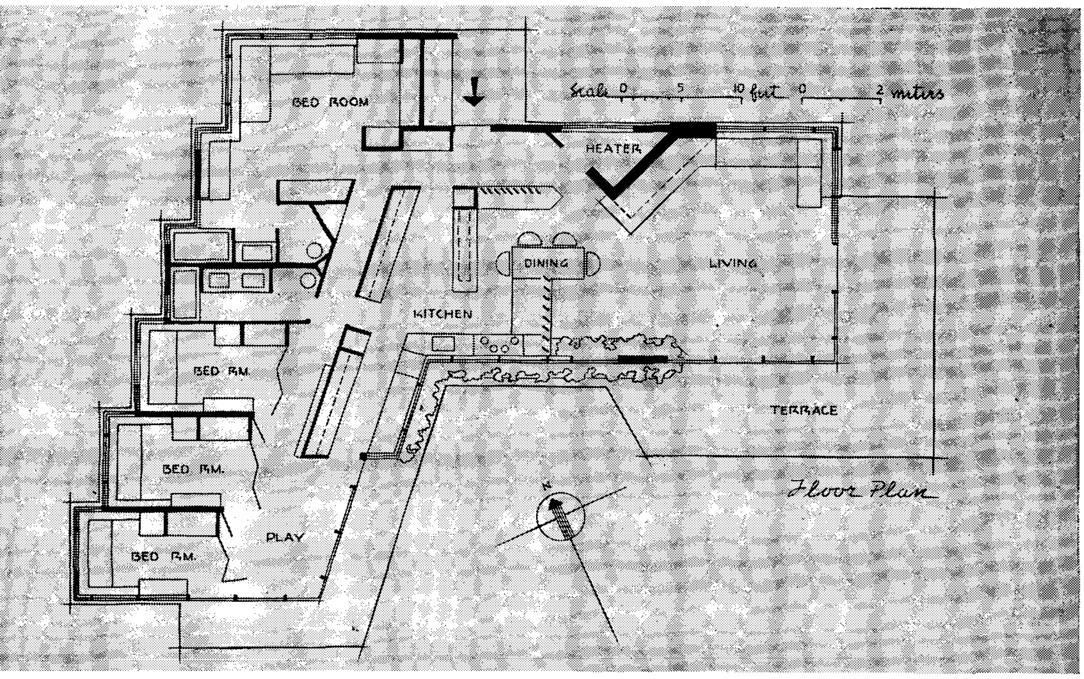
two houses

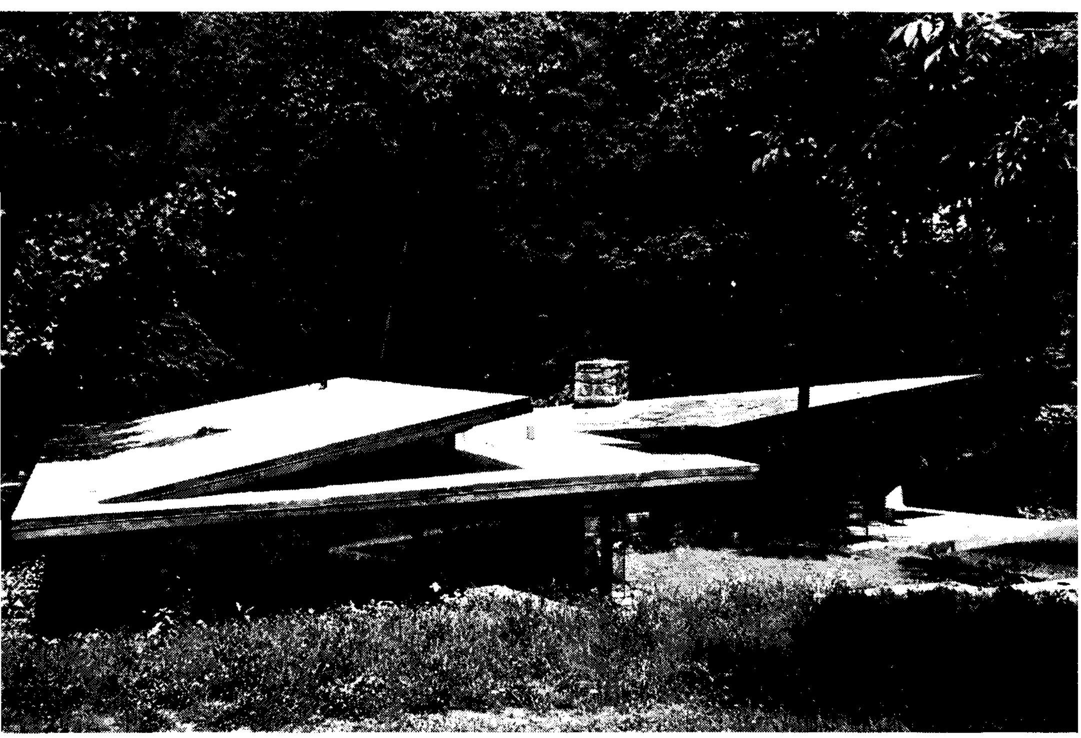
David Henken . . . former Taliesin student . . . designer and builder at Usonia . . . uses form, materials, and color organically. Two of his houses are illustrated here as unique solutions of space, and expressions in three dimensions.

location	Pleasantville, New York
designer	David T. Henken
general contractor	Robert Chuckrow Construction Co.

Earth-hugging organic architecture is familiar enough to arouse frequent accolades, but only occasional skepticism. Rejecting the "box," organic emphasis is upon a three-dimensional integration of space. Designer Henken's cypress-frame and glass house is in the lee of a massive circular creation by Frank Lloyd Wright, and is consistent with many of the best principles of organic architecture. It contrasts camouflage with cantilever . . . what is at one moment obviously earth-bound, at another seems to be suspended in flight.

On a gently sloping site in Usonia, a co-operative community, Henken superimposes elements of the hexagon upon a square module, within the confines of a circular plot. This is a house planned for a family of four, and its three small children's bedrooms convert it into one play area. Each bed, with its storage chest beneath, slides against the wall. Doors on piano hinges fold back and one entire wing of the house may be opened upon a bedroom terrace. Room divisions are simplified by a rhythmical offsetting, and make full use of the northern exposure. But the nucleus of the house is in the shaded-clerestory utility area. The kitchen, laundry, sewing, and art activities are compartmented into a work space . . . permitting constant supervision in three directions.





The bedroom wing, oriented north, opens upon a terrace in the foreground (above)*, and maximum light and ventilation is assured by a clerestory above the utility area.*

Photos: P. E. Guerrero

Throughout the house, native stone is contrasted with tile-red concrete floors and oiled cypress, as seen in the living room (above); *a view toward the bedroom terrace* (right); *and the dining areas with skylit entry and louvered divisions* (below).

The living room, deeply shaded on all sides, sweeps sharply to the south. Its cantilevered terrace is a tile-red slab growing from the side of the hill . . . contrasting with the oiled and varnished gold of the cypress siding and the rough-hewn native stone. By a combination of corner glass windows and clerestory lighting, at almost every turn there is a changing light-and-shade pattern and a rich display of color. Rigid and infra insulation below the plank and spline ceiling, windows opening at different heights and in all directions, and a radiant floor slab combine to provide ideal temperature conditions. Storage space is voluminous. Cabinets, closets, shelves and chests are built in everywhere. Throughout the house, areas open onto secluded terraces, and there are constantly new perspectives.

two houses

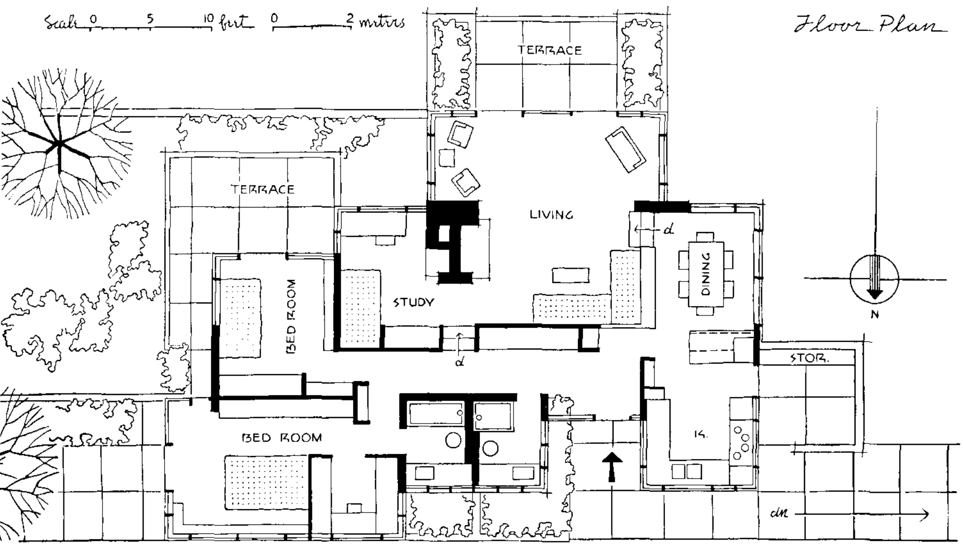
location	Bronxville, New York
designer	David T. Henken
landscape architect	Arthur Edwin Bye, Jr.
structural engineers	Joseph Saravis, P. E.
general contractor	Henken Builds, Inc.

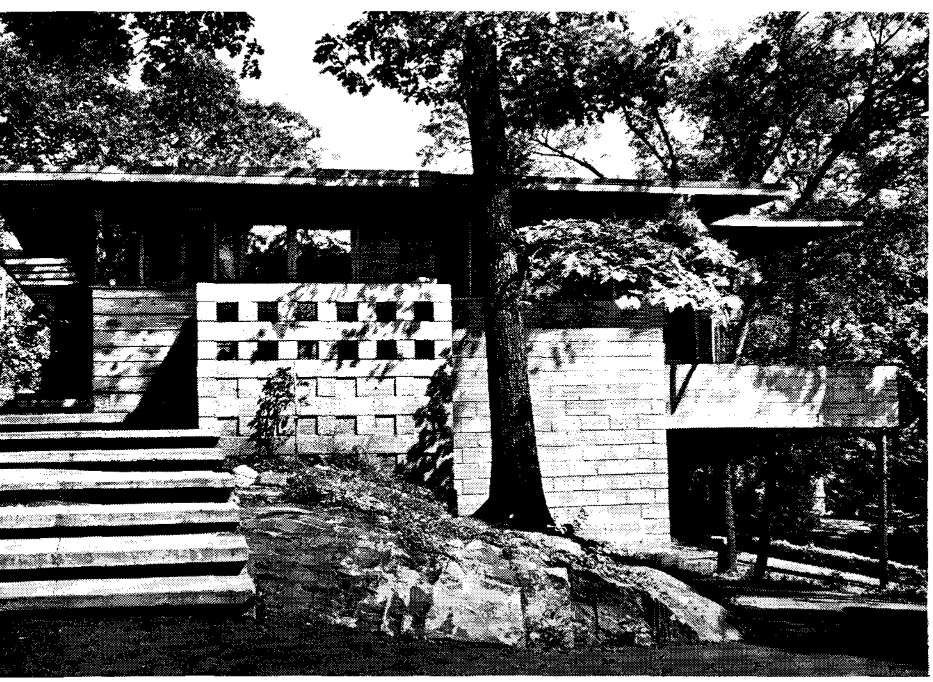
This two-bedroom house by Designer Henken is set on a sharply-inclined slope curving continuously about three sides of a suburban plot. By taking advantage of land forms imposed by unusual and rocky site conditions, with luxuriant natural growth, little blasting was necessary—only the sharp ledges were cleaned off—and the house then being molded to their forms. To make full use of a difficult site, bedrooms and the work spaces were set on the north side of the house at the highest level. Following the slope, living and study areas were located three risers lower. The living room window wall opens fully along the south onto a cantilevered terrace, supported by two massive reinforced-concrete girders.

Throughout the house, masonry block was chosen for its distinctive color and texture, harmonizing well with oiled-cypress plank and tile-red floors. Besides the retaining and foundation walls, there are planting boxes, fireplaces, and exterior walls of salmon-pink concrete block. And harmonizing with this color, are the continuous tile-red floor slabs and the entrance steps—wafer-thin cantilevered slabs.

Combining both structural and finishing operations, 8″ lightweight-aggregate, colored-concrete blocks were used, and a clear silicone water-repellent was then applied. The floor slab, containing coils for a gas-fired, hot water radiant-heating system, is poured over a sub-slab of vermiculite—all carried on precast-concrete joists. Frame walls are insulated by reflective aluminum foil and block cavities are filled with vermiculite insulation. Above, the ceiling framing, V-jointed and splined 3″ x 10″ fir plank spanning up to 12 feet, is covered by composition roofing over $1\frac{1}{2}$″ rigid insulation.

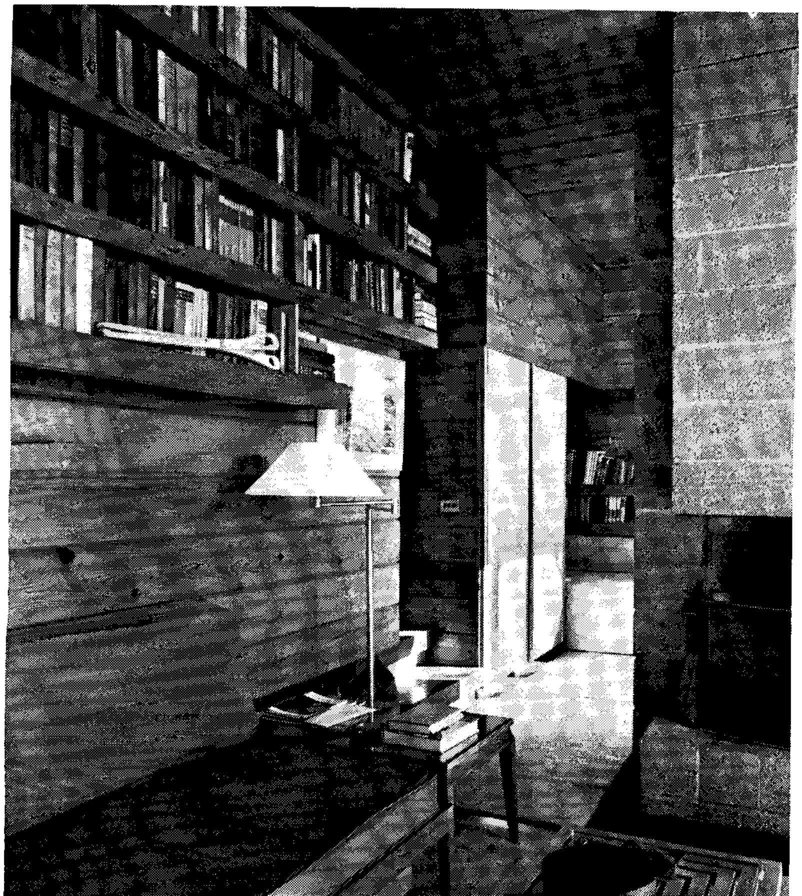
The horizontal roof plane, its sweeping overhang designed for sun control, deeply shades the interior areas. Upon its rugged stone outcroppings, it is a house oriented to provide the maximum usage of the site—materials and color contrasting subtly with nature. At one moment it is a part of its Rousseau setting . . . at another it is thrust sharply into space.





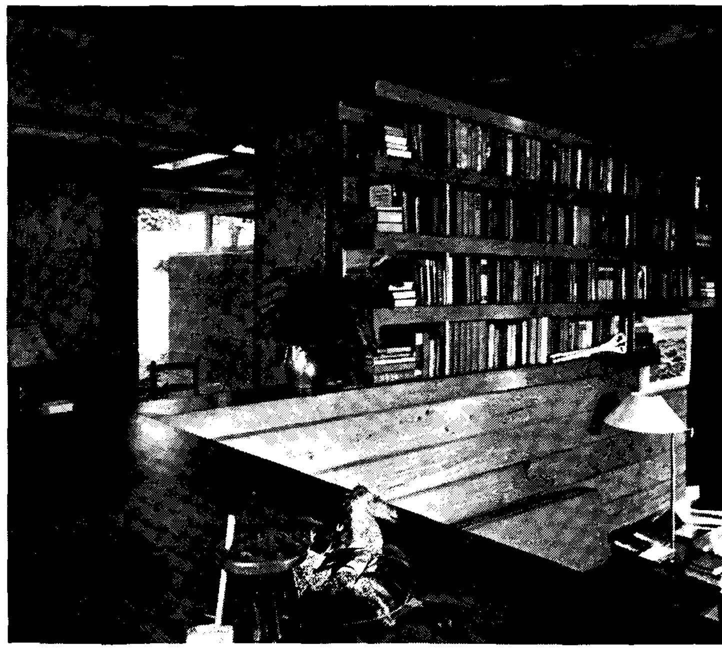
View of the entrance shows relation of planting boxes to design, the V-joint shiplap cypress siding of walls and soffits, and the overhead lighting (above).

Pierced-block storage wall, adjacent to utility area, screens service yard from entrance to house, located at the highest point of the site (left). Photos: Pedro Guerrero

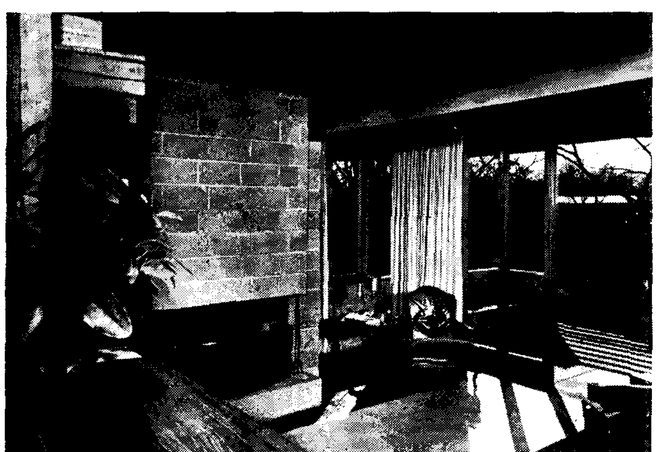


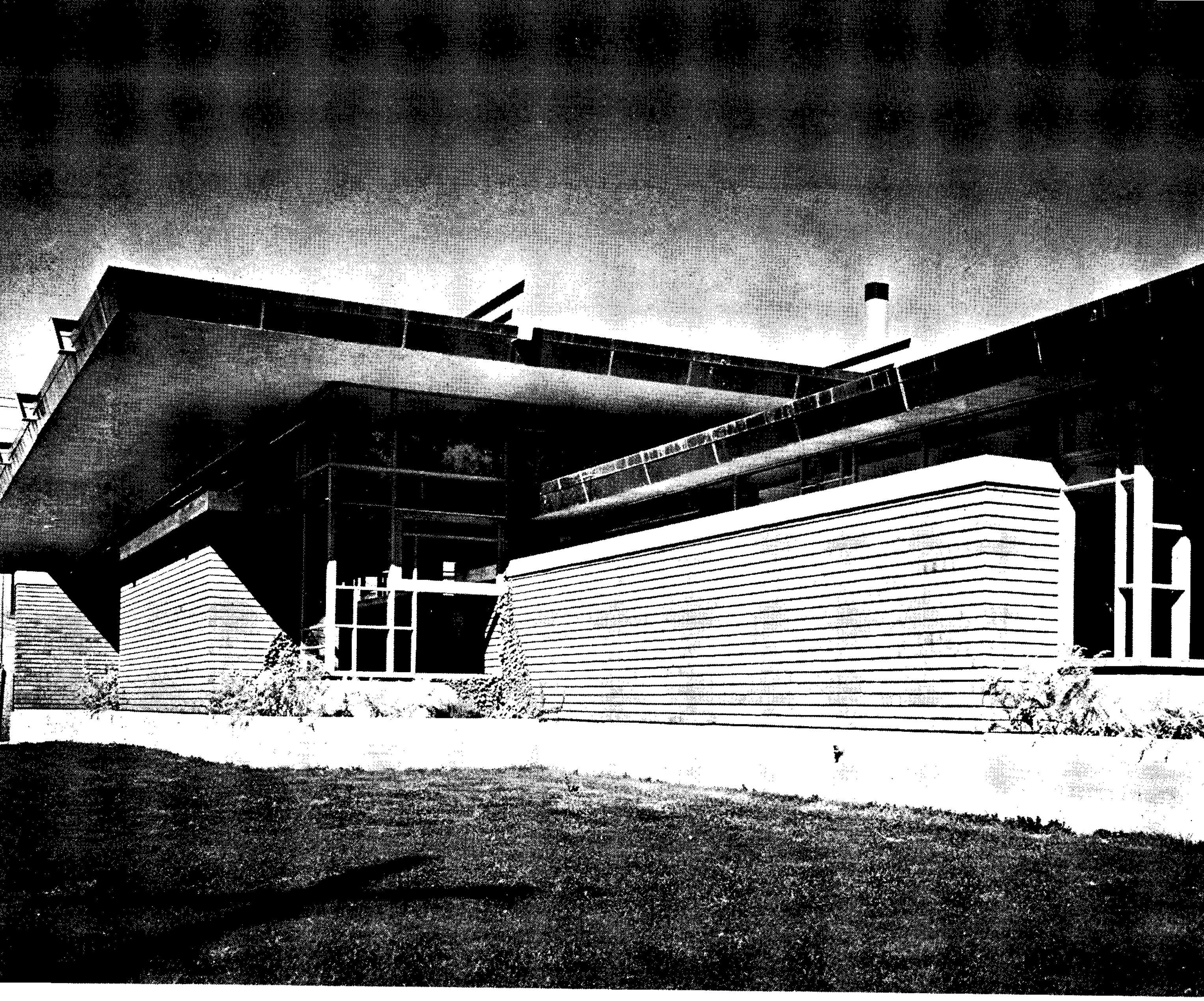
The living area, three steps below bedroom and work spaces, opens onto a tile-red concrete terrace imposingly cantilevered to the south (above). *The study, convertible to a guest room, connects to living wing by private corridor in foreground* (left).

Kitchen (above left) *is finished completely in wood. It directly adjoins dining area* (below left) ; *walls are concrete block; lighting is by fluorescent tubes in trough: windows are casement-type cypress sash.*



Open planning and interpenetration of spaces and volumes, apparent throughout the house, is most characteristic of entrance and living areas (above) ; *the dining unit* (left) ; *and a view through to the terrace* (below).





branch library

location	Denver, Colorado
architect	Victor Hornbein
mechanical engineers	Marshall & Johnson
electrical engineer	Arthur F. Weers
general contractor	Bellamy & Williams

A library is a center for learning and enlightenment; it is also a retreat for quiet, concentration, and reflection. If one were to search for architectural symbols to express the library function, on might look for a combination of two apposite elements —open, windowed areas to let the sun flood in and to facilitate reading, and partially enclosed walled areas where study and reading can proceed without distraction.

In the Frederick R. Ross memorial branch of the Denver Public Library system, the architect seems to have employed precisely these. Whether one considers the total design from this symbolic point of view, or from the point of view of the abstract design satisfaction of mass contrasted with openness, or from the very matter-of-factual viewpoint of housing bookshelves, at the same time obtaining sufficient daylight, this sparkling little library is well worth study.

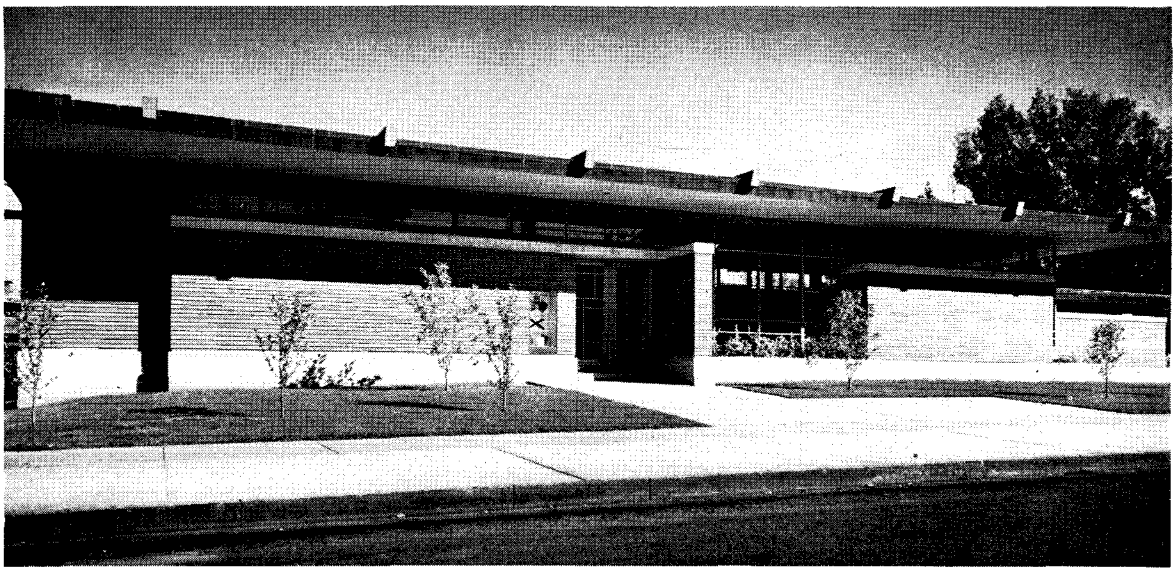
In structure, *too, the building* is equally frank, employing the arresting device of exposing the steel frame—the columns on the inside of the building; the beams on the outside. Wall areas, including partitions (except in toilet and work rooms, whose walls are of glazed structural tile) are red brick, laid up with raked joints. All cabinetwork is of oak, and the exposed steel is painted blue-green; the asphalt-tile flooring is a medium-dark green. Interspersed throughout the glass areas are red and green stained-glass inserts, the books themselves adding variety to the color scheme.

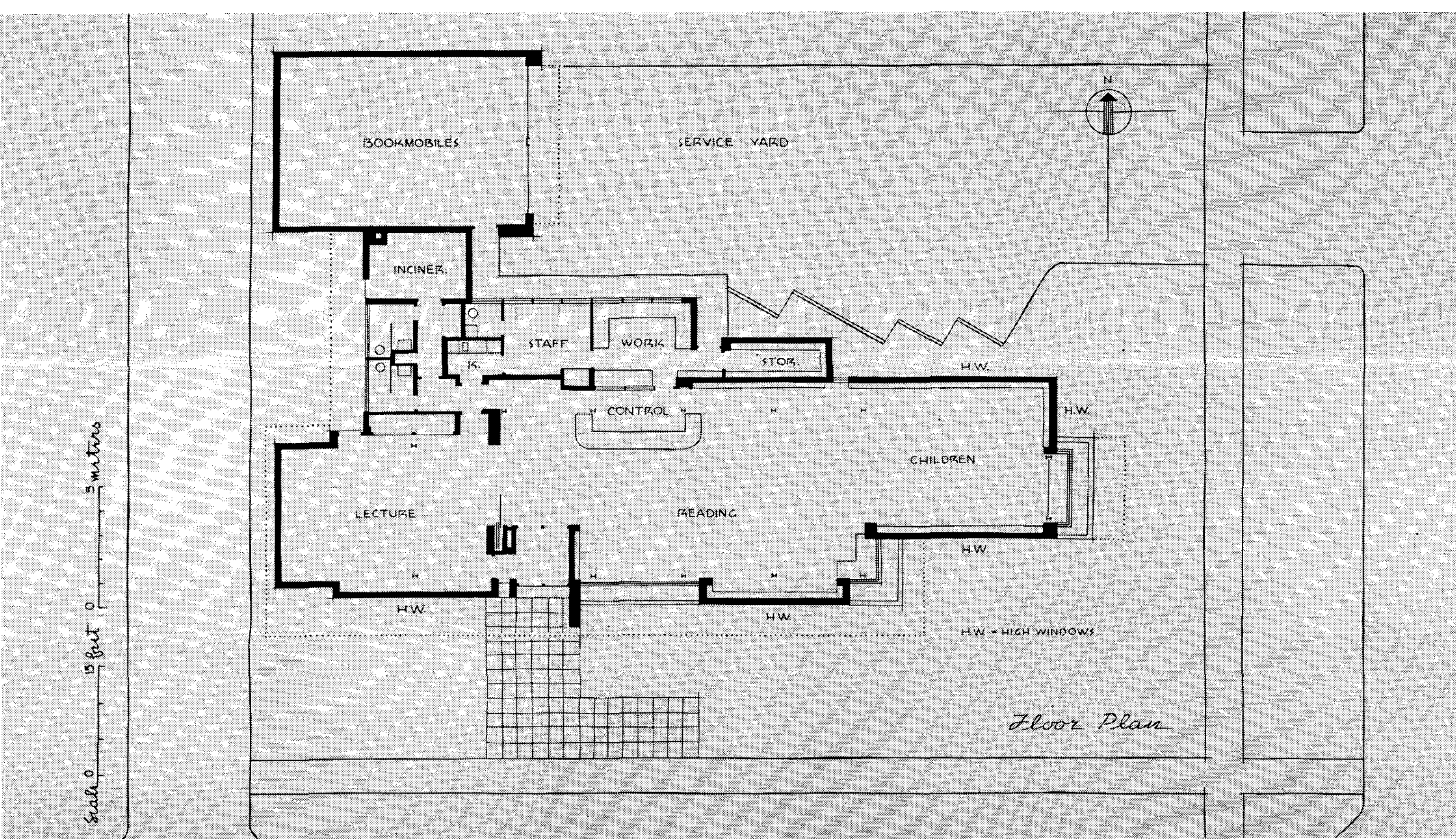
To improve the sound level, ceilings are of acoustical plaster, while intense heat is tempered by wool-type batts embedded in the structure. The wood, awning-type windows are glazed with either ¼″-plate or colored glass. A combination of fluorescent-strip lighting, cove and stack lighting, and incandescent ceiling fixtures provides the artificial light. Heating derives from a hot-water panel system, using steel piping. The fuel is natural gas, and the system is automatically controlled.

Total cost, exclusive of land, fees, furniture, and books—$75,000.

In addition to the main and children's reading areas and attendant work spaces, the program required a room that could be closed off from the rest of the library to be used for a variety of community activities (west end of building), and a garage to house two bookmobiles.

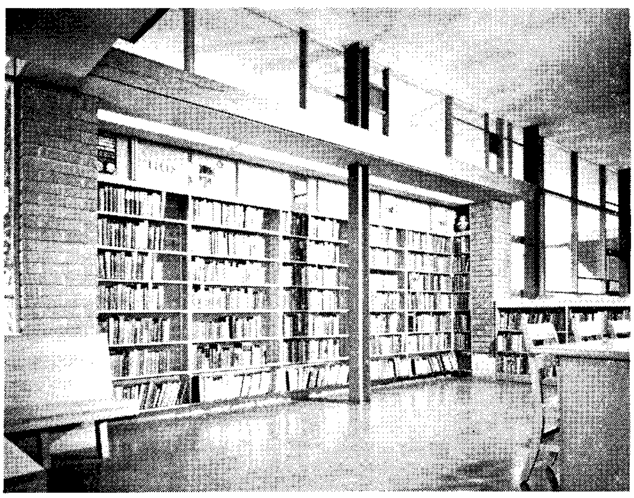
Photos: Reynolds, Photography, Inc.



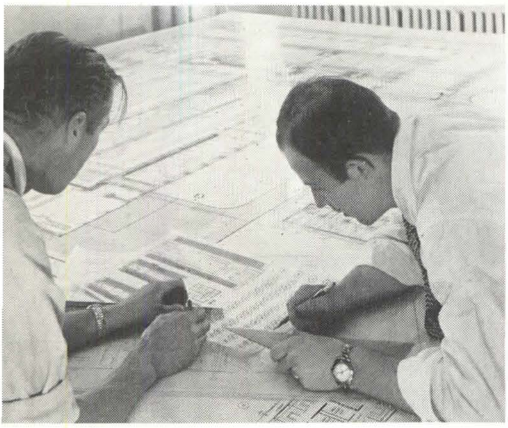


3 & 4
EASY BOOKS

branch library



The interplay of solids and voids—quite apart from providing useful wall areas to receive bookshelves—forms an exciting design pattern, whether viewed where the mass materials create depth and a succession of planes (as in the reading corner, across page), *in the main reading room* (above and left), *or in the community-use room* (below) *that may be closed off by a sliding partition and entered separately from the vestibule.*



new plant-layout procedure

The Peerless plant-layout procedure has made the old drafting-board system not only obsolete but also needlessly expensive. Many well-known mass-production plants are currently enjoying its cost-reducing and expediting advantages. Here's how the system works: (1) Make floor plans on special white-surfaced aluminum plates, precision-printed with a $\frac{1}{4}''$ grid (plates are butted together to represent any large area). Permanent plant features such as walls, bays, stairways, columns, and elevators are outlined with special gummed tapes or inked lines. (2) Scaled templates representing machine tools, conveyors, benches, aisles, etc., are then drafted in ink on either tracing paper or vellum. All necessary data is lettered within the outlines of the templates (drawn to the same $\frac{1}{4}'' = 1' - 0''$ of the plates). (3) Templates are drawn only once. When original is prepared, templates are reproduced in any quantity desired, on plastic or heavy card stock, with a photocopy printer. (4) Templates are cut out after photocopy reproduction. Zipatone patterns can be used, if desired, to key special floor areas, aisles, or templates. (5) After preliminary layout is planned, templates are placed in position on the plates (*see illustration*). (6) As layout progresses, high-contrast negative photocopies of each completed plate are quickly and easily made on a vacuum-bed printer. (7) Vellum positives are then made in the same way.

For conference or reference, the light and easily handled layout plates can be stored vertically or laid out on large tables. Designers can view the whole plant area at once for discussion. Handy reference books containing $8\frac{1}{2}''$ x $11''$ positive reproductions of 36" x 48" plates can be routed to executives or used for conferences at distant points. Peerless Photo Products, Inc., Shoreham, Long Island, N. Y.

air and temperature control

Gas-Fired Unit Heater: unit heater, available in seven new sizes, may be used with all types of natural, manufactured, or LP gas. Heat output ranges from 20,000 to 160,000 Btu per hour; fan diameters from 12" to 20". Finished in gray-green baked enamel, units are especially suited for store, lobby, studio, and small office installations. American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.

Thermostat-Controlled Air Diffuser: ceiling diffuser for air-conditioning systems serving zones with variable heat loads contains pneumatic motor, remotely-controlled by thermostat, which regulates movement of damper. Sleeve damper moves up and down without enlarging or constricting neck area; air quantity alone is changed. Connor Engineering Corp., Shelton Rock Rd., Danbury, Conn.

Downflow Furnace: new oil-downflow furnace, currently available in two sizes of 60,000 and 85,000 Btu per hour output, is designed for use in basementless houses. Blower and motor are rubber-cushioned to counteract vibration; unit is insulated with heat-holding and sound-absorbing material. Ductwork can be installed in concrete slab or in crawl space of basementless home. General Electric Co., 5 Lawrence St., Bloomfield, N. J.

Electric Draft Control: improved model of electric draft control is suitable for coal- and oil-fired heating plants in factories, office buildings, hospitals, hotels, and other commercial buildings. Construction of control with two damper openings makes possible longer "off" periods for stoker or burner since chimney makes most of its pull from boiler room air rather than from boiler itself at the point of peak heat. Fuel Reduction Corp., 220 N. Ada St., Chicago 7, Ill.

Industrial Fans: new line of industrial fans has added feature of sealed, lifetime-lubricated ball bearings in both fan and motor. Sizes: 24" to 48"; $\frac{1}{3}$ to $\frac{3}{4}$ hp motors. Same specifications as standard line of fans with exception of guarantee which is extended to 10 years. The Murray Co. of Texas, Inc., Ventilation Fan Div., 185 Harris St., N. W., Atlanta, Ga.

Schoolroom Heater: new central-heating and ventilating system incorporates principle of forced air gas heat. Preheated outside air mixes with room as it passes through heater. Outside air is drawn in by damper; heater draws room air back through side return-air inlet. Unit may be used with natural, manufactured, or LP gas, has capacity of 60,000 Btu input per hour. Motor is resiliently mounted and fully enclosed. Norman Products Co., 1150 Chesapeake Ave., Columbus 15, Ohio.

Type B Multizone Air Conditioners: new line of air conditioners provides cooling and heating from one unit to number of separate conditioned areas which have individual temperature control. Blow-through type units; equipment consists of filter, blower, heating coil, cooling coil, and multiple-zone mixing damper sections. Four models are designed to serve up to 12 to 16 zones and range in capacity from 7,500 to 18,000 cu ft per min. United States Air Conditioning Corp., 3300 Como Ave., S. E., Minneapolis 14, Minn.

construction

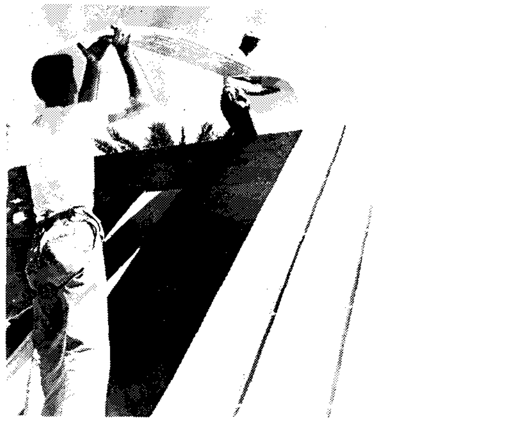
Spectra-Glaze: new type of glazed masonry unit is available in two glazings. Lightweight concrete blocks are manufactured, steam-cured, and air-dried by usual method. Acoustical glaze is a sprayed-on finish, retains rough texture of natural block. Tile face is cast directly to face of block in individual molds, has uniformly smooth surface. Ten soft-toned colors chosen for interior wall treatment are standard; other colors can be matched on special order. Burns and Russell Co., Tower Bldg., Baltimore, Md.

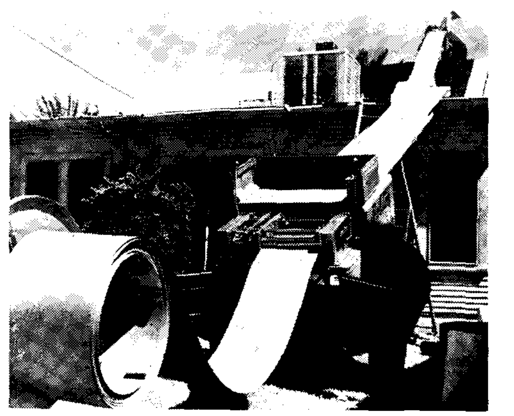
Fenestra Econorib: open-rib deck is $1\frac{1}{2}''$ deep with full Z4 coverage in 18- or 20-gage NCB steel; formed with $\frac{1}{2}''$ base, full last rib, and $\frac{3}{4}''$ rib opening, throughout. Decking is recommended on roof installations where high carrying capacity is not critical. It can be overlapped several feet and forced into place, eliminating need for cutting on last runs of jobs. Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit 11, Mich.

Concrete Anchor Studs: special concrete anchor studs are designed to simplify fabrication and improve quality of steel curb angles, trench frames, column guards, joists, and other structural members to be anchored in concrete or masonry. Cold-drawn steel with tensile strength of 75,000-85,000 psi is used in fluxed anchor studs which are welded in angle or on faces of steel members without causing distortion. Nelson Stud Welding Div., Gregory Industries, Inc.. 2727 E. 28 St., Lorain, Ohio.

Versabar: structural steel channel, made of cold-rolled carbon steel, may be used to form racks, concrete inserts, pipe supports and clamps, mountings for fluorescent fixtures, and conduit supports. Four basic sizes available, furnished in different combinations. Standard finishes: plain, green enamel, or galvanized. No welding or drilling required. M-H Standard Co., Versabar Div., 515 Communipaw Ave., Jersey City 4, N. J.

eave-to-eave aluminum roofing





Low-cost aluminum roofs can now be installed on new construction, or as replacements on old defective roofs, by means of a new, patented, portable, metal-processing machine. The machine is brought alongside the building and tilted at an angle approximating the pitch of the roof and a guide track is adjusted between machine and roof. After a 30-lb overlapping felt base has been laid, the Roliton aluminum roof can be applied. Two coils of aluminum are fed into the machine, with one forming a 16-in. wide panel and one a batten which covers the seams between panels. These continuous strips are laid from eave to eave and nailed to the deck by aluminum clips. Following this, all vents, valleys, chimneys, cooling equipment ducts, dormers, and parapet walls are flashed in aluminum. This type of construction allows for expansion and contraction and also permits the escape of water vapor. For added strength and rigidity, serrations or "ribs" are formed into the aluminum which run continuously along the length of the panels. A crew of two men can install a Roliton batten-seam aluminum roof on the average new house in 16 man hours. Seams, end laps, and exposed nailing are eliminated in this type of roof. Roliton of America, Inc., 714 E. Van Buren Street, Phoenix, Ariz.

doors and windows

Series 300 Panels: new flat, extra-rigid panel has been designed for shower doors and enclosures. Made by combining resins and glass fibers under heat and pressure, panels are shatterproof, fire-resistant, and unaffected by heat or cold. Stock sizes: 32" x 60" and 24" x 66"; weight: approximately 11 oz per sq ft; thickness: .09"; five pastel colors. Alsynite Co. of America, 4654 De Soto St., San Diego, Calif.

Tee-Cor Doors: new line of exterior and interior hollow-core flush doors has field of truss blocks arranged in all-over "T" pattern throughout core between veneer facings. Exterior door with 3/16" face veneer is constructed of stile and rail assembly with wide top and bottom rails and 3 ft lock block, utilizes waterproof resorcinal glue. Interior door is made of wood-fiber blocks with urea coating on inside surfaces. Morgan Co., Oshkosh, Wisc.

Residential Door Locks: new line of key-in-knob, push-button tubular locks consisting of three preassembled units: outside assembly containing extra-heavy bridge girders and triplex spindle; latch assembly with steel latch case; and inside knob assembly with push-button unit. Locks are available in solid brass in bright finish and solid aluminum in anodized finish. New line contains locks for all normal residential requirements. The Yale and Towne Mfg. Co., 200 Henry St., Stamford, Conn.

electrical equipment, lighting

Series "20/20" Fixtures: new line of fluorescent fixtures are available with metal or plastic side panels with baked-enamel louver fins. Fins provide 35-25, 35-45, or 45-45 degree shielding and are interchangeable in one 8 ft channel. Series incorporates 2- and 4-light 4-ft units, as well as 4-ft and 8-ft slimline and 8-ft bi-pin fixtures. Electro Silv-A-King Corp., 2000 W. Fulton St., Chicago, Ill.

Mercury Lamp: new 700-watt mercury lamp, giving 35,000 lumens initially, is designed for street, flood, and general lighting applications which demand intermediate size mercury lamp. Recommended minimum mounting height is 24 ft; average rated life is 4000-hours. Lamp may be operated from 460-volt circuits. Westinghouse Electric Corp., Lamp Div., MacArthur Ave., Bloomfield, N. J.

finishers and protectors

Ultra Flat Latex Paint: in coating walls boards used in dry wall construction, new flat latex paint serves as primer, finish, and joint seal with one-coat application. Sprayed, brushed, or rolled on, it will dry in approximately one-half hour. Finish is available in white and 10 colors, in one- and five-gallon containers. The Glidden Co., 2080 W. 110 St., Cleveland, Ohio.

insulation (thermal, acoustical)

Kaylo Heat Insulations: hydrous calcium silicate pipe and block insulation for industrial equipment is effective to temperatures of 1200 F. Compressive strength: 150 lb per sq in.; weight: 11 lb per cu ft. Material may be cut, scored, or sawed with conventional tools. Produced in thicknesses and diameters for pipe sizes from ½" to 23". Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio.

Insuliner Sleeves: split-fiber tubes for insulation of electrical conduit connections are slipped by hand inside standard conduit bushings. Wires or cables are pulled through conduit and bushing in standard manner, then insulation is snapped into place. Sleeve presents smooth, rounded insulating surface separating conductors from raceway and presses outward against inner diameter of conduit for maximum clearance. The Thomas & Betts Co., 2838 Butler St., Elizabeth, N. J.

sanitation, plumbing, water supply

Indirect Water Heater: new heater for commercial installations is made in eight sizes with Btu outputs of 140,000 to 1,600,000. Unit will deliver hot water at required temperature or two given temperatures. When second and higher temperature is required, water is recirculated through second heat exchanger that boosts water to required temperature. Bryan Steam Corp., Peru, Ind.

Sumo Type A Submersible: ⅓ hp electric submersible water well pump, designed to fulfill requirements of average domestic water supply system, is furnished as a package unit complete with heavy-duty waterproof electrical cable sealed into motor and motor control box with built-in overload protection and continuously-rated capacitor. All-bronze and stainless steel corrosion-resistant construction; motor water-filled and water-lubricated to eliminate sealing problems. Sumo Pumps, Inc., 375 Fairfield Ave., Stamford, Conn.

specialized equipment

Recessed Bathroom Scale: new bathroom scale, recessed in wall, swings down to floor when needed. Scale is attached to door of heavy pressed-steel cabinet. Self-compensating spring arrangement allows scale to swing down to floor and rest on rubber bumpers. Chrome-plated door. Conant Bros., Somerville, Mass.

p/a manufacturers' literature

★ *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

1-40. Herman Nelson Amervent, A.I.A. 30- D-1 (625), 8-p. bulletin describing cooling, heating, and ventilating unit specially designed for mild climate areas. Typical plan of unit and utility cabinet in school classroom, cross section details of three models, specifications, capacities, and dimensions. American Air Filter Co., Inc., Louisville, Ky.

1-41. Jenn-Air Power Exhausters, A.I.A. 30-D-1 (53-B), 6-p. folder giving information on centrifugal wall exhauster, axial and centrifugal roof exhausters, back-draft eliminators, and ring-type grills. Charts give hp, rpm, sound level, cfm, and dimensional data. Photos, cutaway drawings, recommended air changes for various spaces. Jenn-Air Products Co., Inc., Architects & Builders Bldg., Indianapolis 4, Ind.

1-42. Ray Oil Burners, 16-p. condensed catalog listing commercial and industrial oil and combination gas-oil burners. Features of automatic, semiautomatic, and manually-controlled rotary and steam turbine drive burners: commercial and domestic pressure atomizing types for oil, gas, or combination gas-oil. Hourly capacity ratings, specifications, photos. Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12, Calif.

★ **1-43. Titusville-Iron Fireman Boiler-Burner Unit,** A.I.A. 34-B-1 (B-3133), 14-p. brochure with descriptive details of new pressurized boiler-burner unit developed for high or low pressure heating, power or process steam. Discussion of various elements in burner system; output rating chart; cutaway drawing indicating basic components; charts of ratings, performance data, and dimensions. Titusville Iron Works Co., Titusville, Pa. and Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, Ohio.

1-44. Heating Coils by Young, A.I.A. 30-C-4 (4533), 32-p. catalog containing construction data, selection and dimension information, and specifications for steam and hot-water coils. Piping, installation, and general engineering data with illustrations. Photos, drawings. Young Radiator Co., 709 S. Marquette St., Racine, Wisc.

construction

2-45. StoRack Multipurpose Steel Framing (MC535), 4-p. folder describing steel framing which can be used to frame, hang, support, and mount mechanical and electrical equipment, fluorescent lighting, pipe, cable, and tubing. Sizes and gages for 5 types of channels. Photos, drawings. American Steel and Iron Works, 58 and S. Lowe Ave., Chicago 21, Ill.

2-46. Canvas in Contemporary Architecture, A.I.A. 35-P-2, 4-p. folder illustrating the use of custom-designed canvas in solar heat control and other climate control problems. Data includes types of canvas, colors and patterns, durability, and mildew, water, and fire-resistant treatments. Photos, drawings. Canvas Awning Institute, Inc. and National Cotton Council, P. O. Box 18, Memphis, Tenn.

2-47. Asbestos Movable Walls, A.I.A. 35-H-6 (TR-109A), 20-p. current edition of catalog covering 3 types of asbestos partitions for office, school, industrial, hospital, and institutional installations. Elevation, wall facing, and construction details, isometrics of "W" and "S" type walls, specifications, color photos. Johns-Manville Corp., 22 E. 40 St., New York 16, N. Y.

2-48. Trusbeam, A.I.A. 19-B-3, 4-p. folder describing roof support system for commercial and industrial buildings consisting of factory-fabricated I-shaped girders constructed of welded laminated solid lumber. Two-p. chart gives safe loads in pounds per linear feet for various spans. Photos and drawings. McKeown Bros. Co., 5303 S. Keeler Ave., Chicago 32, Ill.

2-49. Stran-Steel Reference Manual, 14-p. booklet on light-gage steel framing material for houses, partitions, and other light loadbearing structures. Sections on its use in floor and wall construction, framing of door and window openings, roof framing, and industrial uses. Data on main members and attachments, lengths, properties, spans, specifications. Stran-Steel Corp., Detroit, Mich.

2-50. Armorply: Modern Material of Imagination, A.I.A. 19-F (1032-5011), 12-p. brochure illustrating interior and exterior uses of bonded metal-to-plywood sheets. Photos of various patterns, information on available sizes. Other photos, drawings. U. S. Plywood Corp., Weldwood Bldg., New York 18, N. Y.

★ **2-51. Recommended Building Code Requirements for Vermiculite Plastering, Acoustical Plastic, Fireproofing and Concrete,** (Fourth Edition), 16-p. booklet presenting recommendations covering requirements for vermiculite products based on standards of American Standards Assn., American Society for Testing Materials, and Vermiculite Institute. Details of vermiculite fireproofing and concrete roof decks and floors. Vermiculite Institute, 208 S. La Salle St., Chicago 4, Ill.

doors and windows

3-47. The New Overline Door, A.I.A. 16-A, 4-p. folder on hollow steel doors with narrow stiles for entrances and office interiors. Door designs, specifications, sectional drawing, hardware recommendations. Overly Mfg. Co., Greensburg, Pa.

3-48. Wilson Doors, 24-p. catalog covering line of doors including rolling steel, Underwriters' steel, section-fold overhead types; also rolling steel grills and shutters, midget slat rolling steel closures, and rolling wood partitions. Construction features, specifications, space requirements, typical installations. Photos and drawings. The J. G. Wilson Corp., 370 Lexington Ave., New York 17, N .Y.

electrical equipment, lighting

4-30. Buchanan Electrical Fittings (53), 16-p. catalog describing line of solderless wire connectors, molded terminal blocks, insulated conduit bushings, and snap-action plugs. Specifications, dimensional data, application instructions, ordering information. Drawings and charts. Buchanan Electrical Products Corp., Hillside, N. J.

★ **4-31. Curtis Light and Sound Conditioning System,** A.I.A. 31-F and 39-B (2418), 20-p. brochure describing complete ceiling installations with vertical panels of acoustical material positioned between fluorescent lamps which are supplied wired with ballasts and lampholders. Illumination and acoustical data, construction and installation details, typical layouts using basic sections. Photos, drawings, charts. Curtis Lighting, Inc., 6135 W. 65 St., Chicago 38, Ill.

4-32. Fiberduct Data Manual, A.I.A. 31-C-62 (18-142 UF), 48-p. booklet giving detailed data on underfloor distribution system with impregnated fiber ducts for wiring of commercial, industrial, and institutional buildings. General information, individual equipment descriptions, specifications, installation notes. Dimensional drawings and installation photos. General Electric Co., Construction Materials Div., Bridgeport 2, Conn.

insulation (thermal, acoustic)

6-16. Armstrong's Insulcolor (11-43-253), 4-p. folder showing indoor and outdoor applications of plastic coating which combines insulation finish and color identification of various pipe lines in one application. Coating may be used over 85% magnesia pipe covering, asphaltic finishes, asbestos cement, and duct insulation. General data, color chart. Armstrong Cork Co., Building Materials Div., Lancaster, Pa.

6-17. Fiberglas Products (G53-1), folio containing data sheets on various glass fiber products for school buildings: roof insulation, perimeter insulation, blowing wool insulation, air filters, acoustical tile, ceiling board, translucent structural panels, light diffusors, duct insulations, stage curtains, and draperies. Advantages, product data. Owens-

Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio.

sanitation, water supply, plumbing

7-12. The New Design Heat Exchanger (22), 8-p. bulletin describing hot water generator for intermittent and varying flows which has internal compensator for extreme variations in temperature and flow rates. Cutaway drawings, installation diagram, list of operating features, table of water capacities, method for determining size of generator needed, and specification table. Aerco Corp., Englewood, N. J.

7-13. Moen Mixing Faucets and Valves. A.I.A. 29-H-5, 4-p. folder illustrating line of single-handle mixing faucets and valves for kitchen sinks, lavatories and sinks, tubs, showers; also combination tub and shower valves. Construction data, illustrations of various models, drawings. Moen Valve Co., 6518 Ravenna Ave., Seattle, 5, Wash.

7-14. Fiat Precast Receptors, A.I.A. 35-H-6 (115), 12-p. catalog containing data on foundations for stall showers, one type for plaster walls or tile and one for slab-wall construction. Construction details, specifications, installation recommendations, drawings. Fiat Metal Mfg. Co., 21-33 Borden Ave., Long Island City 1, N. Y.

7-15. Taco Hot Water Heaters, Heat Exchangers. Hot Water Heating Specialties, A.I.A. 29-D-2 (H-99), 16-p. general catalog on line of heating specialties, including circulators, flow checks, fittings, control for panel heating systems, tankless water heater valves, external tankless heaters, and external storage heaters. Installation details and diagrams, average service water requirements for various types of buildings, photos, charts, and drawings. Taco Heaters, Inc., 137 South St., Providence 3, R. I.

7-16. Brule Model FG-4 Series, 6-p. bulletin describing line of industrial incinerators with capacities ranging from 400 to 4000 lb/hr. List of models includes information on capacities, grate areas, and dimensions. Photos of installations, discussion of main features. Goder Incinerator Corp., 407 S. Dearborn St., Chicago 5, Ill.

specialized equipment

8-26. Jensteel Bathroom Cabinets, A.I.A. 29-I (15B), 8-p. booklet giving information on seamless and welded types of bathroom cabinets, wall-hung cabinets, wall mirrors; also built-in mail boxes. Models, sizes, weights, drawings. Jensen Industries, 159 S. Anderson St., Los Angeles 33, Calif.

8-27. Jerrold Constant Level Master Antenna System (601), 4-p. folder on antenna system and its equipment for TV reception in hotels, motels, institutions, apartment buildings, and department stores. Diagram of system in multiple dwelling installation, photos and descriptions of equipment, charts. Jerrold Electronics Corp., 26 and Dickinson Sts., Philadelphia 46, Pa.

8-28. TeleNurse Saves Nurse Hours, 4-p. bulletin describing audio-visual nurses' call system. Photos and data of master communication unit, bedside calling stations, duty room stations, and corridor lights. Optional features, drawings. Stromberg Time Corp., 109 Lafayette St., New York 13, N. Y.

surfacing materials

9-13. Norton Abrasive Floors (1935), 12-p. booklet with detailed data on four types of abrasive floors: terrazzo aggregate, ceramic mosaic tile, cement floor aggregate, and stair and floor tile. Advantages, method of manufacture, specifications, photos of installations, colors and sizes. Norton Co., 1 New Bond St., Worcester 6, Mass.

9-14. Approved Maintenance Methods for Rubber Floors, A.I.A. 23-C, 12-p. bulletin containing recommended methods for cleaning and waxing rubber floors and list of approved cleaners and waxes. Products have been tested and found to be free from substances harmful to rubber flooring. The Rubber Manufacturers Assn., Inc., Rubber Flooring Manufacturers Div., 444 Madison Ave., New York 22, N. Y.

9-15. Vinylast, 4-p. folder listing outstanding characteristics of vinyl-plastic floor and wall tile; also static-conductive tile. Color chart, sizes, specifications, recommended maintenance methods, and photos of installations. Vinyl Plastics, Inc., Sheboygan, Wisc.

vertical traffic

10-2. Guilbert Alsteel Freight Elevator Doors, A.I.A. 33-G-4 (G2-2), 12-p. catalog giving information on steel bi-parting, telescoping, and single-section freight doors for use on elevators in industrial and commercial buildings. Also descriptions of steel dumbwaiter doors used on hatch entrances for dumbwaiters, trayveyors, subveyors, and other vertical conveyors. Layout data, specifications, hoistway construction requirements, cutaway diagrams. Guilbert, Inc., 1105 Frankford Ave., Philadelphia 25, Pa.

10-3. An Explanation of Otis Autotronic Elevatoring, A.I.A. 33-B (A-405), 16-p. booklet describing electronic system for automatic elevators in commercial buildings, with or without attendant operation. Six basic traffic programs, illustrations of six fully automatic programs in operation, photos, drawings. Otis Elevator Co., 260 11 Ave., New York 1, N. Y.

(To obtain literature, coupon must be used by 12/1/53.)

(We request students to send their inquiries directly to the manufacturers.)

PROGRESSIVE ARCHITECTURE, 330 West 42nd Street, New York 36, N. Y.

I should like a copy of each piece of Manufacturers' Literature circled below.

1-40	1-41	1-42	1-43	1-44	2-45	2-46	2-47
2-48	2-49	2-50	2-51	3-47	3-48	4-30	4-31
4-32	6-16	6-17	7-12	7-13	7-14	7-15	7-16
8-26	8-27	8-28	9-13	9-14	9-15	10-2	10-3

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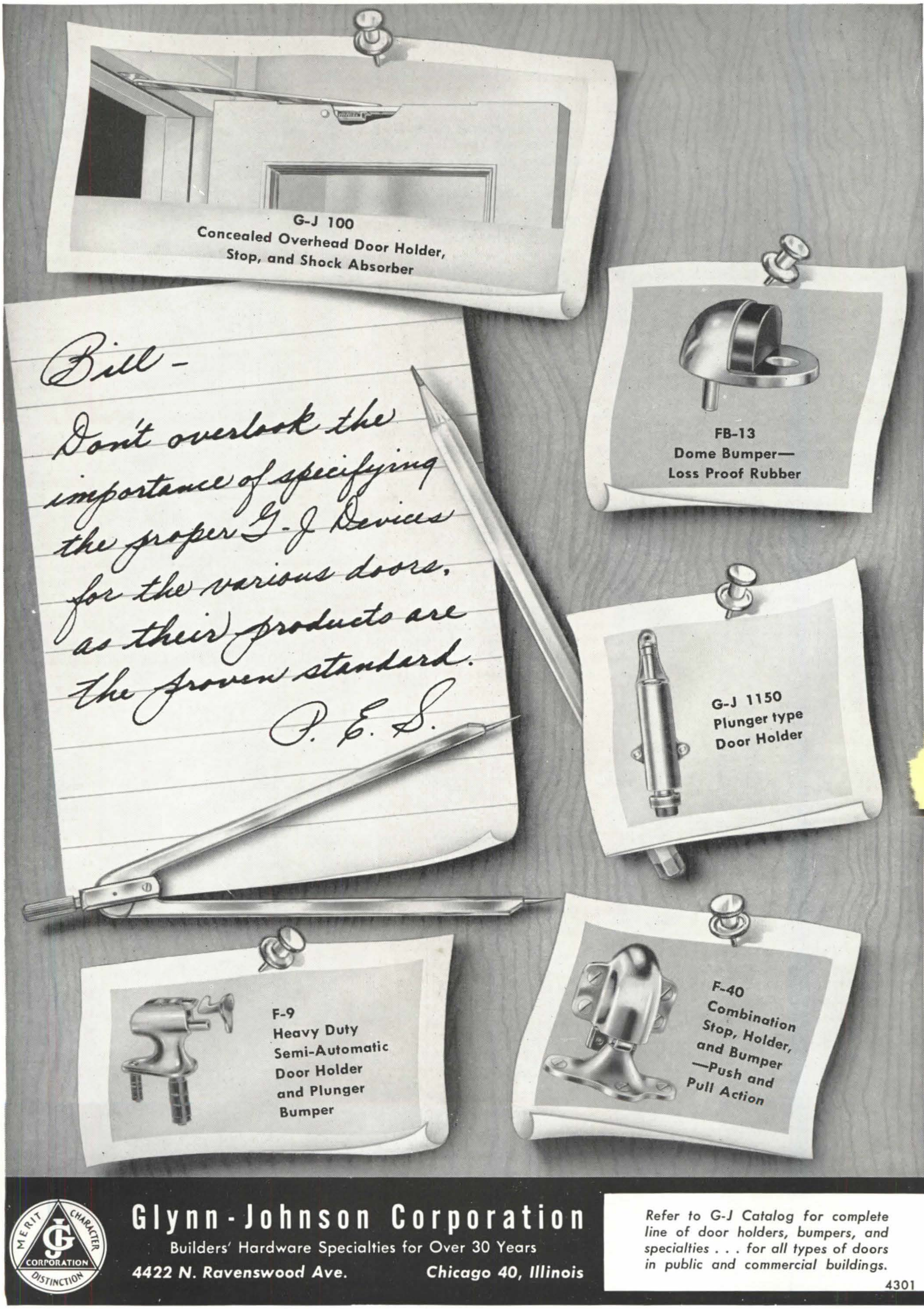
10/53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spec small talk

by Ben John Small

perlite idea

I know you are very busy, but if you do not read this column regularly how do you expect to be brilliant? Did you know that there is an idea in operation which, if broadened to other fields, would improve the quality of construction materials and make our lives a mite freer of daily difficulties? Listen to this: The Perlite Institute is pioneering a new idea in quality control for the plastering industry. The objective is to enable architects and engineers to specify a locally produced plaster aggregate of nationally certified quality, backed by a guarantee that it conforms to A.S.T.M. Specification. By establishing and publicizing a copyrighted *Certification Seal*, they have created a valuable new means of specification control. We can now specify "certified" perlite-plaster aggregate, building supply dealers can stock it, and plasterers can use it, all secure in the knowledge that they are handling an up-to-specification material. Good quality materials are the first requirement for good plaster. However, quality materials alone do not guarantee a satisfactory plaster job in every case. Other factors, such as structural movement, poor workmanship, or failure to protect plaster properly during setting and drying may result in defects for which the materials are not responsible. Therefore, to produce better workmanship, a certified aggregate should be specified and every precaution taken to assure that plastering procedure conforms to American Standards Association Specification A 42.1. The new seal features the insignia of both the Perlite Institute and the Pittsburgh Testing Laboratory. The guarantee on the seal is stated as follows: "Producer guarantees this Perlite manufactured in conformance to A.S.T.M. Specification C 35-52 T. Production regularly sampled and tested for conformance to above specification by Pittsburgh Testing Laboratory." Who is next?

kost kwiz

How is your sense of values? Without taking your eyes off this paper, which is generally more costly:

1. Hi-Early or white Portland cement?
2. Clear plain red oak flooring (25/32" x 2¼") or clear plain white oak flooring (same size)?
3. Standard gray limestone or standard buff limestone?
4. Smooth hollow clay tile (terra cotta) or scored hollow clay tile?
5. Cement mortar mixed 1 to 2½ or 1 to 2?

If you are not subject to migraine headaches stand on your head and read the answers at the end of the column.

1. White Portland; 2. Clear plain red oak; 3. Standard buff limestone; 4. Smooth; 5. 1 to 2.

packaged air

With the increasing varieties of glass-fiber insulations coming upon the construction scene, I think it is high time I gave you the benefit of some recently accumulated data (gathered on the boss' time—please send checks to me at your earliest convenience). Of necessity, I must use trade and manufacturers' names, so if you manufacturers will please leave the room I can have a word with my professional friends without you leering at me. There appear to be two groups of glass-fiber insulations, the "short fiber" type and the "long fiber" type. In the "short fiber" group we have "Microlite" (Glass Fiber Inc.), "Ultrafine" (Gustin-Bacon Manufacturing Co.), "Superfine" (Libbey-Owens-Ford Glass Co.), "Aerocor" (Owens-Corning Fiberglas Corp.), and "Superfine" (Pittsburgh Plate Glass Company)—not to be confused with that other company's "Superfine." In general, nearly all of the above materials are made under the same license. They have pure glass fibers processed by blowing, .00012" in diameter (one marble produces 42 to 97 miles of fiber) and approximately 4" to 5" long. They use phenolic resin binder (smokes at 450 F); have expanded thicknesses of ½", ¾", 1", and 1¾"; and are of ½, ¾, 1, and 1½ pound densities (weight of fibers per cubic foot). Used for thermal and acoustical insulation, they list at from 3¢ to 9½¢, per square foot depending upon thickness and density. At additional cost these materials are available with a variety of facings whose function is to protect, bar vapors, keep insulation clean, and improve appearance. These facings are factory applied and generally consist of aluminum foil (from .0007" to .0025" thick, reflective, vapor barrier, noninflammable), reinforced kraft paper (less costly than aluminum foil, vapor barrier, inflammable, paintable), reinforced asbestos paper (no vapor barrier, noninflammable, paintable), aluminum-pigmented vinyl film (varying thicknesses, vapor barrier, noninflammable, available in colors), neoprene-latex-impregnated muslin (no vapor barrier, noninflammable, sound absorbing facing, paintable), vinyl-film spray directly on insulation (no vapor barrier, prevents fibers from flaking off). Still awake? Now for the "long fiber" type. The answer is quick and painless. It is the same as the "short fiber" type, with the exception that "Ultralite" (Gustin-Bacon) is a drawn fiber which, after drawing, is "garnetted" (a weaving technique), has fiber length of 5" to 7", has 30% less resin (because of the process involved), runs from ½" to 6" thick in ½" multiples. In densities of ¾, 1, 1½, 2, and 3—it seems to have more bounce to the ounce. I don't, so I'd better stop now.

bitter sweets

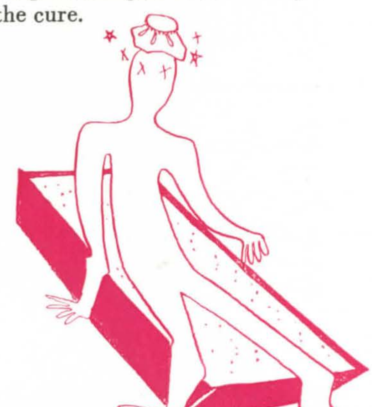
What the heck has happened to the Sweet's Catalog File index anyway? I can remember in the not-too-distant past when there was absolutely no difficulty in finding one's way around the catalogs. In the current editions I waste time and grow increasingly irritable in the pursuit of data because of the awkward indexing system. I hope sincerely Sweet's will be somewhat sweeter to us specifiers in the subsequent series.

sreenev

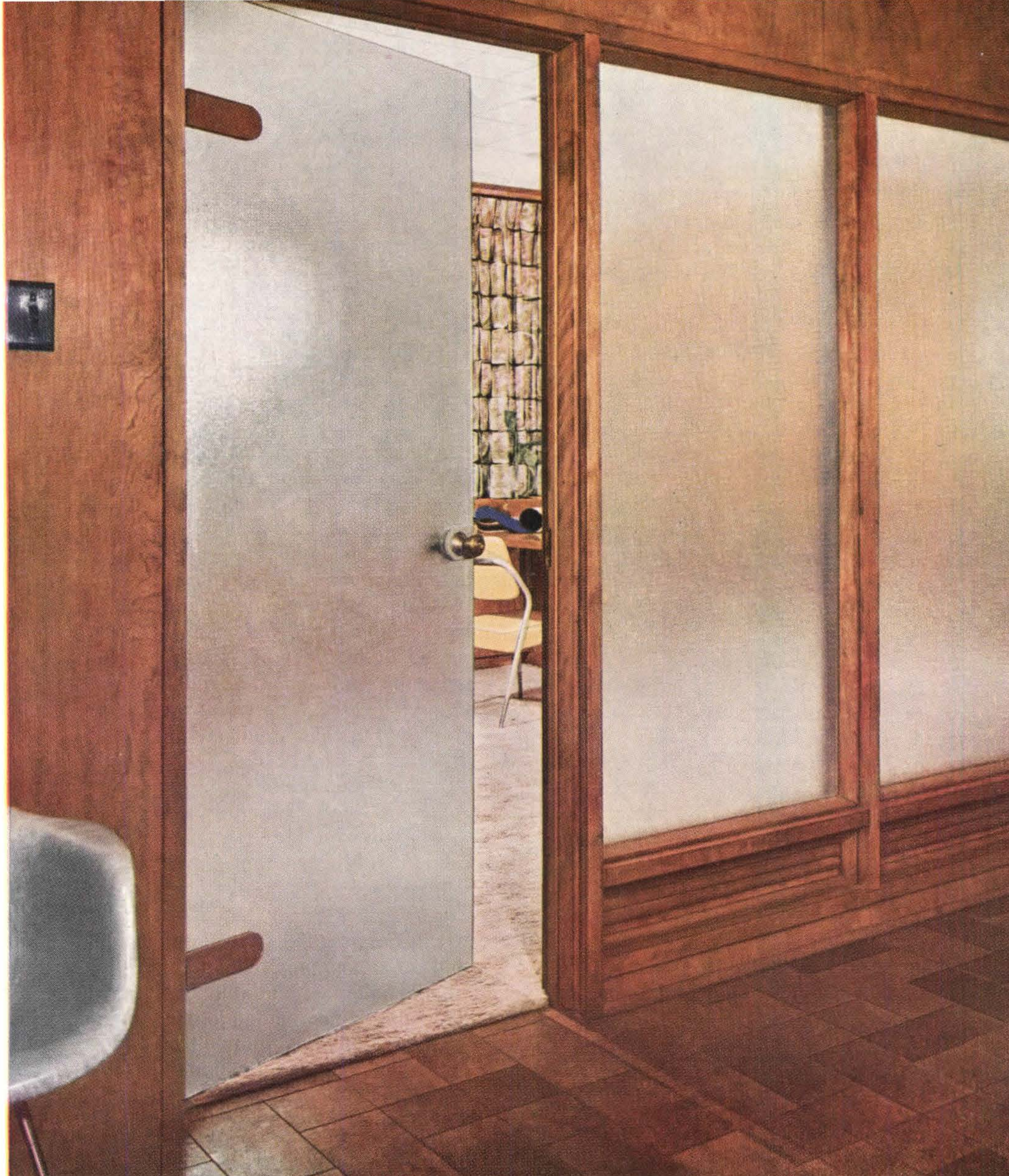
What am I talking about when I use the following terms: avodire, bubinga, ceiba, emeri, gonzalo alves, imbuya, iroko, kelobra, kewazinga, ohia, sapeli, sinora, sucupiro, okoume, quilt, mansonia, maidou. "Sreenev" spelled backwards, is veneers—which is the answer.

taking the cure

White, reflective, curing paper for cement-concrete highways works on an insulated-cure principle which maintains a low temperature range in green concrete during the first 24 hours. Tests by Research Division of the Virginia State Highway Department show that waterproof paper is a superior method for retaining moisture in fresh concrete. The paper was tested on U.S. 30, Whiteside County, Illinois. Temperature readings over a 24-hour period showed that surface temperature of the concrete under the paper had a range of only 24°. Under regular tan-colored, reinforced paper the range was 37°. The free air temperature range was 42°. This temperature-control feature reduces greatly the tendency toward preliminary cracking and checking and the high-moisture-retention feature of the paper cure insures dense, uniform concrete throughout the slab. "Sisalkraft" White Reflective Curing Paper consists of one sheet of white, bleached kraft and one sheet of regular, tan kraft laminated with asphalt and heavily reinforced in both directions. The kraft is pretreated with a chemical which gives it high wet strength and resistance to shrinkage—a good thing to know when you are taking the cure.



WHAT A BEAUTIFUL WAY TO BE DIFFERENT!



Securit Door in the office of Architect John B. Danna, Dallas, Texas.

. . . a door of translucent patterned glass

This door decorates with light—and does a grand job of it. Everyone who sees the Blue Ridge *Securit** Interior Glass Door remarks on its contribution to the appeal of the room. They ask questions, of course, such as:

"*Is it rugged?*". . . The glass is heat tempered, so it can stand hard usage.

"*Is it as expensive as it looks?*". . . Not by a long shot—its cost compares favorably with high-quality doors of common materials.

"*What about installation?*" . . . It's simple, quick and money-saving. There's no cutting or mortising on this door. Beautiful, easily applied hardware and hinges come to the job with the door. When specified, the door can be shipped with a Sargent closer or prepared for use with an LCN concealed closer.

See your L·O·F Glass Distributor or Dealer about this newest thing in doors. He's listed in the yellow pages of phone books in many principal cities. Or mail the coupon. *®

BRIEF DATA

ass—3/8″ thick. Muralex pattern on both surfaces.

mpered—3 to 5 times stronger than untempered glass of same thickness.

eversible—can be used right or left hand.

andard Sizes—2′6″ x 6′8″ 3′0″ x 6′8″ 2′8″ x 6′8″ 3′0″ x 7′0″

—also 4 sizes for openings of these dimensions with proper allowance for clearances.

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L·O·F GLASS

INTERIOR GLASS DOORS

Page Beauchamp: health facilities waiting rooms

All of the selections this month have one most desirable quality—a complete lack of the institutional look. The interior designers felt that it was important to make these lobbies and waiting rooms as attractive as possible. Contributing to the successful results were many factors—furniture design, scale and arrangement, colors and textures. So often, people using hospital lobbies or waiting rooms of medical centers are apt to be uncomfortable and ill-at-ease while awaiting medical examination. Anyone who has to sit on a straight, hard bench and stare at white walls is bound to concentrate on what he is about to face—whereas comfortable, pleasant surroundings will help to relax him and divert his attention.

The furniture and furnishings in these examples are all fairly small scale and arranged more in the manner of a living room than a waiting room. Particularly praiseworthy is the attractiveness of design achieved through color and texture, but still with strict attention to ease of maintenance. Serviceability is one of the most important considerations in a hospital, but it need not ignore beauty, even if budget is also a problem. Color is one of the least expensive of design elements: it is all a matter of emphasis. If the problem is approached with comfort and pleasantness in mind, as the desired result, all of the practical aspects may fall in line without harming the design. But if emphasis is placed on practicality alone, ignoring all of the attractive elements, the institutional look will surely take over. This is the interior designer's potentially great field. Hospitals are just beginning to awake to the therapeutic value of color and beauty. It is not likely, however, that one trained in hospital management could achieve the proper balance in design, nor is it expected. The ideal working arrangement is when a consultant medical man works with the interior designer. Following are some handsome examples of interior design—a really encouraging collection, a tribute to the necessary contribution of design thinking to the medical needs.

p/a interior design data

waiting rooms

This lobby was designed with the consciousness that it is always on view—either by visitors or through the glass wall facing Fifth Avenue and Central Park. Therefore, the lines were kept clean and uncluttered. The furniture has also been scaled to modify the effect of the overwhelming glass wall and the large columns, and also arranged in an informal open plan. The drapery fabric helps to soften the room, and yet does not interfere with the clean lines. *Photo: Ben Schnall*

acoustic tile

12' sofa

terrazzo

data

cabinetwork

Cabinetwork: Sloane & Moller Woodworking Company, Inc., 87-28 130 St., Richmond Hill, N. Y.

Hardware: Sargent & Company, New Haven, Conn.

doors and windows

Revolving Doors and Windows: General Bronze Corporation, Stewart Ave., Garden City, L. I., N. Y.

Glass: Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Pa.

equipment

Heating and Ventilating Grills: Tuttle & Bailey, Inc., New Britain, Conn.

furnishings and fabrics

Sofas: #U190/ special 12' length/ upholstery, textured hand-weave/ Jens Risom Design Inc., 49 E. 53 St., New York, N. Y.

Lounge Chairs: #U390/ upholstery, textured hand-weave/ Jens Risom Design Inc.

Wing Chair: #U415/ open arm, high back/ natural leather upholstery/ special design/ Jens Risom Design Inc.

Arm Chair: #C120/ birch frame/ natural leather upholstery/ Jens Risom Design Inc.

Tables, Plant Boxes: custom design/ executed by Jens Risom Design Inc.

Drapery: #50504/ natural and white hemp with metallic thread/ Creative Looms Inc., 210 E. 51 St., New York, N. Y.

lighting

Table Lamps: custom design/ ceramic/ Berrier-Gnazzo, 206 E. 49 St., New York, N. Y.

Ceiling Fixtures: custom design/ executed by McPhilben Mfg. Co., Inc., 1329 Willoughby Ave., Brooklyn, N. Y.

walls, ceiling, flooring

Walls: painted plaster/ brick
Ceiling: acoustic tile/ Jacobson & Co., Inc., 227 E. 44 St., New York, N. Y.
Flooring: terrazzo/ V. Foscato Inc., 22-02 40th Ave., Long Island City, N. Y.

location	The Mount Sinai Maternity Pavilion, New York, New York
interior designers	Maurice and Joseph Mogulescu & G. Luss: Designs for Business, Inc.
architects	Kahn & Jacobs

location	Sinai Hospital, Detroit, Michigan
furnishings consultants	Maurice and Joseph Mogulescu & G. Luss: Designs for Business, Inc.
architects	Albert Kahn Associated Architects and Engineers
consultant	Dr. Jacob J. Golub

data

equipment

Registers and Ceiling Outlets: Tuttle & Bailey, Inc., 1706 Corbin Ave., New Britain, Conn.

Temperature Controls: Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis 8, Minn.

Heating Convectors: The Trane Company, 2020 Cameron Ave., La Crosse, Wis.

furnishings and fabrics

Sofa: #5015/ walnut, brass leggings/ Lehigh Furniture Corp., 16 E. 53 St., New York, N. Y.

Upholstery: #K/529/ Scotch linen/ Knoll Fabrics, Inc., 575 Madison Ave., New York, N. Y.

Lounge Chair: #4030/ walnut, brass leggings/ Lehigh Furniture Corp.

Upholstery: #K/534/ Scotch linen/ Knoll Fabrics, Inc.

Open-arm Lounge Chair: #2020/ walnut, brass leggings/ Lehigh Furniture Corp.

Upholstery: #GLO-1362/ natural leather/ Gilford Leather Co., Inc., 515 Madison Ave., New York, N. Y.

Tables: walnut/ tops, white travertine/ brass leggings/ Lehigh Furniture Corp.

Plant Box: walnut/ Ezra Blank Associates, Brooklyn, N. Y.

lighting

Hanging Lamps: #A1965, #A1957/ brass/ Finnish American Trading Corp., 41 E. 50 St., New York, N. Y.

Recessed Fluorescent Fixtures: The Miller Company, 99 Center St., Meriden, Conn.

walls, ceiling, flooring

Walls: walnut paneling/ Roddis Plywood Corp., Marshfield, Wis.

Ceiling: "Travacoustic"/ acoustic tile/ National Gypsum Co., Inc., Burley Bldg., 325 Delaware Ave., Buffalo, N. Y.

Flooring: terrazzo—red Levanto, red Vermont, Botticino, Tennessee pink

pierced-brass chandeliers

cotton carpeting

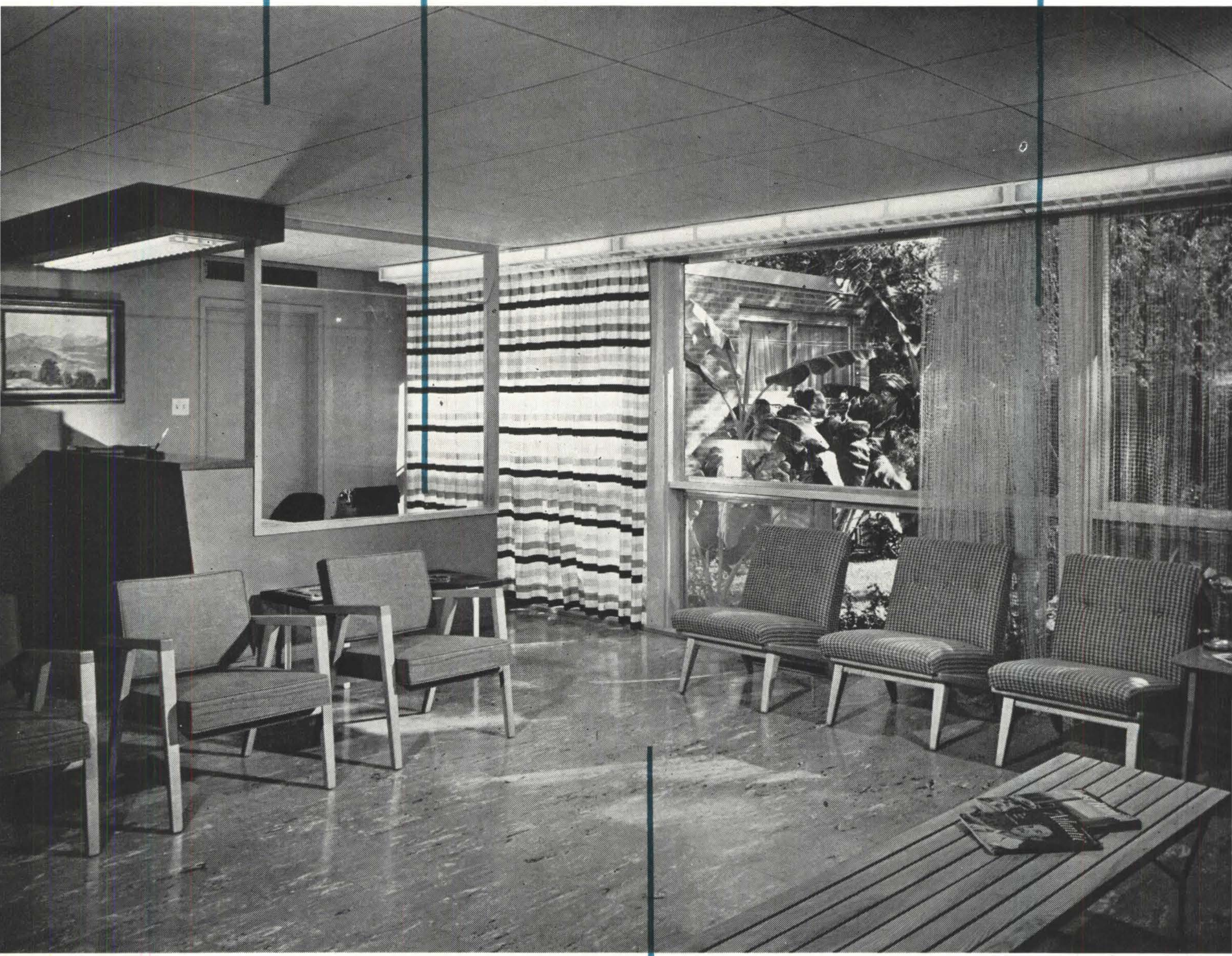
walnut paneling

terrazzo

It is difficult to believe that this lobby is in a hospital: it could as easily be in a hotel. Several very important elements eliminate all traces of institutionality. The colors are all warm earth tones—natural leather, gold-and-rust colored linens, dark natural-walnut walls, and dark brown carpets on the light terrazzo floor. The texture of the carpeting softens the terrazzo surface. Furniture is scaled down to lend intimacy, and the arrangement is informal—more like that of a living room. The growing plants add the final touch.

Photo: Benyas Kaufman

waiting rooms



location	Kreisle Clinic, Austin, Texas
architects-interior designers	Fehr & Granger

receptionist's desk

Designed to accommodate as many as 20 patients, this waiting room serves three doctors' offices. The interior designers based their entire approach on the premise that waiting for a medical examination is usually not too happy an experience and that the interior should do as much as possible to dispel this depression through pleasant, cheerful, and colorful surroundings. The west wall, of glass, permits cross ventilation and also affords a view of the out-of-doors, which helps even more to cheer the waiting patients.

Photos: Ulrich Meisel

data

cabinetwork

Receptionist's Desk: designed by Fehr & Granger/ executed by Calcasien Lumber Company, Austin, Tex.

Hardware: Sargent & Company, New Haven, Conn.

doors and windows

Doors: flush type, birch/ United States Plywood Corporation; The Mengel Company, 1215 S. Seventh St., Louisville, Ky.

Hardware: 4500 Series/ aluminated aluminum/ Sargent & Company

Windows: glass/ Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio

aluminum sash/ "Alumar"/ R. H. Folmar Co., Austin, Tex.

equipment

Heating and Air-Conditioning Outlets: Barber-Coleman Company, 150 Loomis, Rockford, Ill.

furnishings and fabrics

Sofas: #23/ birch natural finish/ 73½" x 29½" high/ upholstery, 13 yds. K527 green and light green linen/ Knoll Associates, 575 Madison Ave., New York, N. Y.

Chairs: #21/ birch natural finish/ upholstery, 7½ yds. K532 olive green/ yellow plaid linen/ Knoll Associates

Armchairs: #652U/ birch natural finish/ upholstery, 4 yds. K510/7 black transportation cloth/ #49/ birch natural finish/ upholstery, 7½ yds. K529 red, yellow, green linen/ Knoll Associates

Birch Laminated Base Chair: #72ULB/ upholstery, 1½ yds. K529 red, yellow, green linen/ Knoll Associates

Black Steel Base Chair: #72USB/ upholstery, 1½ yds. K510/9 black transportation cloth/ Knoll Associates

Tables: #NK5, NK6, NK7, NK8/ European elm top/ birch base/ Knoll Associates

Table: #115/ dark-gray slate top/ white "T" iron base/ Knoll Associates

Bench: #400/ ash slats, black-steel base/ Knoll Associates

Curtains: #K282 Fishnet, #K11 yellow, charcoal, and gray stripe/ Knoll Associates

Curtain Hardware: Kirsch Company, Sturgis, Mich.

lighting

Fluorescent Strip: #97200-26/ Daybrite Lighting Corp., 5434 Bulwer Ave., St. Louis, Mo.

Brackets: #603A/ Gotham Lighting Corp., 37-01 31 St., Long Island City, N. Y.

Light at Receptionist's Desk: #67200-6/ Daybrite Lighting Corp.

walls, ceiling, flooring

South Wall: "Mission Colonial" brick/ Valley Brick & Tile Co., Mission, Texas

North and West Walls: United States Plywood Corporation; The Mengel Company

East Wall: plate glass/ Libbey-Owens-Ford Glass Co.

Ceiling: 24" square "Cushion Tone"/ Armstrong Cork Co., Lancaster, Pa.

Flooring: light gray rubber tile/ Robbins Rubber Co., Tuscombi, Ala.

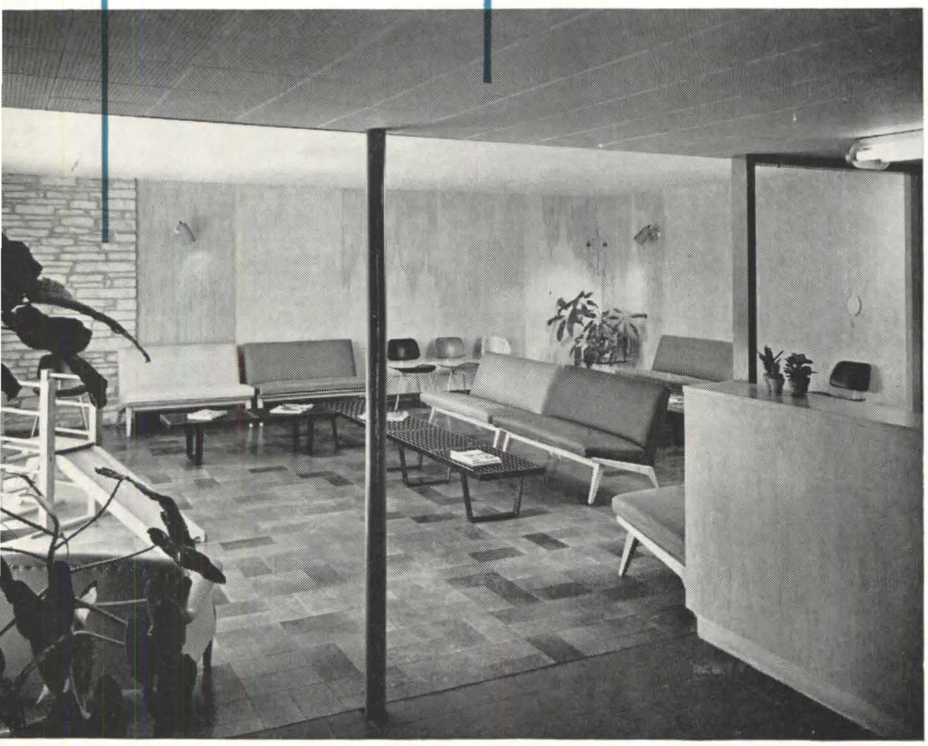
waiting rooms

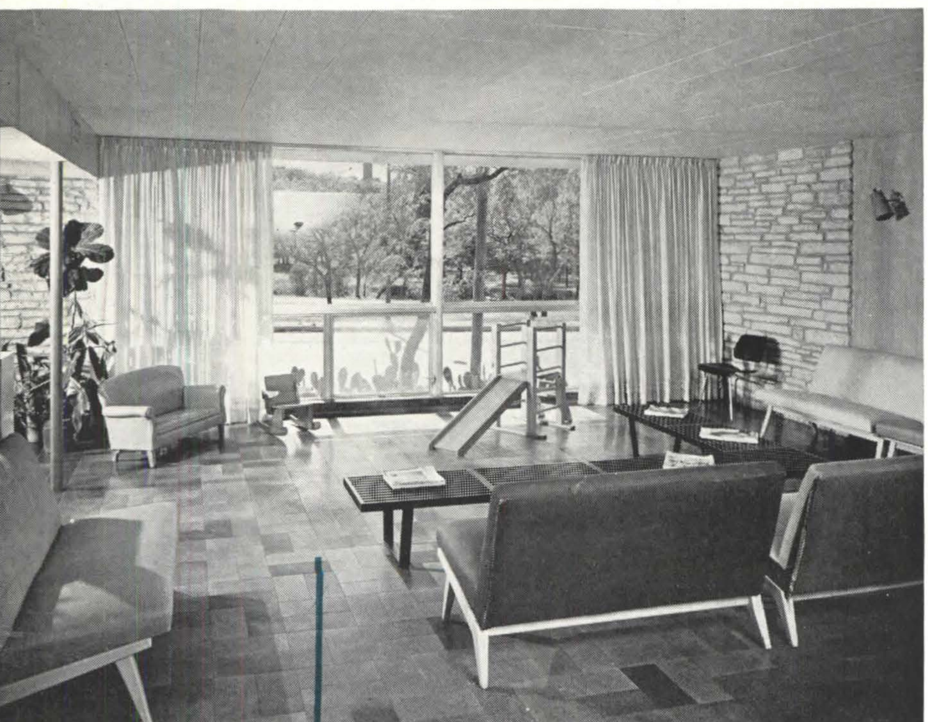
Fortunately, the site of this building permits a view of a park from the waiting room. The designers, with the use of primary colors and a "Fishmobile," have achieved an atmosphere somewhat like that of a playroom, to divert the children awaiting examination. The room was planned to operate with a minimum staff, beyond the required nurses and receptionists, so that it is efficient as well as attractive. Fabrics and finishes were selected to be as children-proof as possible.

Photos: Ulrich Meisel

acoustic tile

limestone





quarry tile

data

cabinetwork

Receptionist's Desk: designed by Fehr & Granger/ executed by Calcasien Lumber Company, Austin, Tex.

Hardware: Sargent & Company, New Haven, Conn.

doors and windows

Doors: flush type/ United States Plywood Corporation; The Mengel Company, 1215 S. Seventh St., Louisville, Ky.

Hardware: 4500 Series/ aluminated aluminum/ Sargent & Company.

Windows: glass/ Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio
ABC Aluminum Windows, Miami, Fla.

equipment

Heating and Air-Conditioning Outlets: Barber-Coleman Co., Rockford, Ill.

furnishings and fabrics

Chair: #72/ upholstery, red Saran/ Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.

Loveseats: #22/ ordered in muslin/ slip-covered with linen/ Knoll Associates

Chairs: DCM/ 4 red, 4 black/ designed by Charles Eames/ Herman Miller Furniture Company, Zeeland, Mich.

Platform Bench: #4692/ birch and black lacquer/ Herman Miller Furniture Co.

Black Lacquer Tables: IT/ Herman Miller Furniture Co.

lighting

Wall Brackets: #628B/ Gotham Lighting Corp., 37-01 31 St., Long Island City, N. Y.

Receptionist's Desk Light: #46220-4/ Day-Brite Lighting Corp., 5434 Bulwer Ave., St. Louis, Mo.

Entrance Light: #88-6600/ "Prescolite"/ Presstool Co., Berkeley, Calif.

walls, ceiling, flooring

Walls: native limestone and natural-finish birch plywod

Ceiling: 12" square "Cushion Tile"/ Armstrong Cork Co., Lancaster, Pa.

Flooring: quarry tile/ Carlysle Mfg. Co., Ironton, Ohio/ "Kencote"/ Kentile, Inc., 58 Second Ave., Brooklyn, N. Y.

location | Children's Medical Center, Austin, Texas

architects-interior designers | Fehr & Granger

location	Pelican Valley Health Center, Pelican Rapids, Minnesota
architects	Thorshov & Cerny
color stylist	Jeanne Des Marais

data

cabinetwork

Bookshelf-Radiator Cover: birch hardwood/ designed by Thorshov & Cerny, Inc.

furnishings and fabrics

Armchair: Duran upholstery/ Selig, Inc., Leominster, Mass.

Hardware: #9005/ recessed drapery track/ Kirsch Company, 309 Prospect, Sturgis, Mich.

lighting

Ceiling Fixture: #801/ round recessed/ Corning Albolite lens/ Litecraft Mfg. Corp., 8 East 36 St., N. Y. 16, N. Y.

walls, ceiling, flooring

Walls: painted plaster; paint/ Devoe & Raynolds Co., Inc., 44 St. & First Ave., New York, N. Y./ tan brick/ Hanley Company, Summerville, Pa.

Ceiling: acoustic plaster/ "Gold Bond," National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y.

Flooring: black, green, gray, terra cotta (to match Plate #112, National Terrazzo & Mosaic Catalogue)

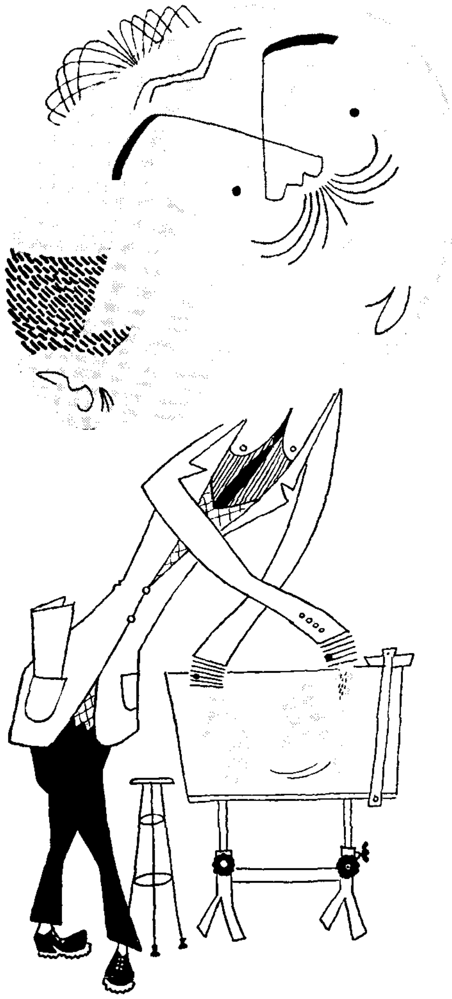
windows

Windows: ¾" double-glazed Thermopane/ Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio

The successful interior design of this lobby may be credited to a number of people. First, the architects created wall, ceiling, and flooring areas that guaranteed easy maintenance—uncluttered planes in finishes that require little refreshing and are simple to clean. The custom-made bookcase, which also encloses the radiator, helps to further the smooth, orderly (but not institutional) look. The wall of glass adds a look of spaciousness.

The second contributor was the color stylist. All colors are soft and muted in value. The drapery fabric and terrazzo incorporate all of the colors—grayed chartreuse, terra cotta, gray, and green. The chairs are upholstered in a chartreuse plastic fabric, the terra cotta is repeated in the lettering, the walls are painted dark gray-green.

As often happens in community hospital projects, the decorating was done on a limited budget by a local women's committee. In all, the lobby is a well-integrated whole, combining cheerfulness and airiness with a cleanness of design. *Photo: Reynolds, Photography Inc.*



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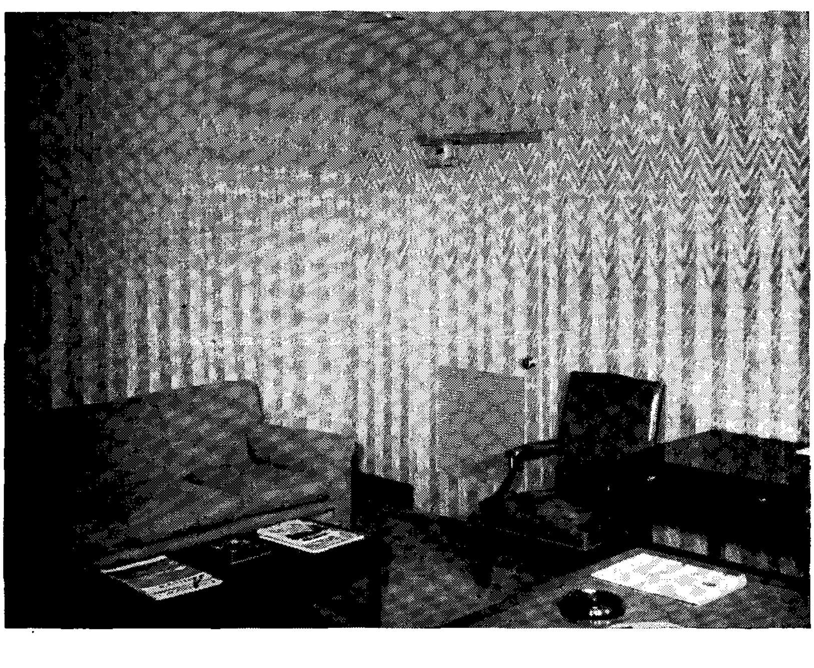

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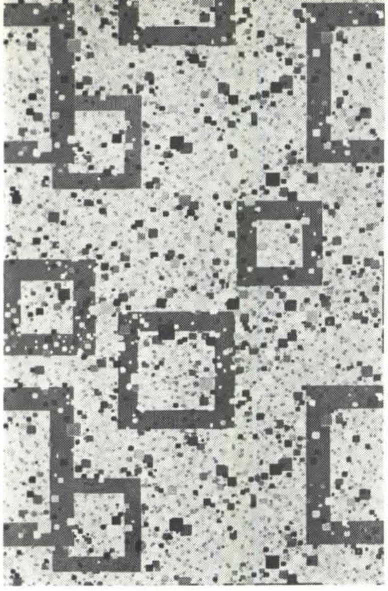
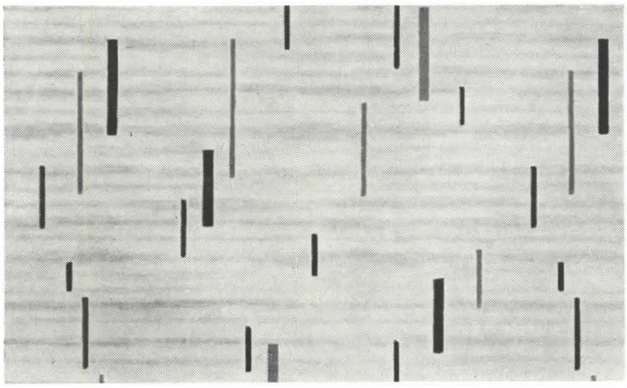
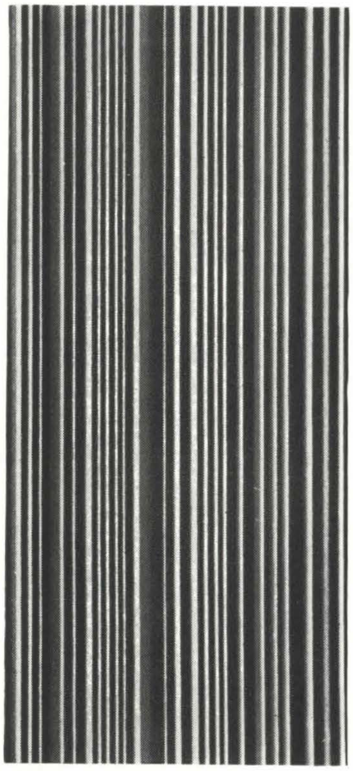


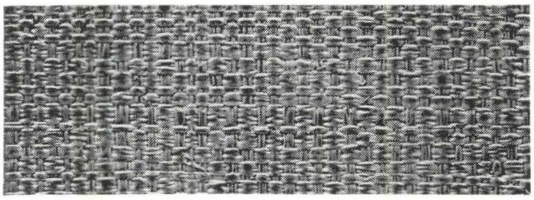
Gold Seal Congoleum (felt base): #888 Pebbletone red and #889 Pebbletone green/ floor covering, six-foot widths/ scattered color specks on hollow squares; **Gold Seal Congowall:** "Jackstraw"/ wall covering/ #W70, Elf gray; #W71, Sprite yellow; #W72, Pixie green/ **Congoleum-Nairn Inc., 195 Belgrove Drive, Kearney, N. J.**



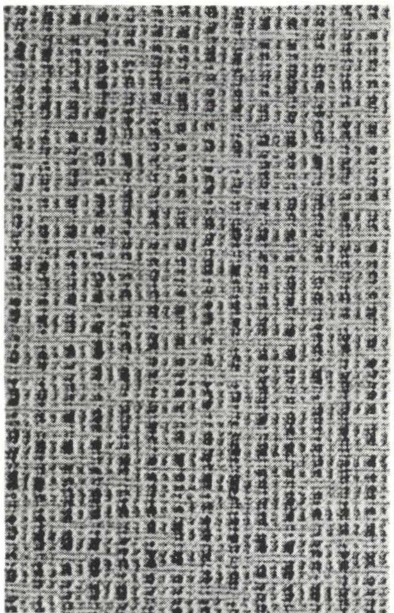
Wall Tile: "Paneltile"/ 9" squares/ polystyrene/ striated surface, "sure-grip" diamond back/ washable/ scratch and mar-proof/ withstands heat/ will not rust, warp, or swell/ may be installed on plywood, sheetrock, plaster board, or plastered walls/ **New Plastic Corporation, 1026 North Sycamore, Los Angeles 38, Calif.**



Upholstery: "Toloron Straw"/ rayon-based plastic coated/ has appearance of woven straw/ available in 54" width/ easy to clean, long-wearing, resistant to stains, water, and oil/ natural straw, yellow, fern green, antique white, red, turquoise, and coral color/ **Textileather Corporation, Toledo, Ohio**



Carpet: "County Fair"/ all-loop texture/ tones of green, beige, cocoa, dawn gray, champagne, or red, with accents of cinnamon, gold, gray, black, or white/ may be cut without binding and joined almost invisibly because of "Lokweave" construction/ **retail:** $9.95 a square yard/ **The Bigelow-Sanford Carpet Co., 140 Madison Ave., New York 16, N. Y.**

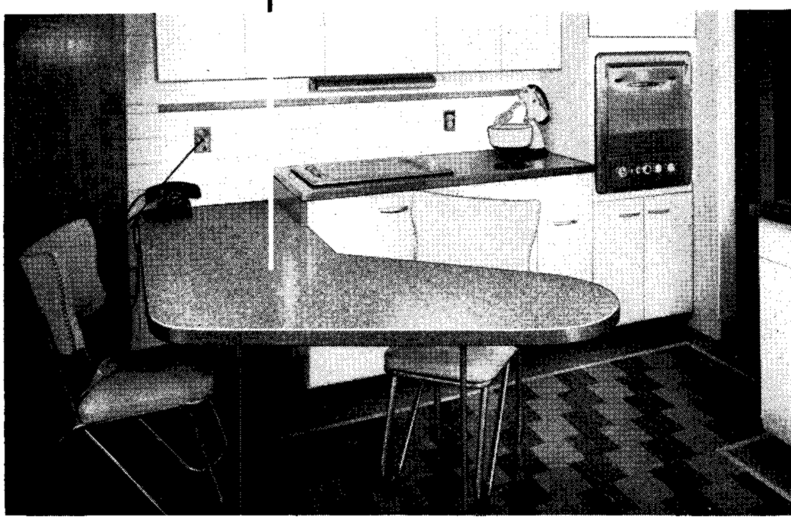


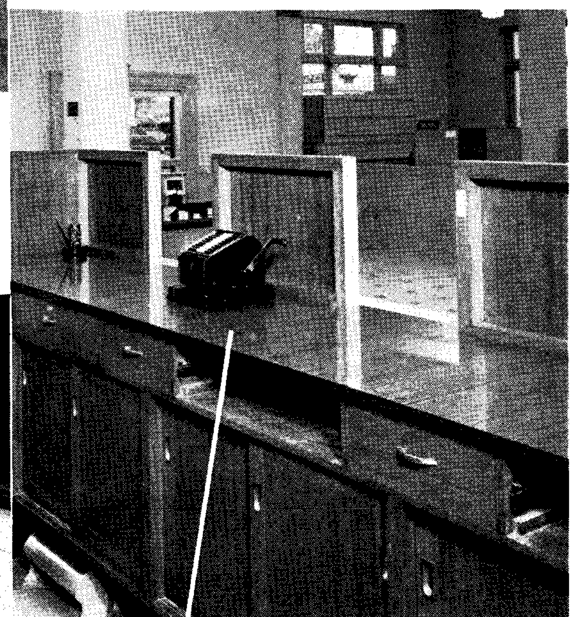
hotel lobby

Hollywood Plaza Hotel: Cigar stand and cashier's desk, surfaced in Parkwood Genuwood — Mahogany with Gray Harewood Feature Strip. Designer, Harry Werner. Fabricator, Liquid Carbonic Corp.

modern kitchen

Kitchen of house in Worcester, Mass. Styled by George Flynn. Parkwood Decorative work surfaces by Ryan Mfg. Co., Palmer, Mass.





bank teller's desk

Parkwood Genuwood work surfaces in teller's spaces, People's National Bank, West Seattle.

Parkwood

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The wedding of handsome appearance, maximum resistance to wear and minimum maintenance found in Parkwood high-pressure laminates has resulted in their selection by architects and designers for a wide range of installations. For duty, for beauty, specify Parkwood. *Write for new Kodachrome brochure or see insert in Sweet's File No. 14a Par.*

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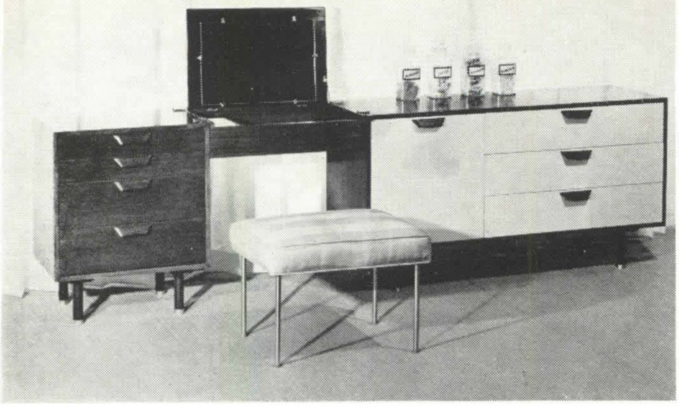
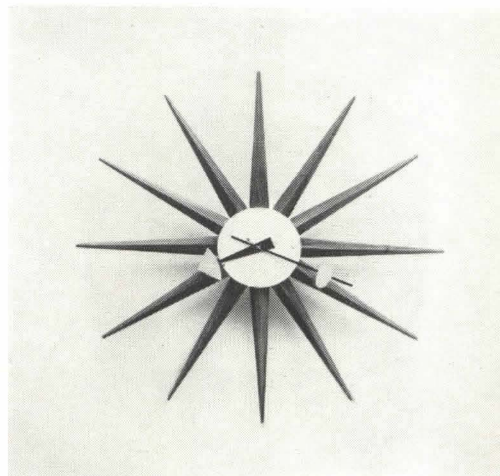
p/a interior design products

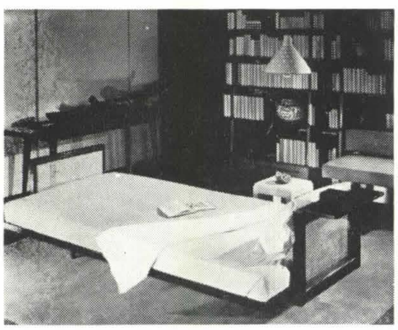


Combination Vanity Dresser: #704, #783, #734/ 4-drawer cabinet, dressing table, and cupboard and three drawers/ single unit handles all storage for a bedroom/ 24", 26", and 56" widths/ **retail:** $174.05, $134, and $297/ **Harvey Probber Inc., 136 Fifth Ave., New York, N. Y.**

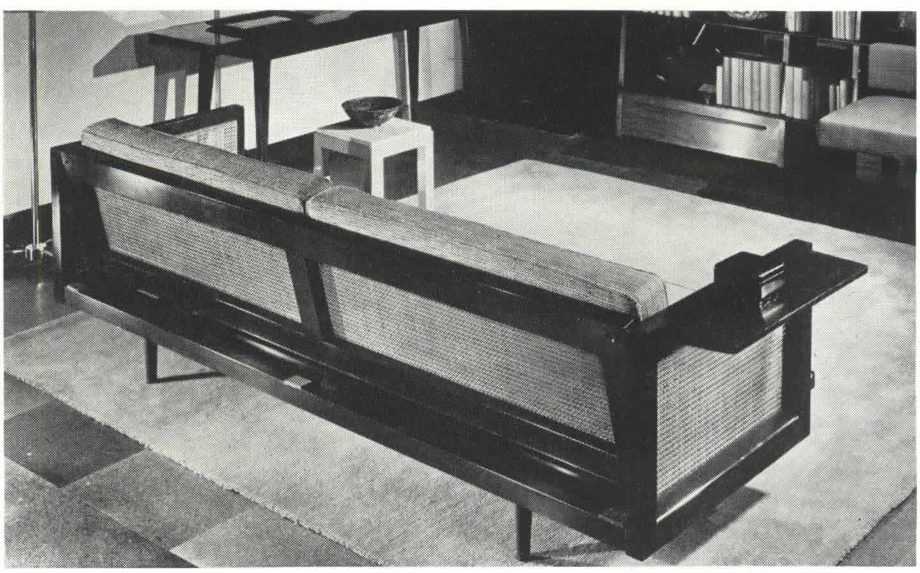
Table Lamp: #9892/ "Profile"/ ebony metal shades/ walnut legs/ 16¼" high/ one, two, or three bulbs may be lighted at one time/ **retail:** $29.50/ **Lightolier, Inc., 11 E. 36 St., New York, N. Y.**



Modern Sunburst Clock: #2202/ tapered wood shafts, available in walnut or brich/ white metal center/ black hands with accents of orange and gray/ 19" diameter/ designed by George Nelson/ **retail:** $25/ **Howard Miller Clock Co., Zeeland, Mich.**



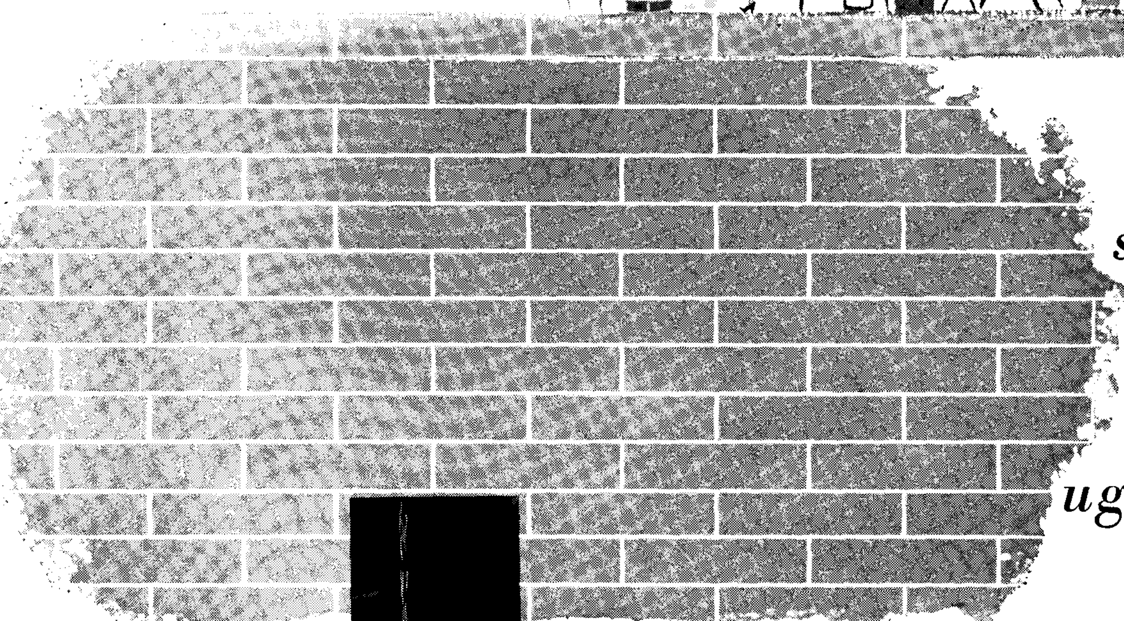
Sofa Bed: #5327/ 96" long, 24" deep, 42½" wide, opened/ back drops to form bed/ foam rubber upholstery/ mahogany frame with cane back and arms, rosewood legs/ tablet arm eliminates need for end table/ designed by Edward Wormley/ **retail:** $730, in muslin/ **Dunbar Furniture Corp., Berne, Ind.**



Dow Corning

Silicones

make masonry walls



shed water,
stay clean,
and free from
ugly efflorescen

Silicone treated masonry repels water

Water soaks into untreated masonry

You use brick or masonry to make your home more beautiful, more durable, easier to maintain. But rain and water borne stains soak in; frost can chip away the brick and stone; salts are frequently leached out by rain to form an unsightly white deposit called efflorescence.

And there was little that anyone could do about it without changing the surface appearance or the vapor permeability of masonry. These problems went unsolved until we developed a silicone product that could be used to make above-grade masonry walls shed water.

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These silicone water repellents are completely invisible. They do not fill the pores or prevent "breathing". And they're easy and economical to apply; remain effective for years.

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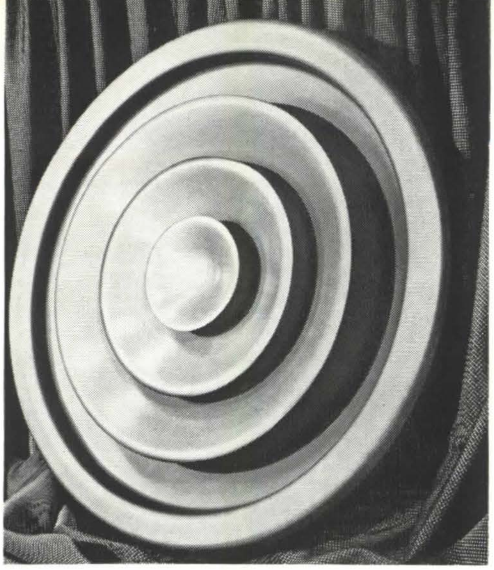
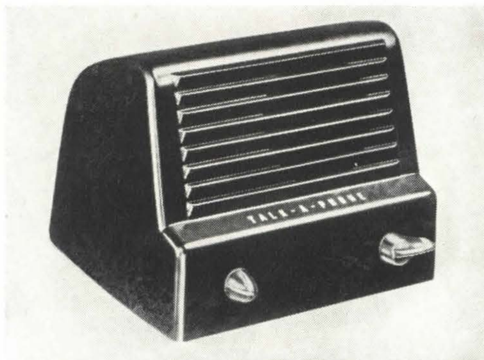
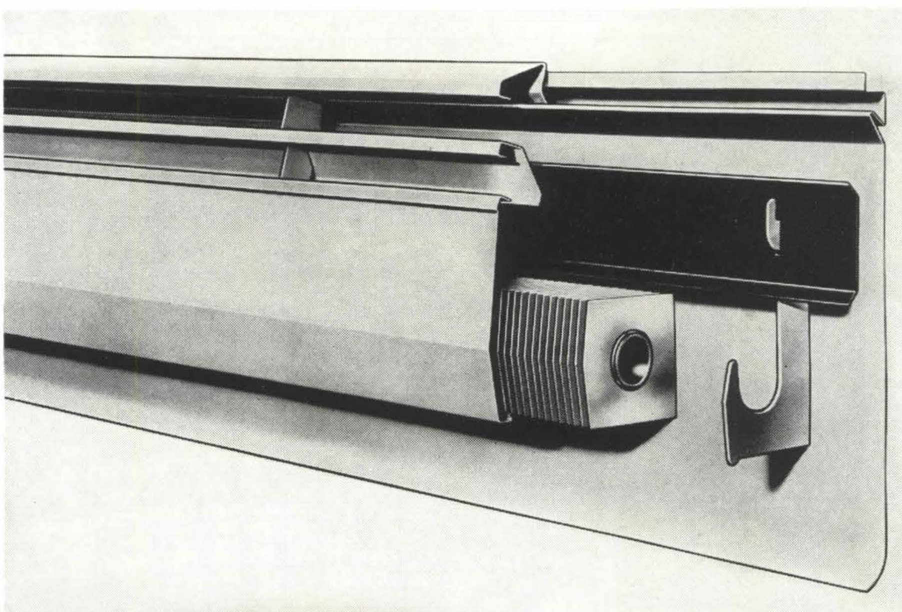
p/a interior design products



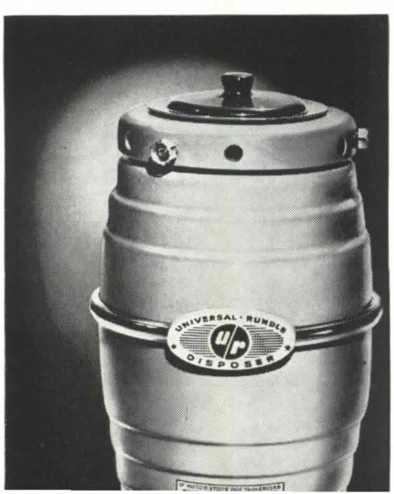
Air Diffuser: Type "P" Series/ "PA," adjustable, multipassage, air distribution may be varied from horizontal to vertical/ "PS," stepped-down type, fixed pattern diffuser/ "PF," flush type/ "PR," fixed pattern supply and return diffuser/ "PH," fixed pattern, half round diffuser/ uniform appearance permits use of varying types within one area/ **Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.**

Intercommunication System: #LC-33/ wireless, two-station requires no wired installations/ may be plugged in any electrical outlet/ suppresses line noises and hum/ more stations may be added/ finished in walnut or gray/ **Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago, Ill.**





Baseboard Heating Panels: #BR for recessed installation, #BF for freestanding installation/ available in 5 and 6 foot lengths/ one-piece front and back/ finished in prime coat, may be painted to match wall or trim/ styled by Walter Dorwin Teague/ **Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.**



Food Waste Disposer: #69100/ easily installed/ features quiet, fast operation disposes of a pound of waste material in 30 seconds/ weighs $24\frac{1}{2}$ pounds/ **Universal-Rundle Corporation, New Castle, Pa.**

arcadia details no. 5 of a series

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J. DALE HEALY

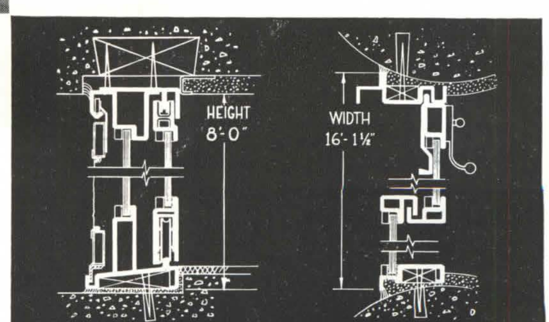
arcadia

the finest costs no more

Four floors of Arcadia sliding glass doors — 80 Arcadia units provide a restful, spacious outlook and "get well" atmosphere in keeping with the entire feeling and purpose of this modern hospital.

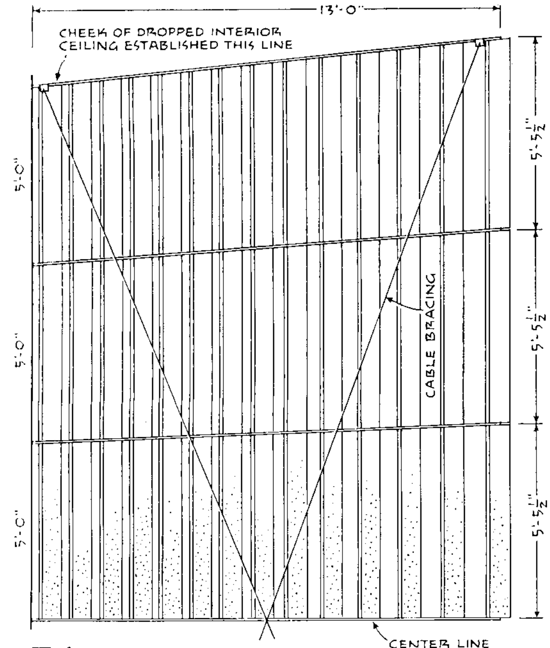
In patients rooms and solariums the compact sliding action preserves precious floor space, simplifies draping problems and is easily operated by convalescents. Wide openings allow easy passage of hospital equipment.

KAISER FOUNDATION HOSPITAL
Hollywood, California
Wolff & Phillips, Architects
C. L. Peck, Contractor

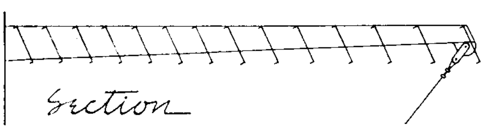


For information consult Sweets' architectural file or write
ARCADIA METAL PRODUCTS
P. O. BOX 657 ARCADIA, CALIF.
National Member Producers' Council Inc.

department store: louvered sun hood

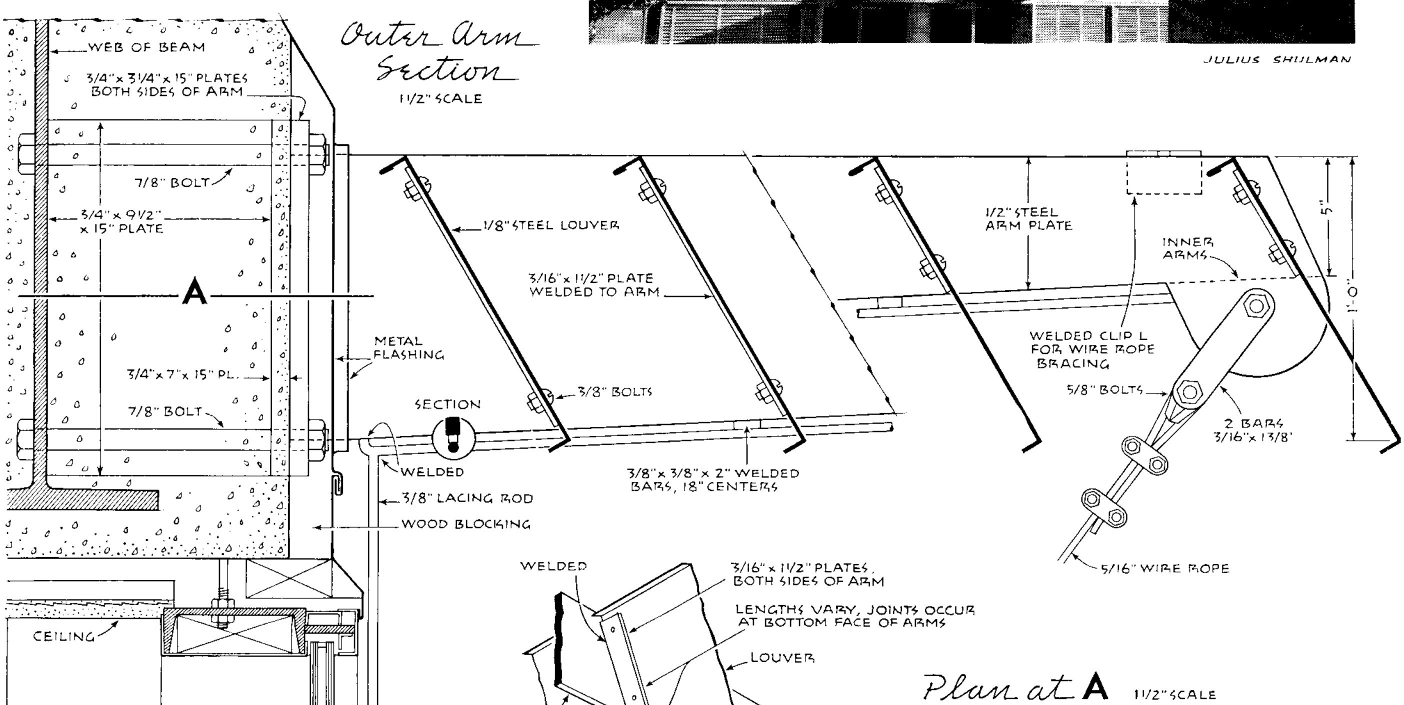


Plan 3/16" SCALE

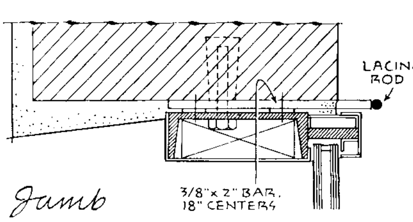


Section

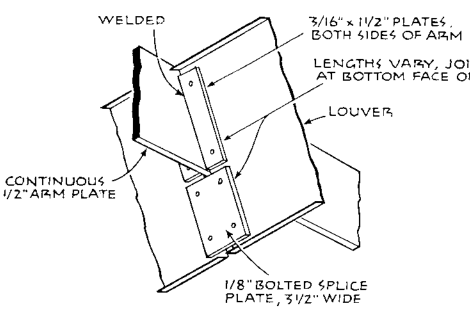
JULIUS SHULMAN



Outer Arm Section 1 1/2" SCALE

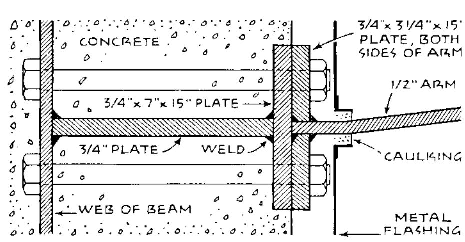


Jamb



Inner Arm Connection

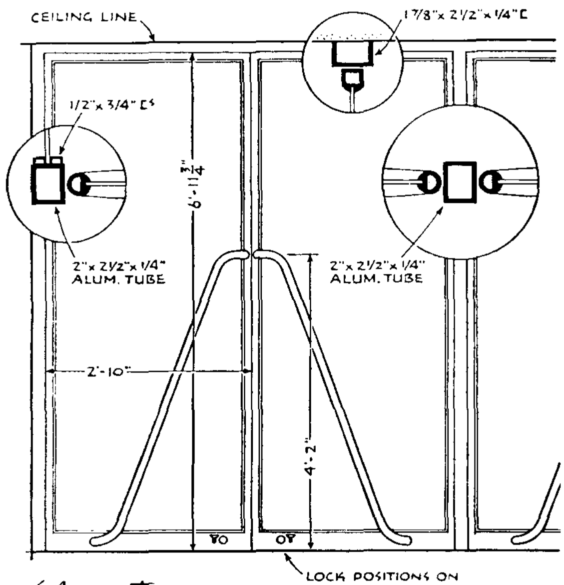
Plan at A 1 1/2" SCALE



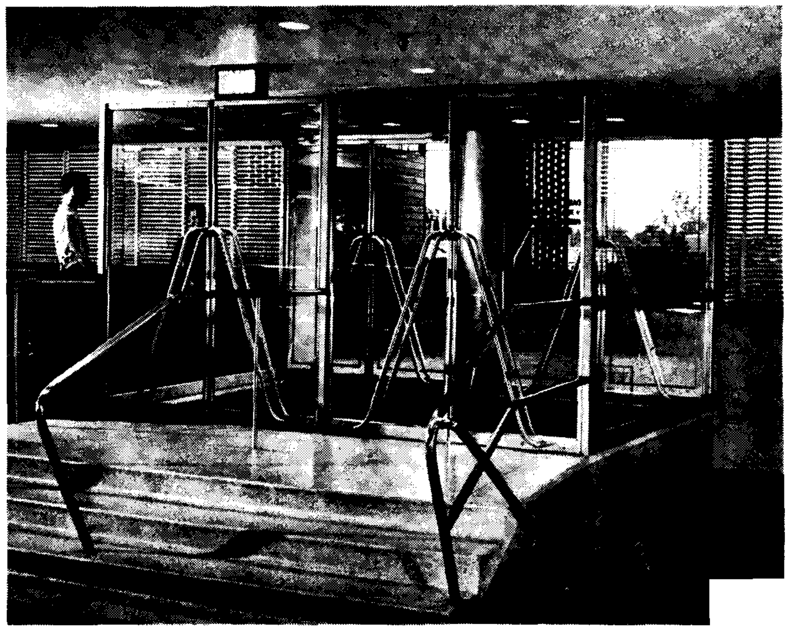
SUBURBAN BRANCH DEPARTMENT STORE FOR SCRUGGS, VANDERVOORT & BARNEY, Clayton, Mo.

Harry Armstrong, Architect

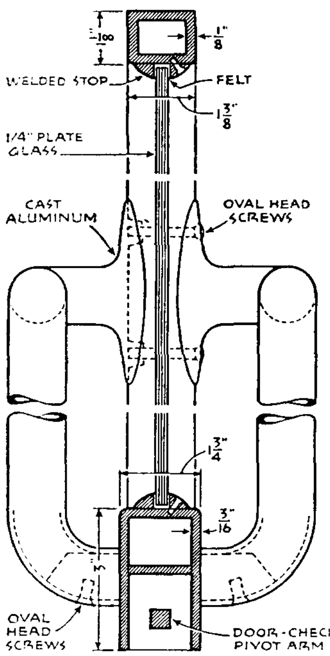
department store: entrance doors



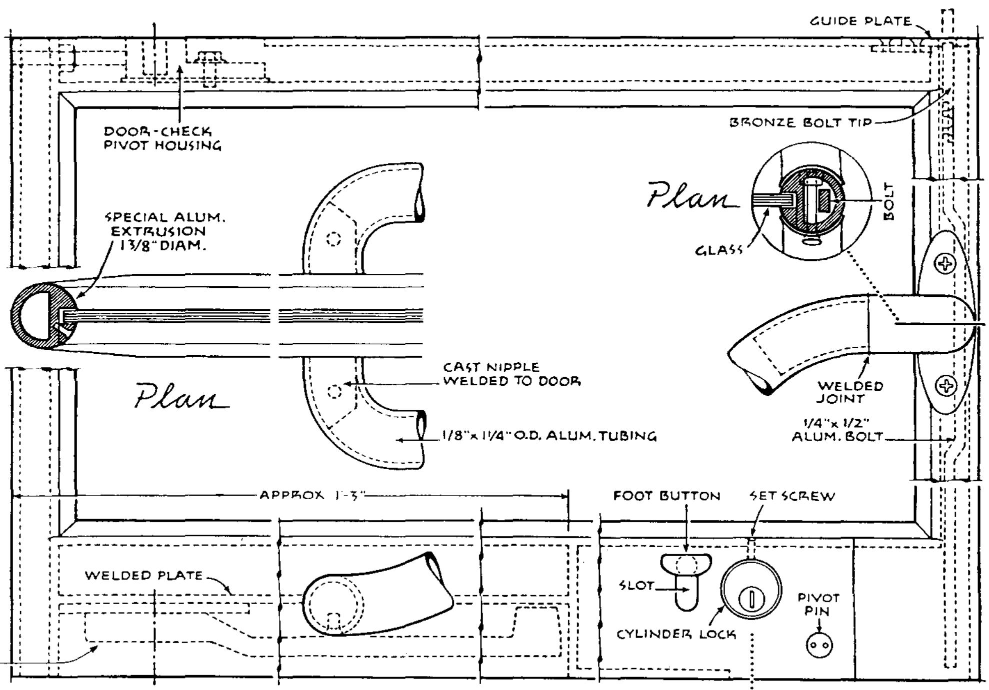
Elevation
3/8" SCALE



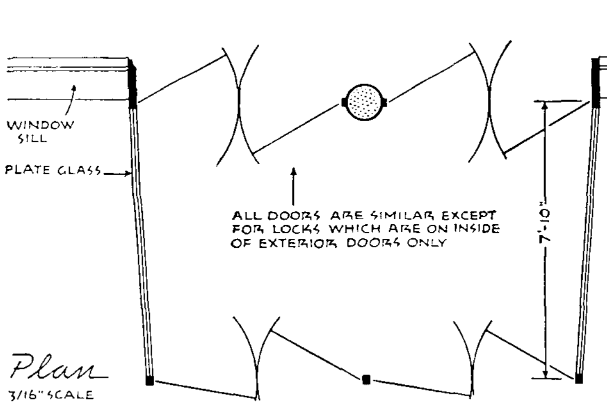
JULIUS :



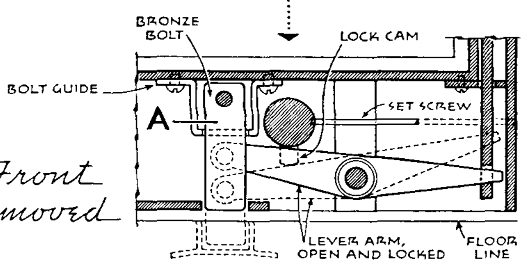
Door Section



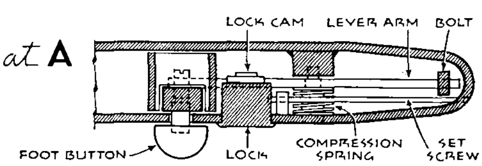
Door Elevation 3" SCALE



Plan
3/16" SCALE



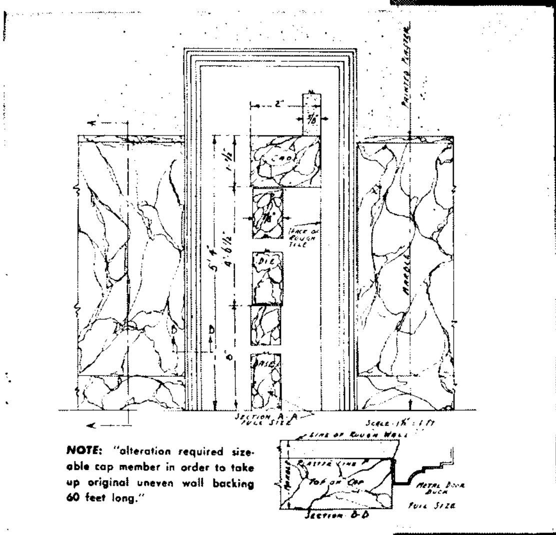
Front Removed

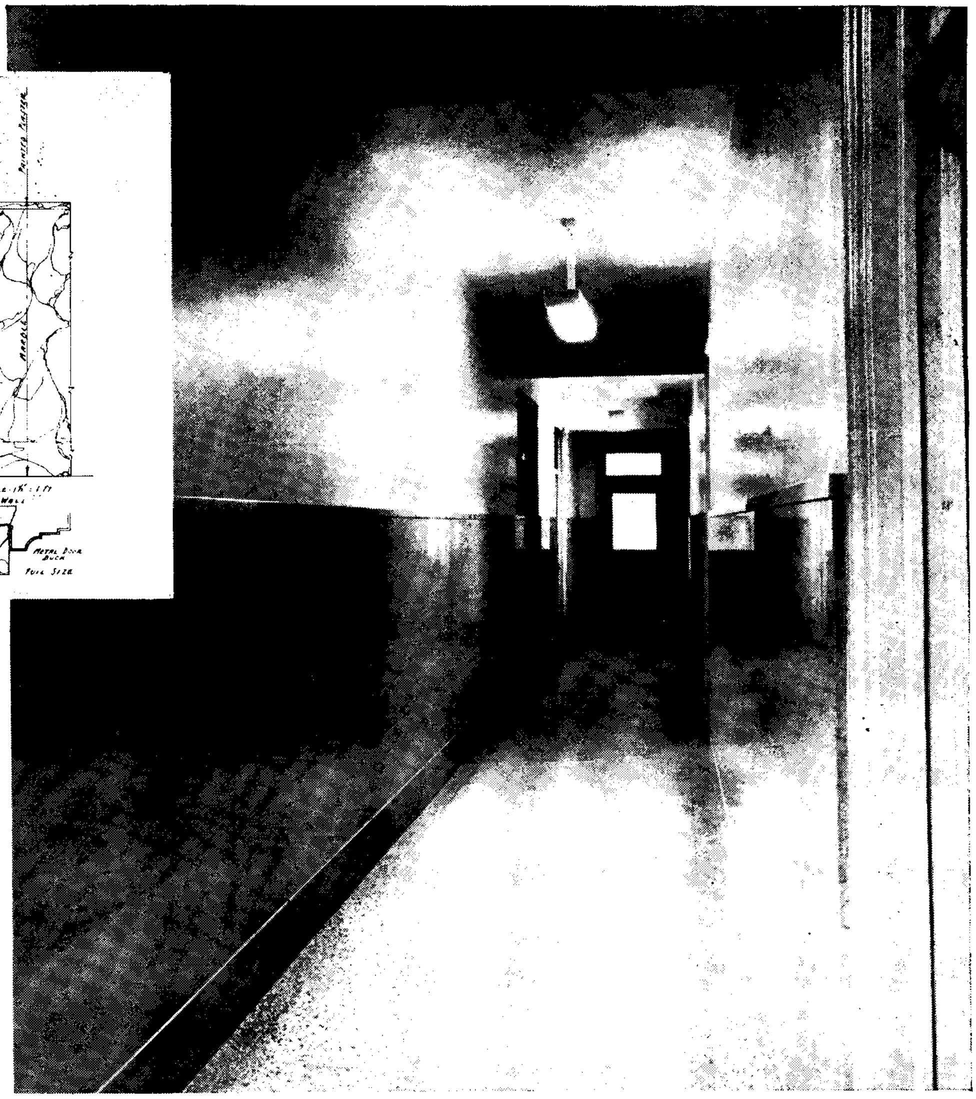


Plan at A

SUBURBAN BRANCH DEPARTMENT STORE FOR SCRUGGS, VANDERVOORT & BARNEY, Clayton, Mo.

Harry Armstrong, Architect





Starrett & Van Vleck, Architects

The great economy of marble is certainly important in a building this size. But equally important is the fact that marble makes each corridor a "main" corridor, each office an "important" office.

marble

"In line with the owners' decision to make various capital improvements to the building, one of the first steps was the installation of improved lighting and a marble wainscot 5′-4″ high in the corridors of ten of the twenty floors in the building.

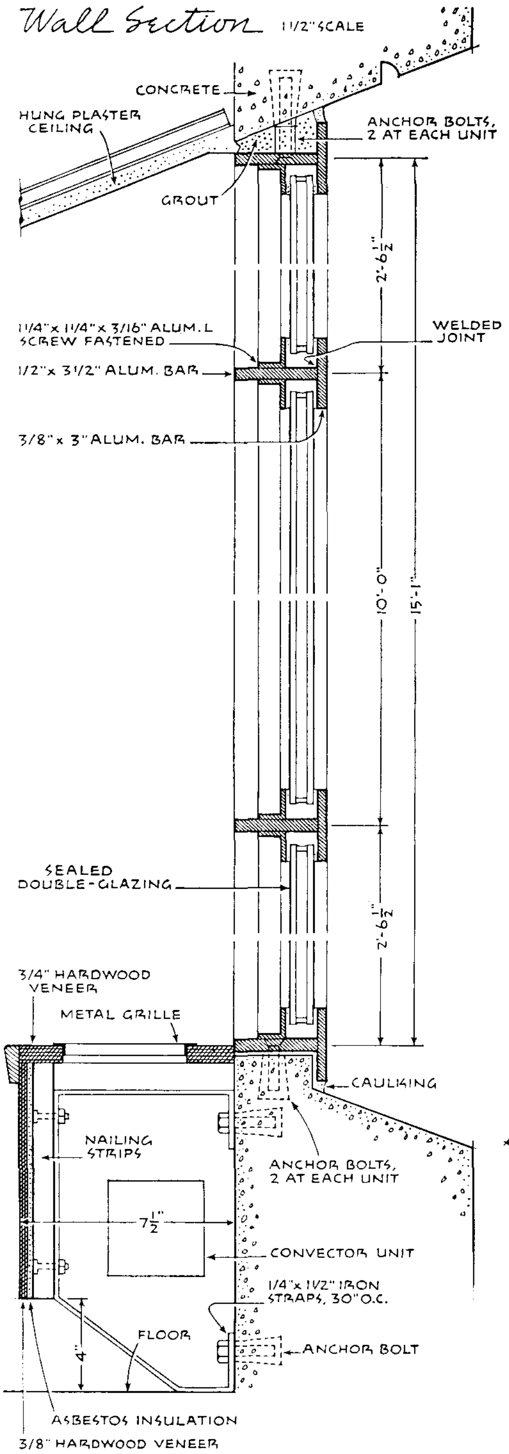
"In addition to changing the appearance of the corridors drastically, we feel that a certain economy of maintenance will be achieved due to a reduction in decorating work on the most heavily abused portions of the wall. Needless to say, we plan on improving the remainder of the floors in the same manner." R. H. Durst, Vice President, Van Dorn Realty Corporation, Bartholomew Building, New York, New York.

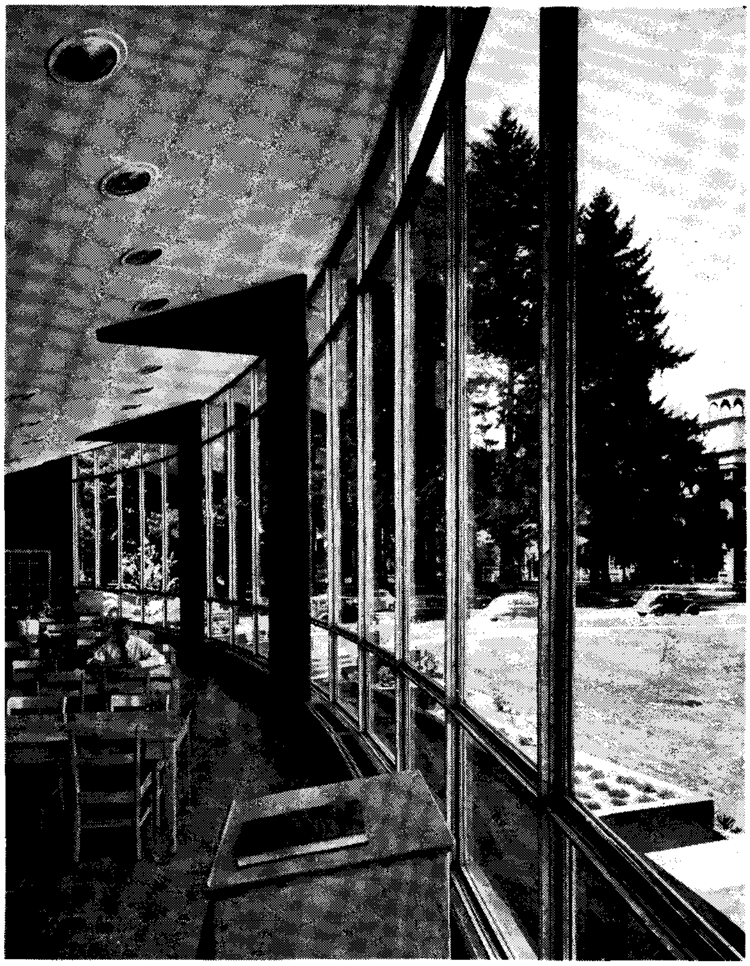
Your free copy of colorful booklet: "Proof That Marble Costs Less" available now. Write:

MARBLE MIA INSTITUTE OF AMERICA, INC.

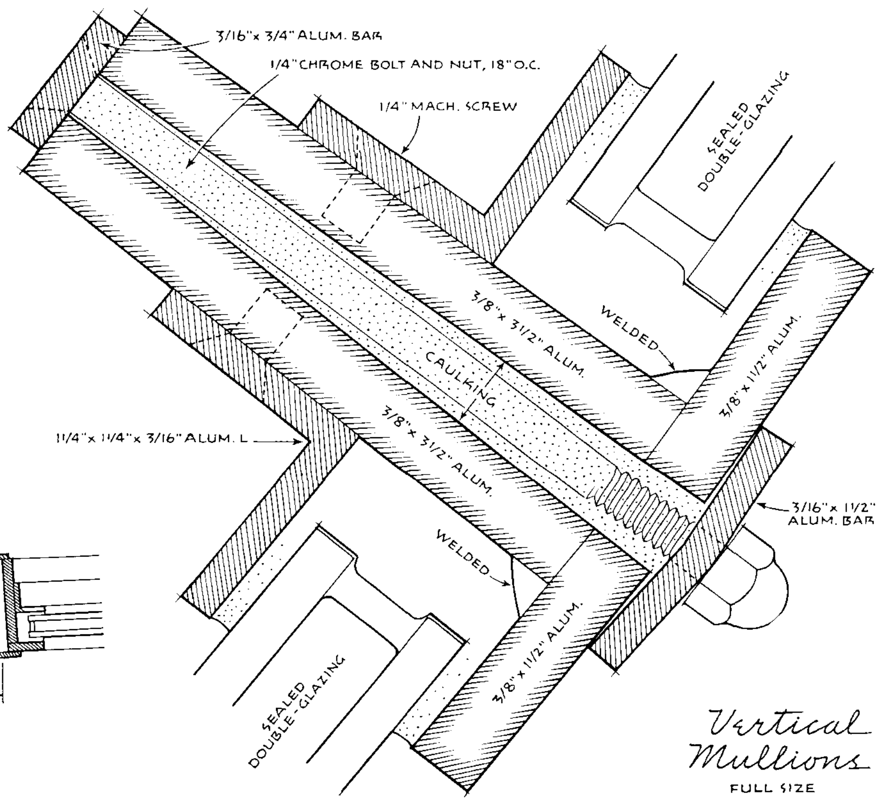
108 FORSTER AVENUE, MOUNT VERNON, NEW YORK

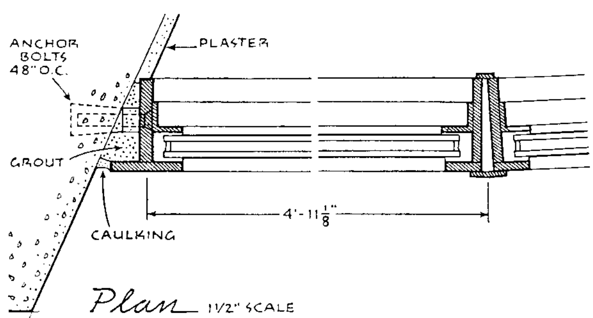
library: window wall





TOM BURNS JR





OREGON STATE TEACHERS COLLEGE LIBRARY, Monmouth, Ore.

Wolff & Phillips, Architects

Mount Royal Manor Apartments, Duluth, Minn. Contractor-Owner: W. C. Smith, Inc. Architect: A. Reinhold Melander—both of Duluth.

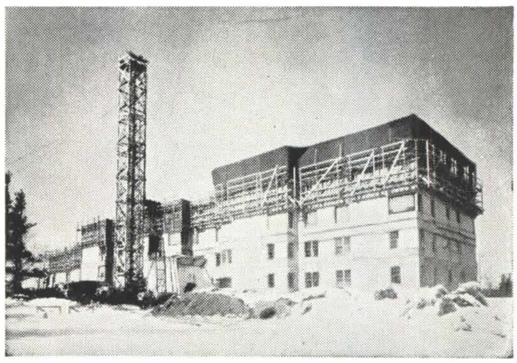
Owner-builder notes "lower costs" with Atlas Duraplastic* Cement

GOOD WORKABILITY is a prime essential in the success of architectural concrete since it serves as both a structural *and* a finish material. W. C. Smith, whose firm is contractor and owner of the Mount Royal Manor Apartments in Duluth, found "concrete made with Duraplastic has better workability, requiring less effort in placing, and that helps lower costs."

When you design for or build with concrete, it will pay you to consider the special advantages of Atlas Duraplastic, the original air-entraining portland cement.

You'll find it requires less mixing water for a given slump. And its more plastic mix aids proper placement, resulting in *improved surface appearance*. Moreover, since entrained air minimizes bleeding, or water gain, and segregation, concrete made with Duraplastic is also *fortified against the effects of freezing-thawing weather*. Both features add up to better concrete.

YET DURAPLASTIC COSTS NO MORE! It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For more information, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.



Construction goes ahead satisfactorily even in 20-below Minnesota weather. And since the mix is made with Duraplastic, finished concrete will have extraordinary resistance to freezing-thawing weather ahead!

"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Co.

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Editor's Note — Tomson continues this month his discussion of the grave risk run by the Architect when he issues Certificates of Payment without proper control and auditing of the Contractor's disbursements. This is another, perhaps the most important, question raised by this columnist for serious study by the active professional.

What are the provisions of the *General Conditions* which pertain to payment to the Contractor? Initially, it should be pointed out that the *Conditions* do not contain any provision for audits of the Contractor's books and records. In *Article 24* is the chief provision relating to payment to the Contractor. This article provides in substance that the Contractor shall submit to the Architect an application for each payment and that *if required* by the Architect, he is to furnish receipts or other vouchers showing payments for material and labor and payments to sub-contractors. This article further provides that if payments are made, based on valuation of work done, the Contractor is to submit to the Architect a schedule of values on the various parts of the work and, *if required*, support such schedule by such evidence as the architect may direct.

For the protection of the owner, *Article 24* should not make the requirement to furnish evidence optional with the Architect. Before a Certificate of Payment is issued, the Architect should have sufficient evidence in his hands to make a sound determination. In this respect, receipts and vouchers are not sufficient. The Contractor should be required to furnish to the Architect the requisitions of his sub-contractors and other supporting papers upon which the Contractor's own application for payment is based. The Architect then is in a position thereafter to check against such sub-contractor's requisitions to ascertain if they have been paid pursuant to *Article 37* of the *General Conditions.* This check could be made by an audit of the Contractor's books and records, if the "*General Conditions*" were amended to provide for such procedure.

•

Now, *Article 37* of the *General Conditions* covers the relations of Contractor and sub-contractor. It provides that the sub-contractor submit to the Contractor application for payment, in order to enable the Contractor to apply for payment under *Article 24.* The Contractor agrees to pay the sub-contractor:

(1) The amount allowed to the Contractor on account of the sub-contractor's work under the schedule of values described in *Article 24*; or

(2) To pay the sub-contractor upon payment of Architect's Certificate, so that at all times such payments shall be in proportion to the value of the work done by the sub-contractor; or

(3) To pay the sub-contractor in the manner provided by the contract documents, or the sub-contract, if these provide for earlier or larger payments than "(1)" or "(2)" above; and

(4) To pay the sub-contractor on demand at the time the Architect's Certificate should issue, even though it has not been issued for any cause not the fault of the sub-contractor.

No method is provided for the Owner, under *Article 37*, to determine as a matter of course whether *Article 37* has been complied with. Noncompliance can result in such unfortunate consequences as the imposition of mechanic's liens, disputes delaying completion or interrupting the job, insolvency, or bankruptcy of the Contractor, and other situations which can follow a Contractor's neglect or failure to treat such funds in the same manner as trust funds. Regular audits of the Contractor's books and records, to ascertain if payments have been made for labor and material and if the sub-contractors have been paid under *Article 37*, will afford a more orderly and controlled method for the supervision of the Contractor by the Architect.

•

The *Article 26* of the *General Conditions* is concerned with payments withheld. It provides that the Architect may withhold or nullify a Certificate of Payment to protect the Owner from loss because of (a) "defective work not remedied"; (b) "claims filed or reasonable evidence indicating probable filing of claims"; (c) "failure of the Contractor to make payments properly to sub-contractors or for material or labor"; (d) "a reasonable doubt that the contract can be completed for the balance unpaid"; and (e) "damage to another Contractor." This again emphasizes the need to empower the Architect or Owner to check and audit the Contractor's books and records to determine whether payment should be withheld.

And *Article 32* of the *General Conditions*, which refers to final payment to the Contractor, provides that neither the final payment, nor any part of the retained percentage shall become due until the Contractor, *if required,* shall deliver a complete release of all liens arising out of the contract, *or* receipts in full for all labor and material. It further provides that *if required* the Contractor will furnish an affidavit that the releases and receipts include all labor and material for which a lien could be filed.

For obvious reasons it would be better if *Article 32* provided that the final payment or the payment of a retained percentage should be based upon proof of payment for all labor and material and upon the furnishing of release of liens by the Contractor. Further, the Owner and not the Architect should have the option of waiving this requirement.

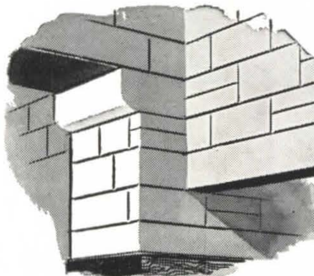
•

The provisions of the *General Conditions,* which relate to payment of the Contractor and sub-contractor, are not satisfactory from either the Owner's or Architect's point of view. In making optional the Contractor's duty to furnish proof, it may be implied that the Architect is to require the submission of such proof only when he has reason to believe, because of extraneous facts, that the application or requisition of the Contractor is improper. The Owner, however, should be satisfied with nothing less than a binding requirement that proof be furnished as a matter of regular course and practice before a Certificate of Payment is issued. Further, it is obviously in both the Owner's and Architect's interest that the proof furnished be sufficient so that the Architect's determination is not based on surmise.

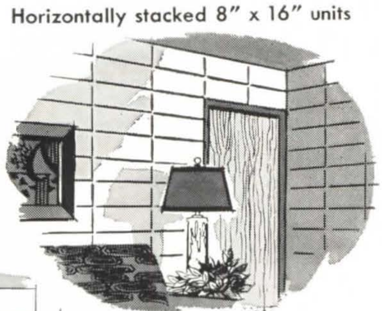
The *General Conditions,* as presently drawn, afford the Architect no sure and certain method by which he can execute his responsibility with a minimum of risk. In recommending that the *General Conditions* contain a provision making the books and records of the Contractor subject to audit, I do not mean to imply that the final responsibility for the issuance of a Certificate of Payment should be shifted from the Architect to the Owner. The costs of any audit and the personnel to conduct the same should be borne and furnished by the Owner, but the responsibility for the issuance or withholding of a Certificate should continue in the Architect.

In next month's column, I will recommend specific amendments to the General Conditions *insofar as they relate to "supervision of the Contractor."* B.T.

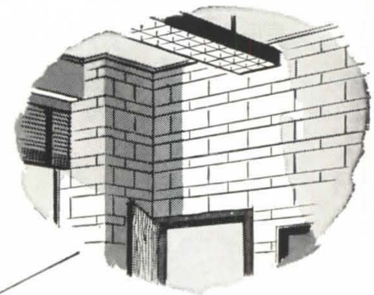
Coursed Ashler variation with 4" & 8" units



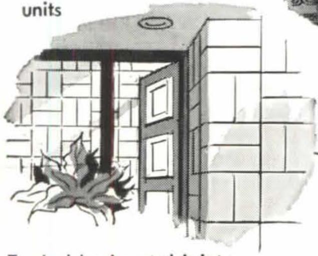
Horizontally stacked 8" x 16" units



4" x 16" and 8" x 16" courses

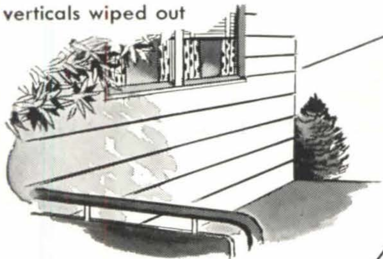


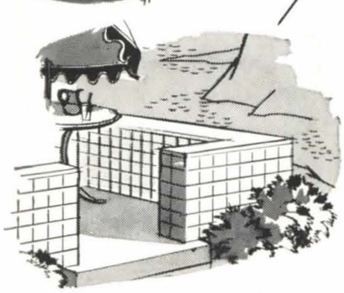
Basket-weave using 8" x 16" units



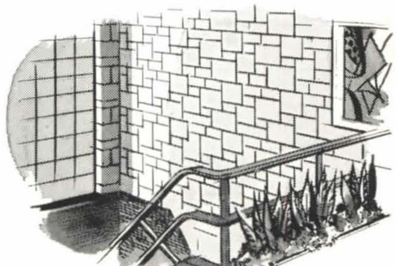
Theme and Variations

Tooled horizontal joints; verticals wiped out

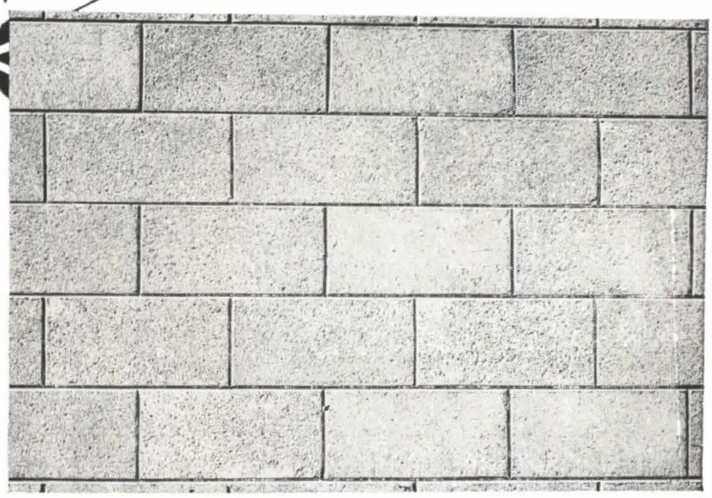




Here 8" x 8" units are stacked



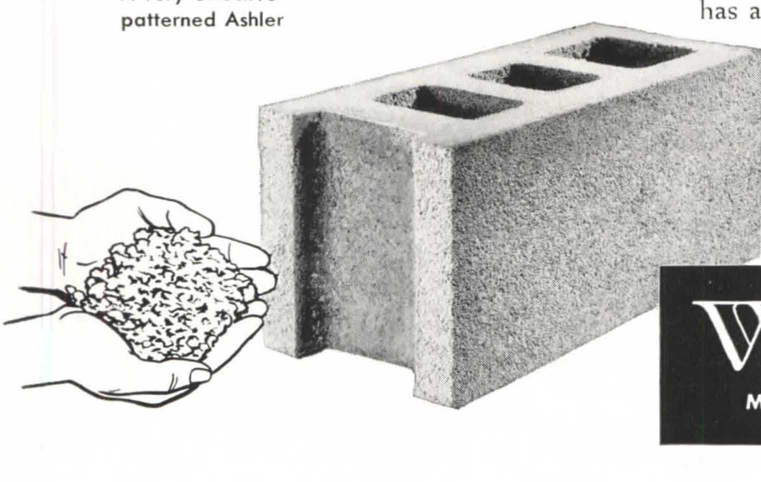
A very effective patterned Ashler



THE FAMILIAR THEME—8" x 16" FACE UNITS IN RUNNING BOND

...with exposed WAYLITE Partitions and Bearing Walls

The vast musical literature of the world is limited to a maximum of 13 tones in any one octave . . . similarly there is a very wide range of harmonious effects to be obtained with Waylite masonry walls of any thickness . . . a few of the different handlings are shown here . . . they are achieved very simply. . . . Waylite masonry has adequate structural strength—superior thermal insulative qualities—and exposed Waylite interior walls need no acoustical treatment. The Waylite Co., 105 W. Madison Street, Chicago, or Box 30, Bethlehem, Pa.



WAYLITE

MASONRY UN