PROGRESSIVE ARCHITECTURE

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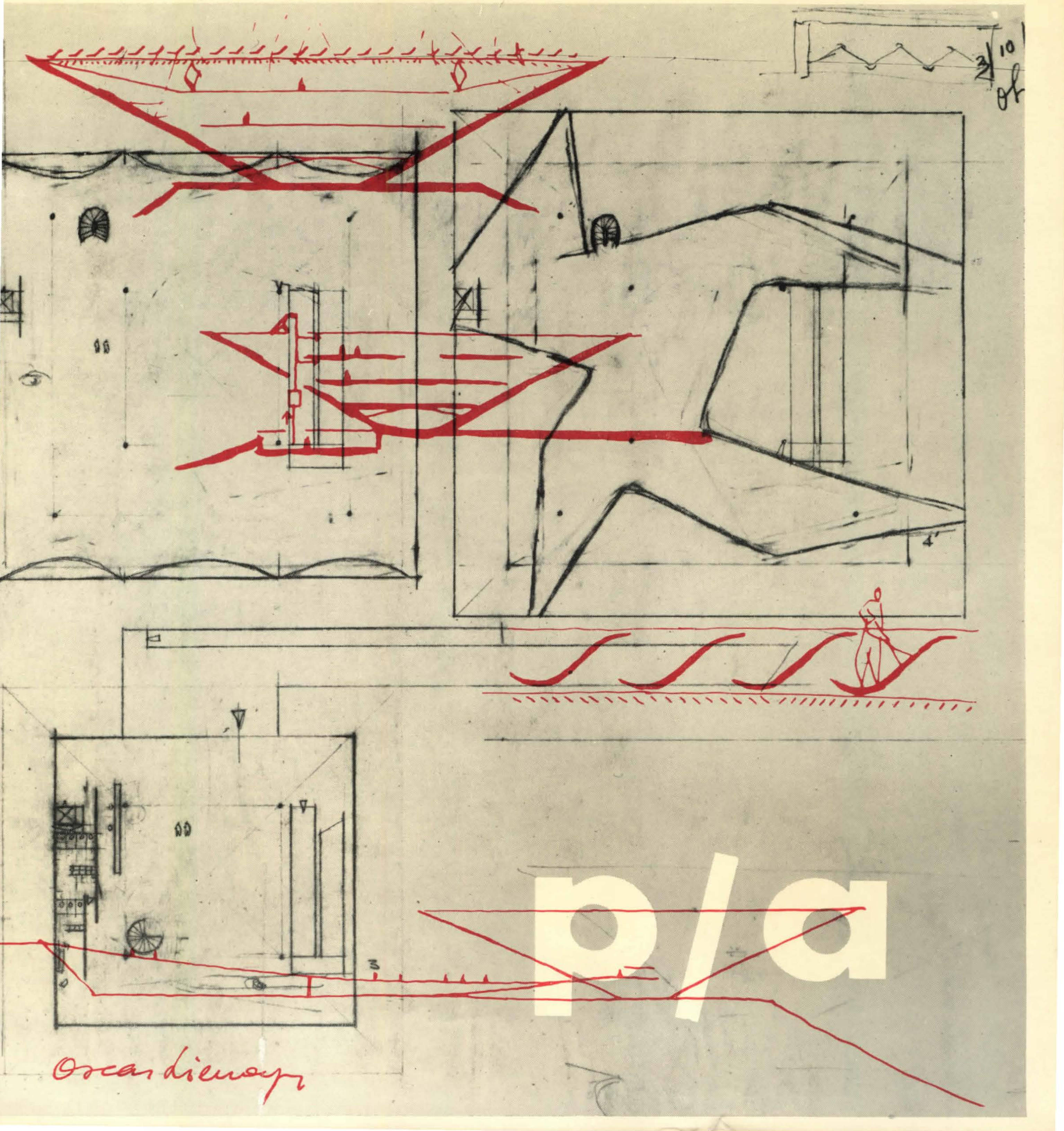


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PROGRESSIVE ARCHITECTURE

February 1956

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Volume XXXVII, No. 2

Rolling Steel Doors

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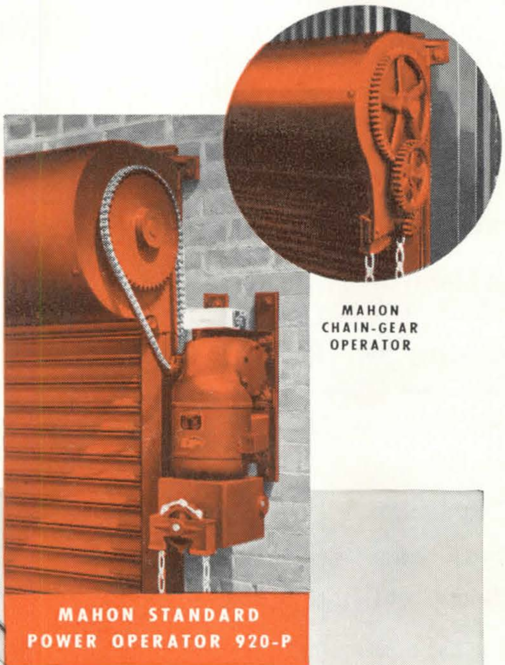

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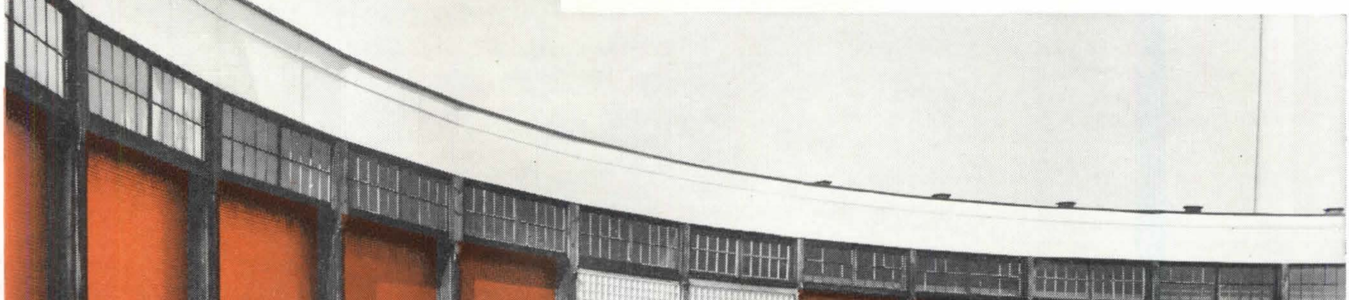

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In the Diesel Locomotive Roundhouse illustrated above there are fourteen 12 Ft. x 16 Ft. Mahon Rolling Doors installed in track openings. These permanent, all-metal doors replaced old wooden doors.

MAHON

It's the Law *by Bernard Tomson*

P/A Office Practice ***article on the validity of a zoning ordinance excluding schools or churches from a residential area.***

The mushrooming of suburban residential communities and the expansion of both public and private educational facilities has brought to the fore the issue whether zoning regulations can exclude public or private schools, or both, from a residential district.

Because public education is a governmental function of the state, the prevailing rule is that a locality or municipality cannot by zoning regulations validly exclude public schools from a residential zone or, for that matter, from any zone.

In the case, *Union Free School District of Hempstead* v. *The Village of Hewlett Bay Park* (N. Y.) 198 Misc. 932, the Court said the town could not prevent the construction of a public school within its borders, in the following language:

"As the plaintiff is an official body to whom the education of the youth of the district has been entrusted by the State by special statute, I do not believe that the defendant village, whose territory is within the school district, may by the exercise of zoning powers conferred upon it by section 175 of the Village Law, defeat or obstruct the plaintiff in the performance of its State function."

May a zoning regulation permit *public* schools but exclude *private* schools from an area?

Until recently, the courts have struck down such regulations on the ground that they were capricious or arbitrary in distinguishing between public and private educational facilities. For example, in the leading case, *Catholic Bishop of Chicago* v. *Kingery* (Ill.), 20 N.E. 2d 583, the Court was squarely faced with the question. It stated the long-accepted rule that the exercise of the police power must bear a substantial relation to the public health, safety, morals, or welfare and held that the zoning ordinance which excluded only private schools was a capricious invasion of property rights and therefore unconstitutional. In this and similar cases the courts found no reasonable basis for distinguishing between the two types of schools, saying that both types would equally add to the congestion of the streets, bring crowds to athletic events, remove property from the tax rolls, etc. In all of these cases the nub of the decisions was that there was no substantial difference between public and private schools in relation to the object sought to be accomplished by the zoning ordinance and therefore, insofar as it prohibited the presence of a private school while allowing a public one, it was void.

Some recent cases, however, have upheld the constitutionality of ordinances which permitted public and banned private schools in certain restricted areas. Thus, in the New York case, *In Re: Great Neck Community School,* in which the village ordinance permitted public schools in certain areas but excluded private schools except under certain conditions, a private school was denied a building permit to add a room to its facilities. The Court stated with reference to the regulation, that although a village cannot curtail the State's right to construct public schools, private schools have "something less in prerogatives" than public schools and the village may exclude them.

The distinction was made more explicitly in the case, *State ex rel. Wisconsin Lutheran High School Conference* v. *Sinar,* (Wis.) 65 N.W. 2d 43, in which a private nonprofit corporation sought to compel the city to issue a permit in order to construct a private *high school* in a residential zone in which only public schools and *private elementary schools* were permitted. The Court dismissed the suit as follows:

"The subject of public education and the establishment and operation of public schools is a governmental function of the state. . . . In the performance of other governmental functions we do not restrict the behavior of persons or the use of property to the same extent that we do when only private interests are pursued and the fact that the standards are different commonly raises no suspicion that an illegal discrimination is thereby imposed or that the difference between municipality and citizen is insufficient to support separate classifications. . . .

However, we decide the present appeal on the narrower ground that tangible differences material to the classifications of the ordinance can be readily pointed out which sustain the distinction made by the ordinance between schools. To begin with, the term 'public' is the antithesis of 'private.' The public school is not a private one. They serve different interests and are designed to do so. The private school is founded and maintained because it is different. Is that difference material to the purpose of zoning? In many respects the two schools perform like functions and in probably all respects concerning noise, traffic difficulties, and the other objectionable features already mentioned they stand on an equality, so that in several of the objects of zoning ordinances . . . the promotion of health, safety and morals . . . we may not say that the two schools differ. But when we come to 'the promotion of the general welfare of the community,' . . . 'Ay, there's the rub.' The public school has the same features objectionable to the surrounding area as a private one, but it has, also, a virtue which the other lacks, namely, that it is located to serve and does serve that area without discrimination. Whether the private school is sectarian or commercial, though it now complains of discrimination, in its service it discriminates and the public school does not. . . . The private school imposes on the community all the disadvantages of the public school but does not compensate the community in the same manner or to the same extent . . . we cannot say that such a distinction is arbitrary or unreasonable or that such discrimination between the two schools lacks foundation in a difference which bears a 'fair, substantial, reasonable and just relation' to the promotion of the general welfare of the community, which is the statutory purpose of zoning laws in general and of the ordinance in question."

The Court admitted that it had not found any decisions sustaining the distinction between schools in zoning cases and that the authority was, if anything, to the contrary. Nevertheless, it found support for its departure from the general line of decisions in other activities. It pointed out that an ordinance could properly distinguish between municipally owned and privately owned parks and playgrounds, on the ground that such areas for the common benefit of all the people are not to be compared with the lands used by private corporations. Finally, the Court concluded that no unconstitutional or otherwise illegal discrimination existed in the ordinance which excluded private high schools and permitted public ones in the same residential area.

To be continued in March 1956 P/A.

Mechanical Engineering Critique *by William J. McGuinness*

P/A Office Practice ***column on mechanical and electrical design in architecture is devoted this month to the subject, Extramural Air-Conditioning Ducts.***

The booming city of Caracas, Venezuela, has an unusual climate. Although temperatures are continually pleasant, radiant heat from the sun is intense throughout the year and the relative humidity rarely drops below 75 percent —a condition that causes IBM cards to curl and keeps a person "sticky" during working hours. Caracas is also noisy— due to the constant roar of traffic—and, although normally a clean city, a red dust from excavations of vast construction projects now fills the air. In the past, because of pleasant air temperatures, there has been virtually no air conditioning except for isolated functions where humidity was a recognized problem.

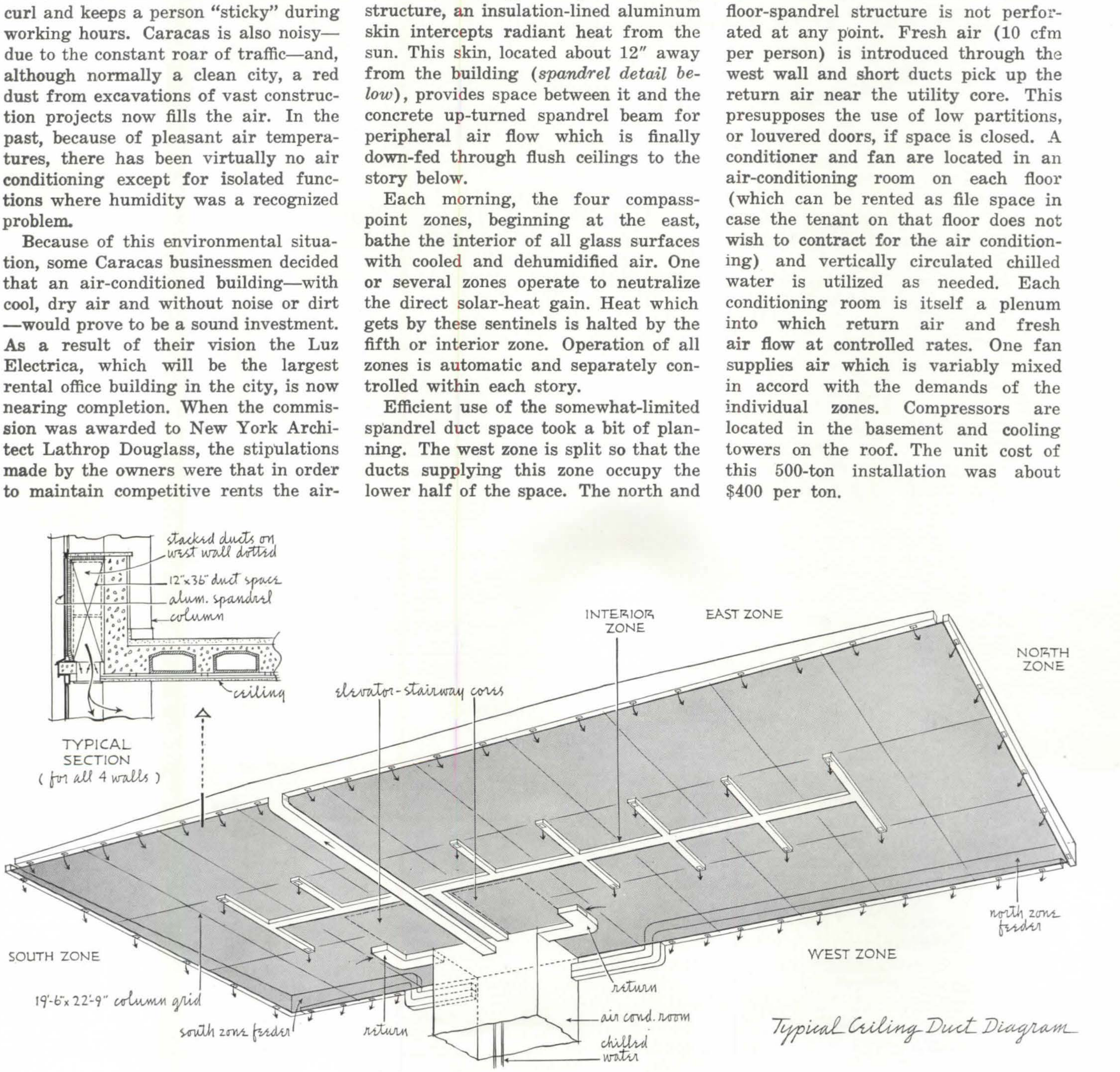
Because of this environmental situation, some Caracas businessmen decided that an air-conditioned building—with cool, dry air and without noise or dirt —would prove to be a sound investment. As a result of their vision the Luz Electrica, which will be the largest rental office building in the city, is now nearing completion. When the commission was awarded to New York Architect Lathrop Douglass, the stipulations made by the owners were that in order to maintain competitive rents the air-conditioning system should be designed so that it would be low in initial cost, that tenants could contract for space with or without air conditioning, and that a minimum amount of expense would be required for installing lateral ducts. Douglass and his consulting mechanical engineer, Sidney Barbanel, collaborated closely from the inception of the design to attain these ingenious results.

On the outside of this reinforced-concrete, 11-story, earthquake-resisting structure, an insulation-lined aluminum skin intercepts radiant heat from the sun. This skin, located about 12" away from the building (*spandrel detail below*), provides space between it and the concrete up-turned spandrel beam for peripheral air flow which is finally down-fed through flush ceilings to the story below.

Each morning, the four compass-point zones, beginning at the east, bathe the interior of all glass surfaces with cooled and dehumidified air. One or several zones operate to neutralize the direct solar-heat gain. Heat which gets by these sentinels is halted by the fifth or interior zone. Operation of all zones is automatic and separately controlled within each story.

Efficient use of the somewhat-limited spandrel duct space took a bit of planning. The west zone is split so that the ducts supplying this zone occupy the lower half of the space. The north and south zone feeders proceed to their destinations by passing above the west-zone ducts in the spandrel duct space. They then continue beyond the north-west and southwest corners, dropping to the ceiling to be perforated for registers. (*Spandrel section* **A** *is typical for all four exterior walls, but on all of these walls except the west, only one duct is enclosed.*)

It will be noticed that the air handling is complete within each story and that the monolithic-concrete column-floor-spandrel structure is not perforated at any point. Fresh air (10 cfm per person) is introduced through the west wall and short ducts pick up the return air near the utility core. This presupposes the use of low partitions, or louvered doors, if space is closed. A conditioner and fan are located in an air-conditioning room on each floor (which can be rented as file space in case the tenant on that floor does not wish to contract for the air conditioning) and vertically circulated chilled water is utilized as needed. Each conditioning room is itself a plenum into which return air and fresh air flow at controlled rates. One fan supplies air which is variably mixed in accord with the demands of the individual zones. Compressors are located in the basement and cooling towers on the roof. The unit cost of this 500-ton installation was about $400 per ton.

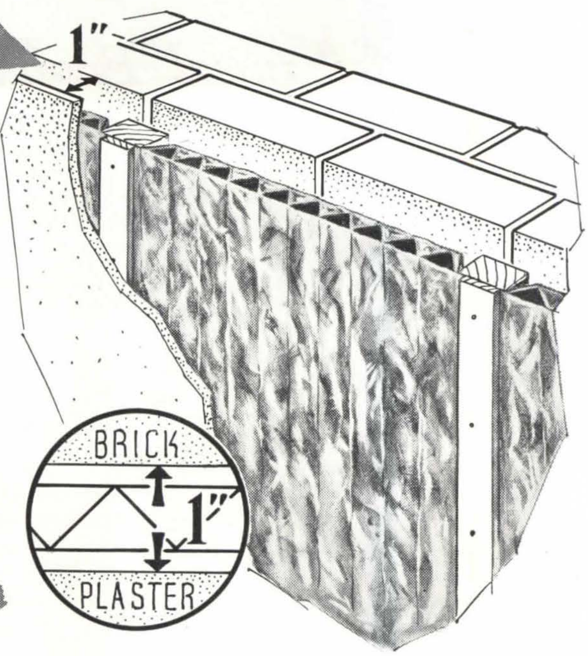


Typical Ceiling Duct Diagram

HOW TO

Insulate Masonry Walls
Get 2" Insulation Value
Create 1" Wall Space

PROTECT WALLS OF BRICK, STONE, CONCRETE AND CINDER BLOCK AGAINST HEAT LOSS, HEAT INTRUSION, AND DAMPNESS AT ABOUT 8¢ SQ. FT. (Insulation with Labor)



Insulate economically and effectively against heat and vapor flow in masonry construction, with 2 sheets of tough aluminum separated ½" apart by a flame, mold, and insect retardant accordion fiber. They install easily in one operation to furring strips. Only ½" deep installed, this insulation fits into the shallow 1" spaces created by the furring.

Comfortable areas can also be created in basements and other places in existing buildings for playrooms, storage, laundries, workshops, even living quarters; by this scientific construction of multiple aluminum and reflective spaces.

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HEAT AND VAPOR FLOW RETARDED

With respect to radiant heat flow, the aluminum surfaces of this insulation have 97% reflectivity, and only 3% absorptivity and emissivity. Conduction is slight through the air spaces of low density. The layers of aluminum and fiber retard inner and outer convection. These comprise ALL methods of heat flow.

Because they are METALLIC and CONTINUOUS, the aluminum sheets are almost impervious to vapor flow. Infiltration under the flat flanges is slight. The possibility of condensation formation on or within this kind of insulation is minimized by the scientific construction of multiple layers of aluminum, fiber and air spaces.

This scientific insulation is commercially available as Infra Type 4 Jr. It has 4 reflective spaces, 2 outer, and 2 inner rows; and 4 reflective surfaces. Made for 16" centers, it is packed 500 sq. ft. to a carton in one continuous strip. It is also available with an asbestos partition.

HOW TO INSTALL

Attach 1" furring strips to walls on 16" centers. Tack flange of unopened Type 4 Jr. to *face* of furring strip with an occasional staple, bottom (flat) surface facing room. Expand insulation and tack to face of adjacent furring strip. Lap and tack flange of next piece of insulation *over* previously tacked flange of adjacent installed insulation. Nail rough lattice strip *over* combined flanges, which will prevent contact with subsequently installed lath or wall board, and create an additional air space.

The U. S. NATIONAL BUREAU OF STANDARDS has published an informative booklet describing the destruction which condensation can cause and means of preventing it. It is entitled "Moisture Condensation in Building Walls." Send us coupon for a FREE copy.

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Quantity Surveying: What It Is *by Michael F. Kenny, F.C.S.I.*

P/A Office Practice *article explaining the functioning of a group closely allied to architectural practice. On the following page the subject is further explored.*

Quantity surveying is a profession that people closely connected with the construction industry often have difficulty in defining. A quantity surveyor studies the plans and specifications of a construction project, and estimates the quantities of labor and materials necessary to complete the project. He is not an estimator, in the sense that he is more concerned with quantities than with prices. Physical quantities are a matter of fact, whereas prices involve considerations less factual. However, a quantity surveyor should be familiar with prices, so as to produce a reliable estimate.

There is no standardized method of preparing a construction estimate, and the people who do most estimating—namely, general contractors—do so in the light of their experience of what they had to produce and pay for on past projects, and by a thorough examination of the plans, specifications, and contract documents, to find out what is required.

While this has not produced standardization, it has brought a striking uniformity in the main items contractors include in their estimates. Formwork by the square foot of contact surface, concrete by the cubic yard, and masonry units by the piece or thousand, are so listed because these are the ways such items are produced, purchased, or paid for. Differences in estimating arise not in the main items, but in the extent these items are broken down thereafter. One contractor, for instance, may price all his wall forms at a flat rate, while another may price plain walls in this way, but price pilaster forms and brick seats at a differential, because he thinks this gives him a better balanced estimate.

The quantity surveyor includes in his survey all items of labor and materials which will incur a cost on the job.

It was stated that physical quantities are a matter of fact. This is not always recognized. Some contractors think there are two principal variables in estimating—labor and materials. A bidder may lose a job, or get rich, by overestimating the one or the other. It is true that labor productivity is variable, but quantities are not. A 3′-0″ x 3′-0″ x 1′-0″ concrete footing requires 1/3 of a cubic yard of concrete, and 30 such footings require 10 cubic yards of concrete. Multiply this by the items that make up a job, and you have the quantities. The only time quantities are not fact, is when the facts are unascertainable, such as the amount of rock a contractor may encounter in excavating, or the lineal feet of piling that may be required on a job; or when the architect's drawings are poor and ambiguous. In the first case, these should be included in the estimate on a unit rate basis, and the contractor paid upon completion for the work he has done. In the case of poor drawings, these should be clarified in advance of bidding, or the contractor can refuse to bid upon them—which, if he is wise, he will often do.

Few contractors prefer to get work because of a mistake in their quantities. They want to get it by the keenness of their pricing and by their acumen in sizing up the job; qualities which reflect their own organization more than does the production of quantities, over which they have no control.

This is why quantities should be produced by a competent surveyor. A further, and very important reason, which is inevitably bringing quantity surveying into greater use, is that it saves time and money in estimating.

Take a job going out for bids today. Ten general contractors may be invited to submit bids, so ten estimating staffs get to work and produce approximately the same quantities. Three times as many subcontractors may submit bids. Apart from the time consumed, this costs money, in estimators' salaries alone. And this money is not paid by the contractors and subcontractors out of profits—it is passed along to some client as part of the bidder's expense.

In Britain, this was recognized years ago and quantities form part of the contractual system. When a contractor receives the drawings and specifications to enable him to submit a bid on a job, he also receives a document called the Bills of Quantities. This is a part of the contract documents, and has been prepared by a licensed quantity surveyor, working in collaboration with the architect. It contains a Bill of Preliminaries, which is in essence a general conditions specification, and wherein the contractor's attention is directed to those items of a general nature he will have to include in his bid. The Bill of Preliminaries is followed by a listing of all the work under the various trades, tabulated by quantity and unit of measurement. The bidder prices out each item and the sum of all the items constitutes his bid.

The Bills of Quantities document is prepared on the basis of *The Standard Method of Measurement of Building Works*, with which all contractors are familiar as part of their business. This is a document prepared in collaboration among the recognized bodies of British architects, contractors, and building trades operatives, stating how work shall be measured. The preamble runs: "Bills of Quantities shall fully, accurately, and completely represent the work to be contracted for." To ensure that this embracing order is carried out, no British surveyor is allowed to affix his name to a Bills of Quantities until he has passed three stiff professional examinations.

The British system is undoubtedly too restraining for our dynamic American construction industry, but it has some ideas we could profitably copy, such as more standardization in our estimates and training and qualifying our estimators.

The American Institute of Quantity Surveyors, founded in Chicago in 1926, was progressing toward these ideas, until the depression killed interest in quantity surveying. Today's high volume of construction activity, and the shortage of trained estimators, has brought renewed interest in the profession, and has caused some of us to look critically at our methods. The time seems ripe to do something about them.

The Construction Surveyors Institute, a successor to the original body which asks qualifications on the part of its members and has members engaged in selling quantity survey services in many cities over the country, is presently studying how to standardize nomenclature in estimating. From this it is not a long step to standardization, or at least some standardization, of methods of take-off. A program for the training of estimators could easily follow.

The writer teaches estimating at both the Builders' & Traders' Exchange of Detroit, and at Wayne University, in Detroit, and he can testify that there is no dearth of eager and suitable candidates for training as estimators or quantity surveyors. Also engaged full time as a quantity surveyor, he can testify to the number of contractors, architects, and owners who are interested in buying competently and accurately prepared quantity surveys.

But changes in our methods of estimating are not the business of only one institute or individuals. They are the business of all segments of the construction industry, through their accredited organizations, like the AIA and the AGC, and the trade unions. This article is not only an explanation of quantity surveying, it is a plea for the rest of the industry to pitch in and help.

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Quantity Surveying: How It Works

by Arthur Schneider, F.C.S.I.

P/A Office Practice *article discussing Purchase Requisitions and Bid Separation in relation to Quantity Surveying, and what this may mean to the architect.*

The adaptability of the construction industry to political, social, and economic changes currently taking place, constitutes a factor of prime importance to our continued prosperity. Construction projects require the combined skill and brains of labor, management, and architects, although the responsibility for coordinating these elements rests upon the shoulders of the latter. It is a responsibility which must be discharged in the most economical manner possible in view of rising costs throughout the economy. This industry, which comprises roughly one-seventh of our national product, is vitally concerned with its own contribution to rising inflation. The challenge we face is how to reduce costs through the elimination of needless repetition in preparing construction bids. It is our contention that the purchase-requisition system of preparing bids provides the only means by which the owner is assured of receiving full value.

purchase requisitions

Under the present wasteful system (as Kenny's article has stated), plans and specifications for a given project are submitted to prospective bidders, who prepare individual quantity surveys as a basis for estimating the cost of construction. Under the purchase-requisition system, contractors receive an analysis of the definitely established quantities of work required as prepared by professional surveyors, together with plans and specifications. This analysis becomes part of the bidding and contract documents. Bidders then apply unit prices in preparing their bids. Thus they can affect tremendous saving in their overhead and reduce cost to the owner.

A system of purchase requisitions further reduces costs since it eliminates for contractors the element of chance, as far as quantities are concerned. Architects benefit from the advantage of working closely with a professional surveyor who can supply them with preliminary cost data, enabling them to design construction projects more economically during periods of extensive cost fluctuation. This feature should obviate the necessity for specifying and drafting wasteful alternates . . . a device which rarely, if ever, returns full dollar value.

Who pays for purchase requisitions? Under the traditional system (or lack of system) owners pay indirectly to contractors whose bids must necessarily include the cost of all estimates; whereas, under the purchase-requisition system, they pay the surveyor directly for one analysis only. In so doing they save money and also learn how much they are paying for definitely established quantities of construction they are buying. Furthermore, this provides owner and architect with means of evaluating work done.

Who should be responsible for the accuracy of quantities included in purchase requisitions? Under this system the owner assumes responsibility, although in so doing he takes no risk because he is paying only for quantities of work done. Should errors or omissions be discovered, settlement can easily be reached without resorting to expensive and time-consuming lawsuits. In like manner, the contractor is fully protected, having based his bid on given quantities of construction required.

In order that a purchase requisition system may be implemented, it is fundamental that quantity surveys be scientifically prepared by qualified professional surveyors. Proper recognition by architects and contractors, of professional surveys, will assure for themselves and their clients the highest standards of surveys.

Some take the position that owners will resist the so-called added expense involved in having purchase requisitions. The truth is that this does not constitute added expense; it is an expense which already exists either hidden in the traditional system of bidding, or exposed by buying purchase requisitions. As there is no additional cost involved, and especially since construction cost is reduced, there is no reason why owners will not accept the purchase-requisition method. Most certainly, they are entitled to any information and guidance on the part of architects so that the ultimate cost of the project is no greater than it should be.

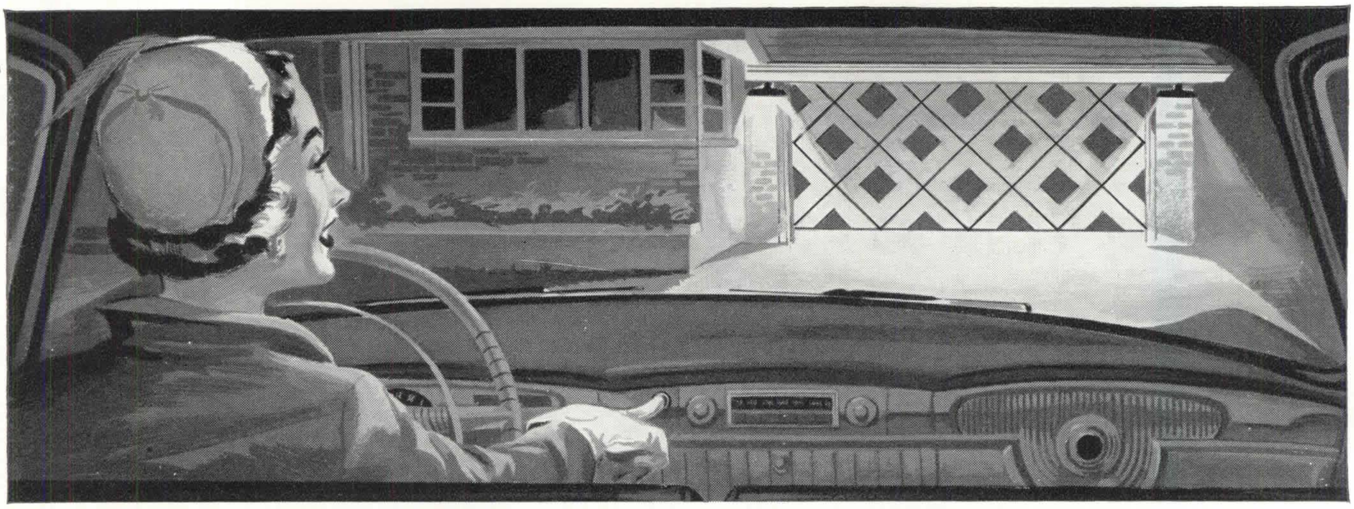
bid separation

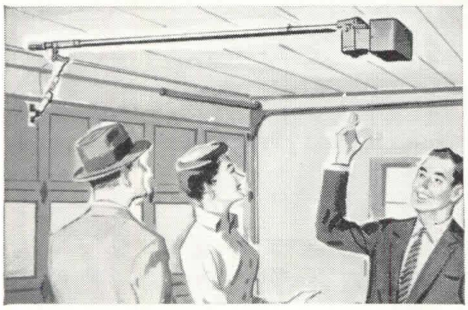
Progressive architects have recognized the need for reducing construction costs and have taken necessary steps in that direction. One method which deserves consideration is the practice of separating bids for general construction, intermediate subcontracts, and mechanical trades from the general contract. This system enables subcontractors to prepare bids with the knowledge that such bids become part of the record, and that they will have an opportunity to compare their bids with those of competitors.

The principle of bid separation offers the architect means whereby his knowledge, and therefore his control of the project, is complete. Thus, he is better able to fix responsibility for specific items of work, and to insure his client against duplicate payment of these items. Purchase requisitions, together with the practice of bid separation will result in material saving to owners and added security to all parties to the contract.

Some contractors have voiced objections to bid separation, on the grounds that this tends to diminish their supervisory control over subcontractors. The fact is that in either system supervisory control is delegated to contractors, and architects retain ultimate control. Moreover, it is common practice for architects to require approval by general contractors for all payments made in favor of subcontractors; therefore, the general contractor retains sufficient authority to discharge his duties in the field. In addition, he sustains no loss because he is still entitled to charge his regular fee for supervision, overhead, and profit.

Change rarely takes place without first meeting the challenge of tradition; indeed, this is a healthy state of affairs because it insures us against discarding that which is desirable for that which may prove to be undesirable. On the other hand, we must recognize that a rapidly expanding economy, such as now prevails, can lead to greater prosperity, or it may lead to greater inflation. The construction industry must utilize new ways to adapt itself to greater expansion. The purpose of the proposed system is to create progress and prosperity with stability.





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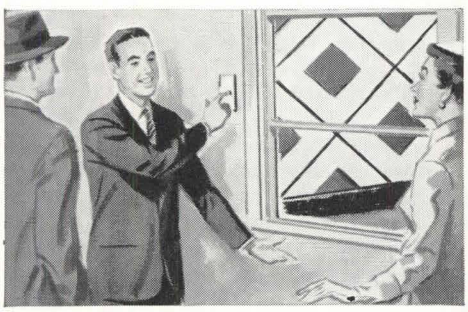
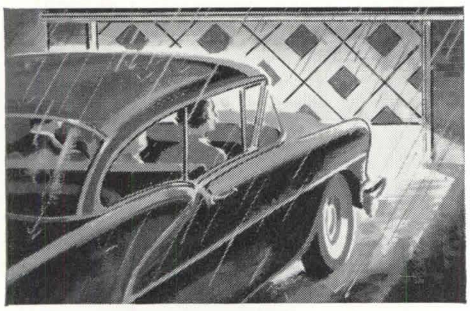


Housewife operates Delco-matic from button in car or button inside home; can open and close door for kids taking out bikes, etc., without effort.



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GARAGE DOORS

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REINHOLD

no wave of future

Dear Editor: The holiday crush has delayed my writing you to support your views on the role of the architect in the building process. The undifferentiated team may be a way of life for some—Austin Company has been at it for decades—but I hope no magazines interested in architecture will look on it as the Wave of the Future.

From speaking to other professionals, I gather you have many supporters in your stand. Keep up the good work! WALKER O. CAIN
New York, N. Y.

flavor or fashion?

Dear Editor: May a mouse whisper in the lion's ear?

I'm not much, just a cement-stained contractor, but I'd bid leave to ask our fine-feathered architects whither the heck they're bound.

Is architecture in America systematically developing any long-term art form, or is it heading up one dead-end street after another on its way to nowhere? Is it dedicated to creating its own modern classicism, or is it fluttering always in the direction the "current trend" wind is blowing?

I sense that the AIA chappies are lacking in perspective of the calendar. They're designing for today and tomorrow—and not all our tomorrows. They're cultists, and faddists, and all the things we deplore in women's fashions, wonder drugs, and Hollywood movie cycles. Too often a building becomes indexed in time the moment its designer puts down his photos of what other architects are doing and gets a plagiaristic gleam in his eye.

When I say our drafting-board droodlers haven't calendar perspective, I mean that if they'll pick themselves up by the label of their shirts and advance themselves forward in time, say 20 years, they'll be able to see their present work in its true light. Let the architect picture himself in 1976 walking down any street that is now cluttered with wheelbarrows, brick, and sand. He'll be able to say without looking at the date on the cornerstone, "Oh yes, that is what we were building back in '56. Alas, poor Yorick . . . although it did teach us a thing or two, you know."

If you think I'm being cruel, I invite you to consult the magazine files, and see what was thought to be High Style, 20 years past. If you find it difficult to project yourself into the future in mind's eye, take yourself backward with the eye of the camera. Do you like what you see? Is this Art?

Now I'm quite aware of the argument that architecture is forever in an evolutional swivet and the minute it stops trying, trying, always trying, it will grow moribund. This is what made America great, etc.

I'll buy that up to a point. It's good as a theory, but as a rationalization of contemporary-for-contemporary's-sake it is plain punk. Waving an American flag over a May-fly design doesn't make it something it inherently is not.

But most particularly, shall you fellows not stop being architects' architects, and become clients' architects—and man-in-the-street's architects? If I commission a building to be designed, whose flavor I'd expect to last longer than a penny's worth of Wrigley's gum, please give it to me. Forget your need to express yourself, to experiment and adapt, to keep abreast of what others are doing, and think of *me*—whose money, after all, is paying the freight. The hot design you stick by today is very apt to be a cold one I'm stuck with tomorrow.

(Continued on page 14)

p/a views

(Continued from page 13)

What will it mean to me that my building was a noble error in Progress Through Trial-and-Error? You've not kept the faith.

How would you, right now, like to own a home that was one of the "first" examples of any bygone architectural style you can name? Of what value to you that it once made an historic contribution to the building art? Forgetting the profession you're in, and thinking of yourself strictly as a homeowner, how would you like folks to drive by and say, "Ah yes, I remember when—"

I'm sure we'd have no trouble agreeing that the current crop of automobiles has about as much esthetic appeal as a plate of franks and beans. I think that for lasting beauty any one of us would choose an aged Rolls-Royce over the best that Detroit is producing in this Year of Our Lord.

May our architects not get classic in the same way the Rolls designer is classic? In behalf of all their clients—who can't keep making an annual trade-in at a Used Buildings lot—as well as future generations of plain citizens whose eyes want pleasing whilst waiting for a bus, can't they strive to give America more Style and less stylization? RAY HARVEY
New York, N. Y.

notices

scholarships

Department of City Planning and Landscape Architecture, HARVARD UNIVERSITY, announces that ALFRED BETTMAN FOUNDATION is offering a scholarship, or scholarships, in the amount of $1200, during the academic year 1956-57, for graduate studies in City or Regional Planning. Recommendations for the award will be made on the basis of admissions to Department of City Planning and Landscape Architecture approved prior to April 1, 1956.

Exercises preliminary to selection of the 67th winner of ROTCH TRAVELING SCHOLARSHIP will be held in April. Applicants must be American citizens whose architectural record includes study or experience in Massachusetts. For details write: William G. Perry, Secretary, Rotch Traveling Scholarship Committee, 955 Park Square Building, Boston 16, Mass., before March 1, 1956.

fellowships

UNIVERSITY OF PENNSYLVANIA announces availability of the following: ALBERT KAHN MEMORIAL FELLOWSHIP, $1100; ELLEN L. MATLOCK FELLOWSHIP, $1200; THEOPHILUS PARSONS CHANDLER FELLOWSHIPS, each $1200 (open only to Architecture graduates of the University); HENRY GILLETTE WOODMAN TRAVELING FELLOWSHIP (by competition, to student

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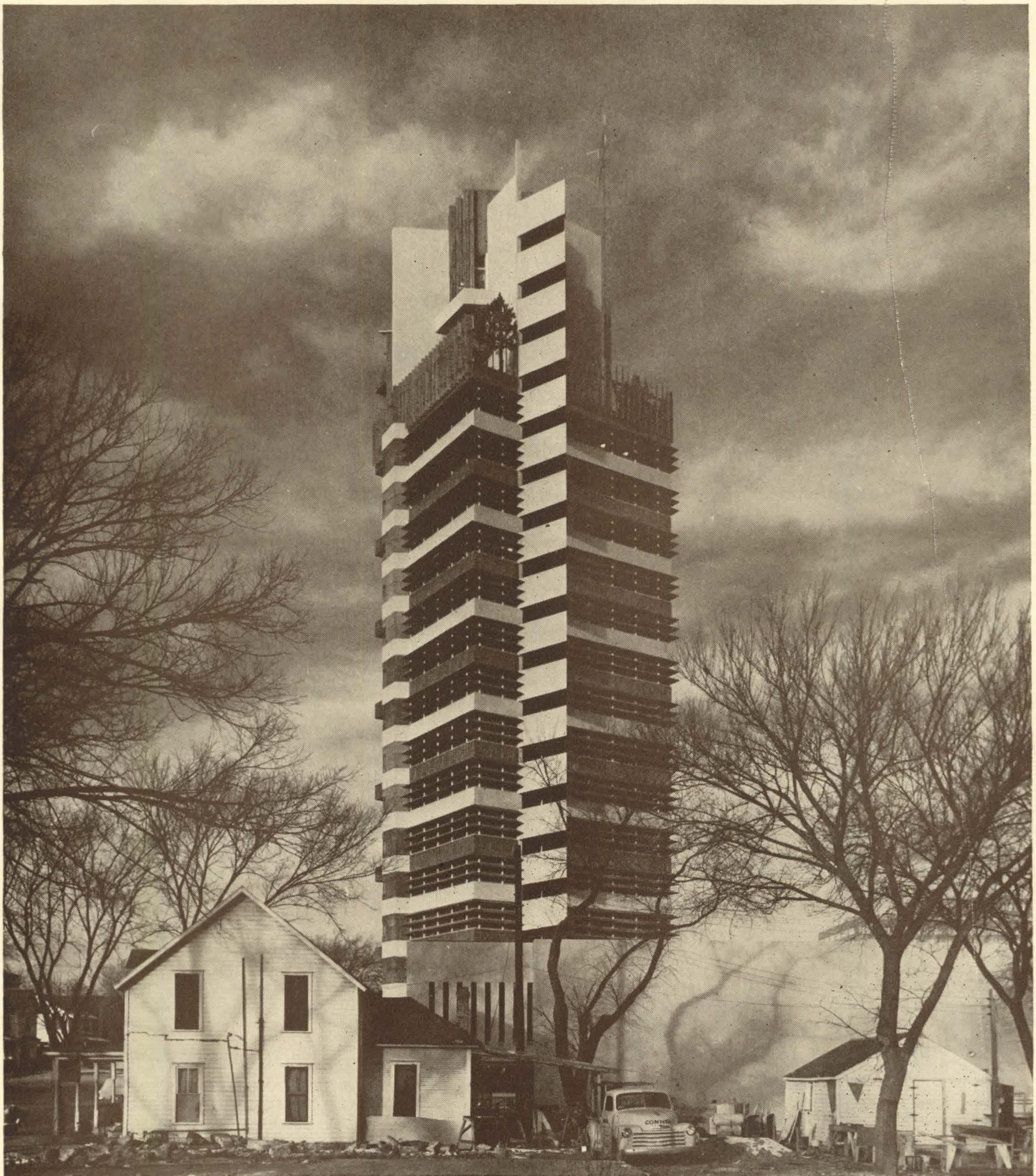
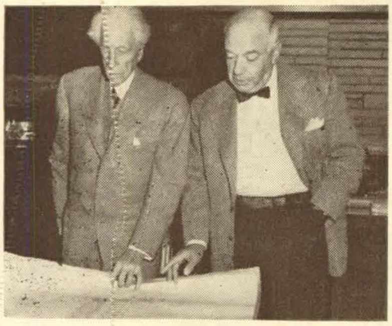
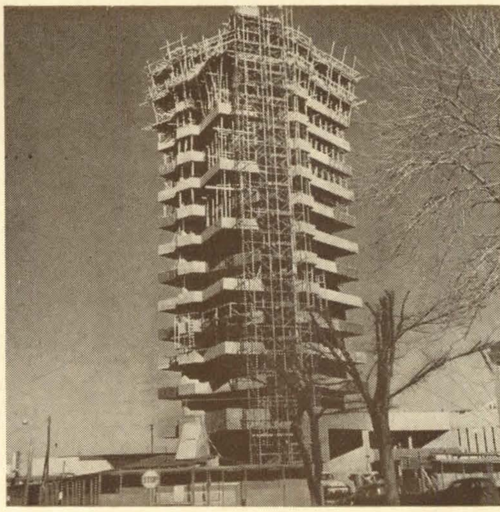
WRIGHT COMPLETES SKYSCRAPER

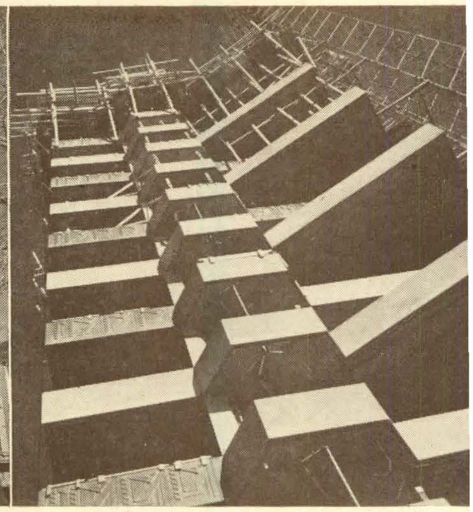


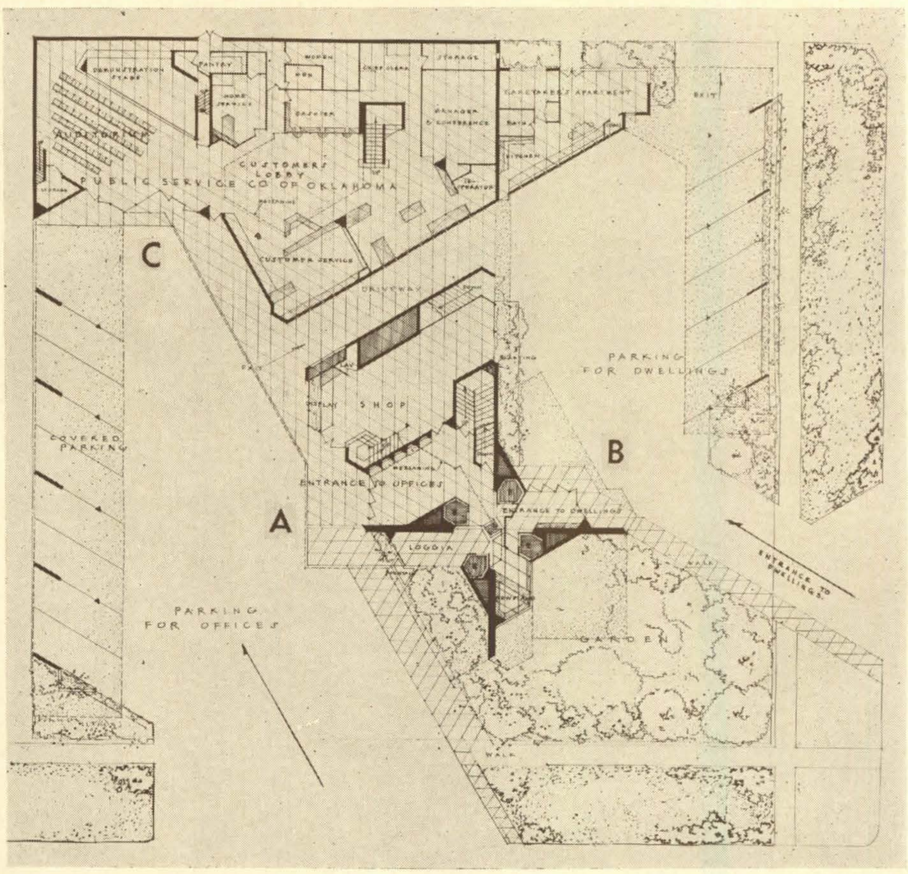
client: *Harold C. Price*



architect: *Frank Lloyd Wright*







Photos: Joe D. Price

The site is a 140'x150' corner lot, and the tower section of the building (A) *is placed on the diagonal. Note the separate entrance* (B) *for residents of apartments. Bartlesville area offices of the Public Service Company of Oklahoma occupy the two-story wing* (C) *which is joined to the tower at the rear. Faces of the tower are approximately 45 ft wide. Because of the structural design, the building weighs much less than a conventional skyscraper.*

The recently completed Price Tower, in Bartlesville, Oklahoma, is likely to be this year's most discussed new architectural landmark. A remarkable performance in almost every respect, it represents the realization of Frank Lloyd Wright's long-held theories of what—and where— a tall building should be. It towers 186 feet, a lone sentinel in an otherwise horizontal city on the rolling plains. Wright despises the forests of skyscrapers that jam our great urban centers, because he feels that a skyscraper can come into its own (be "fit for human occupancy") only when standing free—fully seen; receiving fully the benefits of light and air.

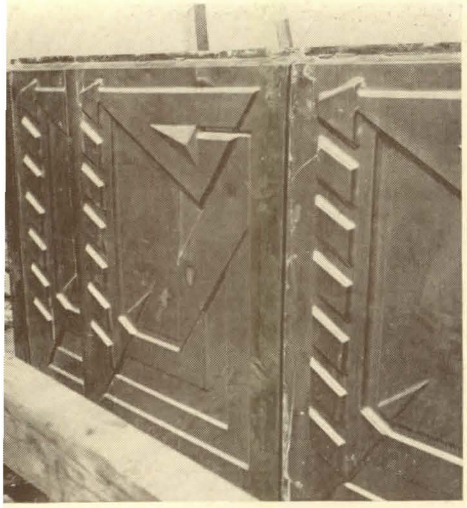
Read the plan and the resulting structure. Or—if you will—the structural scheme and the resulting plan. In essence, the entire tower is a single, immense cruciform, reinforced-concrete column, with its four 10-in.-wide, 18-ft-long vertical fins engaging the floor slabs at 18 levels. Each floor proceeds outward as a cantilever slab, and the outer envelope is made up of alternating bands of exposed concrete and copper-sheathed spandrel areas; glazed openings with aluminum sash; and fixed, metal louvers. Within this discipline are defined four separate quadrants. And—yet another "first"—the floors contain both work and living spaces—three of the quadrants consisting of offices; the fourth, made up of duplex apartments. The three office quadrants are at 30° and 60° angles to the vertical supports, while the screen walls enclosing the apartments are at 90° to the pylons.

The drawings shown are from a $5 book called "The Story of the Tower," by Wright, with an introduction by his client, Harold C. Price, to be published this month by Horizon Press, Inc., N.Y.

Outside the windows of office areas, the 20-in. louvers are attached horizontally; window areas of the apartments, which face south and west, are finned vertically. The angled mezzanines of the apartments continue beyond the building envelope into triangular, exterior balconies. All of these things add up to give the building an astonishing variety in appearance depending on the direction from which it may be viewed.

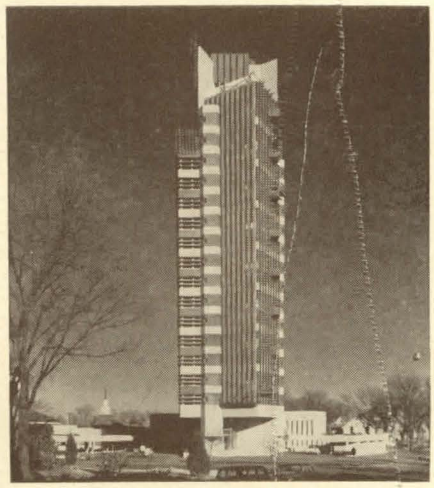
The tower is fully air conditioned. Within the structural elements—vertical pylons and the floor slabs—are contained the plumbing chases and ducts and plenums for the heating and air-conditioning system. Each quadrant is served by its own push-button elevator; and, at ground level, a separate entrance is provided for apartment dwellers. A two-story wing that branches off from the tower houses offices of the Public Service Company of Oklahoma.

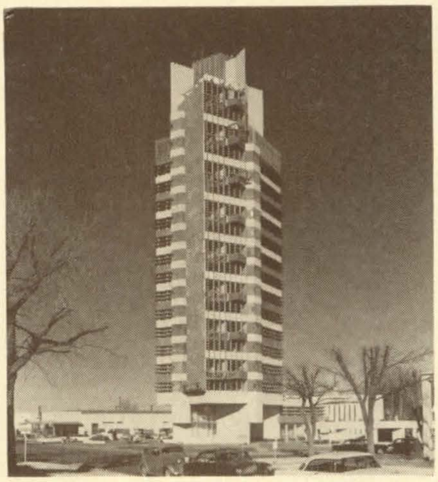
Assisting Wright in erecting the tower were Collins & Gould, Mechanical Engineers; L. B. Perkins, Electrical Engineer; and Haskell Culwell Construction Co., General Contractor.

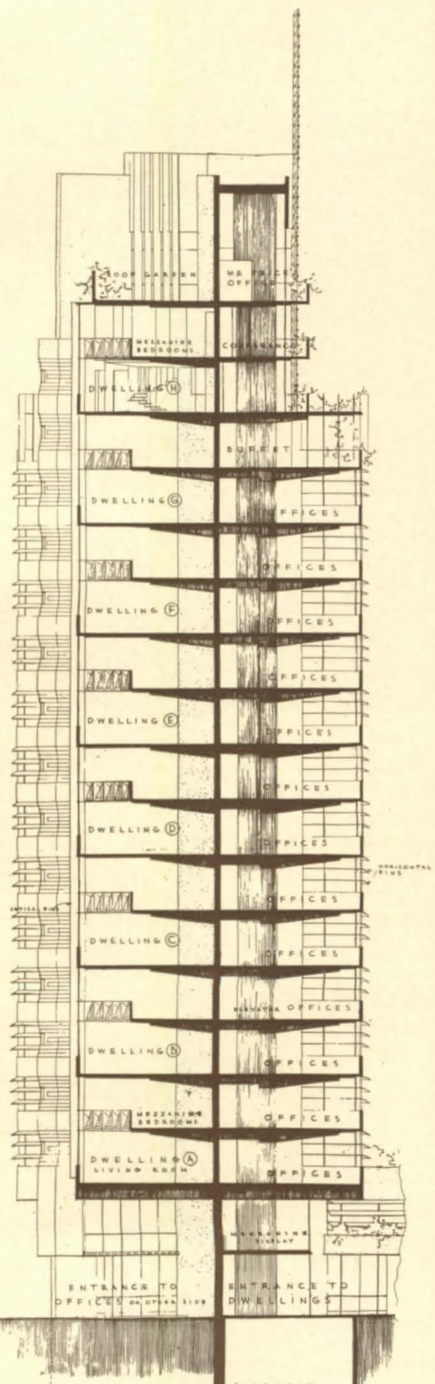


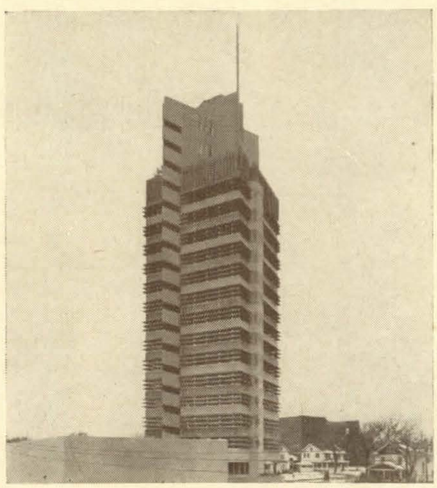
Alternating spandrel areas are surfaced by Wright-designed copper panels (left).

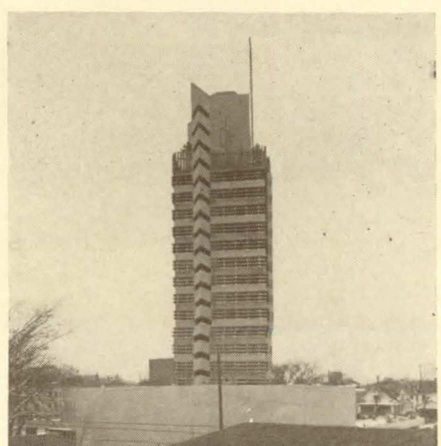
Reading the section (below left), *the eight duplex apartments appear at left. Above the main lobby is an open mezzanine; the thirteen office floors above, upper three of which are occupied by the H. C. Price Company, are of similar design. Above these are a buffet, kitchen and terraces for Price employes; a lounge; and Harold C. Price's private office. Topping the tower is a 30-ft television spire.*

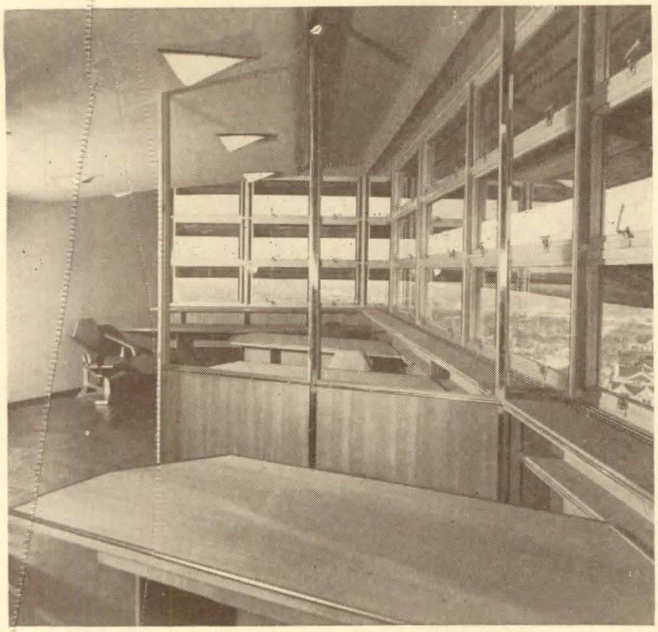


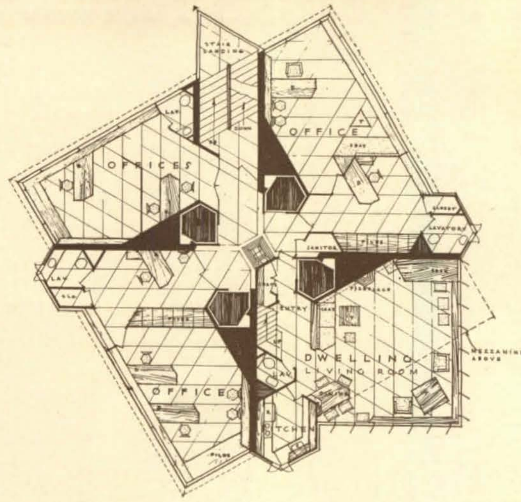


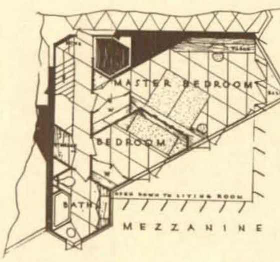


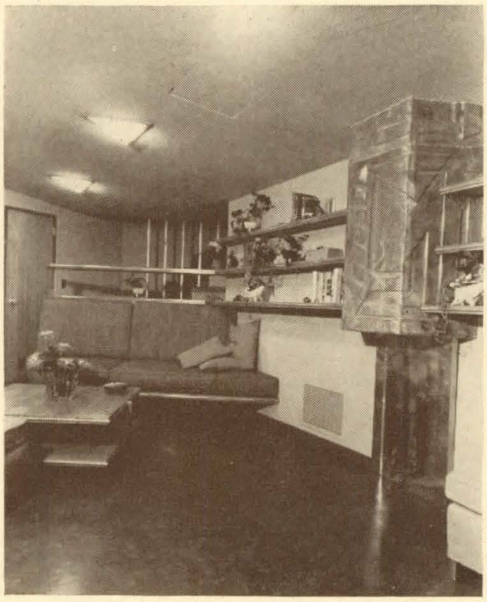


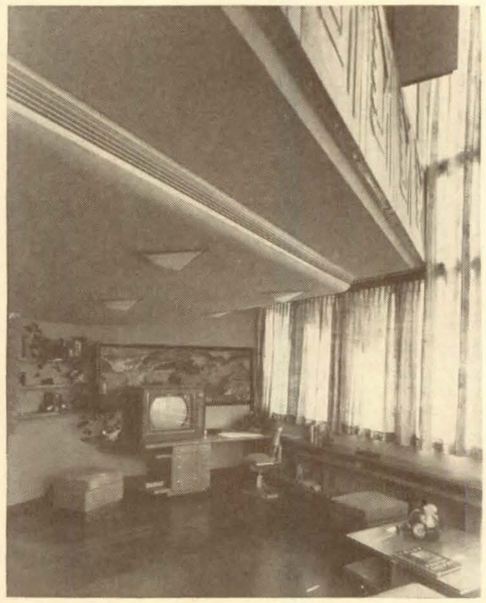


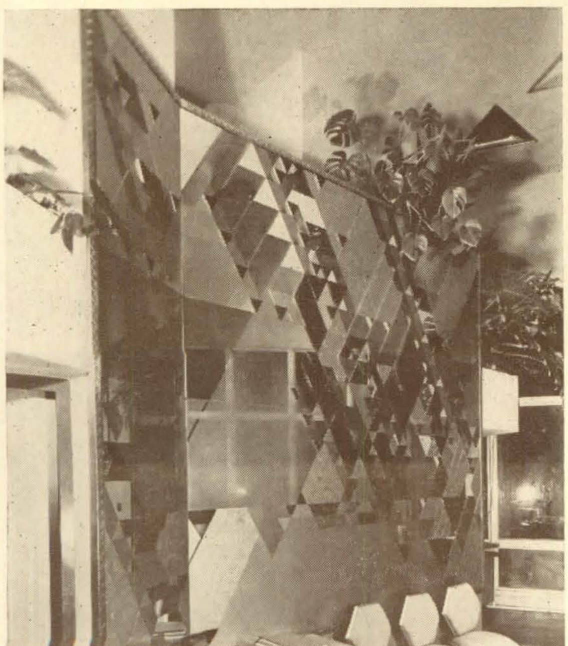








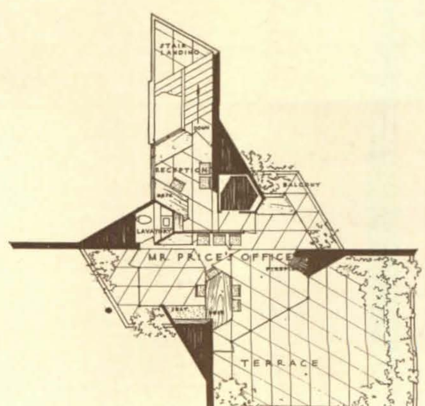




The typical tower floor (top drawing) *contains three office suites, each with a lavatory, and one level of an apartment. Wright designed the office furniture.*

Mezzanines of apartments (center drawing) *cut across the lower level and extend into balconies. Photos* (above) *show the first occupied apartment.*

Price's top-floor office (left *and* below) *has a commodious, landscaped terrace.*



Washington Report

by Frederick Gutheim

Appointment of a special Presidential Co-ordinator to expedite the removal here of Government temporary office buildings gives the added impetus this program has needed. The man named, F. Moran McConihe, is a Washington real estate broker who appears to have anticipated the obvious attacks which will be made upon him, by divesting himself of his real estate interests. What McConihe has to expedite is a program the Public Buildings Service has prepared at the direction of the House Public Works Committee. Although not yet made public, the report is scheduled for delivery to the Committee early in the Session, and has received the general approval of the National Capital Planning Commission. Essentially, the program proposes an orderly removal of the tempos and the creation of equivalent amounts of new office buildings to accommodate the tenants.

The construction of new Government buildings raises problems which require much discussion before they can be resolved. One of these is dispersal. As indicated by the buildings planned by the Atomic Energy Commission (at Germantown, Md., 22 miles from the center of Washington) and the Central Intelligence Agency (at Langley, Va., 8 miles distant), these Agencies, whose employes are now in temporary buildings, are dispersing. The security aspects of dispersal are paramount, of course, but the reduction of congestion in the central area of Washington is a planning consideration affecting vital personal and property interests. Another major question is whether the new buildings are to be constructed directly or by some form of lease-purchase contract. Where general-purpose buildings are created, Congress has tended to favor the latter method. Where they embody special design characteristics that serve the needs of a single agency (and again AEC and CIA are cases in point) direct construction has been favored.

These are some of the areas in which Presidential Co-ordinator McConihe will direct his co-ordinating efforts; and the Office of Defense Mobilization and similar agencies of Government are the ones with which he will be dealing. On the whole, it is the underlying policies rather than the operating details which are of importance. If this were not the case, we should probably have long ago removed our war-built buildings from public park lands—as the British have amid conditions of far greater stringency.

• The Federal school-constuction proposals are a logical sequel to the White House Conference on Education—perhaps the only tangible result of that rather confused and inconclusive meeting here last December. They do not overcome any of the political objections which last year's bills encountered, and it is too early to say what the final form of Federal aid in this field will be.

At this writing, we have the President's plan to allow the states $250 millions annually over the next five years; and Federal credits of $750 millions during that period. Against this is the measure conceived by Democrats in Congress, calling for $400 millions a year in Federal grants to the States in the coming four years. Both of these plans face difficulties arising from their exclusion of private and parochial shools and the consequences of Federal aid upon state and local school-building spending levels.

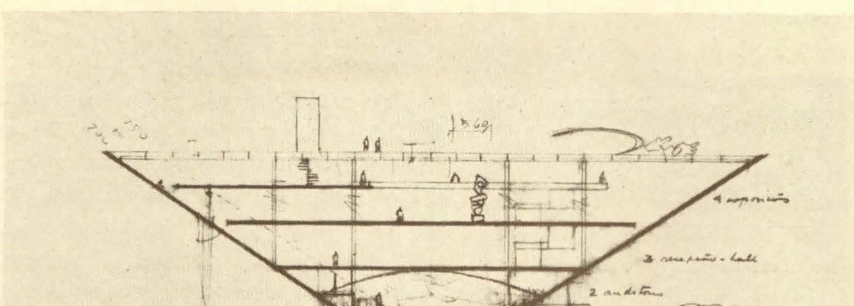
After the evidence provided by the Kestenbaum report, one must face the fact that Federal aid in the new field, such as this, is likely to result in reduced local efforts. The Eisenhower program makes a brave effort to recognize this; against it, the Democrats' plan verges on fiscal irresponsibility. One would hope that whatever plan is adopted, it would stimulate further state and local school-building activity, rather than decrease the total effort. As for the President's hope that the school-building shortage will be overcome in five or ten years, and that the Federal Government can then terminate its activities in this field; this seems to me to err both in its anticipations concerning population growth and school-building needs, and in accepting the static and conservative estimates of the classroom shortage which have been offered by the Office of Education. The latter make scant provision for increasing obsolescence, surburban growth, and new educational needs; yet I find it inconceivable that in another decade the school-building shortage will be with us in scarcely diminished form.

Having failed thus far to gain political recognition of school-building standards, it might be possible to persuade Congress to include in its legislation some modest program for research into the design and construction of schools. This is certainly a desirable feature of a long-term building program. Formulating and urging such a program would be an appropriate activity for the architects who, until now, have played a relatively small part in public action on this question. (It was significant that only one architect, Henry L. Reed, attended the White House Conference on Education.)

But more urgent, if of correspondingly greater difficulty, is the need for some group or agency to stress the qualitative nature of the school-building problem, and the importance of building schools which respond to and support new educational programs. As the peak of the statistical wave of pupils hits the high schools, this becomes of even greater urgency. At lower educational levels the school that is limited to classrooms, and the classrooms that are limited to textbook offerings, do their own damage. But above that level, the jumbo-sized yet stripped high school—the building lacking auditoriums, cafeterias, gymnasiums, libraries, special-purpose rooms—becomes an appalling, inhuman, and anti-educational institution. Yet it is precisely this "large economy size" type of building which the operation of a Federal aid program will encourage, unless steps are taken to meet the threat.

Caracas Plans Modern Art Museum

When Oscar Niemeyer, Rio de Janeiro architect, was invited to Caracas, Venezuela, last fall to produce a scheme for a Modern Art Museum, he worked out in a few weeks a striking solution for the lofty site on a ledge overlooking the city. The inverted pyramid entered from a lobby below (model above, early sketch below, plans on cover of this issue) *will have main exhibition areas at the top lighted by an ingenious system of double louvers. The roof will be used for outdoor shows and meetings. An art school will be accommodated in a separate building on the ledge.*



News Bulletins

• Plans for a $100-millions Palace of Progress atop Manhattan's Penn Station have been abandoned (for economic reasons). Instead, William Zeckendorf, President of Webb & Knapp, is considering a $300- to $500-millions project encompassing nearly 50 acres between 30th and 38th Streets, bounded by 9th and 12th Avenues. Included in this rehabilitation and commercial redevelopment would be a merchandise mart, auditorium, TV center, parking for 20,000 cars, commercial buildings, and a world's fair structure. Also proposed is a 1750-ft "Freedom Tower," which would be the world's highest observation tower. . . . Another project for Manhattan's west side—the Lincoln Square redevelopment—has been expanded to cover 50 acres. Latest version advanced by Commissioner Robert Moses calls for a new Metropolitan Opera House, a concert hall, art center, two-block Manhattan campus for Fordham University, two public schools, 4080 housing units, shopping center, at least one parking garage, and a 12-story office and professional building.

• Eero Saarinen will be one of four judges in an international design competition for a National Opera House in Sydney, Australia, sponsored by the State of New South Wales. Prizes in AIA-approved competition are approximately $11,240, $4500, and $2250; registrations, accompanied by deposit of £10 (Aust.) or equivalent, are due Mar. 15. For details write: Secretary and Executive Officer, Opera House Committee, Dept. of Local Government, Bridge and Phillip Sts., Sydney, Aust.

• William Gillett, Vice-President of Detroit Steel Products Company, was re-elected President of Producers' Council at 34th Annual Fall Meeting held in Detroit. Other officers for this year, also re-elected by unanimous vote, are: First Vice-President, F. M. Hauserman, of E. F. Hauserman Company; Second Vice-President, H. Dorn Stewart, of Armstrong Cork Company; Secretary, T. D. Wakefield, of The Wakefield Company; and Treasurer, F. J. Close, of Aluminum Company of America.

• Harold D. Hauf, Head of RPI's Department of Architecture, has been named Chairman of Building Research Advisory Board for term ending June 30, 1956; A. N. Frederickson, Vice-President of Weyerhaeuser Sales Company, is new Vice-Chairman. Edmund Claxton, Mason C. Pritchard, Charles Topping, Ralph Walker, and B. L. Wood were also appointed to Executive Committee.

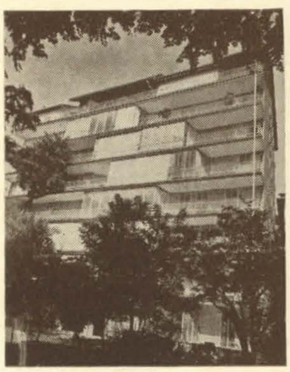
• Walter Gropius, FAIA, has been awarded the Royal Gold Medal for 1956 by Royal Institute of British Architects. . . . AIA Executive Director Edmund R. Purves and Past President Clair W. Ditchy have been elected Honorary Corresponding Members of RIBA.

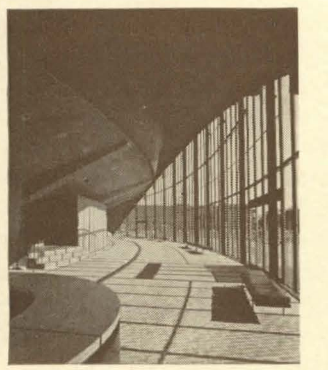
• Competition to stimulate new design and construction ideas for aluminum curtain-wall buildings is being sponsored by Aluminum Company of America and National Association of Architectural Metal Manufacturers. Prizes of $10,000, $5000, $2500, and 15 honorable mentions of $500 will be awarded in contest open to architects, designers, draftsmen, and students. Closing date is Mar. 26; write to Paul Schell, AIA Advisor, c/o National Association of Metal Manufacturers for registration and program.

• Dr. D. B. Steinman, Consulting Engineer, has been awarded Marechal Caetano de Faria Medal by Republic of Brazil for his engineering contribution to that country. . . . New York Academy of Sciences presented D. B. Steinman Prize for Research in Structural Engineering to Dr. Jacob Feld, New York Consulting Engineer, for his work on large, metal-surface reflectors used in radio astronomy.

• 52nd Annual Convention of American Concrete Institute will be held at the Bellevue-Stratford Hotel, Philadelphia, Feb. 20-23. Program will feature sessions on Prestressed Concrete as well as new ACI Standards and Building Code.

• Ing. C. Olivetti & C., S.p.A., Ivrea, Italy, a firm already well known as a patron of architecture, recently announced winners of its first annual National Olivetti Prize Competition in Architecture and Town Planning—to stimulate public interest in the work of Italy's most creative architects, engineers, and town planners. First prize in architecture, a stipend of about $8000, was awarded to Architect Ignazio Gardella for work completed or published in the past five years; especially noted were an apartment project in Milan (below left) and housing for white-collar workers in Alessandria. First prize in town planning was presented to Luigi Piccinato, based on plans for Pescara, Padua, and several other Italian towns. Additional prizes in history and criticism of architecture and town planning were given.





• Included in the four photos which tied for first-place honors in an exhibit of 200 photos displayed at the recent Architectural Photographers Association Convention was an interior view of MIT's Kresge Auditorium (above right) taken by Joseph Molitor, Ossining, N. Y., while on an assignment for P/A. Other winning photos were by Lawrence Williams, Upper Darby, Pa.; Sigurd Fisher, Point Lookout, L. I.; and Robert Lautman, Washington, D. C.

• New officers were elected at 11th Annual Meeting of American Society of Industrial Designers, recently held in Washington, D. C. President for 1956 is Arthur N. BecVar; Executive Vice-President, Jay Doblin; Secretary, Kenneth A. Van Dyck; and Treasurer, Eugene Gerbereux.

Financial News

by William Hurd Hillyer

Babies and taxes will strongly influence architectural design during 1956. Oldsters, too, will play a part. Though their respective roles are offstage, these factors are important and may even affect the architect's income.

Bankers are so impressed by the upsurging American birthrate that the Federal Reserve of Chicago in its January review frankly discusses "the economic consequences of the baby boom." That bank's analysis reveals that the country's population growth is concentrated in the young and the old. More than half the 25-millions increase since 1945 has been in the under-20 age group and fully 14% in the group over 65. By contrast, during the previous decade more than three-fourths of the population increase was within the working-age category.

Today, living shelters must be planned for a population preponderantly of children, teenagers, and elderly persons. Obviously, this situation makes for larger family units—which in turn will require more bedrooms, to say nothing of nursery space. The old-fashioned eight-room dwelling seems definitely on its way back, subject only to the financial ability of householders. Such ability is presently keeping pace with, if not surpassing, the cost upcurve in residential construction. Improved automatic processes throughout business and industry are stepping in to augment the earning capacities of nearly all workers, thus enabling them to build and occupy larger homes. Planning the roomier house for moderate income families, in such manner as to conserve land and curtail building outlay, while retaining what is best in modern design, presents an increasing challenge to the architect's ingenuity.

As for taxes—both property and income—while they will continue to oppress the householder, their impact upon the construction of his working quarters is more critical. No longer may the would-be owner of a projected factory or office building sit down and count merely the cost. He must now invoke high-priced legal skills to set up a prefabricated tax structure before the physical structure is even sketched. An Oklahoma City real estate investor, for example, is putting up a $3.5 millions 15-story office building. To avoid well-nigh confiscatory taxation he has split the ownership among 27 family trusts and 8 corporations. The Wall Street Journal views this situation as typical of that faced by a growing number of American moneyed men whose decisions are dominated by taxes. We may carry our conclusions a step further. Not only does the tax structure precede present-day architectural planning, but also the time is foreseeable when the physical sructure itself may have to be cut up into separate taxable units.

Frontless-backless banking is exemplified by the new glass-walled two-story home of Commercial Bank & Trust Co., Midland, Texas. Laid out in sweeping curves that lend access from all sides, the edifice presages the possible passing of the façade from business building design, with resultant easing for the in-and-out flow of customers.

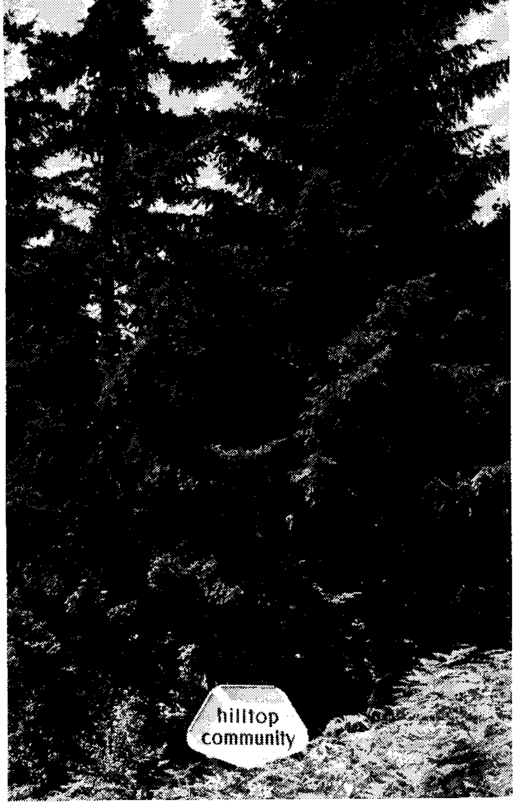
• Like 1955, the first few weeks of the new year rode in on a foaming wave of optimism. We stand "at the threshold of a $400-millions economy," more than one pundit proclaims, implying a continuance of '55s production total. However, the 1956 wave is encountering dissident shoals. Such high authorities as the First National City Bank of New York bluntly warn that "too much inflation virus" has entered the economic bloodstream. So far from viewing chronic mild inflation as a way to perpetual prosperity, that bank denounces inflation of any kind as "a tax on the savings of the poor, an impediment to orderly forward planning." In similar strain Pres. Allen Sproul, Federal Reserve Bank of New York, refers to "the siren song of gradual modest inflation." The Guaranty, that city's largest trust company, though noting dominant opinion as favoring a continued uptrend of business through '56, hastens to remind its clients that such opinion is often wrong. From the Federal Reserve Bank of Texas come intimations of a possible "developing weakness" within the national economy. Bankers, in general, borrowing from the Federal Reserve System to take care of their customers' demands, admit that money is tight and growing tighter. Mounting debts, both public and private, are rocks upon which the melioristic tide may well be shattered.

Money-market tightness, impinging upon construction through customary channels, has impelled "Fanny May" (Federal National Mortgage Association) to indulge in a buying spree that absorbed some $48 millions of mortgages during the last two weeks. Fanny May, as everybody knows, picks up mortgages from overloaded holders who are willing to take a strict valuation and pay her marketing and other fees. When she buys heavily it means that homes are outpacing money.

Understandably, the mortgage-money scarcity is beginning to affect residential building. A more noticeable slackening, due to short supply of banking funds, is observable in other directions. During the first January week, heavy engineering contracts dropped 42% and there were declines in commercial, industrial, and public-housing construction. Lumber output shrank 11% for the week and new orders went down 12%. Outlook for schools, hospitals and other publicly owned structures seems good.

Another pleasant feature is presented by the projected industrial and plant construction, on which business firms expect to spend a record-breaking $3/4 billion during the first 12 weeks of '56. Types of architectural construction hitting new highs: churches, office buildings, public schools, shopping and service centers.

As to the future, much depends on public and private debt control. Consumer debt is still growing faster than income, but banks and lenders are applying firm brakes. Maximum loans are being cut down; trend toward easier terms has been reversed. Encouragingly, business reduced its New York bank loans by $110 millions the first week in January. Apparently '56 will be a good year.



p/a presents:

hilltop community

text by Ilse Meissner Reese
photography by Art Hupy

unspoiled land with incomparable views provides the stimulus for a broad experiment in architecture and co-operative planning

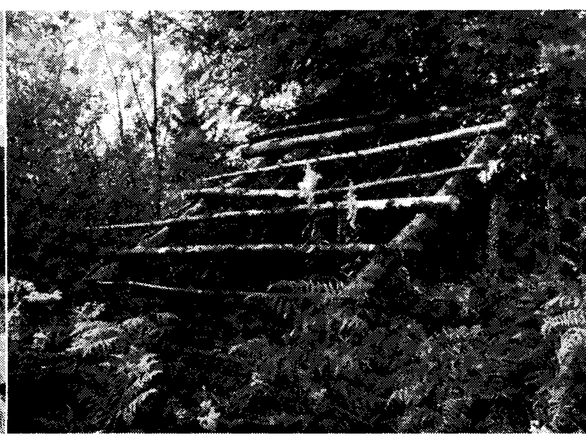
This excerpt from a report on Hilltop Community, a residential development near Bellevue, Washington, about 10 miles from Seattle, sums up the guiding principles and objectives of this co-operative enterprise which have led to its sucessful realization: " Developed by a group of intending home owners who were willing to have a go at pioneering in a beautiful but somewhat inaccessible spot, the community represents their effort to escape the limitations of the commercial type of real estate subdivision. . . . It is the expression of their purpose to utilize the principles of modern planning and architectural design to enhance the natural beauty of each home site and to make possible a sharing of benefits and opportunities among the members of the colony on as equal and democratic a basis as possible."

Hilltop's story began when two groups of friends, searching independently for undeveloped view property near Seattle, joined forces after one of the groups (including three architects, a builder, and two faculty members of the University of Washington) discovered the Hilltop. Protracted negotiations with the owner of the property finally brought the purchase price within reach of the 17 families first interested in the site. As an implementing tool to facilitate arrangements for purchase, siting, architectural planning, and financial administration, a nonprofit organization was formed in which each family holds one membership and one vote. A working budget prepared at that time brought the price of 60 acres, with all necessary improvements up to $80,000 including a 1¼ mile road, well and water-distribution system, platting, corporate expenses, power and telephone lines, and a reserve for contingencies. To meet this obligation without exceeding the proposed average investment of $2000 per family for land and improvements, the size of the community had to be increased from 25 to 40 families. A site planning committee composed of members proved the feasibility of 40 parcels which would provide the corresponding building sites with unobstructed distant views, at the same time allowing for a green belt to insulate against the possibility of future undesirable neighboring developments, a road, and five acres for community use. Criteria in determining lot sizes were natural contours and site features, rather than predetermined areas of equal or commensurate size. After many discussions concerning the precise value of each lot and an equitable system for their distribution, Hilltoppers voted to price all lots at the same value, and to let members choose in the order in which they joined the corporation. Construction of individual houses began with the installation of access roads and utilities—the latter including underground power and telephone lines approved by the foresighted members despite the heavy assessments this meant. The Hilltop constitution specified that members were free to choose their own architects and builders and were not restricted in any way as to the size and price of houses, always provided that the contemporary character of the development be preserved. To insure agreement, meetings of the owner, community planning committee, and future neighbors were arranged, at which time the preliminary plans for each house were approved. Financing through the local standard loan agencies entailed difficulties for owners of the first houses, but this became easier when the FHA eventually reversed an earlier decision against insuring mortgages.

The pages to follow are devoted to a house-by-house tour around the Hilltop loop, touching on the majority of the 26 houses now completed or near completion. Selection from these 26 proved extremely difficult since all display an equally high architectural standard. Each house differs distinctively from its neighbor and reflects the personality of its owners while adhering to the principles of good contemporary architecture governing the whole community.

choosing sites

shelter for clearing parties



outing on the Hilltop

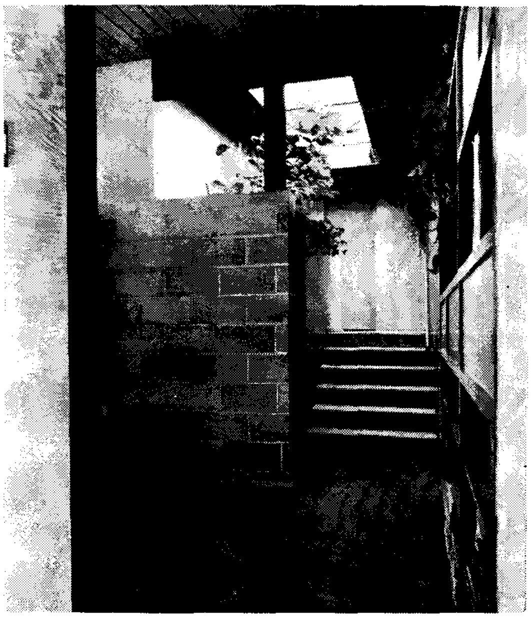

scale 0 50 feet
north
SEATTLE & OLYMPICS
MT. BAKER
MT. RAINIER
SAMMANISH & CASCADES
property line
green belt
Contours at 5' level intervals
900
1000
BASSETT
C.W. SMITH
HANSON
LOVETT
CURTIS
HOWELL
BACON
YANG
DREW
HARDY
N. MORSE
EMERSON
ISAACS
JONES
VAN ARSDEL
1020
970
future community center
CLYDE JOHNSON
BURKS
HOLT
1030
MATTERN
JOHANSON
GATES
1065
BIRNBAUM
KNUDTSON
IVIE
REED
V.B. SCHEFFER
WATERMAN
BROWN
FREEMAN
TAYLOR
1035
CARTER
1075
H.J. JOHNSON
960

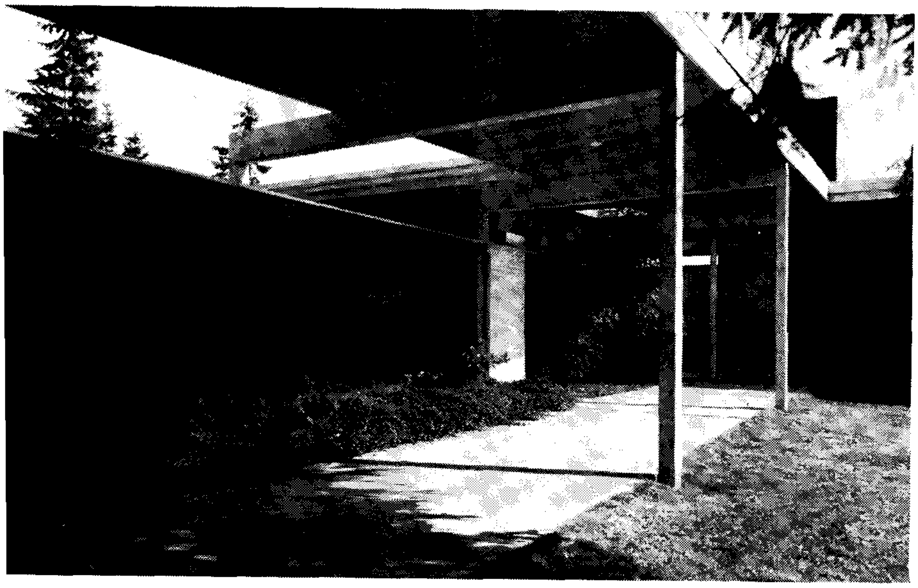
hilltop community

First house (above) *to the right upon entering the Hilltop Community belongs to Mr. & Mrs. Harry A. Carter and was designed by Wendell H. Lovett. The* **simple rectangular plan** *contains kitchen at the west end, three bedrooms to the east, and a well-balanced, central living-dining-entry area is given emphasis by a slight protrusion beyond the basic rectangle toward the southern view. A breezeway to the north links with a double carport.*

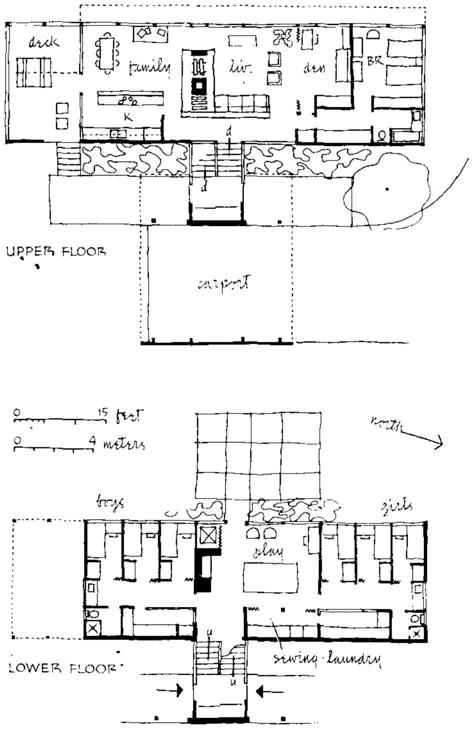
A handsomely detailed covered passage (below) *also connects carport and house of Mr. & Mrs. J. C. Fickel. Living quarters are arranged on* ***two levels,*** *thus making full use of views and the sloping ground. Kitchen, dining and living areas, all with adjoining terraces, are located at the high point of the site. Bedrooms at the opposite side are slightly raised to allow for a spacious recreation room and adjoining terrace one floor below.*

Skylight and interior planting (below) *introduce life and natural light into the house of Mr. & Mrs. Leland J. Clark, designed by Paul Hayden Kirk.*

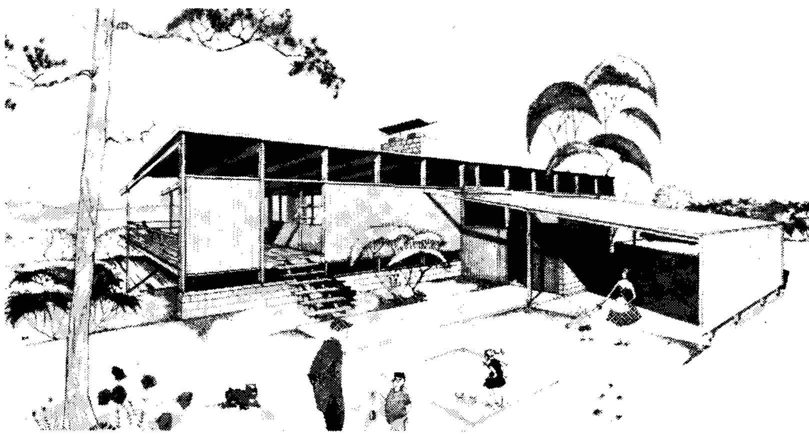


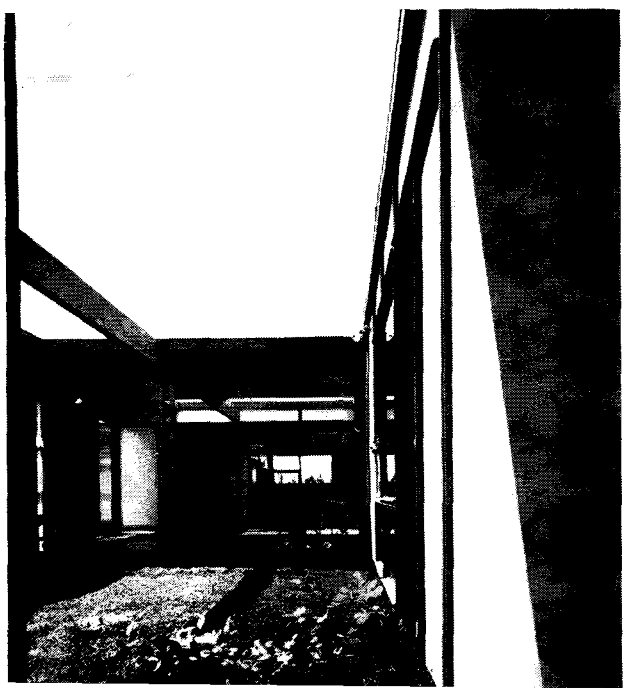


Though not quite completed at the time of photography it was felt important to include this house for the family of Dr. K. P. Knudtson (right), for its **unique and sensible plan features,** *developed by Architect Paul Hayden Kirk. Approach to the 2-story house is from the carport side, on a level midway between upper and lower floor. Most of the upper-floor area is devoted to a large living area, departmented into a family room, living room, and den by means of fireplace wall, and movable partition. A deck at one end of the upper floor adjoins the family room and kitchen, and a master bedroom at the other end enjoys privacy and quiet. Downstairs is entirely devoted to the children's dormitory-like bedrooms and a large central play and work space.*

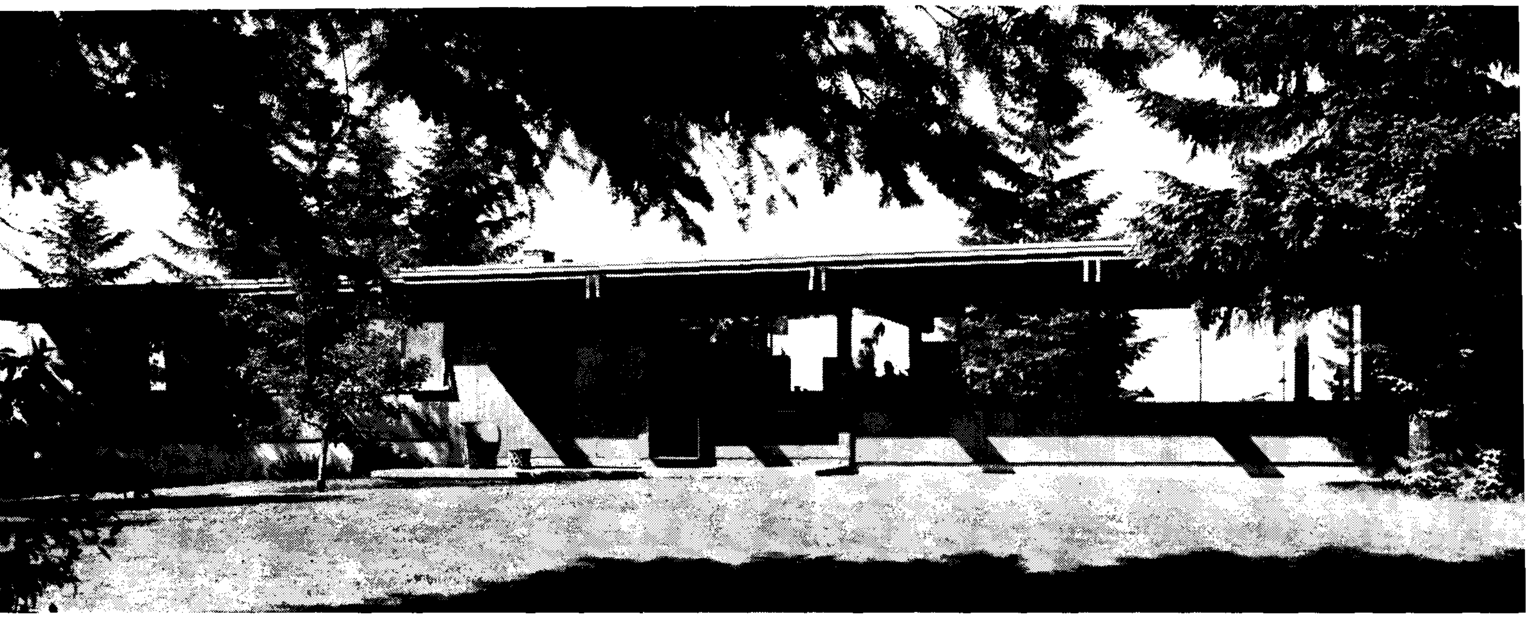


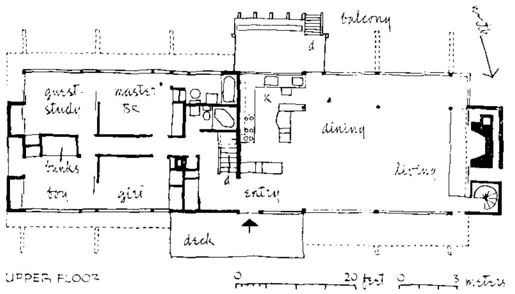
In this house designed by Architects Bassetti & Morse for Mr. & Mrs. Z. W. Birnbaum, living quarters are divided into **four distinct plan sections** *all centered around an entry court* (below). *The four corners of the roughly square floor plan are utilized by: 1. a double carport, 2. a playroom-bedroom group for the children, 3. living-dining-kitchen area, and 4. a master bedroom-study-laundry-work area. Roof overhang* (bottom right) *shades and protects window walls of children's bedroom and adjoining playroom.*

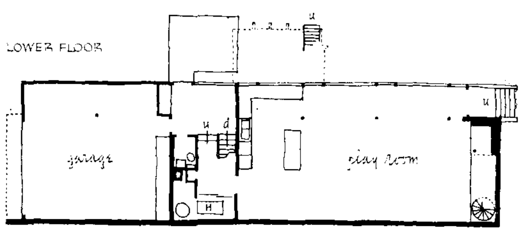




hilltop community

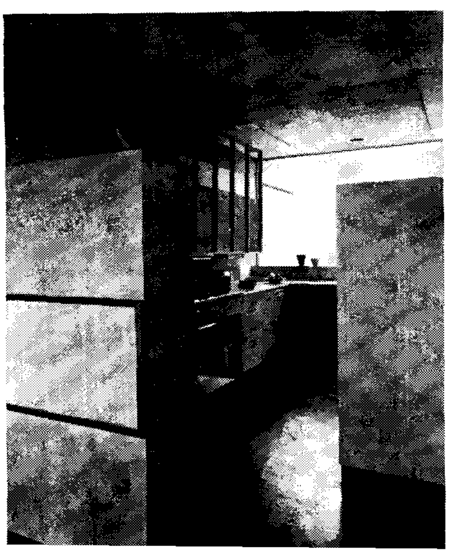






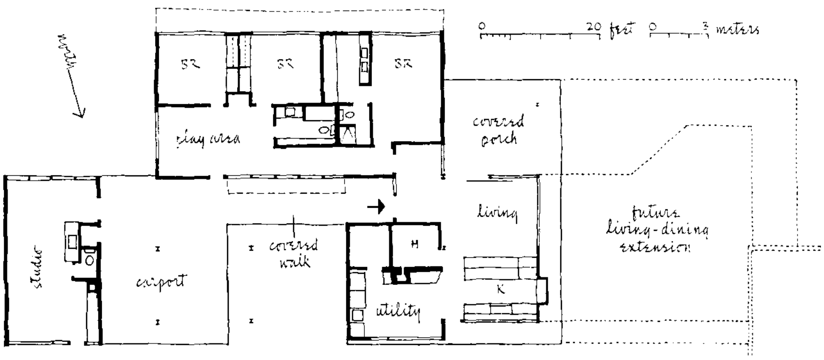
Present chairman of the Hilltop Community, Architect John M. Morse, and his family occupy the house shown here and acrosspage, situated on the crest of a 1000-ft hill. Sweeping views over a valley to the south, lake and mountains to the north, determined the placement of the house and its **consciously large scale** *in keeping with the grandeur of the landscape. The structure employs concrete foundations. reinforced concrete block retaining walls, and a reinforced concrete upper floor slab. Wood post-and-beam construction has been used for roof and upper wall framing. Unusual departure from standard practice is the forming of the upper floor slab by pumice soffit tile, erected on a temporary scaffold. Pumice tile, also chosen for its acoustical qualities, has been painted. Upper surface of this concrete slab has been finished with integral oxide color mixed to a dark slate color, polished by floor sander, and then waxed. Others collaborating on the design and construction of this house were: Bassetti & Morse, Architects (of which Morse is one of the partners); Wendell H. Lovett, Associated Architect; Richard M. Stern, Mechanical Engineer; Harvey H. Johnson, Structural Engineer; F. R. Krull, General Contractor.*

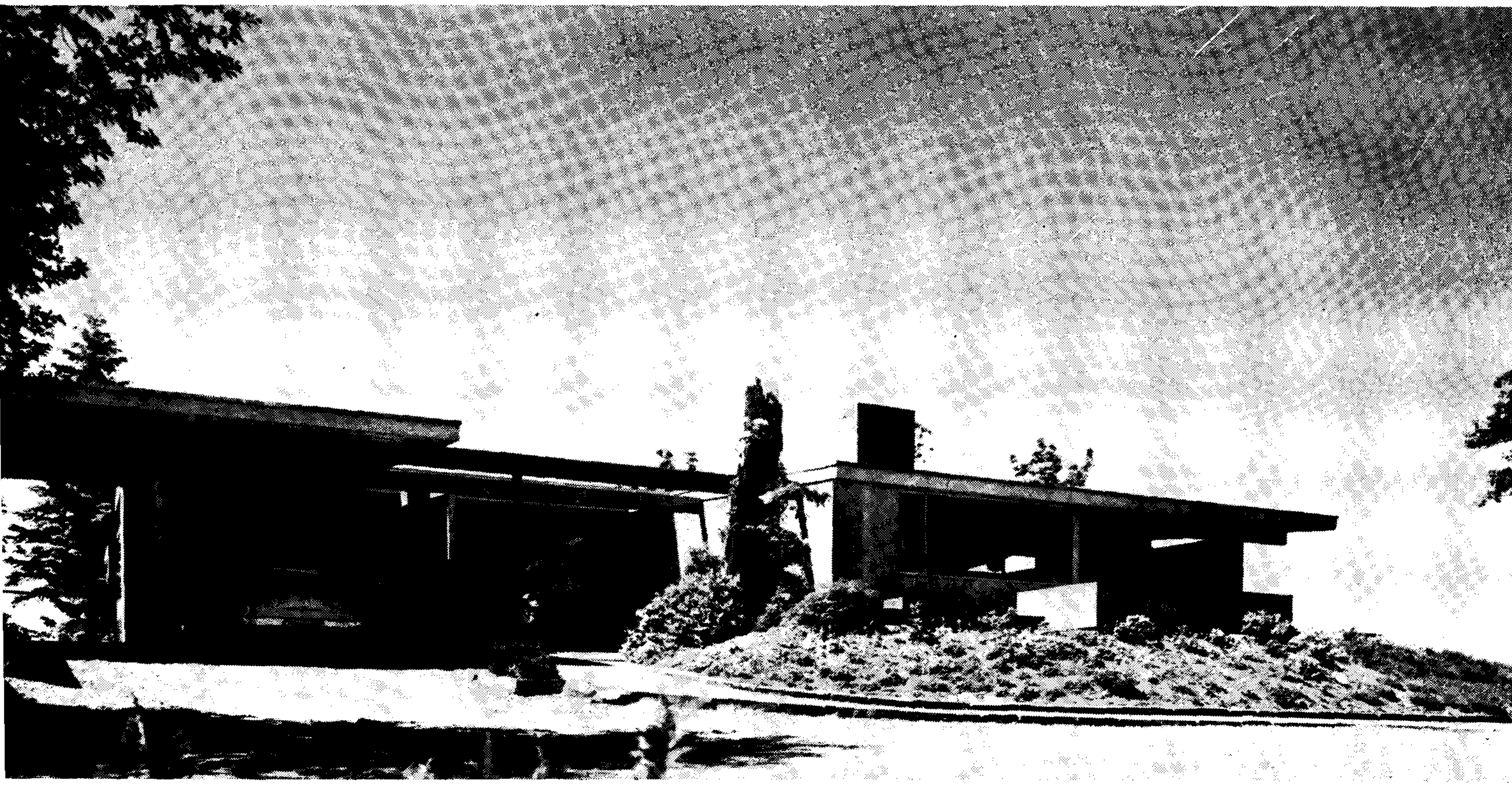
Another handsome **two-story scheme,** *the house of Mr. & Mrs. G. W. Waterman* (right), *has living quarters upstairs, two bedrooms, shop and laundry downstairs. Terrace and carport (far left of photo), and main entry (far right), are on the upper level. Tucker & Shields were the Architects for this house.*

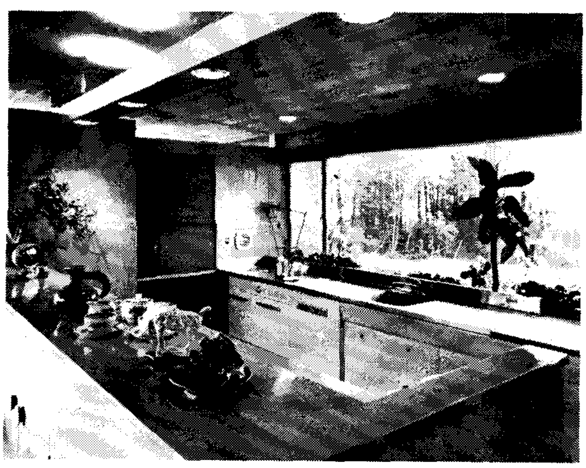


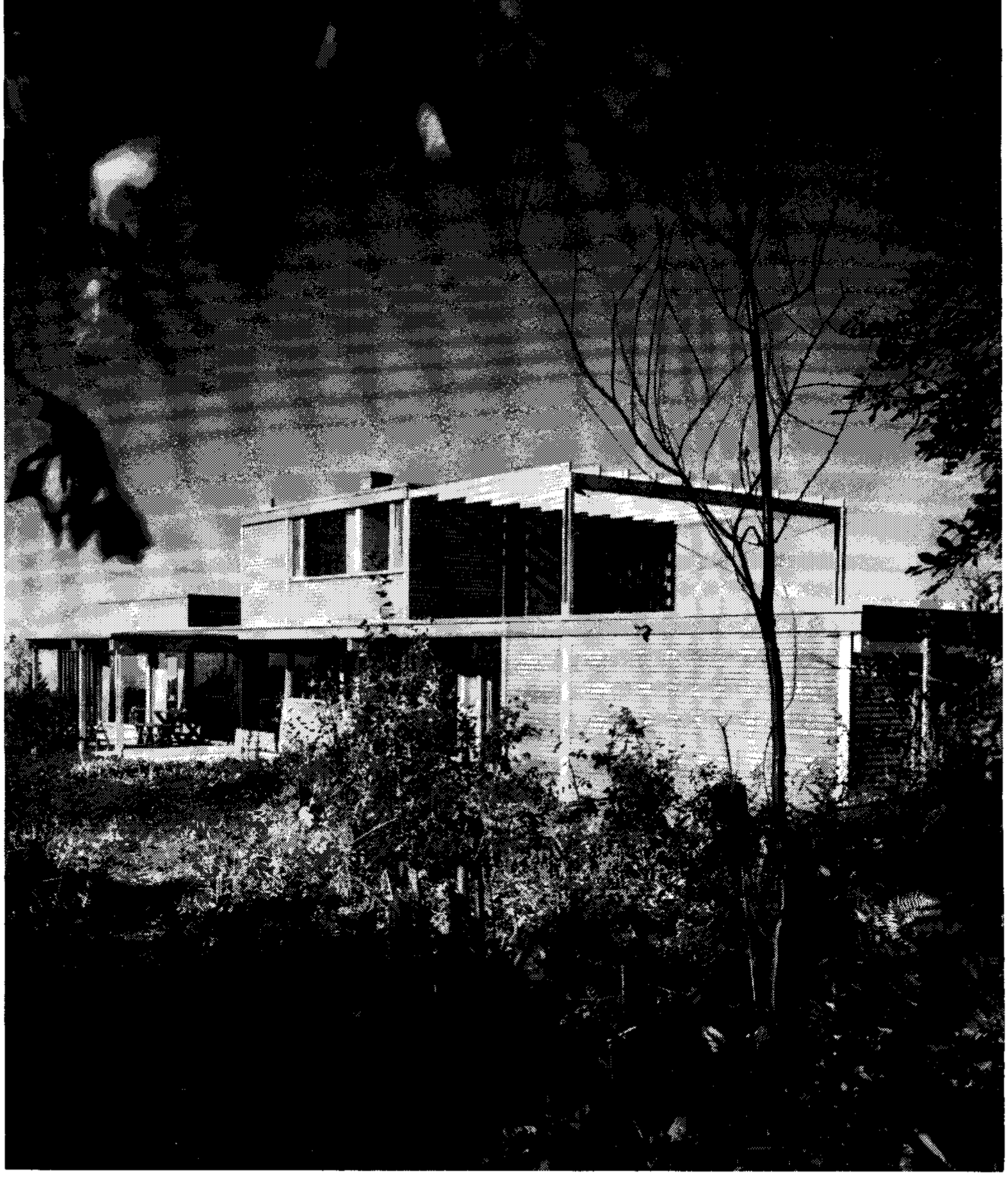
hilltop community

Basic design premise for this house, planned and owned by Perry B. Johanson was the achievement of **"an open extended plan** *to obtain a view and garden exposure from passageways as well as rooms." The relatively level hilltop permitted the desired one-level plan in which bedrooms face vistas to the south; kitchen and family dining room, to the north. A future living room to be added to the end of the present living room* (acrosspage bottom) *will have north, south, and west views. Well separated from the rest of the house is a studio, and for further privacy, children have their own outside entrance to playroom and bedrooms beyond. To take heavy windloads 4" x 4" H columns have been anchored to oversized concrete footings, thus avoiding the need for bearing or bracing walls where glass was desired. Radiant warm air, distributed through 3" ducts on 24" centers, then collected in a perimeter duct and released through floor grills at window areas, has proved to be a most satisfactory system of heating. George Runciman was Structural Engineer; Lincoln Bouillon, Electrical Engineer; Richard M. Stern, Mechanical Engineer; and Nels Hedin, General Contractor.*





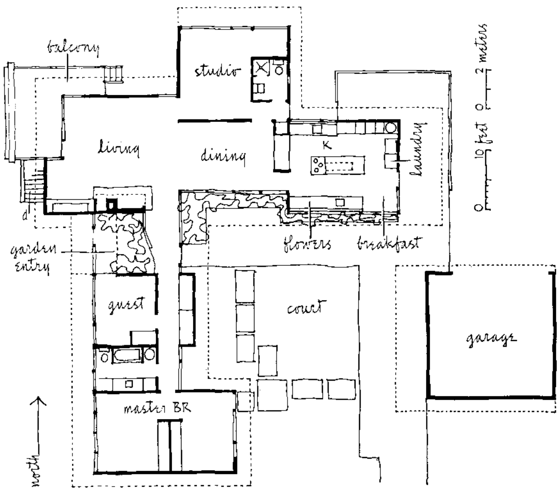


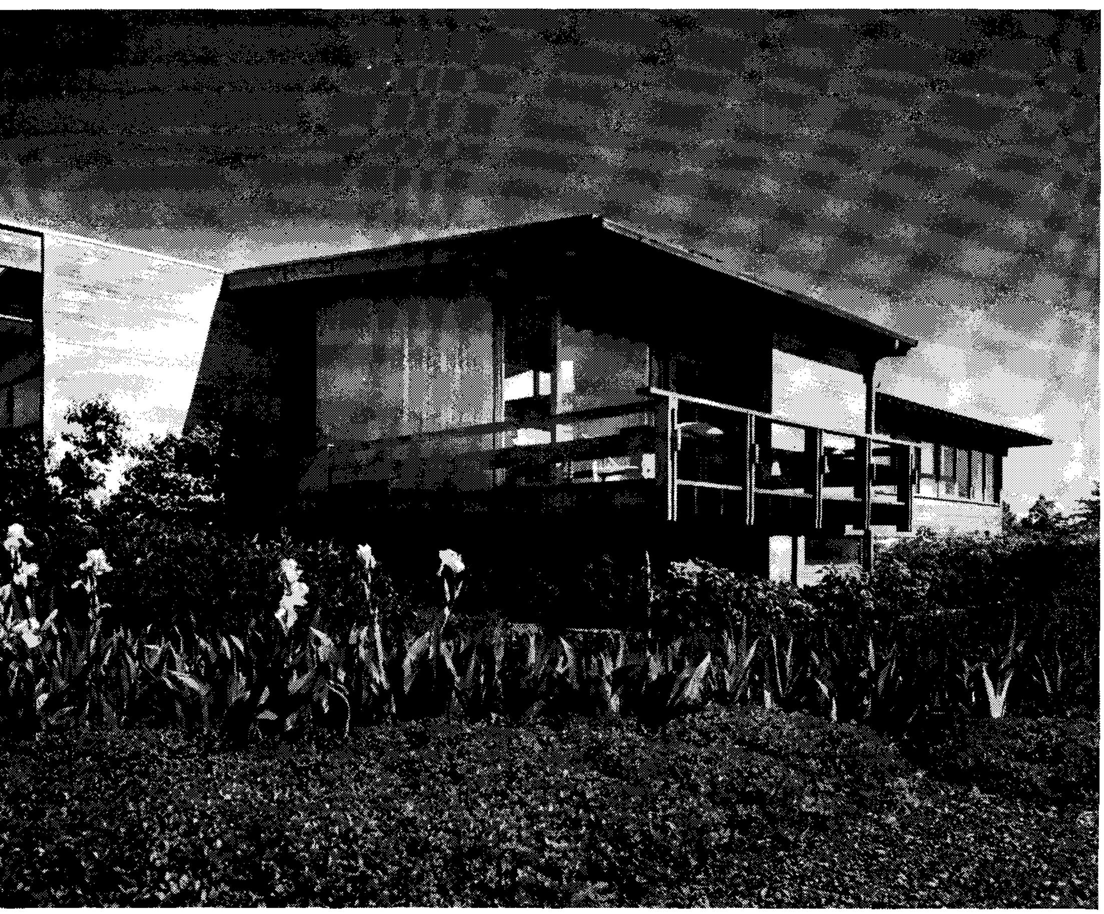


Next door neighbors are Mr. & Mrs. W. Stull Holt who also preferred **living quarters at ground level.** *All of the rooms are closely linked with outdoor terraces and oriented to the views. Space on the upper floor is devoted to a studio and extra sleeping facilities with bath. Architects were Bassetti & Morse.*

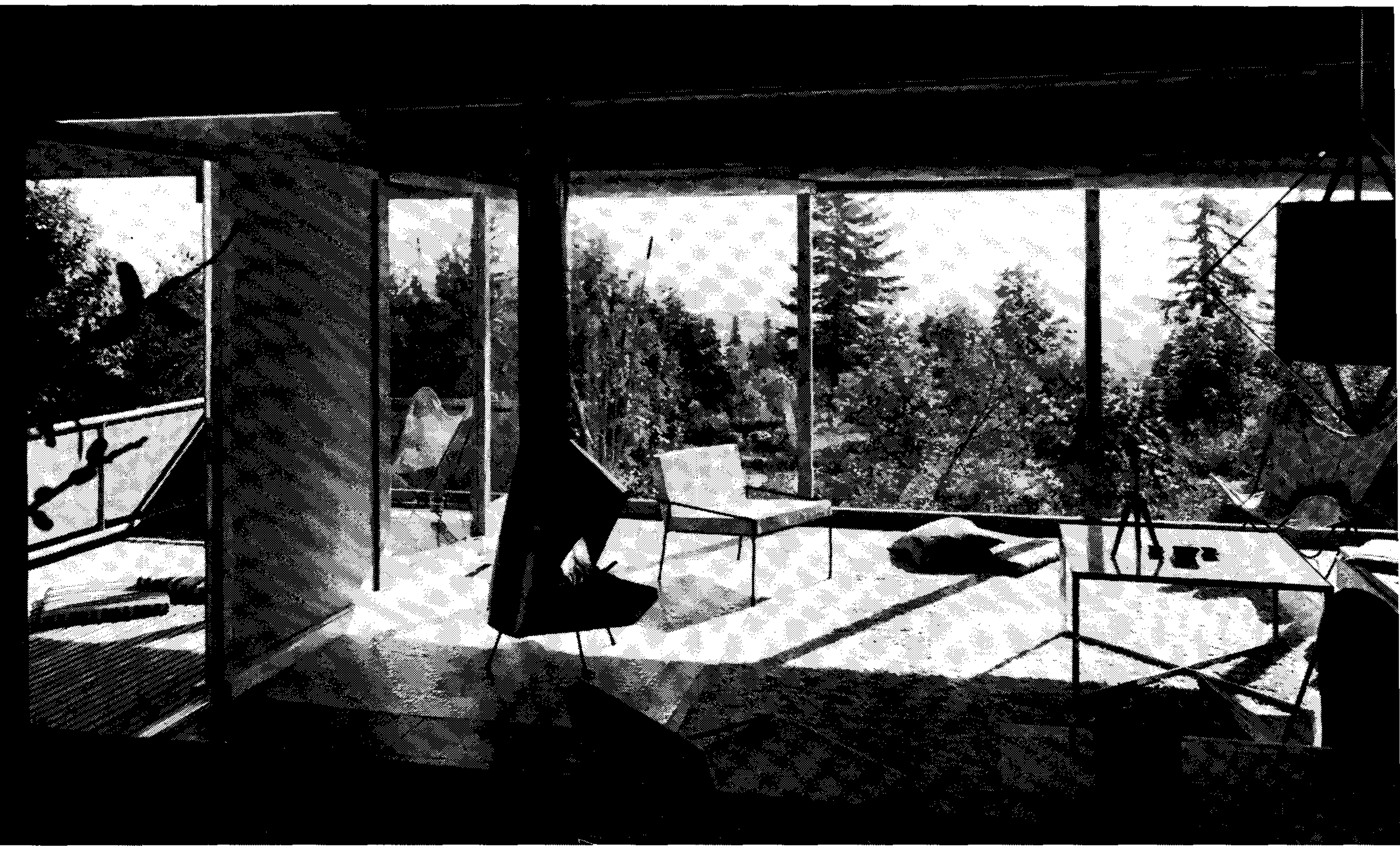
hilltop community

Situated on a high lot at the north curve of the Hilltop road this house combines far reaching views with the intimacy of a sheltered court. The residence, designed by Architects Bassetti & Morse, in collaboration with Wendell H. Lovett as Associated Architect, was **planned for particular interests of the owners,** *painting and gardening. A studio to the north serves the owner, Walter F. Isaacs, who is a professor of art. Mrs. Isaacs' horticultural interests are specially apparent in the garden entry* (acrosspage top) *which links the house with the outdoors and at the same time provides a pleasant transition between bedroom wing and living areas. It was the owners' desire to strive for varied visual effects in space, color and texture, to contrast the spacious and high ceilinged living areas with the smaller and lower rooms in the bedroom wing, and yet achieve continuity from one room to the next. "The owners' appreciation of the arts and sensitive selection of all colors used," according to the architects, "contributed greatly to the pleasantness of the house." Structurally the house has conventional concrete foundations and wood stud and joist framing. Heating is by warm air distributed through ducts in crawl space. Ceilings are of coarse cemented fiberboard and flooring in living-dining area is of pecan wood block. Others who contributed to the success of this building were Landscape Architects, Eckbo, Royston & Williams; Mechanical Engineer, Richard M. Stern; Contractor, King Brothers Company.*

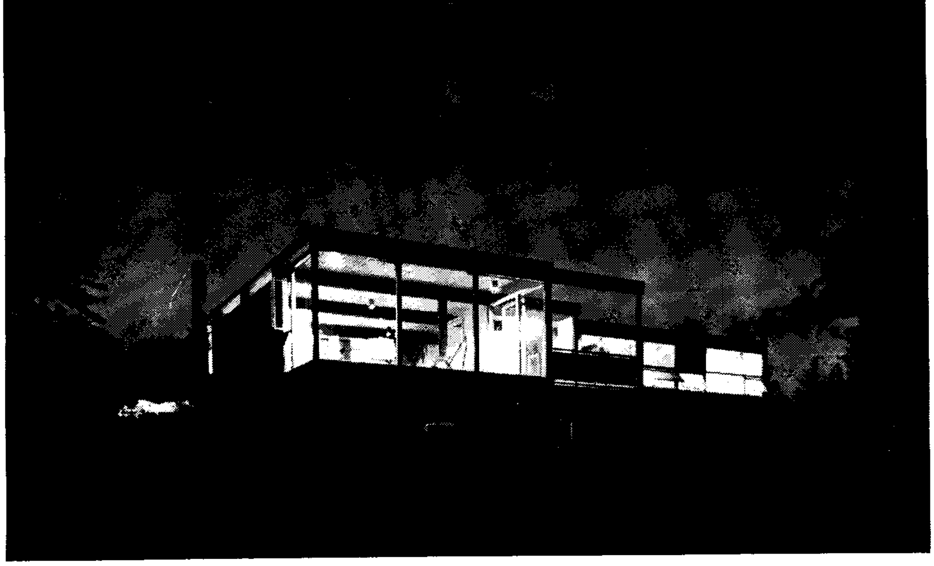

balcony
studio
living
dining
K
laundry
garden entry
flowers
breakfast
guest
court
garage
master BR
north
0
10 feet
0
2 meters

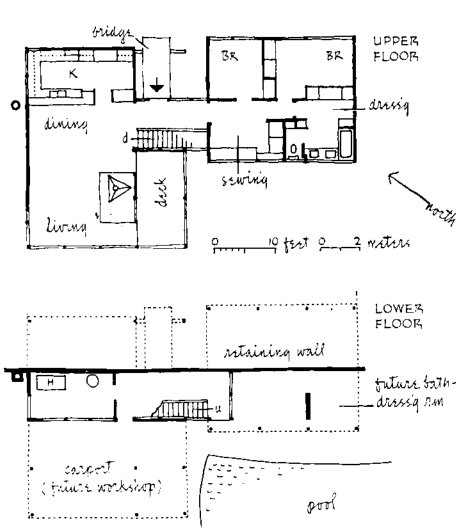


hilltop community



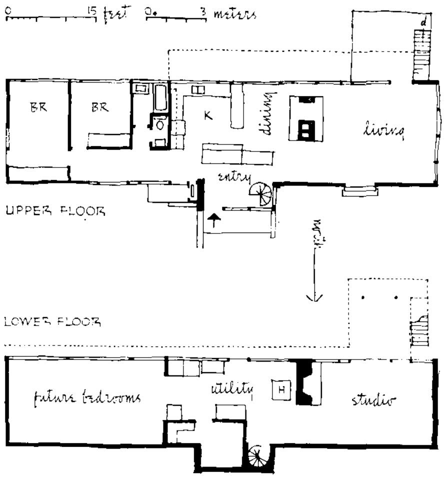
For a better vantagepoint from which to enjoy the magnificent views (to Lake Washington, Seattle, Puget Sound, and the Olympic Mountains) and greater privacy when the adjoining pool will be completed, this house has been **raised off the ground.** *Consisting of a bedroom wing, an entry stair-hall link, and a living area placed at right angles, the building will capture the sunlight for balcony and future pool. Parking and main entrance to the upper floor are to the east, away from the pool, where a future double carport is also foreseen. The basic structure is made up of doubled beams bolted to posts with ring connectors and plank roofing. Flooring is of 2'x2' squares of tempered hardboard in one area, sisal loop rug in the living-room, and venetian glass tile under the free standing fireplace. In general, interior walls are neutral, natural-finish backgrounds—fabric-covered wall board, cottonwood plywood—ready to receive accents. On the exterior, wood has also been kept natural, cement asbestos board was finished with clear sealer. Only color accent is the blue-gray porcelain enameled panels on the balcony railing. Architect and Designer, John R. and Audrey Van Horne wish to give credit to the owner, John L. Prechek, who supervised and "worked on the job all during construction," and Mrs. Patricia Shively Prechek, Interior Designer, who collaborated actively in the design and execution of the house. Harvey Johnson was Structural Engineer; Richard M. Stern, Mechanical Engineer; Alfred F. Easter, General Contractor.*

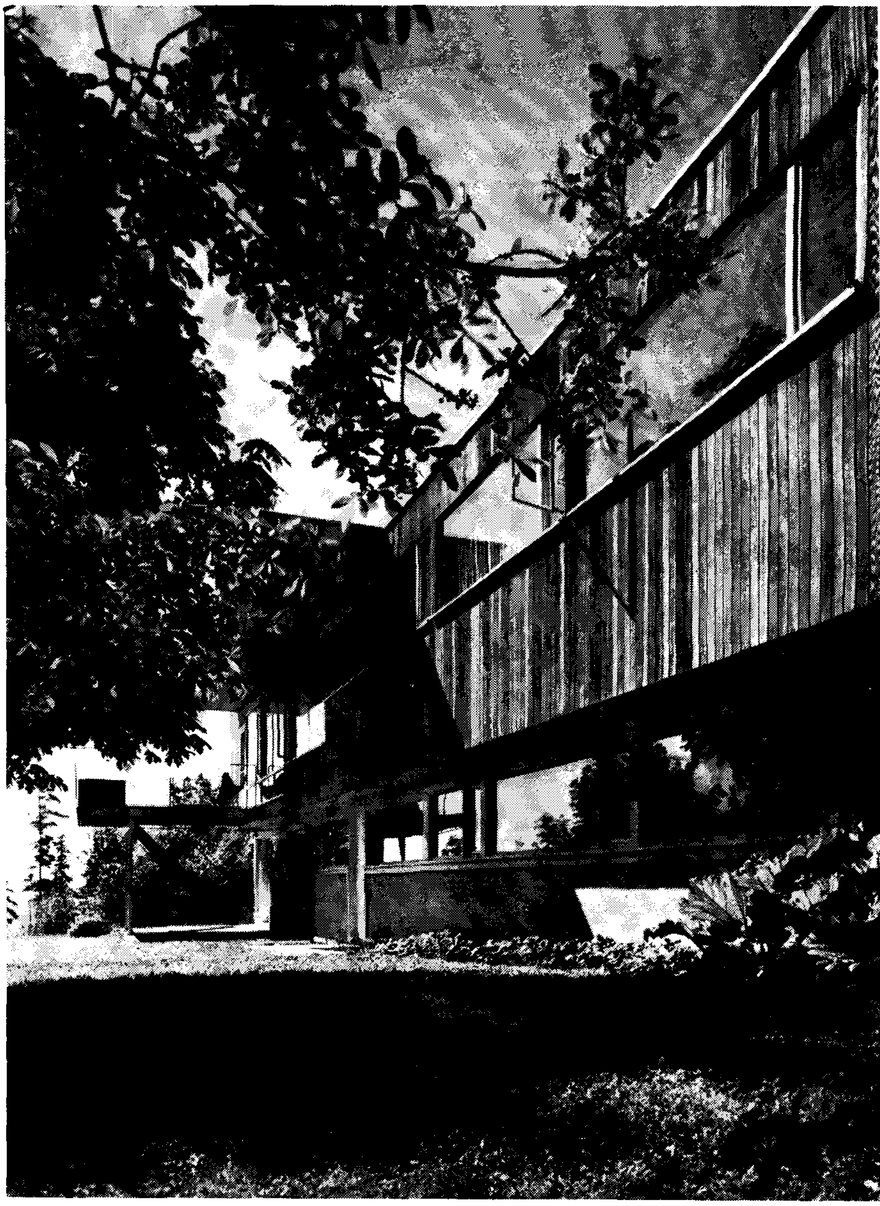


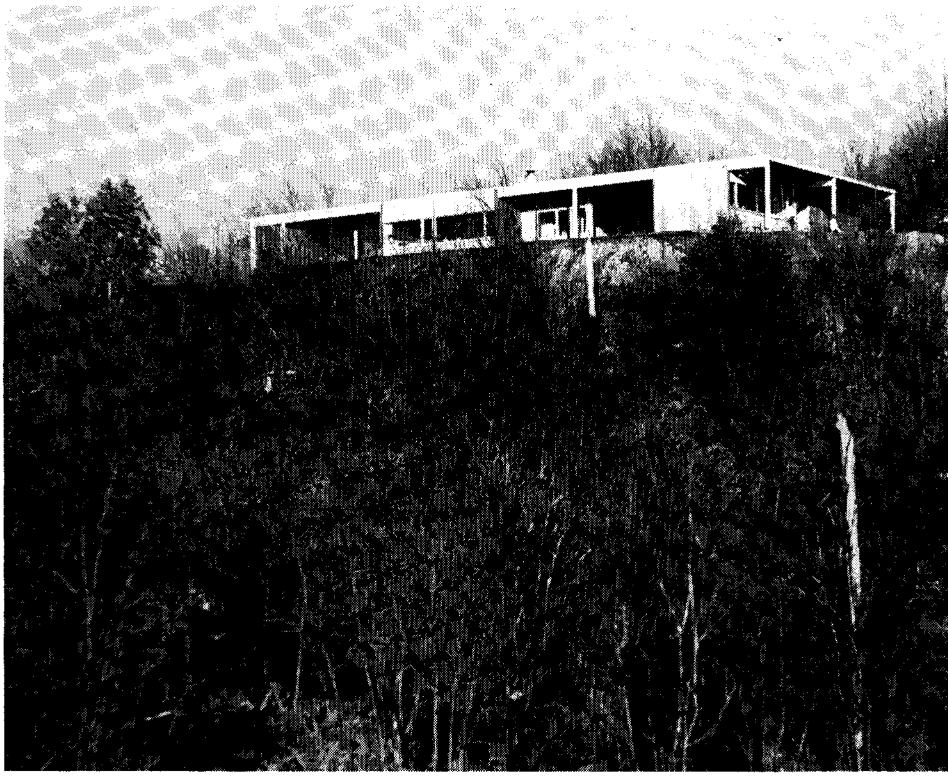

bridge
BR
BR
UPPER FLOOR
K
dressg
dining
d
sewing
deck
living
north
0 10 feet 0 2 meters
LOWER FLOOR
retaining wall
H
u
future bath-dressg rm
carport (future workshop)
pool

hilltop community

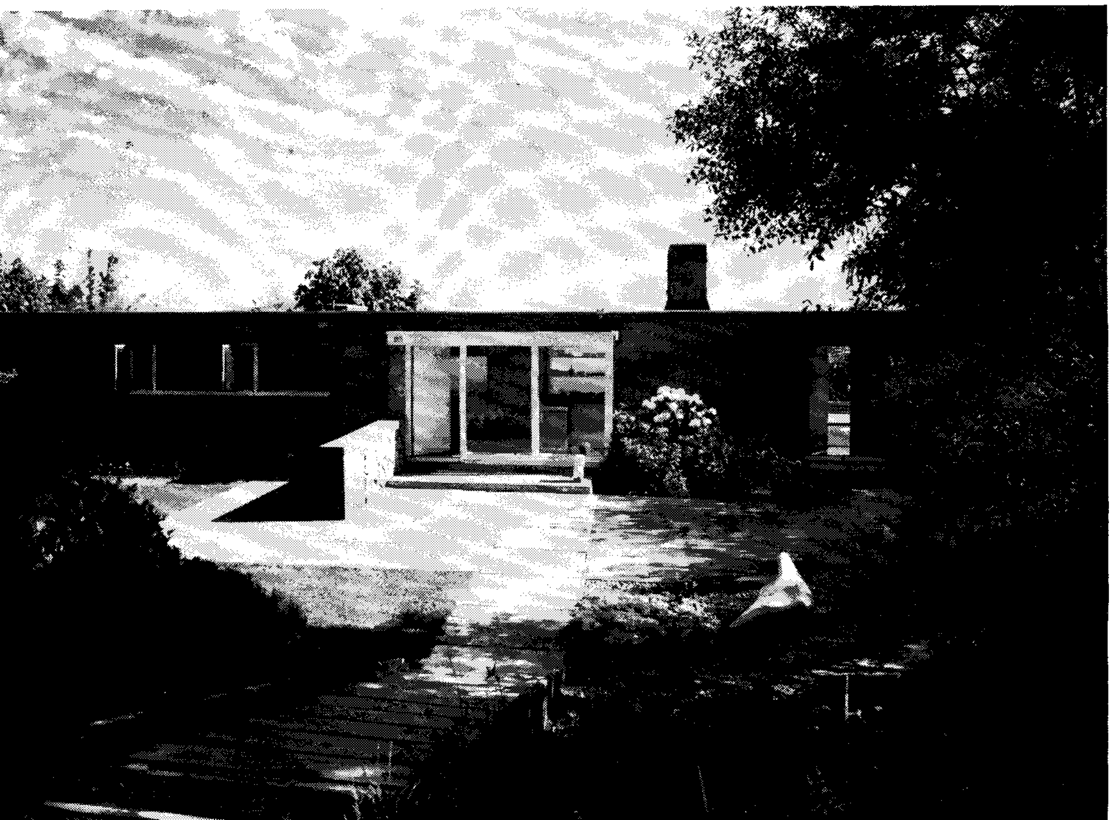
About 20 ft lower in elevation than the road, this hillside house faces toward Lake Washington and snowcapped Mt. Rainer. It extends parallel to the steep contours, and its plan is long and thin (17' x 72') to give every room the benefit of sun and view. Living and sleeping quarters are on the upper floor, approached from a delightful entry court (acrosspage bottom). *The workroom for the owner, a sculptor and furniture designer, is on the floor below. Much of the supervision and interior cabinetwork was done by Mr. & Mrs. Charles W. Smith, the owners, who are also responsible for the* **distinguished landscaping.** *Construction is conventional stud framing with joists spanning the 17' width. Exterior walls are vertical cedar siding and handsome stone masonry. Wall surfaces inside are white or neutral, brightened by well chosen furniture and accessories. John R. Van Horne and Edward L. Cushman were the Architects. Richard M. Stern was Mechanical Engineer; and Western Construction Co., General Contractor.*

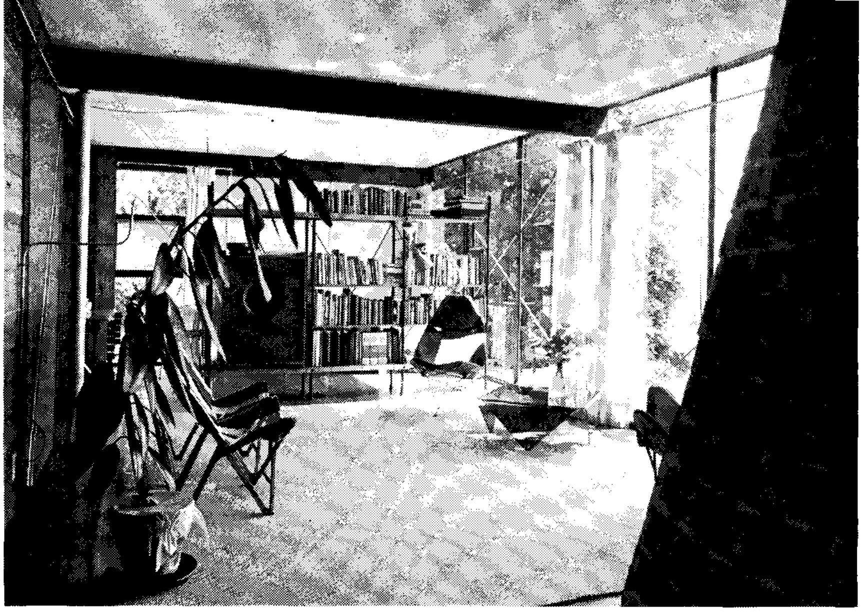






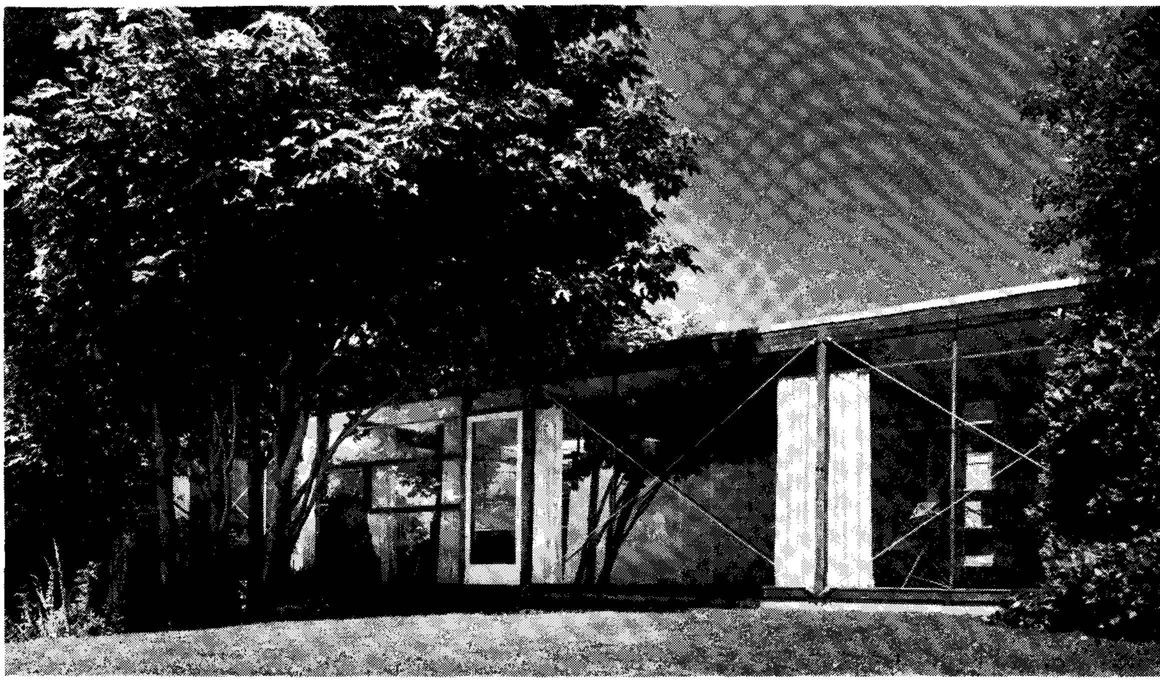
Also represented, though incomplete and not yet ready for full photographic coverage, is the house owned and designed by Fred Bassetti (above). *It is arranged on one level and looks out toward the north, west, and south. Entry from the east is into a large space—partitioned into entrance hall, play space, utility, and kitchen—which also forms a buffer zone between living area and bedrooms.*

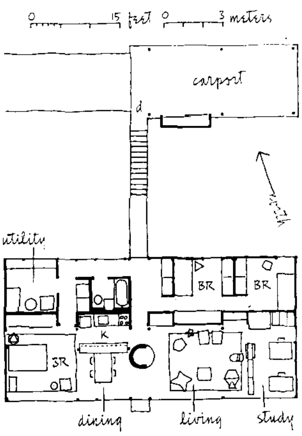


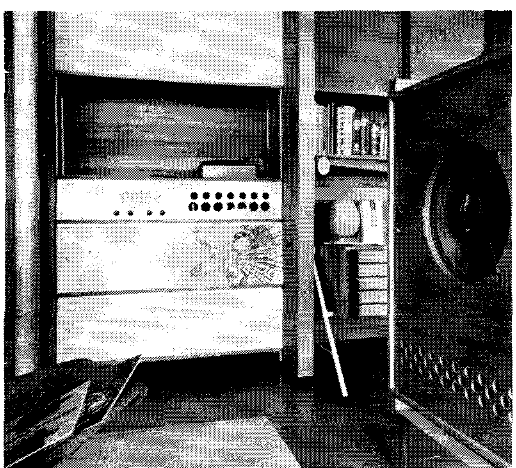


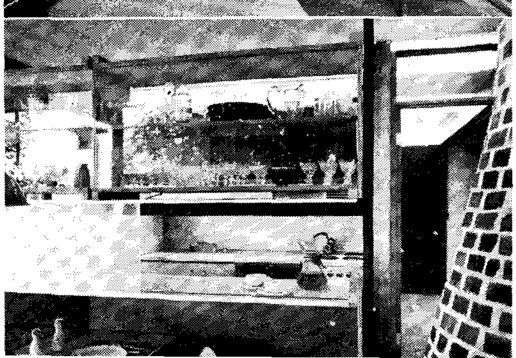
hilltop community

"The site is approximately three-quarters of an acre in area," writes Architect Wendell H. Lovett in describing his own house, "and slopes steeply from the approach road at the north to the south, affording splendid views southward. Two shelves were made on the hillside, one for the house, the other for the carport, while the natural growth was disturbed as little as possible. The earth from the cuts was deposited on the southern slope to create a level terrace adjacent to the indoor living and study areas." The plan divisions of this **structurally ingenious and artistically outstanding house** *are further described: "The southern half, about 700 sq ft, is actually a one-room apartment for two, with space for study, living, cooking, dining, and sleeping, all of which view a magnificent valley and a portion of Lake Washington, 1000 ft below. The northern half of the plan, about 500 sq ft, provides small sleeping spaces for children, an entry, bath, laundry, and small furnace and work room. Space within the two basic portions of the house is divided wherever possible with storage units and furniture rather than solid walls, thus increasing the apparent size and interest of the space, and decreasing its cost." In order to make all walls completely nonloadbearing, post-and-beam construction with exterior rod bracing has been employed. The flat roof is constructed of joists. Opaque exterior walls are of structural insulating panels. "The carport structure"* (foreground color photo), *continues Lovett, "consists of standard steel scaffolding sections and couplers. Lightweight pipe trusses support 3" x 6" and 3" x 8" purlins over which a corrugated aluminum roof is bowed, giving it added strength. The heating system is forced hot air supplied through closely spaced rain leaders in the slab. The result is a satisfying combination of radiant and convected heat. In general, interior color areas, where they are large and fixed, are light, neutral hues; where they are small and/or mobile, colors are deeper and more intense. Ceilings throughout are a light, grayed yellow, beams are a dark blue-gray." Richard M. Stern was Heating Engineer, and A. W. Swartz, General Contractor.*

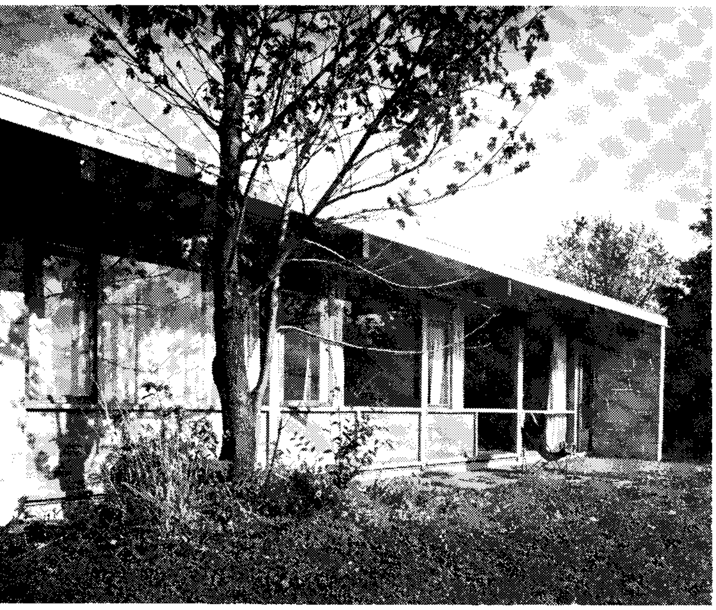




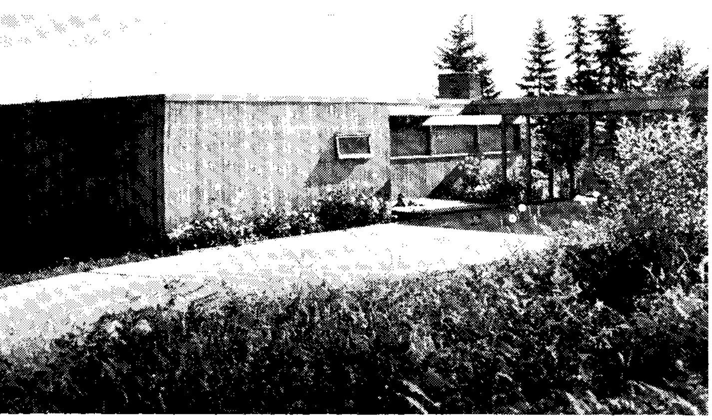




Color Photo: Dearborn-Massar



Two more houses complete the round trip along the Hilltop loop—the residence for Mr. & Mrs. Bacon (above) *and Mr. & Mrs. Clyde Johnson* (below). *The first,* **a simple two-bedroom house,** *was designed by its owner, Douglas A. Bacon. Utility room, bath, and kitchen face north, all major living quarters open toward the south to take in the superb views in that direction. Extensive additions to the west and east at the same level of the present house are planned for the future. In contrast to the Bacon House, the Johnson house makes provision for* **future expansion on a lower floor,** *where partitions and plumbing have been roughed in for a workshop, playroom, and additional bedrooms. The stairway to the floor above terminates in the family room, which is the center of all activities upstairs. Two bedrooms are to the east of this room, the living room is to the west, and a generous balcony to the south. Architect for this comfortable and practical house was Paul Hayden Kirk.*



With the majority of houses completed or well under way, interest is turning toward development of the central 5-acre tract of common property to be used for sports and recreation. Since improvements of this nature mean considerable financial outlay, a two-thirds majority of the entire membership is required before members can be assessed. "We are faced *continu-*

ally with the necessity to discuss and come to decisions on many community problems. However," continues present community chairman John Morse, "Hilltop has been much more successful as a joint land development than most of us could have hoped." What, then, has made Hilltop a success? First of all—the nucleus of the community was composed of professional men familiar with the business of building and planning: engineers, builders, and most essentially, architects, whose ability was given maximum play through all stages. Second—the project was approached with foresight, and planned unhurriedly and cautiously with the aim of not overburdening the members financially. Third—decisions were made by the group as a whole, with each member contributing responsibly to the full extent of his capabilities. Architecturally, the results of this collaborative effort are almost unique among planned American communities, for there is homogeneity without monotony, individuality without conflict.

Dorothy Gees Seckler

sculpture shot from a gun

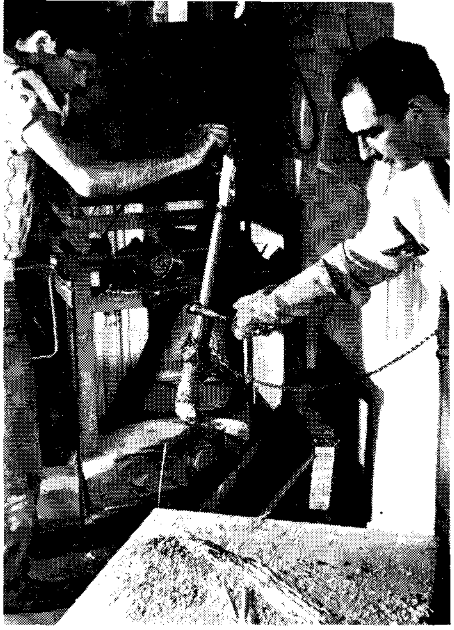
That sculpture can be made by a moving jet of molten metal, literally shot from a gun and at one-tenth the cost of casting, was recently demonstrated by Sculptor Calvin Albert. On the ark doors now installed in the chapel of Milton Steinberg House (modern annex to the Park Avenue Synagogue), a jet-sculptured bird and rampant lion show the strikingly different surfaces obtained by the criss-crossing skeins of lead alloy used in this process. Here the accent is on mass and texture rather than the linear effects associated with most modern metal sculpture.

To sculpture doors in metal was an ambition first born in Albert's student days when he saw photographs of Rodin's "Gate of Hell." This admiration had to be cherished almost furtively while he was studying and later teaching at the Chicago Institute of Design, where Bauhaus "machine for living" design rigidly excluded Rodin's concept of sculptural decoration.

In New York since 1948 and contributing intensely to the ferment of new ideas on sculptural styles and techniques he encountered here, he has plunged into a series of experiments departing both in concept and method from the linear directions pursued by most others in the avant-garde group. The perfection of the gun was the climax of innovations which included a patented process for working with sheet-form alloys and various ways of shaping molten metals, both with and without molds.

For his latest technique, Albert built a total of 14 "guns" each with its own heating unit. His problem was to discover the length of the pressure head needed to drive the metal against a surface with force sufficient to make it adhere. Much experiment was devoted also to the search for a "gun tip" before one was found capable of ejecting the fine, controllable spray required for precise work. Although certain examples existed in the field of industry, it was not easy to adapt their design to a machine light enough to be used in a sculptor's studio. Even more urgent was the problem of reducing the cost from the roughly $1500 of the commercial model.

The perfected gun has proved its versatility as well as its economy. Using the jet of flowing metal spontaneously, the sculptor can create the most fluid abstract forms, or directing it into a mold, he can produce the precise details of a portrait head. This discovery comes, Albert believes, "at the propitious moment when architects, bored by the coldness of many modern buildings, are ready to incorporate the forms of modern metal sculpture into their thinking and planning."



Calvin Albert, with the help of his assistant, manipulates the "gun" from a pulley so that the molten jet of lead alloy is directed with force against the board below (top right). *The metallic skeins, weaving back and forth gradually take the shape of the bird's wing seen here in an early stage.*

When the bird was formed in inch-high relief from the piled up filament layers, it was removed from the board and soldered to a metal panel (right) *previously coated with metal poured from a ladle.*

Albert (above) *uses a blow-torch to join the bird silhouette to the background. Raised crown and fragmented Menorah were added in final stage* (acrosspage).

Installed on the sliding doors of the ark (left) *where Torahs are ritually displayed, the silver-toned relief panels added warmth and dramatic contrast to the severe interior of the chapel of Milton Steinberg House in New York. Albert estimated the final cost of his gun-sculptured panels as one-tenth that of a comparable relief cast in the traditional way.*

general practice: office-laboratory building

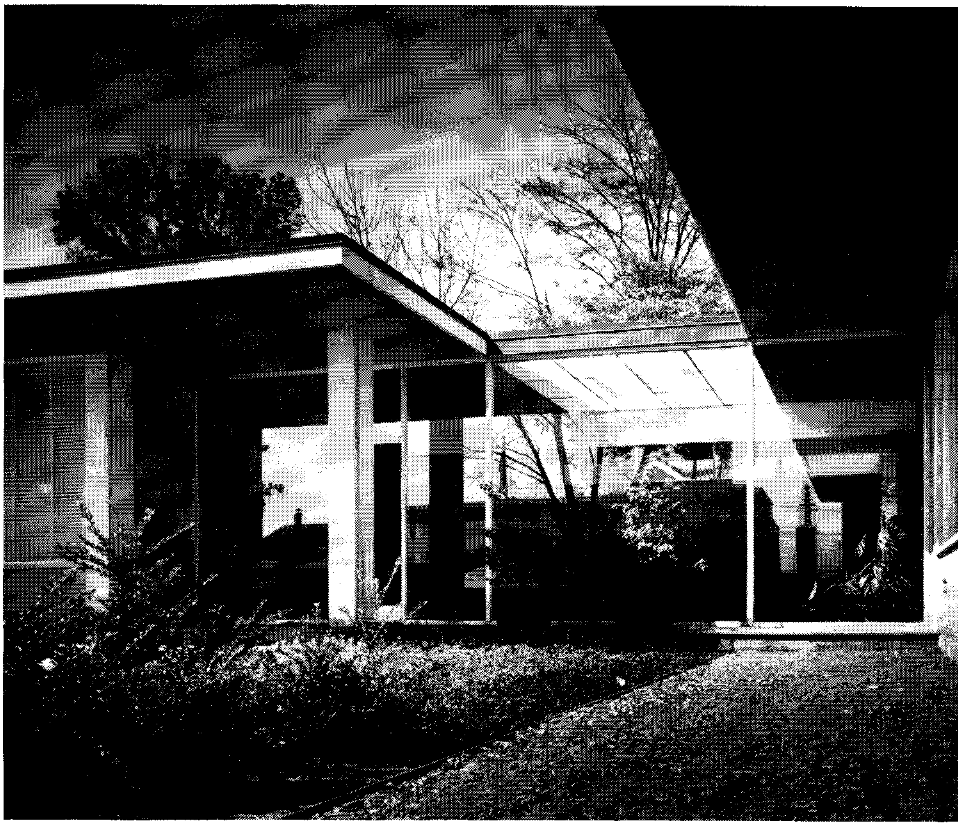
location | Herculaneum, Missouri
architects | Hellmuth, Yamasaki & Leinweber

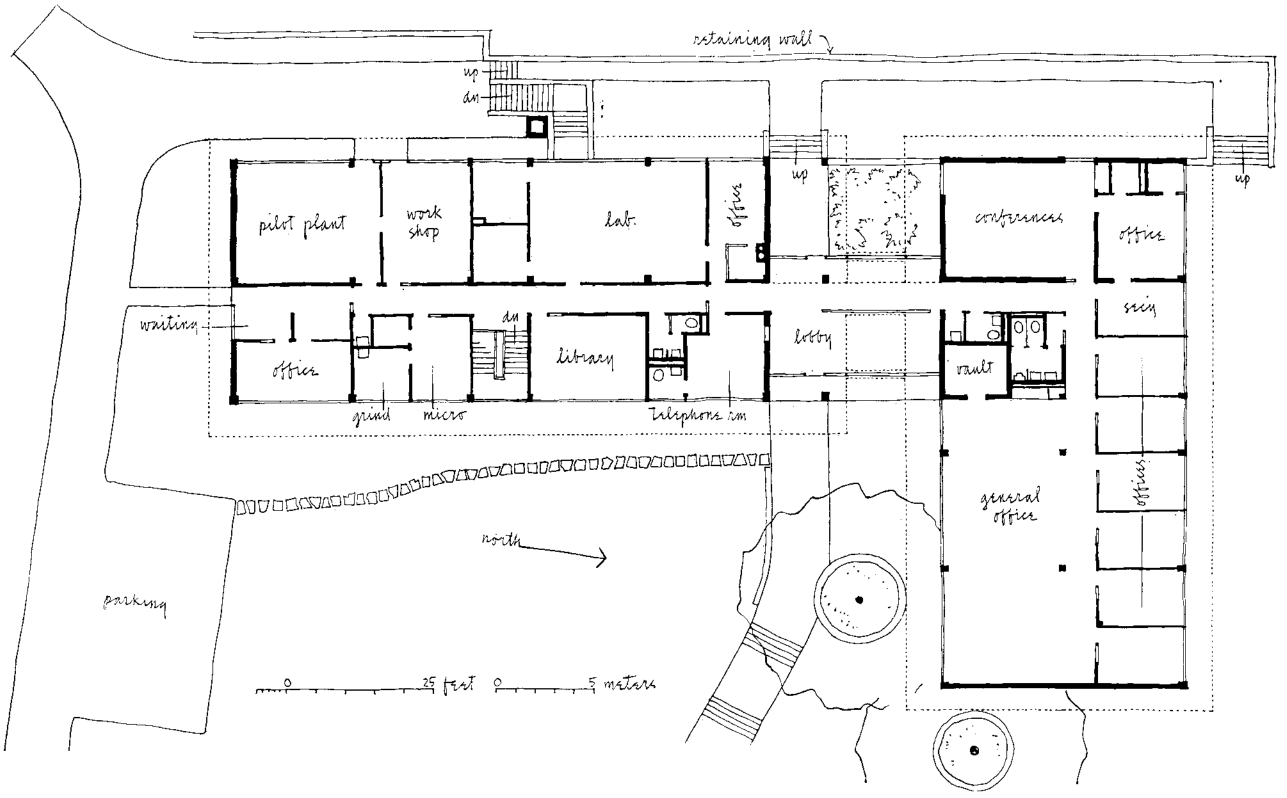
This two-part building, organized in an L plan, houses the administrative offices and laboratory of the Herculaneum Division of the St. Joseph Lead Co. Located on a sloping site that rises steeply to the west, the building is sheltered alike from low, hot western sun and sharp winter winds. The office portion occupies the north leg of the L; the laboratory, the south-extending wing; and the two are joined by a glazed, skylighted lobby (*see* SELECTED DETAIL) and landscaped garden court. A basement, which occurs only beneath the laboratory wing, contains additional lab rooms, as well as the mechanical equipment room, storage, etc.

Completely fireproof, the building has a reinforced concrete frame and 10-in. brick-cavity-wall filler panels; the columns are faced with off-white precast stone, and the interior withe of the cavity walls is left exposed in most rooms. The flat-slab roof is finished with builtup roofing. Floorings include asphalt tile, quarry tile (laboratory), and slate (lobby). Acoustical tile is used on the under side of the roof slab. Sash and sub-frames are of steel, while the skylights are framed in aluminum.

The office areas are fully air conditioned, and heating and air-conditioning supply ducts run above furred-down corridor ceilings. Return air passes through openings in the exterior cavity wall below glass areas. Return air ducts make connections to these openings, so no grill is used. Lighting is handled by running a 4-in.-square, black lighting duct 8 ft above the floor and then mounting rectangular, white, fluorescent fixtures on the bottom of the duct. George E. Horch was Mechanical Engineer for the job; John P. Nix, Structural Engineer; and Howard Donald Construction Co., General Contractor.

Photos: Mac Mizuki





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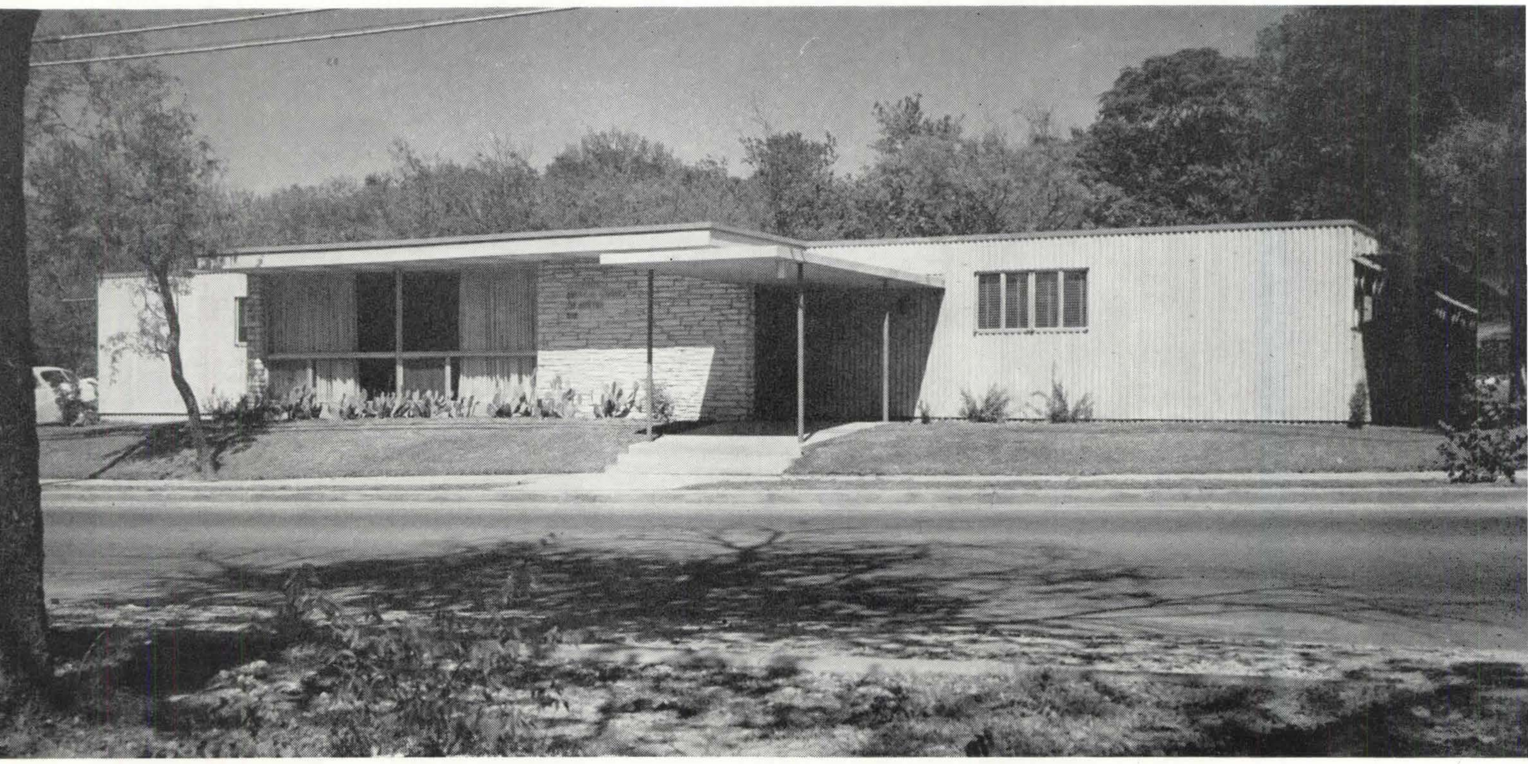
general practice: children's clinic



location | Austin, Texas
architects | Fehr & Granger

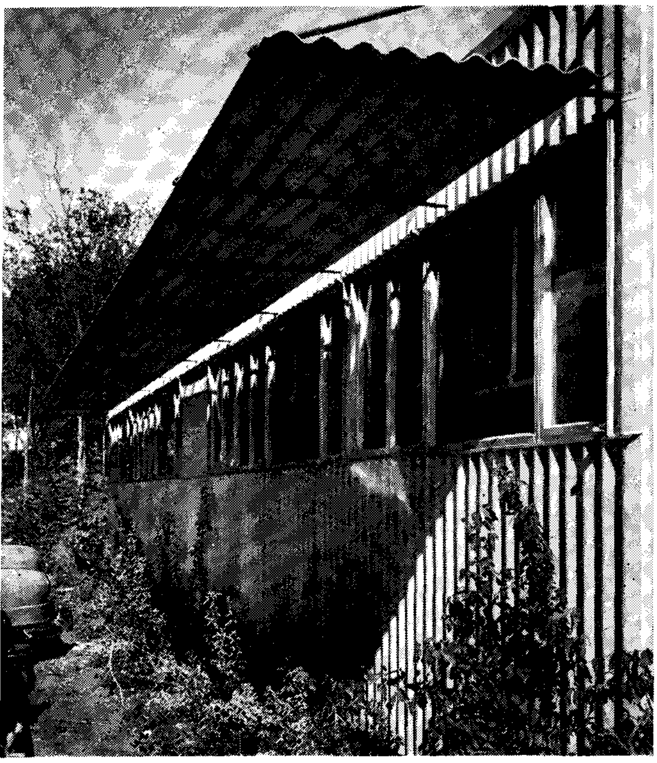
In Austin, as in most growing U.S. communities, congestion and inconvenience of finding a place to park downtown is resulting in the relocation of various services in residential neighborhoods. This Children's Medical Center is an excellent example. Here, ample parking offstreet for patients' cars is provided at the west end of the building, while doctors have their private parking strip off an alley at the east end. Thus, mothers bringing their children to see the doctor can do so with ease and in relaxed surroundings. "The whole idea is more or less like paying a visit to another home," say the architects, almost a therapy itself.

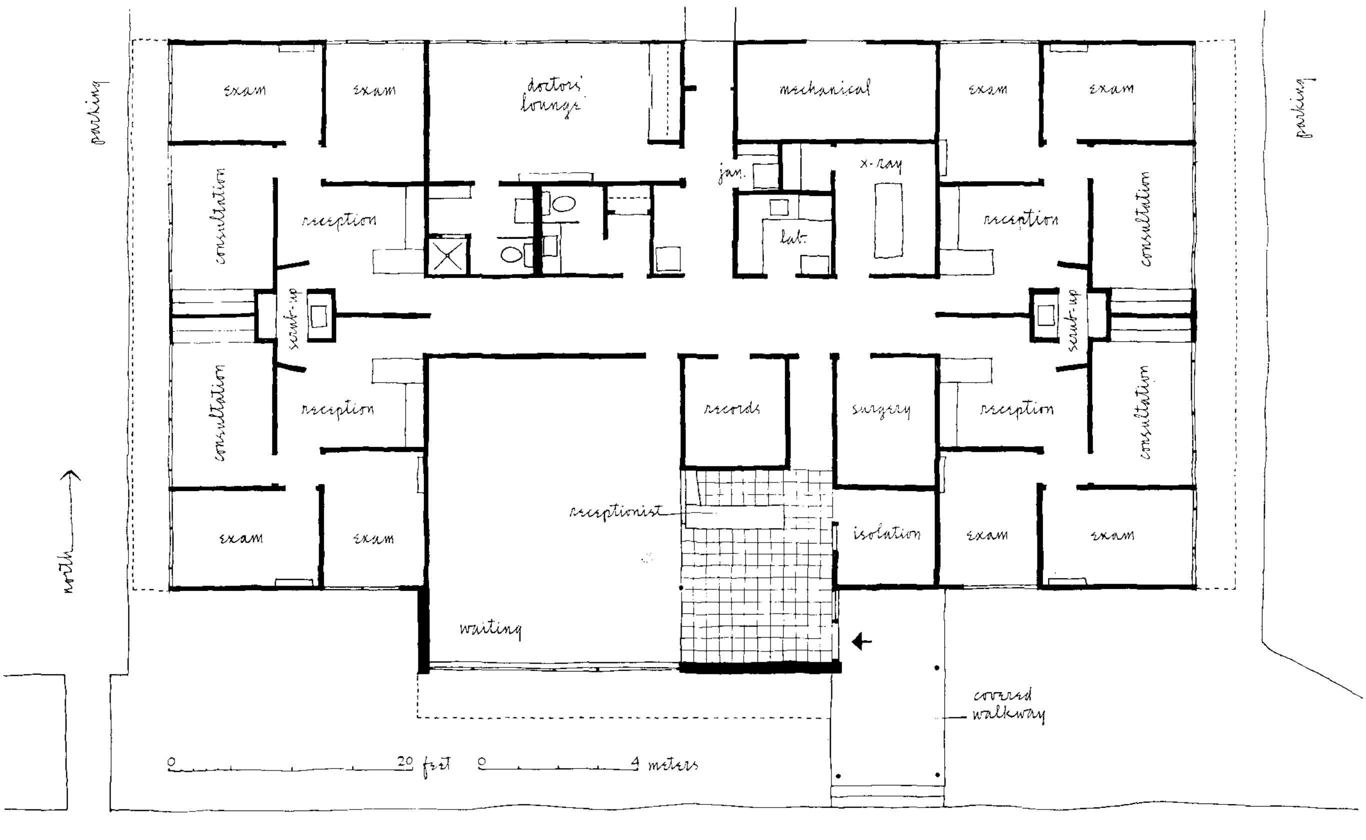
The design problem was to provide identical office space for four pediatricians, organized in such a way that common services—waiting rooms, records, X-ray, minor surgery, lab, and doctors' lounge—would be shared by all. The solution is a rather symmetrical arrangement, with paired suites of offices at either end of the building and the common services grouped in the middle.

Construction consists of concrete-pier foundations, with grade beams and precast-concrete floor panels. Walls are either native stone or wood frame surfaced with corrugated asbestos; the roof is wood framed, with builtup roof surfacing above an insulated flat deck. Interior surfaces: birch-plywood walls, acoustical tile ceilings, and flooring of either rubber tile or cork. All sash are aluminum. The 6107-sq-ft building has zoned, year-round air conditioning and was built at a cost of $40,397.

Working with the architects to accomplish the work were Wilson & Cottingham, Structural Engineers; Blum & Guerrero, Consulting Mechanical Engineers; R. J. Pekar, General Contractor.

Photos: Ulric Meisel

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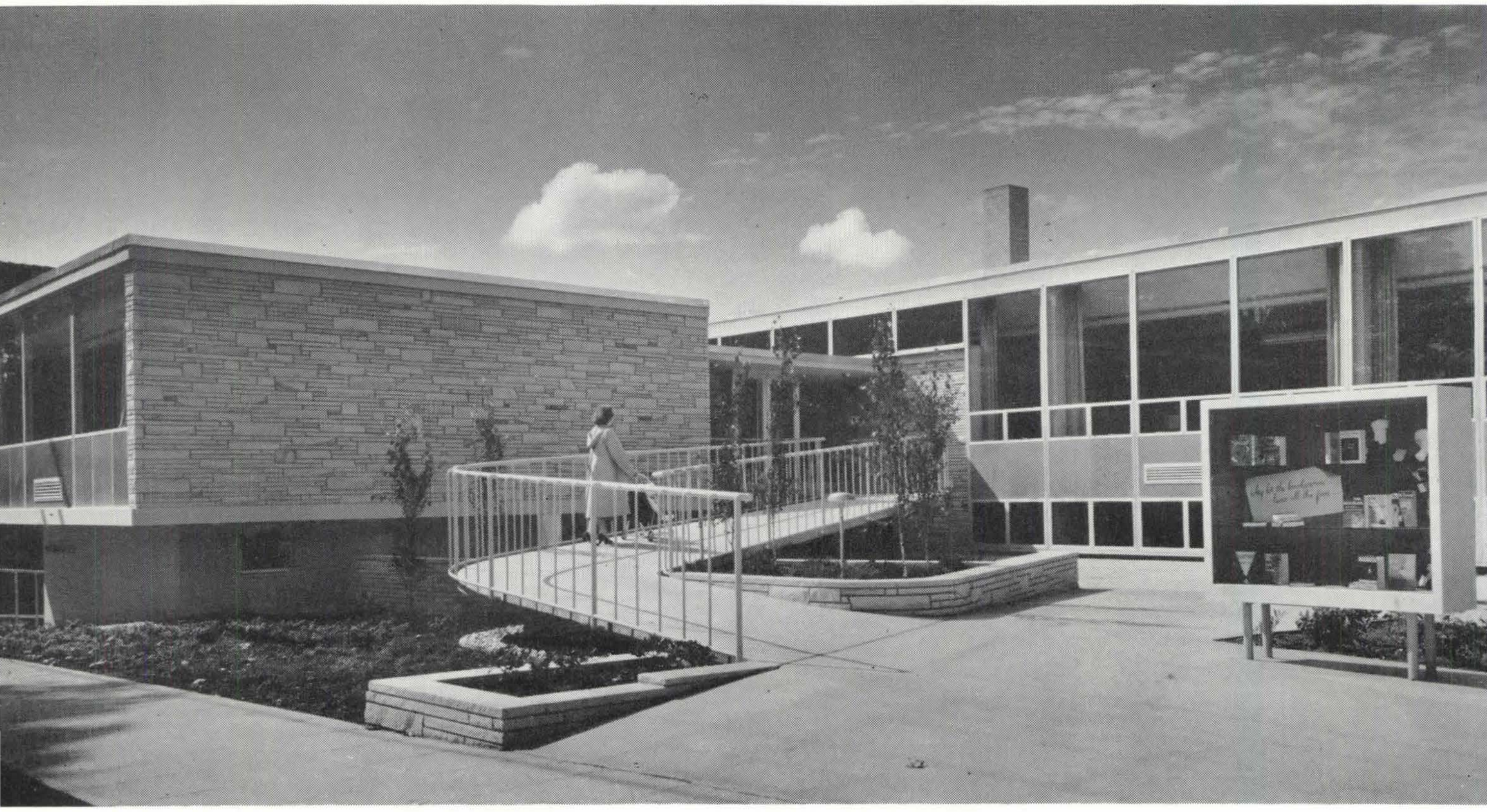
general practice: memorial library



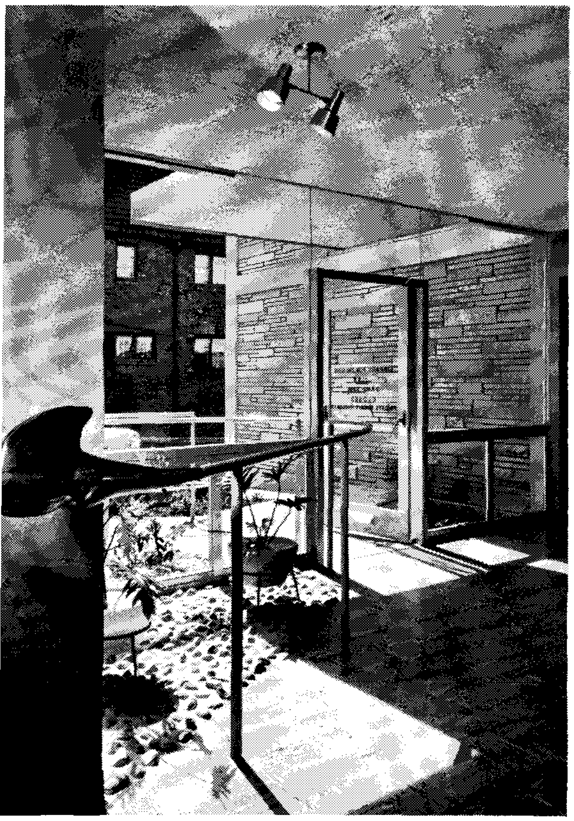
location | **Seattle, Washington**
architects | **Naramore, Bain, Brady & Johanson**

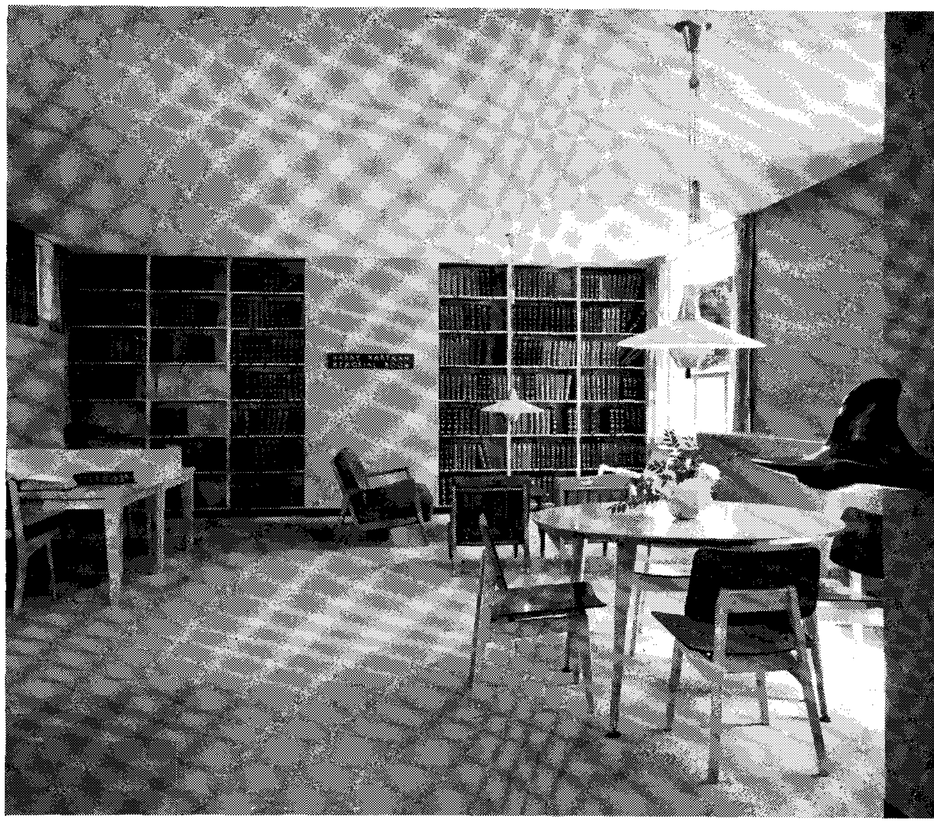
Almost from the outset, it was determined that the Susan J. Henry Memorial Library, centrally located in one of Seattle's oldest residential neighborhoods, would require a two-level solution. For not only was the available site limited in area, but also the program required that the Central Library for the Blind (serving three Northwestern States and Alaska) as well as a branch of the Seattle Public Library for the Capitol Hill area, be accommodated here.

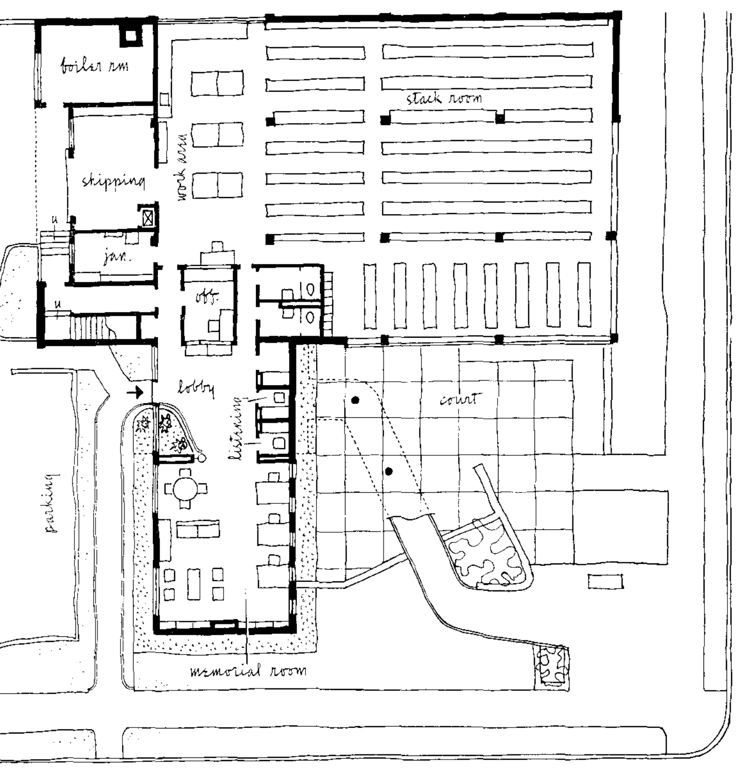
Since the lot slope was slight, the solution was to employ a curving, structurally free ramp up to a raised main floor (the branch library) and a gentle walk on the south side of the building down to the Central Library for the Blind (*acrosspage*). Since the latter serves its public chiefly by mailing out talking books, truck loading and other ways of handling heavy items were important planning factors. The Harry Hartman Memorial Room (*top right*) is used as a reading, browsing, and meeting room for blind visitors. A handrail leading from the street to the entry of this library continues inside, terminating in an abstract sculpture in rosewood by Dudley Pratt.

The structural system reads readily in the photographs—exposed reinforced-concrete frame with filler panels of stone masonry or painted concrete. Spandrel areas under the east-facing windows of the main, first-floor reading room are insulated sheet-aluminum sandwich panels.

Mechanical-Electrical Engineers for the library were Bouillon & Griffith; Structural Engineers, Worthington & Skilling. Roberta Wightman was Landscape Architect and W. G. Clark Construction Co., General Contractor. Cost came to $16.80 per sq ft.



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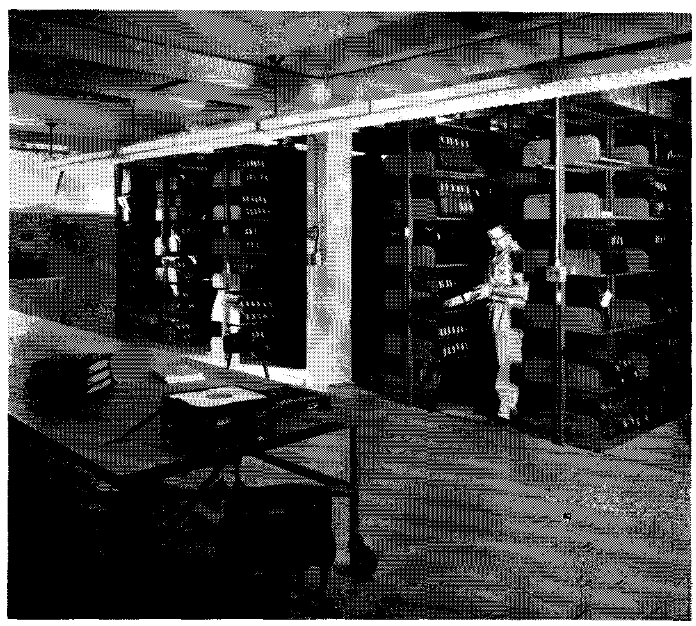
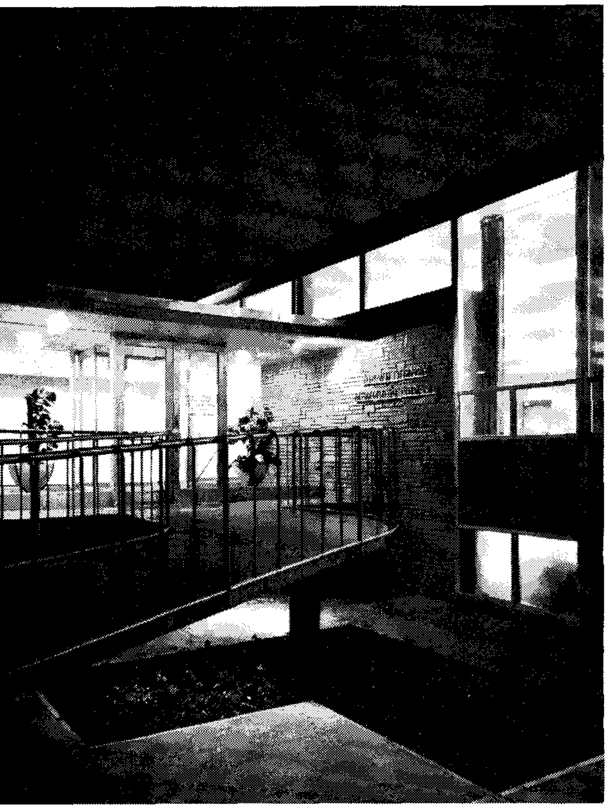
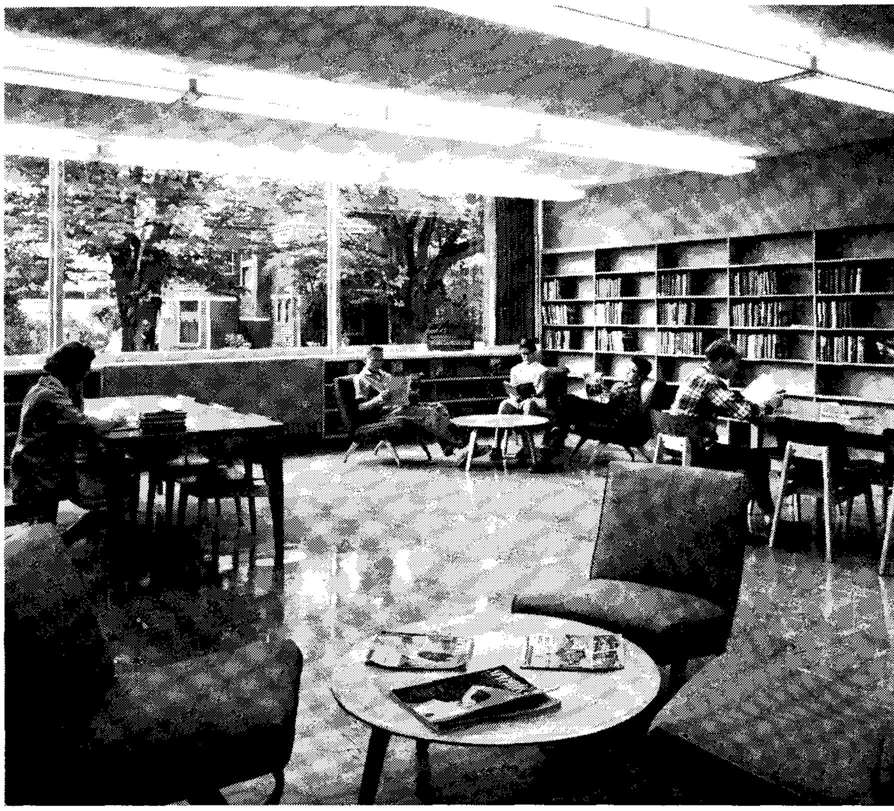
FIRST FLOOR

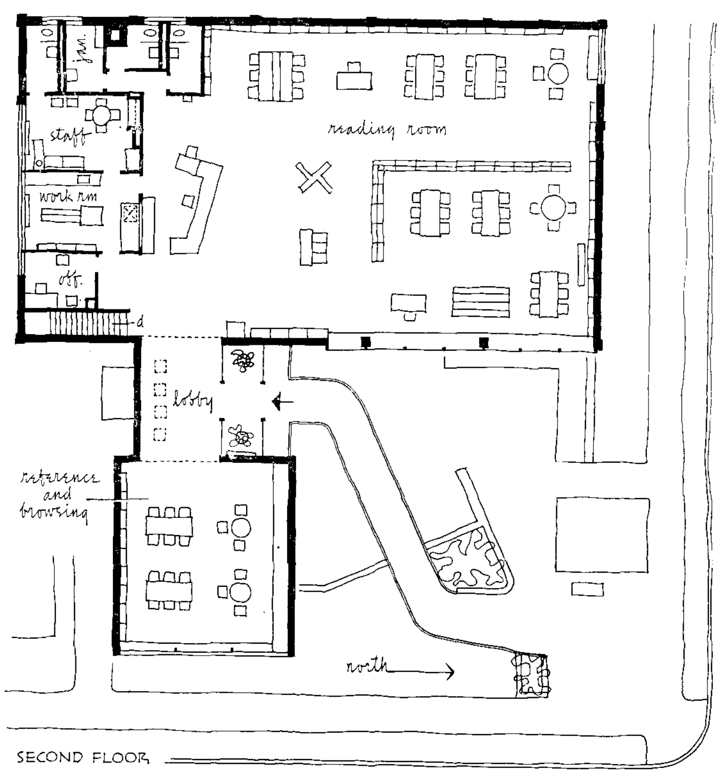


general practice: memorial library

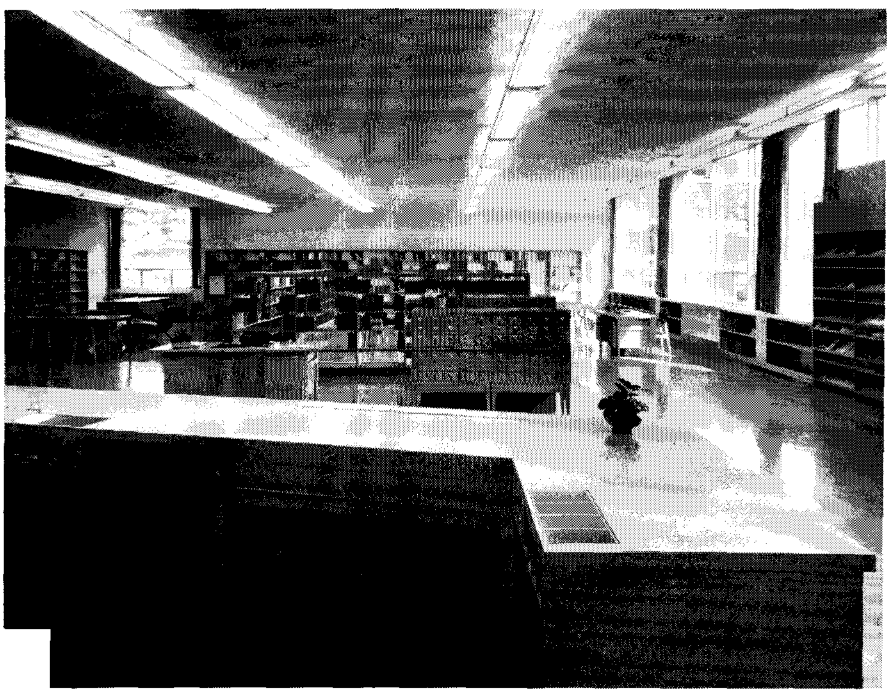




A walk up the freestanding entrance ramp (top left) *leads to the branch-library lobby* (above) *and so to the browsing-reference room* (top right) *or main reading room* (acrosspage). *Main stacks are on the lower floor, under the reading room. John S. Richards, Librarian of the Seattle Public Library, writes: "We readily concur with admiring visitors . . . that this is a beautiful building both inside and out. Even more important to the staff, however, is the fact that it is so functional, practical, and convenient . . ."* Photos: Dearborn-Massar



In the main reading room, the wall of windows faces east. Librarian Richards comments that "the desk, ideally arranged, roomy and workable in every respect, enables us, with a small staff, to serve borrowers with ease and dispatch."



Materials & Methods

construction

Foundation, frame, walls, floors: reinforced concrete: reinforcing steel—Northwest Steel Rolling Mills, Inc. **Roof:** long-span steel joists with reinforced-concrete slab: steel joists—Arcweld Manufacturing Company. **Wall surfacing:** exterior: insulated, sheet-aluminum sandwich panels for spandrels—Fentron Industries, Inc., stone, painted concrete; interior: plaster, cork, concrete, concrete block, birch; rest rooms, toilets: ceramic-tile wainscot—Pomona Tile Manufacturing Company, hard-finish plaster above wainscot. **Floor surfacing:** asphalt tile and vinyl-asbestos tile—Kentile, Inc.; rubber tile—American Biltrite Rubber Company and B. F. Goodrich Company; ceramic tile—American-Olean Tile Company; hardener on exposed concrete floors. **Ceiling surfacing:** exposed concrete; mineral-fiber acoustical tiles—Johns-Manville; hard-finish plaster. **Roof surfacing:** built-up roofing—Koppers Company, Inc. **Waterproofing & dampproofing:** bituminous dampproofing below grade and on concrete concealed behind stone. **Insulation:** glass-fiber—Owens-Corning Fiberglas Corporation. **Roof drainage:** cast-iron roof drains. **Partitions:** interior: exposed and plastered concrete block, ceramic tile, hardwood paneling; metal-panel toilet partitions—Mills Company. **Windows:** sash: aluminum—Fentron Industries, Inc.; glass: plate, B-quality sheet, patterned heat-absorbing and glare-reducing, diffusing, and obscure wired—Mississippi Glass Company; skylights: aluminum framed—Aluminex Inc. **Doors:** hollow-metal doors and frames—Universal Service Sheet Metal Products; sound-retardent—Hardwood Products Corporation; flush wood—Roddis Plywood Corporation; chain-operated, aluminum, rolling, overhead door—Acme Central Metal Products Company, Inc.; aluminum entrance doors—Fentron Industries, Inc. **Hardware:** lock sets—P. & F. Corbin Division of American Hardware Corporation; door closers—Oscar C. Rixson Company and LCN Closers, Inc.; hinges—Stanley Works; panic exit—Von Duprin Division of Vonnegut Hardware Company.

equipment

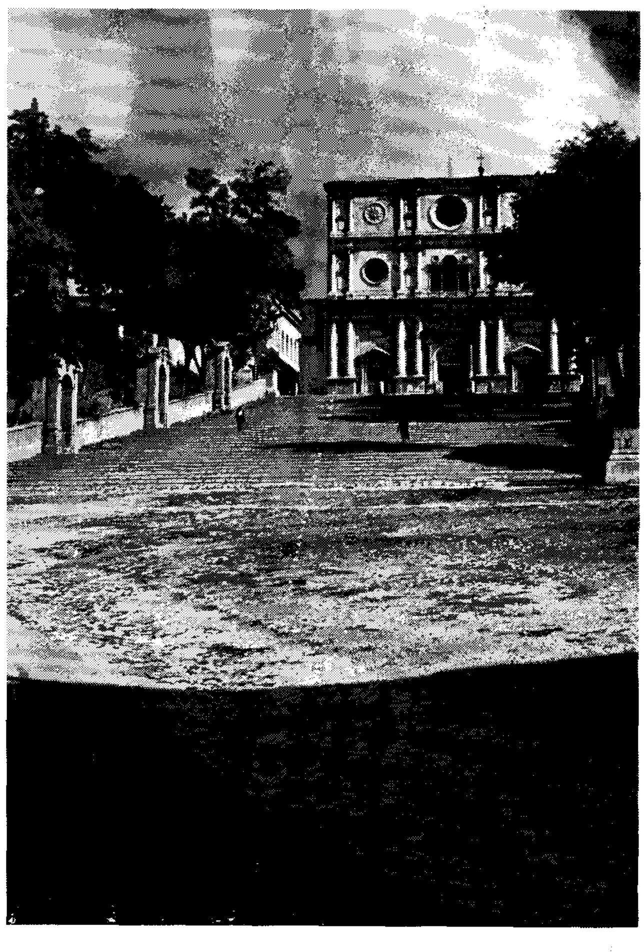
Specialized equipment: door bell, signal light, and chimes signal system—Edwards Company, Inc. **Elevators:** dumb-waiter—Energy Elevator Company. **Lighting fixtures:** General Lighting Company; John I. Paulding, Inc.; The Rodefer-Gleason Glass Company; Pass & Seymour, Inc.; Century Lighting, Inc.; Pittsburgh Reflector Company; The Edwin F. Guth Company; Westinghouse Electric Corporation; Ruby-Philite Corporation; Columbia Electric & Manufacturing Company; Steber Manufacturing Company; Garden City Plating & Manufacturing Company. **Electric distribution:** panelboards and multibreaker—Square D Company; switches—Bryant Electric Company. **Plumbing & sanitary:** water closets, lavatories, faucets, and accessories—American Radiator & Standard Sanitary Corporation; toilet seats—C. F. Church Manufacturing Company; flush valves—Sloan Valve Company; hose bibbs—J. A. Zurn Manufacturing Company; pressure-reducing and flow-control valves—Bell & Gossett Company; strainer on main water service—Mueller Brass Company. **Heating & ventilating:** oil burner—Ray Oil Burner Company; boiler—Birchfield Boiler Company; convectors and unit heaters—Trane Company; unit ventilator—John J. Nesbitt, Inc.; exhaust fan—American Blower Corporation; circulating pumps—Bell & Gossett Company; circulating-pump controls—General Electric Company; stack switch—Minneapolis-Honeywell Regulator Company; time switch—Paragon Electric Company; pneumatic controls—Johnson Service Company.

ITALY BUILDS L'ITALIA COSTRUISCE

ITS MODERN ARCHITECTURE AND NATIVE INHERITANCE: PHOTOGRAPHS BY THE AUTHOR

The most recent of G. E. Kidder Smith's books on architecture of the western world was published late last year—in the United States, by Reinhold. P/A extracts here a few of the author's illustrations and comments from the book's first half—*The Inheritance.*

In an effort . . . to inquire what stimulation there might be for a modern architect in old architecture and planning, the first section of this book . . . will essay to extract from part of Italy's incomparable inheritance some of the particular elements of greatness which have made Italian cities the delightful places they are and Italian architecture of almost constant renown for the last two thousand years. It will attempt to make the past serve the present and future by showing the inspiring solutions which the Italians achieved to their spatial problems. These problems are of a kind which architects and planners have faced since man moved out of the cave, and which they will continue to face until man moves back in.



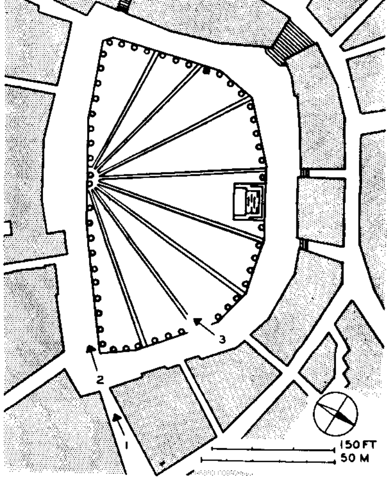
Dorsino (acrosspage top). *The farmhouses of the Dolomites generally have the outrigging of drying framework which gives such a distinctive, and even contemporary appearance to these buildings . . .* (This) *barn and dwelling . . . has one of the finest exposed frameworks in all Italy.*

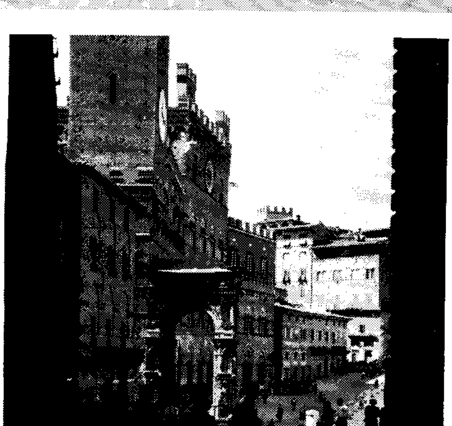
Portofino (left). *Beginning with an incomparable situation, local man, with that creative sensitivity typical of so many Italians, has worked hand-in-hand with the local contours and configurations of the landscape, moulding and adapting his buildings to a delightful harmony with their setting.*

Asolo (above). *In addition to providing climatic shelter, arcades have a psychological attribute. . . . They produce an "excitement of the involved" as one becomes integrated with the architecture of the street.*

L'Aquila (right). *Contemporary city building . . . in general preferring the bulldozer to natural uses of the site, is prone to avoid and even eliminate those differences in level which can add so much spice to urban enjoyment.*

Italy builds

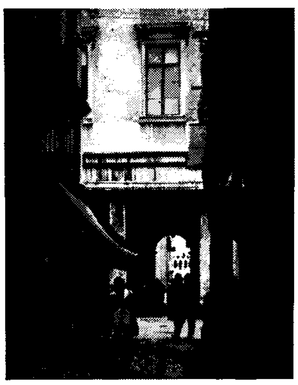


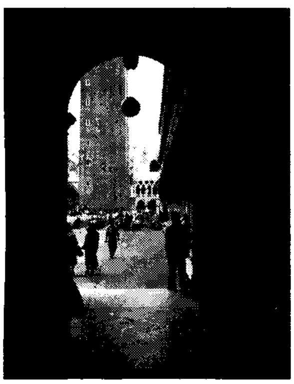


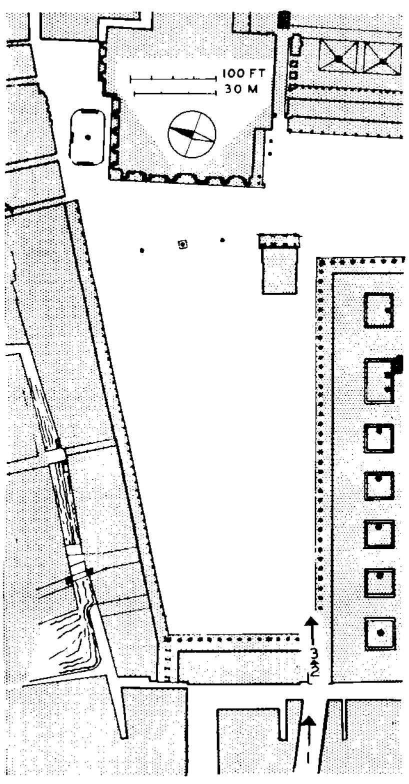
The square, or piazza, *in Italy is far more than so many square feet of open space; it is a way of life, a concept of living. Indeed it might be said that the Italians have the smallest bedrooms but the largest living rooms in Europe. For the square, the street and the sidewalk are their living space . . . The spontaneous gregariousness of the breeze-cooled piazza, the clublike cafe, the life and vitality of the square and sidewalk are integral elements of life, architecture and planning . . .*

Piazza del Campo, Sienna (acrosspage). *The Campo is the very core of the city and all life revolves around it. . . .* (Lower) *photograph shows . . . one of the major entrances to the square, a dark gateway beyond which sparkles a slit of space inviting one in. A few steps further on* (top) *this strip of vertical light bursts into the sunlit horizontal space of the square itself . . .*

Piazza San Marco, Venice (below *and* right). *Down a narrow, somewhat tortuous sidewalk lined by high shops on either side, one sees a small arched opening beckoning in the distance. As one draws nearer, this arch form takes precise shape and . . . one is impelled forward with an irresistible urge* (below). *And then, before one, dancing and sparkling in the brilliant sunshine, in a fusion of architecture, space, color and pageantry, lies the greatest square in the world.*







power plant architecture: engineering prefaces

The engineer who designs the machinery and equipment layout of a power plant is responsible, above all else, for producing dependable power at the lowest practical cost. He fulfils this responsibility by comparing the advantages and disadvantages of different methods of power generation, the economics of unit sizes and numbers, the potentials of various fuels, and the effects of pressures and temperatures.

To the architect, this means that every power-plant project is also a handmade project—and that no two are alike. However, the architect can count on at least two axioms for guidance. The money available for housing the machinery and equipment will be severely limited; this is the first axiom. Owners usually class architectural investment as unproductive investment; consequently, surprise should not be felt if some features of the main building, auxiliary structures such as gate houses, fuel and ash towers, screen houses, plant lighting, landscaping, and interior finish must be skimped or redesigned before the job can be squeezed into the budget.

Average ratios of building costs compared to the total cost of a project are ranging presently as shown *(Table I)*. With the exception of the atomic plant, for which only an estimate can be made, these ratios have been developed from reported costs.

These figures, however, may have wide variations, particularly downward, in small industrial projects, where weather shelter (and no more) often expresses the owner's ideas as well as his pocketbook.

The second axiom is this: the designing engineer will seldom, if ever, rearrange his layout of plant machinery simply to improve the architectural result. True, he *might* consider some minor changes, but only if (a) they do not add to the cost, or (b) they do not delay the construction schedule.

This determined defense of his layout by the designing engineer rests on his conviction that any other arrangement is less efficient, more costly to install, more difficult to operate, etc. His studies indicate that his adopted arrangement will develop dependable power at the lowest practical cost. And the owner usually will back him up.

The architect can advance his own studies in point of time and avoid unworkable experiments if he becomes aware of the reasons which support the interrelationship of power-plant components. These relationships form the specific engineering prefaces which must be established before architectural planning can commence. They all fall in the field of engineering decision; why some arrangements are best and some impossible will become clear in the following discussions.

specific engineering prefaces for housed steam-electric plants

Engineering relationships of prime interest to the architect are these: (a) the number, capacity, and type of turbine-electric generators; (b) nature of the heat cycle if regenerative heating is included, or reheating, straight condensing, etc.; (c) fuel—basic and secondary; (d) source of condenser cooling water; (e) method of fuel delivery; (f) method of ash disposal.

The number and characteristics of turbine generators are controlled by the project load. To illustrate, the designing engineer must choose between a generator large enough to satisfy the peak load (probably running at comparatively low efficiency between peaks) and *two* generators, one for light load while the other stands ready to meet peaks as they occur. Each of these two generators would operate at or near top efficiency all the time; consequently, their preference would be certain were it not for the fact that a single generator will cost less to install per kw of capacity. The final decision usually is based on a comparison of economies over a period of time, say 10 yr—the lower initial cost of the one being matched against the lower operating expenses of the two.

* *Consulting Mechanical Engineer, North Charleston, S. C. Captain Emerick is now on active duty with the U. S. Navy in the Canal Zone.*

Table I: Ratios of Building Costs to Total Power-Plant Investment

Type of power plant	Average percentage of total investment alloted to building
Steam-electric	25 - 30%
Diesel	15 - 20%
Hydro-electric	10 - 12%
Gas turbine	15 - 20%
Atomic*	50 - 70%

*Note: Actual ratios for atomic projects are not available at present; consequently, the range of percentages given here is estimated.

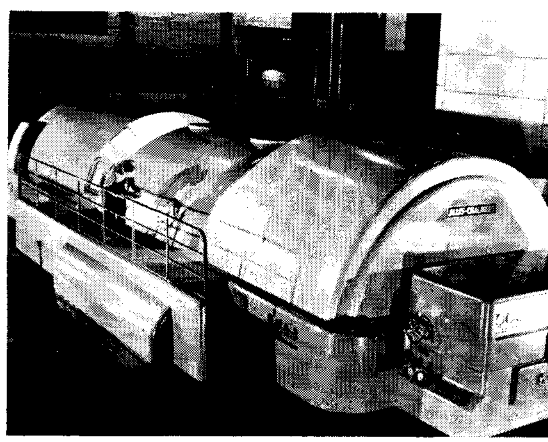
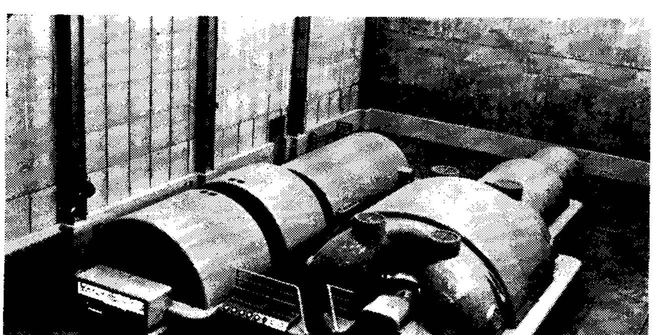


Figure 1—75,000-kw, 3600-rpm tandem-compound reheat steam turbine-generator unit (above).

Figure 2—120,000-kw, 3600/1800-rpm close-coupled cross-compound reheat steam turbine-generator unit (left).

Photos: courtesy of Allis-Chalmers



by Robert H. Emerick*

Obviously, architectural planning must await the engineer's decision on the size and number of the generating units. Equally important thereafter is information on the form of the turbines. The significance of a tandem arrangement, which means that all stages of the steam turbine, the generator, and the exciter are mounted on an extended shaft, is that housing for such a machine will be long and narrow. In contrast, the cross-compound machine, widely favored by large power plants, is really two turbines placed side by side in individual casings —one casing housing the high-pressure stages, the other low-pressure stages. The steam exhausting from the high-pressure side is led to the inlet of the low-pressure casing by a cross-over pipe, where it enters the condenser throat in the usual manner.

Cross-compound turbines present a rather short and wide appearance; they are the rule for large machines, since over-long shafts are subject to warpage and are more difficult to keep in line. Both a tandem design, rated at 75,000-kw output, and an Allis-Chalmers 120,000-kw cross-compound unit employing reheat are illustrated *(Figures 1 and 2)*. The contrasting natures of the two installations as they affect architectural planning are evident. Turbine and boiler combinations are sketched *(Figure 3)*.

Reheating as part of the thermal cycle is quite simple in principle but can be complicated in application. This scheme transfers all the steam from the outlet of a high-pressure turbine back to a coil in the boiler where it is reheated to nearly its original temperature and then returned to the low-pressure section of the turbine. Since the saving in fuel consumption thereby averages from four to five percent, architects can expect this trick to continue for large power plants.

The problem is to provide space for this bulky reheat piping in both directions, making sure that it can compensate for thermal expansion and that it is adequately supported throughout. If the turbine is bled for feed-water heating (regenerative heating), the avoidance of piping conflict can demand some neat arranging.

The feed-water heaters themselves are important for spatial planning. Depending on the heat balance, they may range in number anywhere between one and six (usually more than six are not economical) and they are available for either vertical or horizontal mounting. For vertical units, the roof must be high enough above them to permit withdrawal of their tubes for inspection and repair; if horizontal, the location of the wall nearest their heads is critical for the same reason.

In most power plants—but with some notable exceptions—the main condenser is set beneath the turbine and frequently is suspended from the turbine outlet. However, this location is not always the best and the condenser may be found beside the turbine or perhaps split into halves, one on each side of the turbine. Moving the condenser from under the turbine cuts down on headroom but, of course, spreads out the over-all area demands of the turbine generator. The influence of condenser location on plant architecture is sketched in various arrangements *(Figure 4)*.

effects of fuel on steam-electric architecture

Coal: The reason why a boiler designed for bottom discharge of ashes is set higher above ground than a similar boiler fired with oil or gas is shown *(Figure 3)*. If the coal supply to this high-set boiler enters the furnace from an overhead bunker, roof elevations and design of the building steel will vitally affect the dimensions of the boiler house.

For the architect, coal fuel develops problems quite apart from the boiler-house structure. Coal handling involves a number of auxiliary buildings or structures of such diverse shapes and characteristics as silos—either on the ground or roof, elevators, conveyor towers, bridges for moving belts, and possibly an unloading tower on the water front for drop-bucketing coal from barges.

To these structures, frequently there must be added a coal-storage pile that resembles a black, dust-bowlish desert haunted by drag-scrapers, bulldozers, and

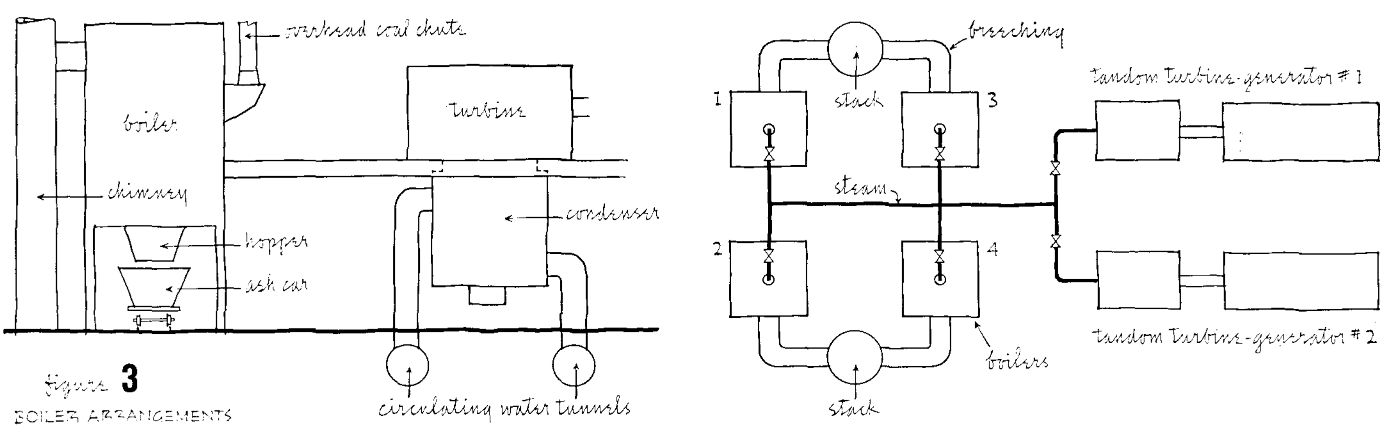


figure 3
BOILER ARRANGEMENTS

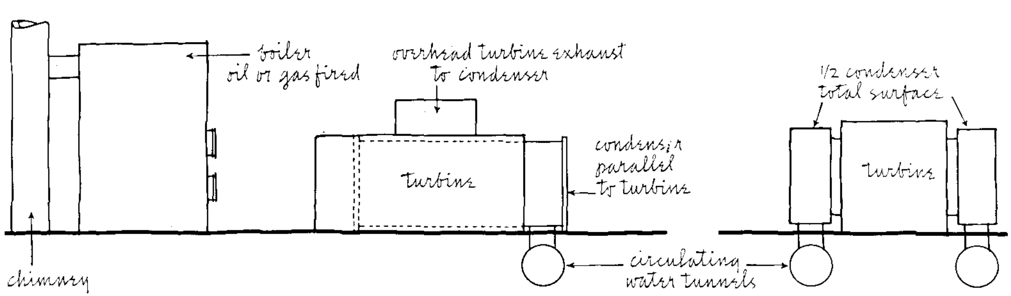


figure 4
CONDENSER ARRANGEMENTS

other materials-handling machinery designed for such service.

The over-all nature of the coal-handling problem, including relative positions of conveyor bridges, towers, coal-storage pile, and so on, is illustrated *(Figure 5)*. The trees in the background suggest a way to conceal the coal pile and to arrest the dust at the area boundary. Landscaping is, or should be, within the architect's area of control. Utilization of concealing foliage is also shown in a substation of the Hawaiian Electric Company *(Figure 6)*.

Ash handling is much less complicated. For one reason, the total material weight is normally only six or seven percent of the coal fed to the boiler furnaces. If the ash is lifted from the boiler alley to a storage bin or receiver by skip hoist, there is, of course, the problem of locating the bin; an outdoor positioning of so bulky a structure probably will not contribute to the plant's appearance.

A favored plan for large, pulverized-coal installations is to sluice away the ashes hydraulically, using water at pressures of 100 lb or more per sq in. The ultimate end of one such arrangement is shown *(Figure 7)*; slurry is discharged into a settling basin where the ash gradually accumulates on the bottom and the excess water, harmless after clarification, drains off to an adjacent river.

While this plan is fine from an engineering point of view, what it does to the landscape planning is obvious.

To summarize, the architect planning a coal-fired project can expect esthetic problems to present themselves on both the black and white sides of the fuel cycle.

Oil: The architect's work is simplified by the use of oil fuel for several reasons:

1. Boilers may be set lower than with coal fuel.
2. Overhead bunkers in the boiler house are not needed, because oil reaches the burners by pipe lines.
3. Oil storage tanks, if provided by the engineer, will usually be outdoor units, designed and erected in accordance with the standards of the American Petroleum Institute and the National Board of Fire Underwriters. Here, the interest of the architect is primarily that of tank orientation, since a decision to place the tank or tanks before, behind, or on one side of the power plant will substantially affect the architectural result.
4. Occasionally, storage tanks of limited size will be housed in small industrial plants for specific reasons of space conservation in yard areas, restrictions of the building code in that particular neighborhood, or simply because space is available under some given roof and the owner desires to use it. Whether the housed tank is located in a separate structure or walled off in a selected area of the plant, the result will be, or should be, work for the architect. Consequently, the architect's early questioning on an oil-fired project should include the two important queries of where and how much oil is to be stored.

Gas: Most gas-fired boilers operate on natural gas and since its burning characteristics are similar to those of oil, the principles of furnace design for one are generally equally true of the other. As with oil, some volume of fuel storage may be considered desirable by the engineer and may even become essential in areas where gas supply is critical at times.

Regarding gas holders, whether of the cylindrical, horizontal type storing gas at high pressure, or of vertical design with an internal piston similar to the familiar gas-works holder, the architect's concern is primarily with holder location. As with oil tanks, the observer will be affected by the impact, or lack of impact, of the holder. If the architect can determine sizes and shapes early in the project, his recommendations on preferred locations have a good chance to be adopted.

The treatment of a project to be fired with city or manufactured gas is similar to that designated for natural gas. Liquefied petroleum gases, however, introduce some special considerations. Both propane and butane normally are handled and stored as liquids (their entry into a gaseous state is dependent on a reduction of pressure over the liquid surface). However, butane will not gasify at temperatures below 31 F, even when the tank is wide open to the atmosphere; consequently, any project that includes butane as a fuel will require, in most parts of the country, some form of heating in or around the storage tank. Propane will gasify all the way down to −44 F, thus being satisfactory without heating, in most areas.

Liquefied-petroleum storage tanks are not permitted in buildings, except those specifically designed for that purpose. Since the distance from such a building to the plant may be not less than 10 ft for storage volumes of 500 gal or more and must range up to 50 ft for tanks of 1200-gal capacity and larger, the design of the storage house becomes a part of the architectural problem.

miscellaneous yard buildings

Most power plants contribute to their economy of operation by condensing the turbine's spent steam; the pure water thus realized is pumped back to the boilers for a new charge of heat energy. This cycle requires a great deal of water for the condenser, 100,000 gpm being not unusual in a turbine of say 200,000-kw output.

If a river is convenient, or a large lake, or the ocean, the design problems center around an intake house, or crib, the piping that leads to the condenser, and the piping which carries the condenser discharge water back to the body of its origin. Being situated on the water's edge, the appearance of the intake house is of importance. The structure contains water screens to prevent trash from entering the system. These screens are usually in constant motion to achieve self-cleaning; consequently, electric motors for actuating the screens must also be accorded space. Large valves and gates with their own operating motors and frequently pumps of various sizes complete the list of major equipment in a typical screen house.

When a plentiful supply of water is not convenient to a plant's location, the condensing water must be reused. Between usings, it must be cooled and to do this the designing engineer commonly provides either a cooling tower or a spray pond. The appearance of a spray pond can be quite pleasing but it characteristically requires a comparatively extensive ground area and wind-born spray can be a nuisance to the neighbors. Occasionally a wind fence is erected to stop the spray in midflight and if this fence is formed of say Lombardy poplars, satisfaction and beauty are achieved by a single contrivance.

The cooling tower, by contrast, is frequently of rather grubby appearance; the reason is, as usual, economic. The redwood of which cooling towers commonly are built resists wetness and weather most successfully when left unpainted. Alternatively, cooling towers are being built of metal, sometimes Bonderized against the weather, sometimes of shining stainless-steel sheets.

Both towers and ponds emphasize how deeply concerned the architect must be with a plant's condensing or cooling water system. The over-all planning is required to weigh the locations of various structures, water-screen houses, cooling towers, spray ponds, and often combinations of these. Rivers in rolling or mountain country, when used for water supply, are sometimes inadequate in seasons of drought. In these areas, the designing engineer almost invariably will develop his water system on a combination basis as the river *and* tower.

the function of a smoke stack

The height of a stack or chimney is important to the boiler it serves because height is an essential factor in producing draft. Other factors which affect stack dimensions are the temperature differentials between the ambient air and the hot gases of combustion, the weight of gases passing through the stack each hour, the frictional resistance inside the boiler, and the frictional resistances of the breeching and of the stack's internal surfaces. From the engineer's knowledge of these factors he creates a stack and the architect can do little but accept the results.

If forced- or induced-draft fans are to serve the boiler, a reduction in stack height can be realized and frequently also a reduction in its bore. However, both of these dimensional curtailments are limited in degree, since short stacks strew soot and cinders around a neighborhood, and an over-narrow diameter may introduce frictional resistance so great that it can be overcome only by increasing the horsepower of the fans.

To illustrate, visualize a stack 100 ft high which is generating a draft at its base of approximately 0.5 in. water gage. If the resistances of the boiler, breeching, and stack-interior surfaces total less than 0.5 in., all is well and the boiler will steam contentedly. If the stack is cut down to 50 ft, thus reducing the natural draft to 0.25 in., immediately the boiler will commence to smoke, the steam production will decrease by half or nearly half, gas explosions may occur in the furnace or boiler passes, and the entire plant will be upset from its normal operation.

The cure for this situation is to restore the essential 0.5 in. of draft by means of a forced-draft or induced-draft fan, sized to make up the lack.

Photo: courtesy of Sauerman Bros.

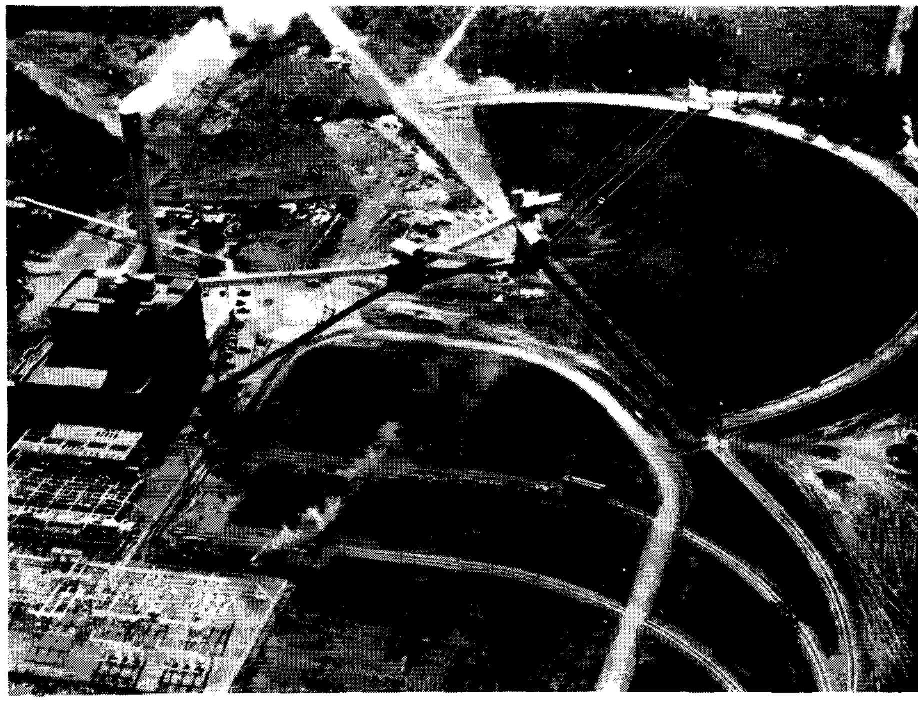


Photo: Honolulu Advertiser

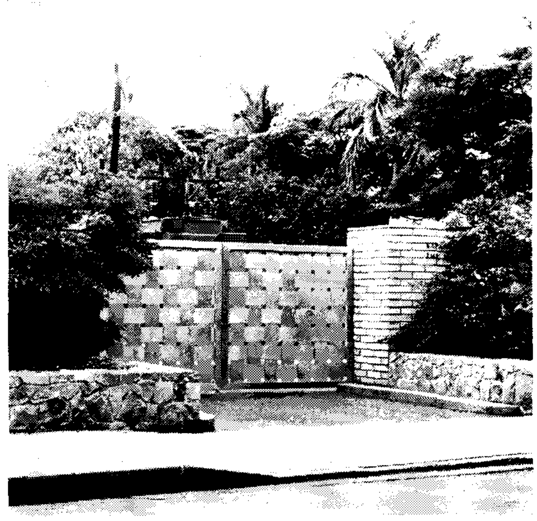
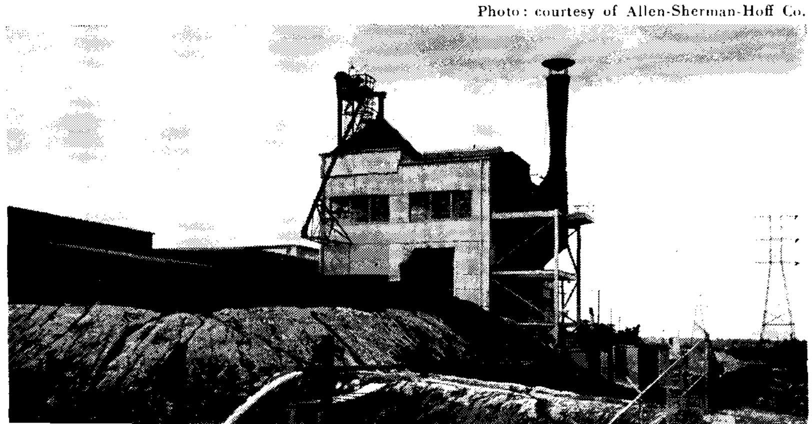


Figure 5—coal handling arrangement (above). *Large drag-scraper machine stores and reclaims at rate of 200 ton per hr at 450-ft radius.*

Figure 6—foliage helps to conceal the Kapahulu Sub-Station, Honolulu, T. H. (right).

Figure 7—hydraulic ash disposal (below).

Photo: courtesy of Allen-Sherman-Hoff Co.



Not infrequently an architect will succeed in controlling or reducing the stack height for schools and public buildings, in the interest of improved appearance. Trouble can follow if the new low height fails to develop the needed draft. There is especial danger present if the stack draft is wholly natural and unaided by fans. This writer has seen a public building suffer heavy damage as the result of a boiler-furnace explosion which followed a reduction in the stack height.

specific engineering prefaces for steam-electric plants: outdoor

The architect naturally expects less work on an outdoor project but nearly always, even in the tropics, shelter is required for a group of weather-sensitive plant activities. These are:

1. The central-control station from which personnel regulate the speed and loading of the many plant components and where the switching of the power from circuit to circuit is governed—in short, where the plant operations are managed.

2. The maintenance or repair department in which both machine tools and hand tools must be kept in readiness for emergency and routine work.

3. The laboratory where water and fuel samples are analyzed and perhaps where plant instruments are checked and calibrated periodically.

4. The general-office area for clerical activities, for supervisors' offices, and the storage of records.

Usually all activities requiring shelter, with the exception of the central-control station, are housed in a common structure which also provides a front and entrance to the plant. The central-control station overlooks plant operations (in many layouts) from an area between the boilers and the turbine generators. It is a collocation of instruments and panels of red and green bull's-eye lights and lately it is taking to the use of a television screen for picturing the internal conditions of steaming boilers.

All shelters will be limited in size and shape to satisfy essentials and nothing more, since the philosophy behind outdoor design is the saving of investment money. Incidentally, weatherproofing of turbines, generators, boilers, motors, ducts, fans, and so on may be expected to add from 10 to 20 percent to the normal sale price of the unit being weatherproofed. Usually this extra cost is more than compensated for by the elimination of a conventional building.

An architect engaged on an outdoor power plant can expect small opportunity to exercise his design ingenuity. This is because sizes, shapes, and relative locations almost always are determined by the designing engineer, having in mind the characteristics of his more or less naked brainchild. The architect's chief problem in most cases is to provide a great deal on an emaciated budget.

Notable outdoor plants well worth study are: Sewaren Station of the New Jersey Public Service Corporation, where boiler balconies are used with striking effect; the Etiwanda Station of Southern California Edison Company, whose designers saved between one and two million investment dollars by eliminating conventional housing; and finally, the Kyrene Plant in the Salt River Valley of Arizona, near Phoenix—a comparatively small plant set against the dramatic background of the desert.

Each of these plants is new, built within the past three or four years, and each gives evidence that machinery can be so arranged that the ultimate effect is dramatic and even a little bit beautiful. Orientation substantially affects the appearance of an outdoor plant, for both good and bad, and on this phase of the project architectural skill can and should be used liberally.

specific engineering prefaces for diesel-electric plants

By comparison with steam-electric plants, which often are as articulated as an insect, the single house of the typical diesel plant is misleadingly simple. It is misleading because to achieve architectural distinction in a straight-line cube is often a most difficult task.

The major machinery components of a diesel plant are these: (a) the diesel engine; (b) the generator; (c) the starting system of air compressor and flasks; (d) the air-intake system; (e) the engine-exhaust system; (f) the control panel which includes synchronizing equipment; and (g) the engine-cooling system.

The architect of a diesel project will find his thinking conditioned by the number and arrangement of the engines, by the need (or absence of need) for cooling tower or spray pond, and by plant orientation with respect to the neighborhood.

Orientation of a diesel plant can introduce sticky problems, not only from the point of view of community appearance but for engineering reasons as well.

First, diesel engines are noisy and the engineer will consequently add a fat-bellied muffler to each exhaust pipe. The result is unsightly and the architect will prefer to place such pipes behind the building where they find some concealment. However, the engineer may have other plans for the back-of-the-building area—he may wish to locate a cooling tower there or a fuel tank—and the exhaust pipes may end up on the side of the building or possibly projecting through the roof.

Second, the air intake should be on the cool or shady side of the building. The reason is that engines require air for combustion in *pounds,* but volumetric limitations cause it to arrive in *cubic feet,* and the warmer the air, the fewer pounds per cu ft. Because of air's nature to expand, a critically laboring engine may lose essential horsepower if the intake air rises much above 110 F.

Supercharging packs in more pounds of air in a given space (and consequently more oxygen) but supercharging is of most value only to engines under full load. At partial loads the warm intake is seldom critical. The designing engineer, however, who is concerned with achieving the utmost in plant efficiency will look always for a cool intake and he will set his grills and ducts accordingly—front, back, or middle—and the architect has another design problem to solve.

A third item of importance can be the cooling tower or towers—very common adjuncts to a diesel plant. If only one tower is needed, the engineer will not want to locate it on the leeward side of the building or even close to the building, as in both locations its efficiency suffers from wind-blanketing. If more than one tower is planned, they must be kept clear not only of the building but also of each other, since recirculation often plagues towers in proximity and the reduction in efficiency, as a direct result, has been known to reach 30 percent.

In order to do his best on a diesel project, the architect should be promptly informed at the start on: (a) the number, size, and arrangement of the engine generators; (b) the weight of the heaviest piece and the overhead clearance needed; (c) the characteristics of the site and the prevailing winds;

(d) the number and placement of cooling towers or ponds; and (e) the relative positions of houses, streets, and the type of the community in which the plant is to be built.

The weight of the heaviest piece and the overhead clearances are extremely important to the architect, since he must provide crane supports and foundations, as well as ample space for handling engine and generator parts.

Architecturally, perhaps the best examples of diesel-plant design will be observed in municipal projects. These buildings fall into the public-building class and usually are intended to be viewed with pride by the taxpayers.

specific engineering prefaces for gas-turbine plants

The architectural design for gas-turbine plants is without special precedent. The gas turbine is an internal-combustion engine and, consequently, its problems of plant design match more nearly those of a diesel installation. However, these peculiar characteristics must be recognized and allowed for: (a) gas turbines are deafeningly noisy—at 45,000 rpm their output of sound is siren-like in its ear-splitting intensity—and architectural treatment may be asked to contain the noise; (b) there are two kinds of gas turbines, requiring different areas and different arrangements—the simple cycle wastes a great deal of heat to atmosphere and operates at comparatively low efficiency, say 14 to 16 percent. Housing is also simple, the machine being smaller and lighter than any other type of driver of equal horsepower. The complex cycle incorporates heat-saving equipment such as heat exchangers and regenerators and will need a measure of cooling water if more than one air compressor is part of the design. Housing, therefore, is expanded for a complex unit and the need for a cooling tower or pond or natural-water source is probable. Finally, (c) the gas turbine is far more sensitive to inlet air temperatures than is the diesel engine, since large volumes of air are compressed and this sensitivity will have an important effect on plant orientation. Actually, the best efficiency is realized at high, cool altitudes, winter climates, and in the Arctic and Antarctic.

While gas turbines are being built and installed to deliver up to 7500 kw, the design is not yet finalized—at least it cannot yet be said that one arrangement is always better than another. Work is in progress on a closed-circuit design in which the air is reused over and over again, being heated at one point on the circuit by a separately fired combustor. In this arrangement, several gases other than air—such as argon, krypton, and mercury vapor—offer possible improvements in the gas-handling treatment and eventually may replace air completely. In such a cycle, the gases of combustion do not pass through the turbine; consequently, the turbine blades last longer and lose efficiency at a comparatively slow rate, thus providing considerable inducement for a choice of the closed-circuit machine.

Public-utility companies, generating power by steam, are liable at any time to lose the load by a boiler-tube failure, by poor coal, and so on, and in these situations the firing of a stand-by boiler can extend into hours. By contrast, a gas turbine can go from cold status to full load in a few minutes; all that is needed is to start the turbine by electric motor, bring it up to speed and cut in the fuel. The initial firing is conventionally produced by a spark plug but almost at once the combustion becomes self-sustaining. No wonder public utilities are adopting them.

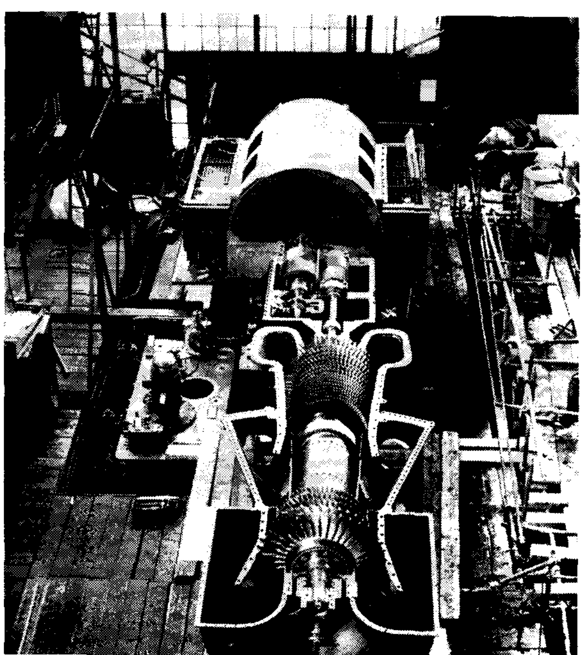
The architect undertaking a gas-turbine project will have neither stacks nor coal piles to contend with but he is faced with a noise problem that he may be asked to solve someway. He might have a waste-heat boiler to be mounted either outdoors or indoors, a regenerator for either outdoors or indoors, and a cooling tower—all of these occupy considerable space. A Westinghouse gas turbine of 7000-kw capacity with the upper halves of the casing removed is shown *(Figure 8)*. The built-in combustor is clearly visible between the compressor and turbine.

specific engineering prefaces for hydroelectric plants

Engineering complications for the architect are least in a hydroelectric project. Penstocks, conduits, tail-races, normally are located below grade where they appear within the powerhouse walls and do not particularly concern the architect.

Engineering decisions on which the ultimate architectural design will be based include these: (a) the choice between vertical- and horizontal-shaft machines. As a rule, generators that require 1000 shaft hp or more in the driving unit are favored with vertical shafts; (b) the number, size, and arrangement of the units; (c) the type of water wheel, whether it is of Pelton, Francis, or Kaplan form. The choice of

Figure 8—7000-kw gas turbine with upper halves removed. Photo: courtesy of Westinghouse



wheel design affects the weight and volume of the heavy pieces which must be handled by the turbine-hall crane.

Pelton wheels are impulse machines with the stream striking buckets on the water wheel; Francis impellers are of the reaction design with full-head pressure on the rotating vanes; and the Kaplan wheel resembles a ship's propeller. This last is usually employed under heads of less than 100 ft, so the architect considering a high-head project need not give preliminary thought to it.

Hydroelectric projects, as a rule, impose less urgency on the architect than do other power plants, as the building characteristics are less intimately bonded to the machinery.

The general arrangement of a Leffel low-head turbine is shown *(Figure 9)*. This arrangement of the turbine room for a vertical generator is typical of the form.

specific engineering prefaces for atomic-power plants

A model nuclear-power plant, built by North American Aviation, Inc., for exhibit by the United States Information Agency at the São Paulo World's Fair, in Brazil, is shown *(Figure 10)*. Architects already knowing steam-electric design will observe that three areas of novelty have been added to the familiar. Area① is devoted to the reactor where the heat of fisson is released; Areas① and② contain the heat exchangers where the heat is put to use. In this plant, the heat-carrying medium is liquid sodium and the steam for driving the conventional steam turbine is generated in the ultimate group of exchangers, Area③. The remainder of the plant, Area④, is of course familiar.

This model illustrates the basic components of an atomic-power plant and though it suggests a probable and acceptable form of architecture, other ideas will be implemented. For example, a sphere *(Figure 11)* also houses an atomic energy plant built by the Chicago Bridge and Iron Company for the U. S. Navy at West Milton, New York. This steel sphere is 225 ft in diameter and is approximately equal in height to an 18-story building.

The radical differences between these two designs illustrates the present wide latitudes in architectural atomic thinking. Clearly, there is not much common ground on which to rest engineering prefaces, since every plant is highly individual, even to the selection of the heat-transferring material for circulation through the heat exchangers. However, the following assumptions may be considered reasonably correct for preliminary thinking:

1. The proportion of total investment that goes into the building is relatively high. One authority estimates that building structure alone *will involve* up to 70 percent of the total funds.
2. Shielding is *not* a major item of cost.
3. The investment per kw of output will range from $250 to $300. On this basis, the building proportion could fall between $17.5 and $21 millions for a 100,000 kw project.
4. Economically, atomic power looks most attractive for plants of 100,000 kw or more when located in areas of high fuel costs.
5. Many communities object to the proximity of an atomic plant, fearing danger from escaping radiation. Since the spherical plant at West Milton is designed to contain *all* the radioactive products of nuclear fisson should *all* reactor controls fail, some equivalent guarantee might be demanded of projects in other areas. How this demand could affect the plant architecture must be imagined.
6. The general adoption of nuclear

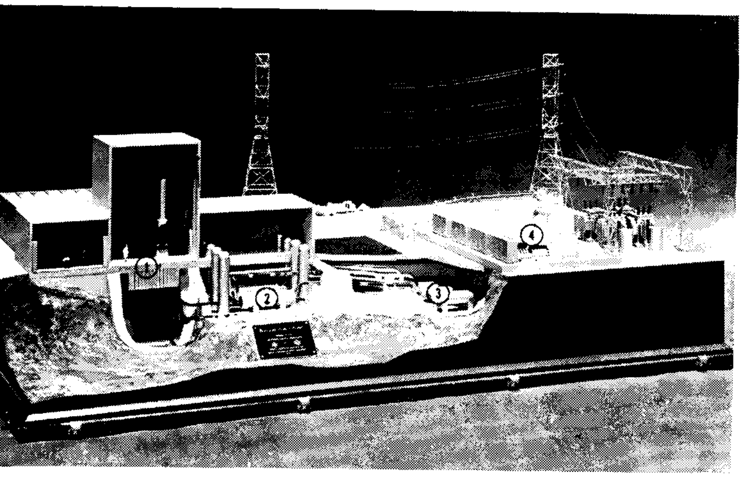


Figure 10—model of atomic-power plant.

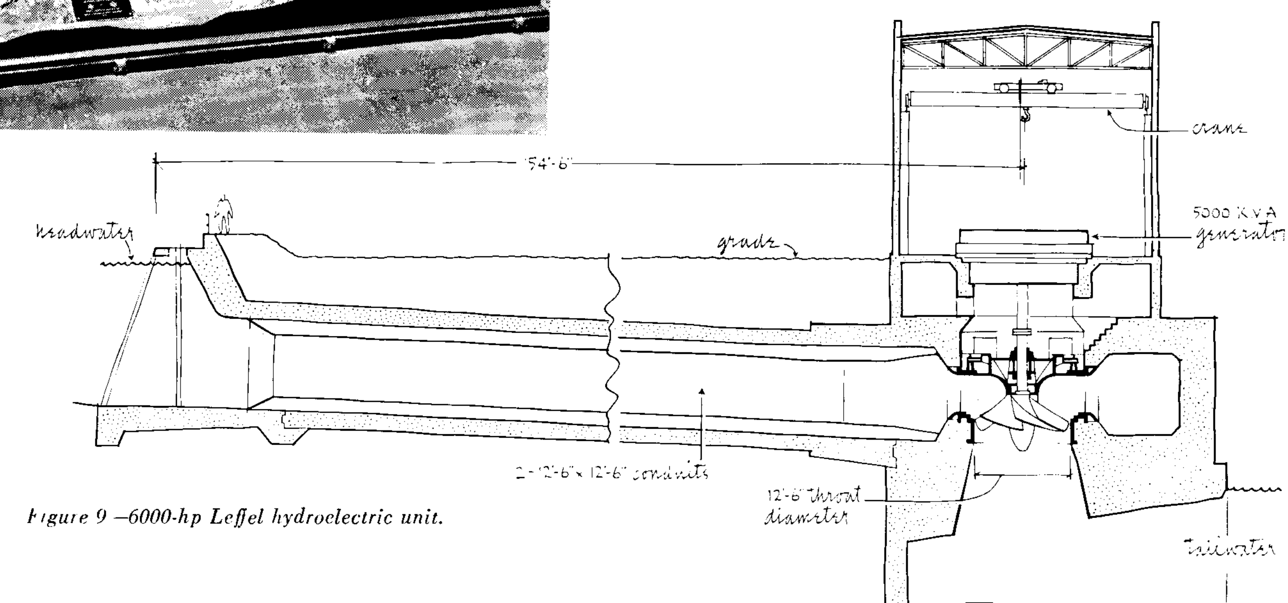


Figure 9 —6000-hp Leffel hydroelectric unit.

power will be delayed until some method is found for the safe disposal of atomic waste. Much of the reactor ash remains toxic for years and continues to be dangerous long after the container in which it is buried or sunk in the ocean has corroded to nothing. *Electrical World* has estimated that by the year 2000 the toxic waste from plants presently building and contemplated will require for their safe dilution approximately 1/10 of all the water in all the seas of the world.

destinations in power-plant architecture

The understanding of building materials, landscaping, and to some degree lighting, has always been the field of the architect. Problems of shape nearly always have been solved by the designing engineer, but with a knowledge of the reasons for placing mechanical and electrical components in certain physical relationships to each other, the architect should be expected, sooner or later, to create some newness of shape.

The old traditional shapes are not sacrosanct, despite the heavy weight of custom. Even the engineers are acknowledging this fact; several of the very latest steamship designs call for the boilers in positions directly over the turbines and at least one power plant has been shaped like a ball *(Figure 11)*.

One form of plant that might be developed into practicality and with a sound foundation of engineering logic is suggested *(Figure 12)*. In this design the boiler is suspended over the turbine, the condenser nestles beside the turbine, and the circulating water for the condenser is spilled down the long slope of the roof line and aerated as it spills in order to expedite cooling. The feed water, on its way from the condenser hot well to the first-stage heater, is exposed to sunlight in a pipe grid on the other slope of the roof, thereby adding a little to plant efficiency in the form of solar Btu. Incorporating an oil-storage tank into the skin of the building, ship fashion, relieves the plant from providing the oil tank with a heating system for cold weather, shortens piping runs to the burners, and reduces pumping costs.

While the architect has exercised diversity in his use of building materials, ranging through concrete, clay masonry, aluminum, stainless steel, preformed compositions of steel and asbestos, glass, and glass blocks, the possibilities of color seem but superficially explored. An examination by this writer of several dozen representative plants produced these data:

a. The hydro plants, almost without exception, are white.

b. 33 percent of the steam and diesel plants are basically either dark-red or buff-red brick.

c. 50 percent of the steam and diesel plants are basically gray or gray-white with brick trim.

d. The remainder use cream and buff, except those of outdoor design which favor black, gray, blue, green, and similarly subdued colors.

e. Most of the auxiliary buildings have been completed in red brick or buff-red brick. In one instance an excellent appearance has been achieved with a canary-yellow office against a cream-colored plant.

This notable sameness of color combinations suggests that architectural imaginations have not been exercised to their full capacities. Certainly in a world that leans more and more to bright color, power plants should not be drab.

The fact is that a new power age is just beginning and our ultimate destination—if there is one—is not yet in sight.

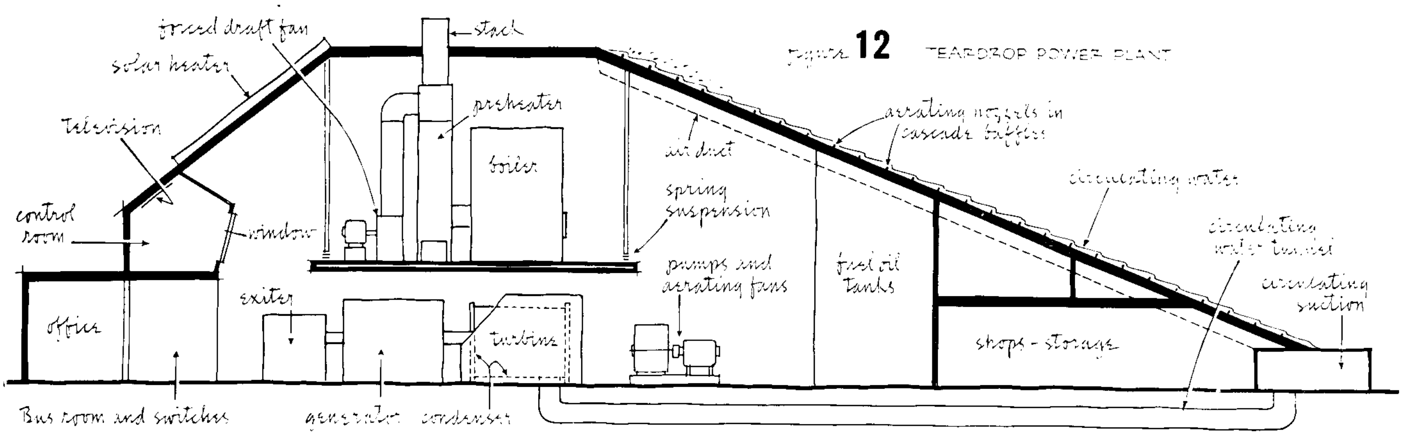
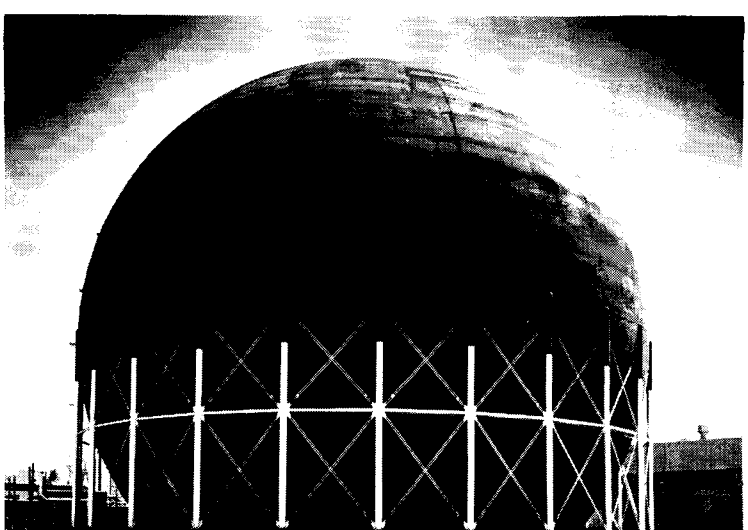


Figure 11—sphere designed to house atomic-power plant at West Milton, N.Y. (right).
Photo: courtesy of Chicago Bridge and Iron Co.



plastics for interior walls

Plastic building materials have gained an increasingly prominent role in the construction field and are beginning to play an important part in interior-wall construction. If an architect is to use a plastic properly in any segment of construction, he must be familiar with the composition of the material, its characteristics, its advantages, and its limitations.

It would require volumes to cover all of the technical aspects of plastics—what they are, how they are formed, and how they are varied. There are hundreds of different plastics, each suited to a particular set of requirements. Broadly speaking, however, plastics are organic compounds of carbon mixed with other elements, such as hydrogen, oxygen, and nitrogen. Some of the mixtures form thermoplastic materials which have long, chain-like molecules that will soften under application of heat and harden when cooled. Other mixtures form thermosetting materials, which have long-chained molecules cross-linked to form large net-like molecular assemblies. Most thermosetting plastics are prepared originally in thermoplastic form, but are molded under pressure and high temperature so that they set permanently—thereby becoming infusible and insoluble. Thus the thermosets show greater strength characteristic and will hold up under higher temperatures.

Though there are hundreds of different formulations of plastics, there are only five basic groups which need be considered for interior-wall use. In the thermoset category, phenolics, aminos, and polyesters are used in interior walls, while in the thermoplastic category, styrenes and vinyls are used.

design characteristics

Design characteristics that should be kept in mind when using plastics in any form of construction are: load factor, thermal expansion, resistance to moisture, shaping, and temperature range.

The coefficient of expansion of many plastics is high *(Figure 1)*, ranging anywhere from that of steel to about 19 times that of steel, for certain phenolics. Therefore, when used in conjunction with steel or glass, the coefficient of the plastic should be checked and allowance made for expansion in joints.

Load factor is important in that an adequate safety factor should be included in all designs. Primary fact here is that thermosetting plastics are, in most cases, stronger than the thermoplastics.

Where possible, materials that absorb moisture should be avoided in wall panels, because the resultant swelling and contraction will cause crazing in the plastic. Although long-term studies of plastics under all weather conditions have not yet been completed, so far most plastic materials have shown fairly good resistance to the elements.

Plastic materials are not fireproof as they stand, but they can be treated or combined with fire-resistant materials. For the plastics used most commonly in wall panels, the maximum-use temperatures range from 160F up to 300F *(Figure 2)*. The thermosets show the best fire-resistant qualities.

A minimum number of changes in thickness of the plastic material should be strived for in any one unit. Sharp edges and V-notches should be avoided where possible, because of the stress they place on the material. Uneven thicknesses cause poor curing.

interior-wall requirements

After considering the characteristics of the plastic materials available, it is well to consider the functional requirements of the unit in which the plastic will be used —in this case the interior wall.

The purpose of an interior wall or partition is to divide space so that privacy, satisfactory viewing, and acoustical comfort are provided. In addition to functional requirements, the interior wall must be relatively easy to install, and must have low maintenance cost, or be simply and inexpensively replaced. In the case of plastics, the interior wall might even offer mobility. It may be used to control light effects through use of plastics which have transparent, translucent, opaque, or luminescent qualities.

An esthetic requirement of the wall is to provide decoration and the plastic wall's adaptibility to color, texture, and application of ornamentation is extremely wide.

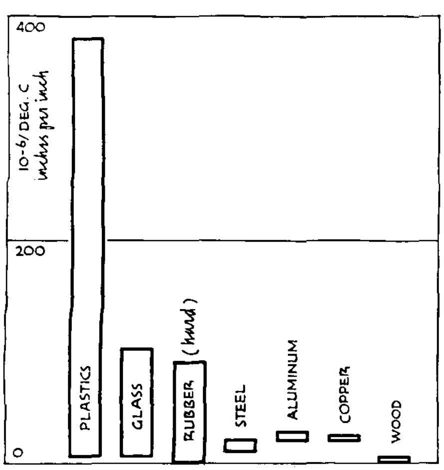
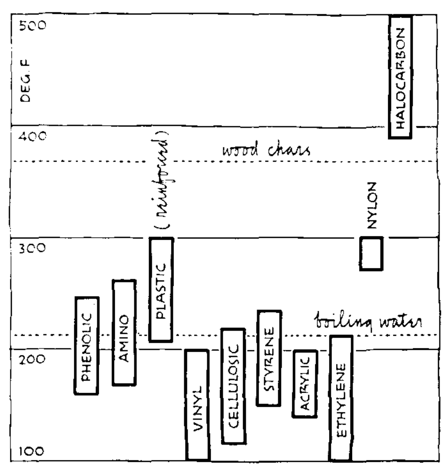


Figure 1—thermal coefficients of expansion, inches per inch, for plastics and various other familiar building materials (left). *Relatively large amount of expansion in plastics demands careful consideration of joint details.*

Figure 2—average maximum-use temperatures of different plastics (right).



by Michael F. X. Gigliotti*

Although interior partitions are frequently nonloadbearing, when the interior wall *is* an important structural component of a building certain plastics can be used successfully by taking advantage of their high strength-to-weight ratio.

Plastic walls also should be considered as possible outlets for radiant heat, heating ducts, and air-conditioning equipment.

acoustical characteristics

Acoustical characteristics of plastics in interior walls vary. Generally, vinyls range from good to excellent in terms of sound absorption, but styrenes and melamines range from fair to poor. Current experimentation in various plastic formulations and combinations should increase the variety of panels offering greater sound absorption.

For instance, sandwich panels have been made combining a honeycomb core of phenolic-impregnated kraft paper, surfaces of reinforced plastic, and various types and amounts of core fillers, such as sand and finely divided silica.

In tests, an unfilled panel had a sound-transmission loss of five db. By filling the core with the silica, a transmission loss of 30 db was obtained without adding unreasonably to the weight of the panel. Commercially available "lightweight" partitions had a transmission loss of 20 to 25 db. Tests of these panels were conducted for a one-octave band (600-10,000 cycles or approximately the frequency range of average household noise).

**Manager, Structural Plastics Engineering Group, Monsanto Chemical Company, Springfield, Mass.*

core applications

Perhaps the greatest contribution that plastics will make to the building industry is in the curtain-wall field where exterior and interior surfaces, as well as core material, can be of plastics. The combination of strength, light weight, ease of fabrication, good insulation, and moisture resistance adds up to plastic curtain walls being suited for wide use in framed buildings and in loadbearing structural units for frameless structures.

There have been recent examples of partition and curtain-wall panels using both a plastic core material and the plastic skin. Sandwich panels designed to be mounted on a light aluminum frame have been as large as 4′0″ x 9′4″ and ½″ thick. The core materials used in these panels have been low-density vermiculite, grain balsa wood, foamed cellulose acetate, or honeycomb paper bonded with phenolic resin.

An experimental building at the University of Michigan now utilizes a plastic sandwich panel which is composed of a self-extinguishing foamed-styrene core between glass-fiber-reinforced polyester skins.

When used as the core material for a wall panel, a plastic can offer many advantages. Most plastics are good insulators and are ranked as "exceptional" when used in an expanded foam. The foaming is done mostly with the styrenes *(Figure 3)* and the isocyanates. These materials have a low K factor (0.25), are light in weight (approximately 1.3 to 4 lb per cu ft), have good compressive strength (30-35 psi), and have good water resistance and negligible vapor transmission.

In addition to styrenes and isocyanates, other plastics which can be foamed and used as core materials are cellulose acetates, acrylics, phenolics, and polyesters. Certain foams can be formulated to have isolated or interlinked cell structures to provide considerable variation in insulation and other properties. Isocyanates, for example, can be controlled for insulation, density, and rigidity.

All of the foamable materials can either be preformed into large sheets or foamed in place between the skins of the wall at the construction site. A variation of the latter method consists of setting up wall forms, pouring the foam into the form, and applying the wall skins to the foamed core. Because of the extensive machinery required for foaming plastics, however, foaming in place is suitable only for mass-construction operations involving at least 10 homes.

The phenolics and styrenes are the most economical of the plastic core materials. The isocyanates give the best rigidity and strength, and the acrylics, though high in cost, are the best for use in translucent panels which might be exposed to the sun.

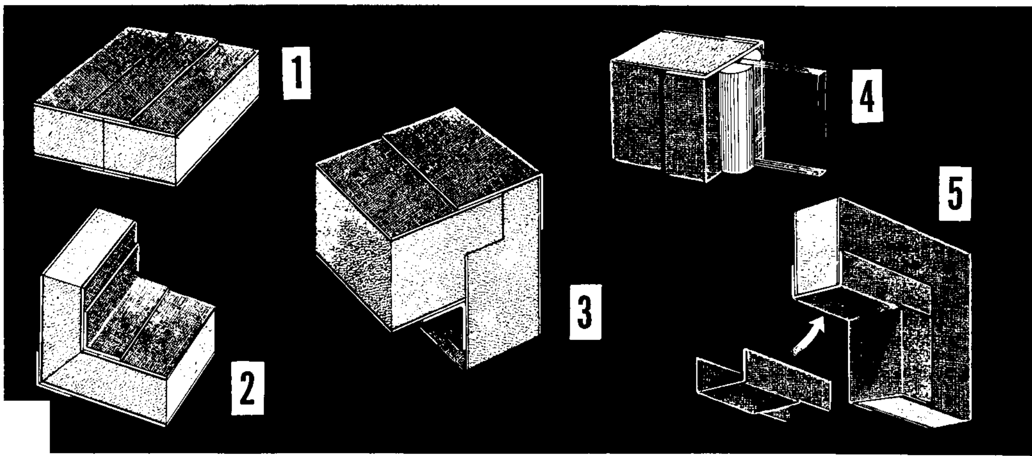


Figure 3—typical assembly details of laminated-sandwich panels composed of glass-fiber-cloth polyester faces and foamed-styrene cores: (1) joint with batten strips; (2 and 3) mitered and rabbeted corner joints with plastic angles; (4) fixed window with channel; (5) cutout or exposed-edge corner joint.

Details: Haskelite Manufacturing Corp.

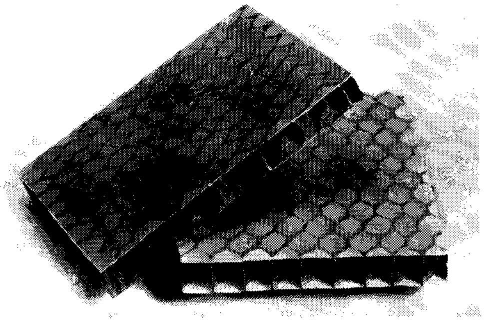


Figure 4—one-half inch sandwich panels of translucent-plastic skins and phenolic-impregnated paper cores (left) *can be used for interior partitions: larger panels can also be used for exteriors. Synagogue* (below), *designed by Fishman Alschuler Associates, uses this translucent material in façade adorned by Star of David.*
Photo and rendering: The Englander Co., Inc.

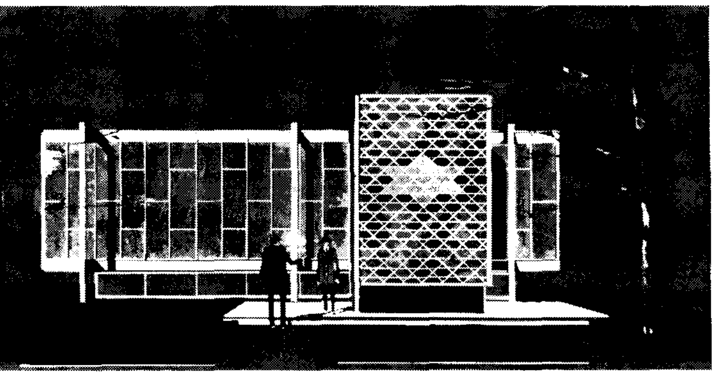


Figure 5—striations on new styrene wall-board are formed during extrusion of panel.
Photo: Monsanto Chemical Co.

Another wall-panel core utilizing plastic materials is the phenolic-impregnated paper honeycomb. This particular material is available in any desired thickness and provides good strength when bonded to the wall skins. It is extremely light and allows large panels to be used. Phenolic-impregnated paper honeycomb offers excellent visual possibilities if used with translucent surfaces *(Figure 4)*. It has high sound- and heat-transmission qualities when used without filler—and is used to best advantage when these are not factors in the panel function, since filler adds to cost and weight.

Phenolic-impregnated wood chips also are used as a core material. These add exceptionally high strength to the panel. They are nondirectional, heavy, and are dimensionally more stable than an equivalent thickness of soft wood.

Phenolic-impregnated wood chips are produced on a continuously moving belt and are available in eight-ft widths in any length desired. This is a relatively inexpensive material since it is made primarily of granulated wood. Phenolic-impregnated wood chips permit factory fabrication of custom partitions with unlimited strength. The structure of this core is rigid and no skin, or only a very thin nonstructural skin, is required. If no skin is used an interesting textural effect can be obtained. This panel core has fair acoustical characteristics and has good fire resistance.

The principal problem encountered in the use of plastic materials as wall-panel cores is that a suitable method of standard jointing for the panels still needs to be developed. This is especially true when the plastic is used in conjunction with other building materials, such as steel or aluminum. The differences in coefficient of expansion might result in buckling of the panel or cracking around bolts unless adequate allowance is made for movement between the panel and supports. One suggestion that has been advanced to overcome this handicap is that an extruded-plastic edging strip, which also serves as a joint, with gasketing for soundproofing, might be incorporated with the panel during manufacture.

special effects

Where borrowed light is required or where special spatial effects are desired, a translucent or transparent plastic panel is ideally suited. This type of panel is usually made of acrylic, polyester, or glass-butyral-glass material.

A translucent or transparent plastic wall-panel surface can be metalized so that light can penetrate from both sides but vision is just one way. In the laminated type of panel, any pattern can be printed or sandwiched into the panel. The acrylic, which has poor surface scratch resistance, can be improved by an integral silical face. Polyester, reinforced with glass fiber with a corrugated or molded core offers extremely high strength in thin, translucent panels.

Polyester, combined with glass, and decorative safety glass also are utilized for decorative purposes in wall paneling. Though both are extremely durable and offer advantages in cases where light transmission is desired, they are limited because of the cost factor.

The sandwich panels offer unlimited combinations of materials to give desired mechanical and visual qualities. Because plastic panels are extremely light in weight and can be produced simply, it is feasible to manufacture them in large sizes, reducing labor costs and cutting erection time on the job.

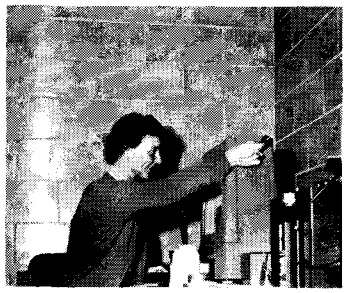


Figure 6—polyester-glass-fiber surface laminated to cinder block (above left) *provides extremely durable finish.*

Figure 7—for industrial laboratory (above right) *cinder blocks are surfaced with a color-impregnated, reinforced-plastic facing that is only 1/32" thick. This skin material is still in the experimental stages.*

Figure 8—louver-type partitions and grill-work on door are of reinforced plastic. Photos: Monsanto Chemical Co., U. S. Rubber Co., Russell Plastics Corp.

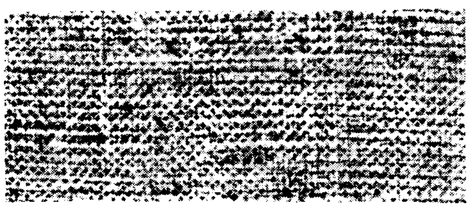


Figure 9—these bathroom walls are covered with vinyl-plastic-coated metal sheet. Plastic applied by patented process is waterproof and scuff resistant. Detail (above) *shows three-dimensional pattern which is formed after plastic has been bonded to metal sheet.* Photo: Clad-Rex Steel Co.

surfaces

From a functional point of view, plastics offer the architect a variety of materials which present an easily cleaned, attractive, and durable surface on any wall panel. An almost infinite variety of textures and colors can be achieved with plastic materials. Because of these factors, the widest current use of plastics in relation to wall panels is for surfacing.

Decorative melamine and polyester are very similar in their characteristics. They both offer wide color range, but melamine is limited texturally. Polyester is slightly lower in initial cost, but the higher mar resistance of the melamine results in lower maintenance costs.

For both new and existing construction in areas outside of the bathroom and kitchen, it is felt that the vinyl covering or surfacing offers the most suitable and adaptable characteristics. It has a very tough, abrasion-resistant surface, will not support combustion, and is available in a broad range of colors and textures. Another important favorable characteristic of vinyl is the ease with which it can be installed.

The durability of stryrene as a wall-surface material has been well established in the bathroom area in the form of wall tile. A completely new style development in the wall-tile field was announced recently. This styrene tile makes it possible to obtain an unique textured effect in various colors, which incorporates a suggestion of a stippled second color. The result is a dramatic change from conventional wall-tile color effects since the illusion of a granite-patterned surface is achieved.

A striated, styrene wall panel for improved surface texturing of plastic sheeting is now being marketed (*Figure 5*). The striations—formed during the styrene panel's extrusion—add depth to wall surfaces, thereby lending an added character to institutional and residential interiors.

A new development gaining wide usage is the plastic-coated cinder block (*Figure 6*). A polyester glass-fiber or sand-filled resin containing a styrene monomer is laminated to the cinder blocks to provide a structural unit which is durably predecorated and requires no further finishing treatment during or after construction.

In terms of total construction costs, these special blocks compare favorably with conventional cinder units and, therefore, it is expected that the building industry will continue to expand its application of them. For instance, it is foreseen that realtors will offer residential home buyers an added inducement in the form of a prefinished cellar den with little or no extra construction costs involved.

The use of plastic materials in construction of interior walls adds to the design freedom of the architect. Flexible use of space is made possible by movable partitions and by free-standing storage units serving as space dividers. When using these flexible partitions, the architect is faced with the problem of providing visual appeal, light weight, sound and thermal insulation, and movability—all at low cost. Plastics satisfy all of these considerations.

The plastic materials offer the architect and builder an attractive design and engineering medium which can be used in ever increasing amounts for more functional and attractive structures.

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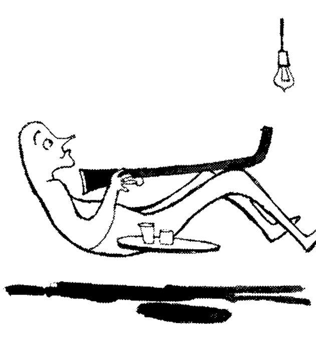
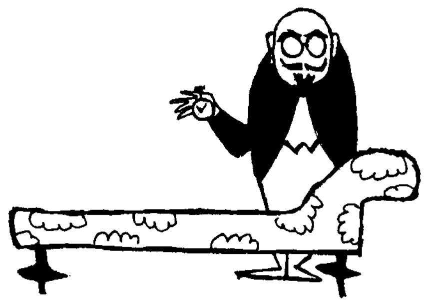
Once I am ensconced securely in my trusty contour chair, rigor mortis sets in almost instantly. Unfortunately, however, at the zenith of complete relaxation, invariably, things happen to me like, say, turning the lights off or fumbling with the problem of less light so that I can observe the cultural benefits of television. I then huff and puff and tote that barge around unscrewing light bulbs to lower the wattage and conserve these dimming peepers. It is at this moment that I invent a gimmick located conveniently near my hot little hand to dim, dim the lights. Happily such a gadget is now on the market so I abandon the invention and patent filing fees and latch on to Luxtrol. What a convenience! And, good looking too! What's Luxtrol? Glad you asked. Luxtrol light control is a 6½″ x 8¾″ x 3 11/16″ deep unit designed to replace the ordinary on-off switch in a wall. Essentially, it is an autotransformer with a movable brush contact riding on a bared portion of the winding. Rotating the contact arm by turning the knob produces any desired light intensity from complete darkness to full brightness. Since the brush is always in contact with the winding, operation is always smooth, silent, and without flicker. A switch is incorporated at the blackout position to shut off the entire circuit. The unit controls by converting watts and uses only the current required to produce the desired illumination; it handles 360 watts of lamp load. Any number or combination of lamps up to the full rated capacity can be controlled. If one lamp burns out or is removed from the line, control of the others is in no way affected. Double protection assures complete safety; both fuse and a thermal overload are provided. The external operating knob and the face plate are styled to blend harmoniously with any room decor. Several optional finishes are available. This is a jim-dandy convenience and I must admit I get an elated sense of lolling in the lap of luxury with my lovely Luxtrol.





$25 please

Pull up a couch. Dr. Small is in a psychiatric mood today. Hm-m-m. Now, let's see! It is my professional judgment that people who have long-winded tendencies in writing specifications possess an ample thoracic cage conformation and write unconsciously with graphic wind pressure equal to their oral variety. Conversely, the emaciated low-blood-pressured specifier usually has a Spartan approach which leaves too much to the Contractor's imagination and, as a consequence, could tax the modulus of elasticity of the Owner's purse. Where, O where does one find the compleat specifier? The lad who was educated in primary or secondary school which had the precisely correct color combinations conducive to complete comprehension, the exact amount of foot candles to permit his orbs to operate without ogling, the contour furniture that was kind to his spinal column and resultant posture, the orientation magnificent, the noise-reduction coefficient of the acoustical system that kept his aural equipment clicking with the clarity of hi-fi, the core curriculum that kept his cranium charged with alacrity? If you find such a guy, you can keep him. I prefer the one who was beaten daily by his drunken father, who was toilet-trained before age two, who learned the 3R's by daily drill on furniture fixed to the floor, who worked in a variety of skills in the construction industry, who is a crazy mixed-up individual full of compulsions to do things well, thoroughly, timely. Your hour is up, $25, please!

streamliners

Note to those in my streamlining cult—listen fellers, do you know why some specifiers refuse to streamline? You don't? Blaise Pascal does. He says, "I have made this a rather long letter because I haven't had the time to make it short." So there!

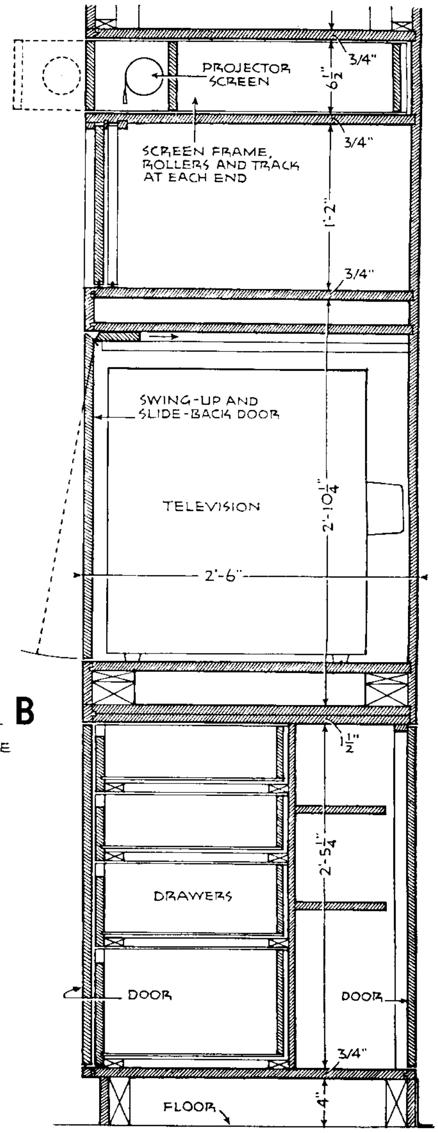
new nest

Zounds, the sounds are killing me! I sold my old home and bought a younger model. The hot-water-heated older girl was quiet and was wont to go about her business (disintegrating) in respectful silence. Our new nest has young but louder arteries. Its 52,000 cubic feet came complete with tones stereophonic carrying the cacophony of each busy little motor which gives sustenance to the refrigerator, the freezer, the clothes washer, the clothes dryer, the kitchen exhaust fan, and the fan that pushes the hot air around. In short, if you are sensitive to sounds, as is Small, stay away from ducted domiciles. Apropos of nothing at all (perhaps it is the hot air I mentioned above), did you know that a simple cough drives air from the lungs at 200 miles per hour? (I lose more readers that way.) Well, then, to ramble a bit, did you know that a relatively new chemical by the name of nitroparaffin will prevent annoying skin or top scum in paint cans? If you are a do-it-yourself as I am, you will find this a cozy convenience. Rambling on a bit more, I would like to mention that I went on a resilient-flooring binge in the new nest. Talked to everybody. Even read my own articles and lectures on the subject! Learned nothing here. Called in ever-faithful Joe Aiello, manager, architectural division of Mastic Tile Corporation, who happily subscribes to my theory that service to the architect comes first, then the commercial. As usual, Joe made excellent recommendations and I am delighted with the results. Mastic Tile Corporation, in a short while, will turn out 500 million square feet of tile annually or about 45 percent of the total industry output. Reckon they must have something to warrant that kind of acceptance, eh? For the past several months I have been bragging to Mrs. S. about the minimal maintenance on our new vinyl-asbestos and homogeneous vinyl-tile flooring. Meet Mr. S., vice-president-in-charge-of-every-Saturday-morning minimal-maintenance-in-the-new-nest.

p/a selected detail

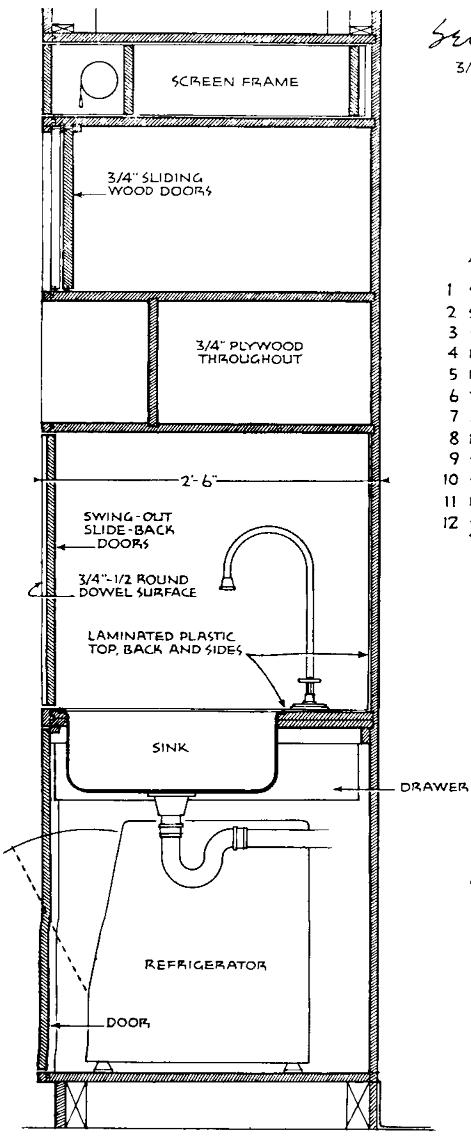
storage wall

MARTIN LINSEY



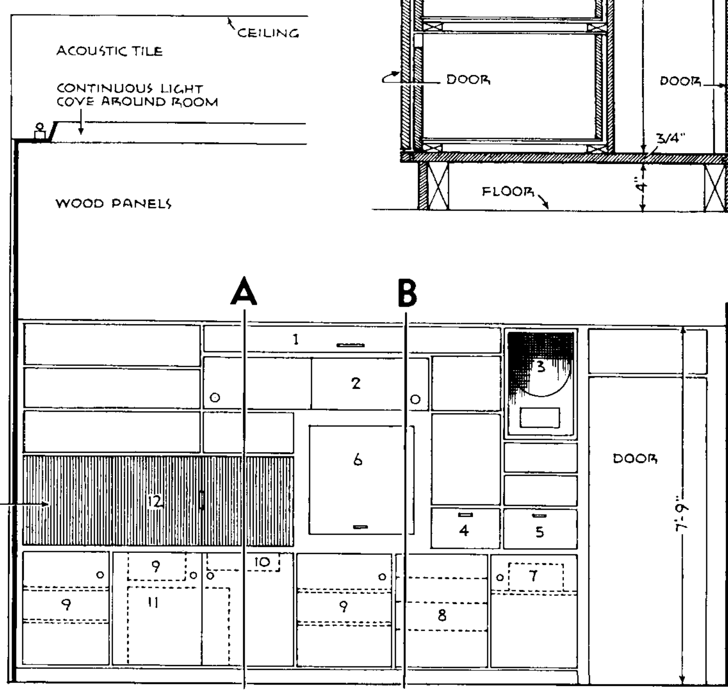
Section A
3/4" SCALE

Section B
3/4" SCALE



Legend

1 SCREEN HOUSING
2 SLIDING PANELS
3 SPEAKER
4 RADIO
5 RECORD PLAYER
6 TELEVISION
7 AMPLIFIER
8 DRAWERS
9 SHELVES
10 SINK
11 REFRIGERATOR
12 SWING-OUT AND SLIDE-BACK DOORS



Elevation
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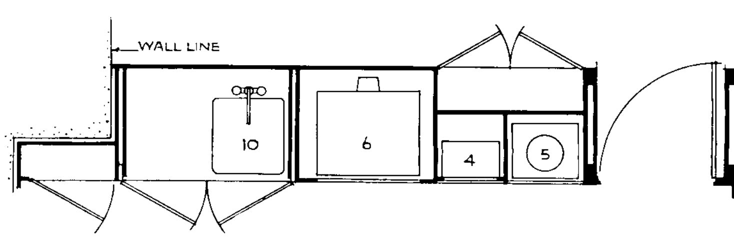
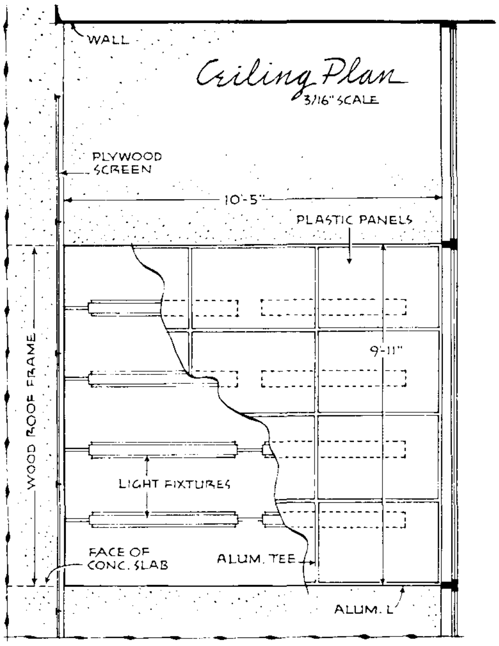
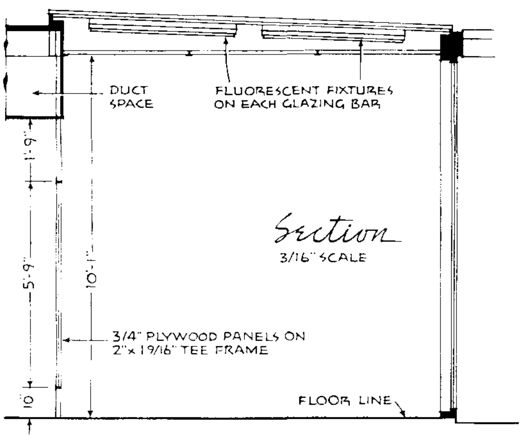


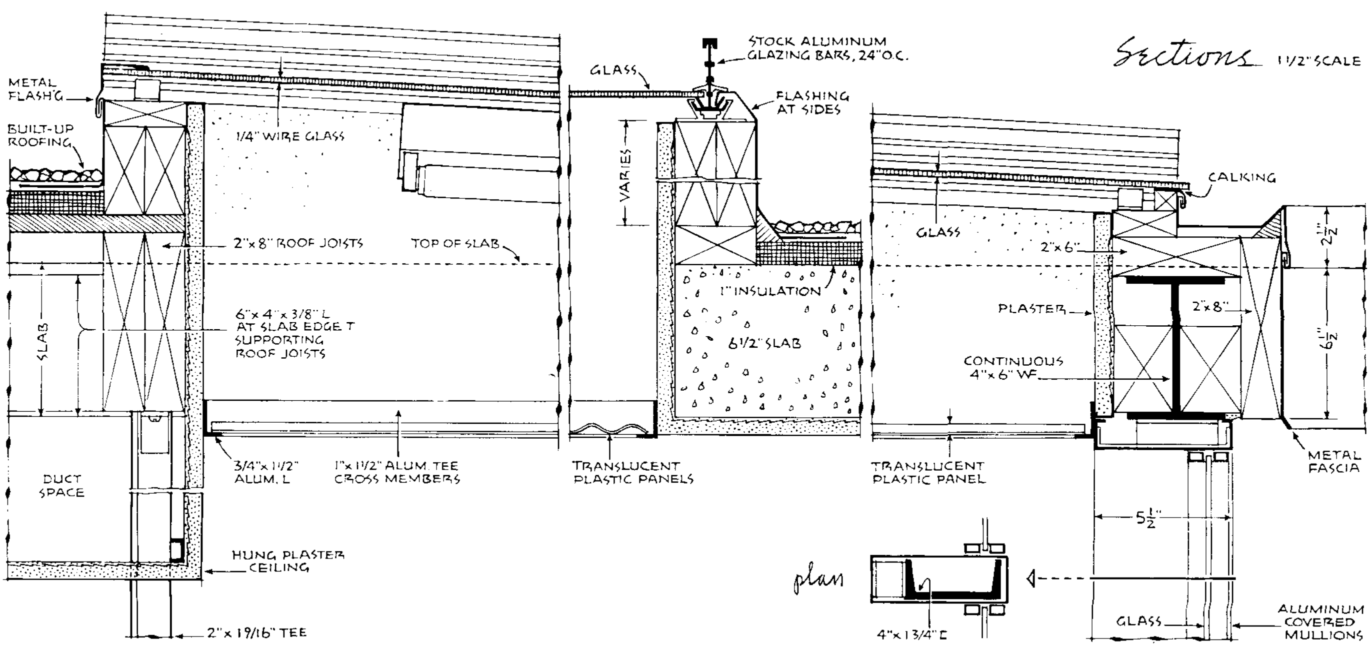
Plan
1/4" SCALE

EXECUTIVE OFFICE, Cleveland, Ohio
George Rider Company, Architects
Leon Gordon Miller, Interior Designer





MAC MIZUKI



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Hellmuth, Yamasaki & Leinweber, Architects

Nurses' Station, Texas Children's Hospital, Milton Foy Martin, Architect

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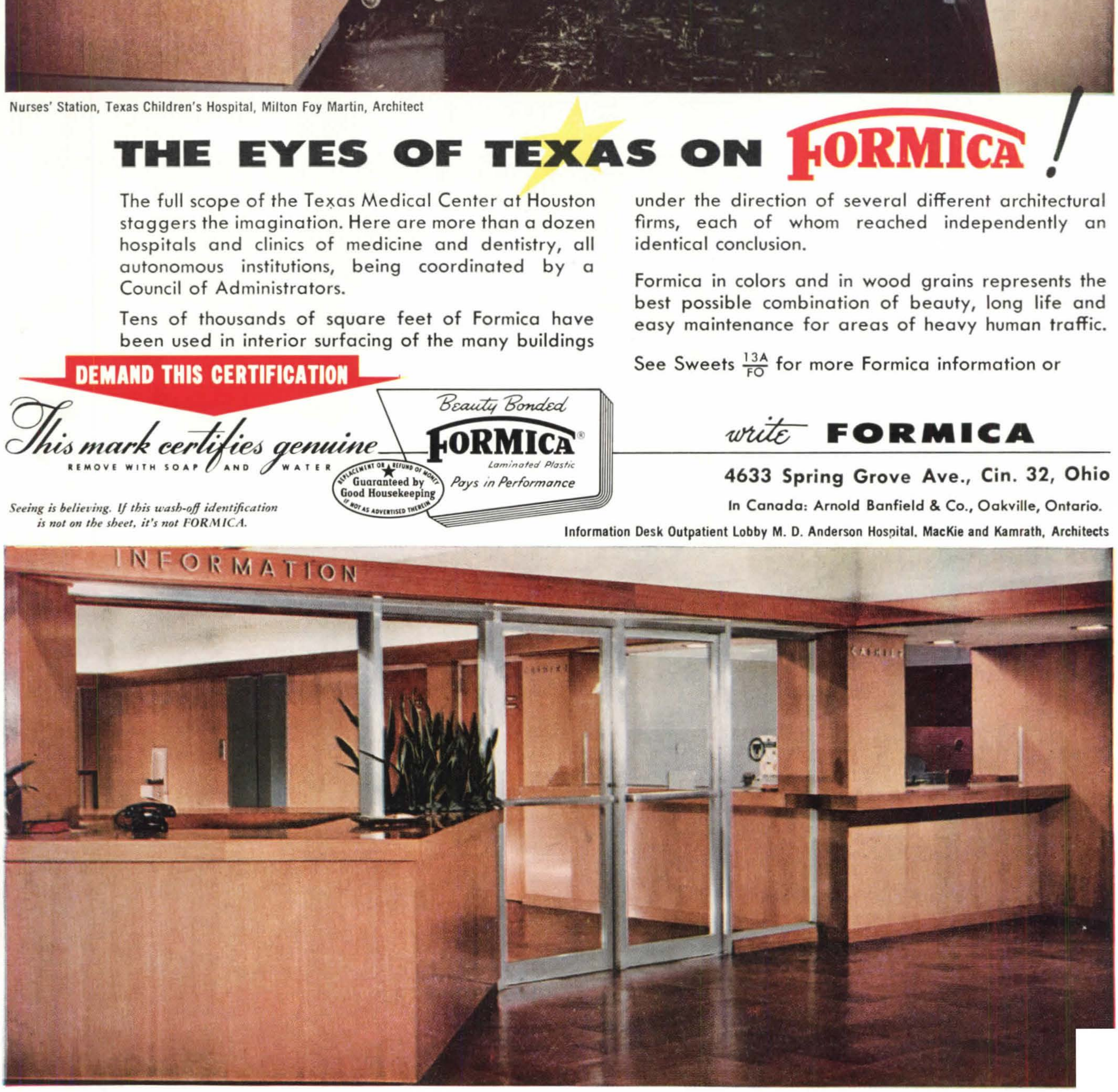
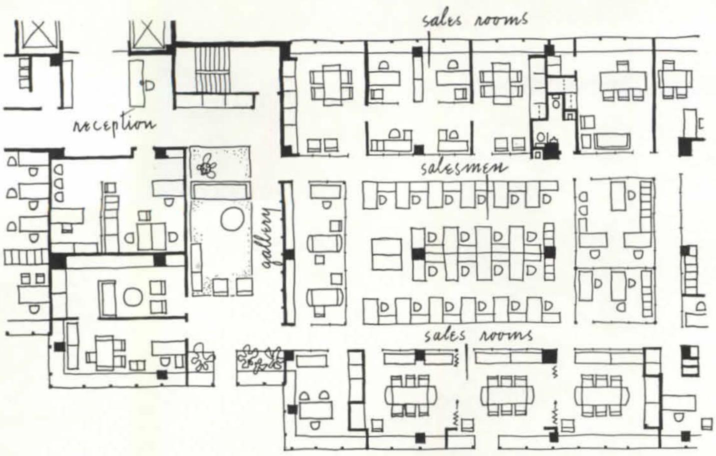




Louise Sloane

showroom/offices

Because it is an especially noteworthy example of interior planning and execution, the office-showroom designed for Avondale Mills, Inc., by Designs for Business, Inc., under the direction of Maurice Mogulescu, Joseph Mogulescu, and G. Luss, is the subject of our entire section this month. The client, acting as sales representative for six major cotton mills, is known for the integrated character of its fabrics and sought a physical layout in which integration would be both inherent and apparent. The designers' goal was to provide attractive and efficient surroundings for executives, salesmen, clients, within an area of about 13,000 square feet. No phase of the client's business demanded absolute privacy, and the changing patterns of the business itself called for maximum flexibility.

Guided accordingly, Designs for Business, Inc., decided on a plan conceived somewhat as an arena, with an open central area for some 30 salespeople and offices for sales managers, executives, and their secretaries, as well as six showrooms, placed around the U-shaped perimeter. This open plan creates, in effect, one area 70′ x 85′, with glass partitions bringing adjoining areas into additional visual use. A luminous ceiling serves not only to light, but also to define the central salesmen's area. All perimeter offices have natural light which, through glass partitions, illuminates the interior as well.

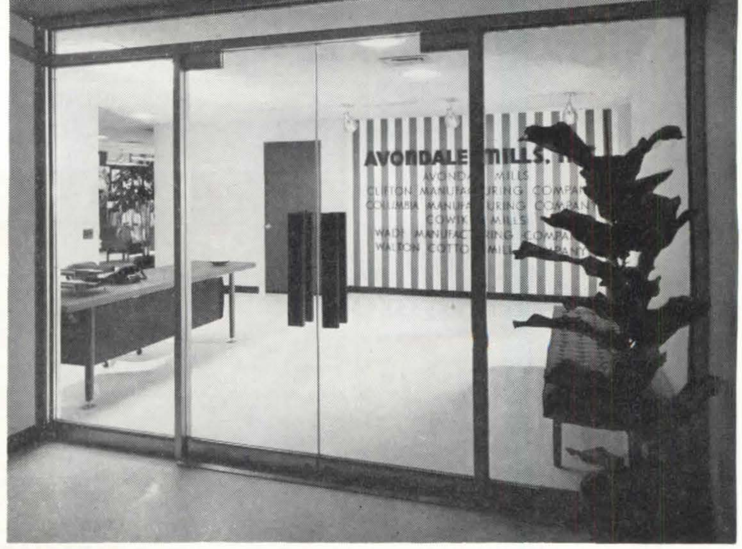
To permit future changes with a minimum of cost and inconvenience, all partitions are movable, all lighting is modular, all storage cabinets are designed on the same three-foot module. This flexible system produced, at the same time, major economies in a custom-engineered job.

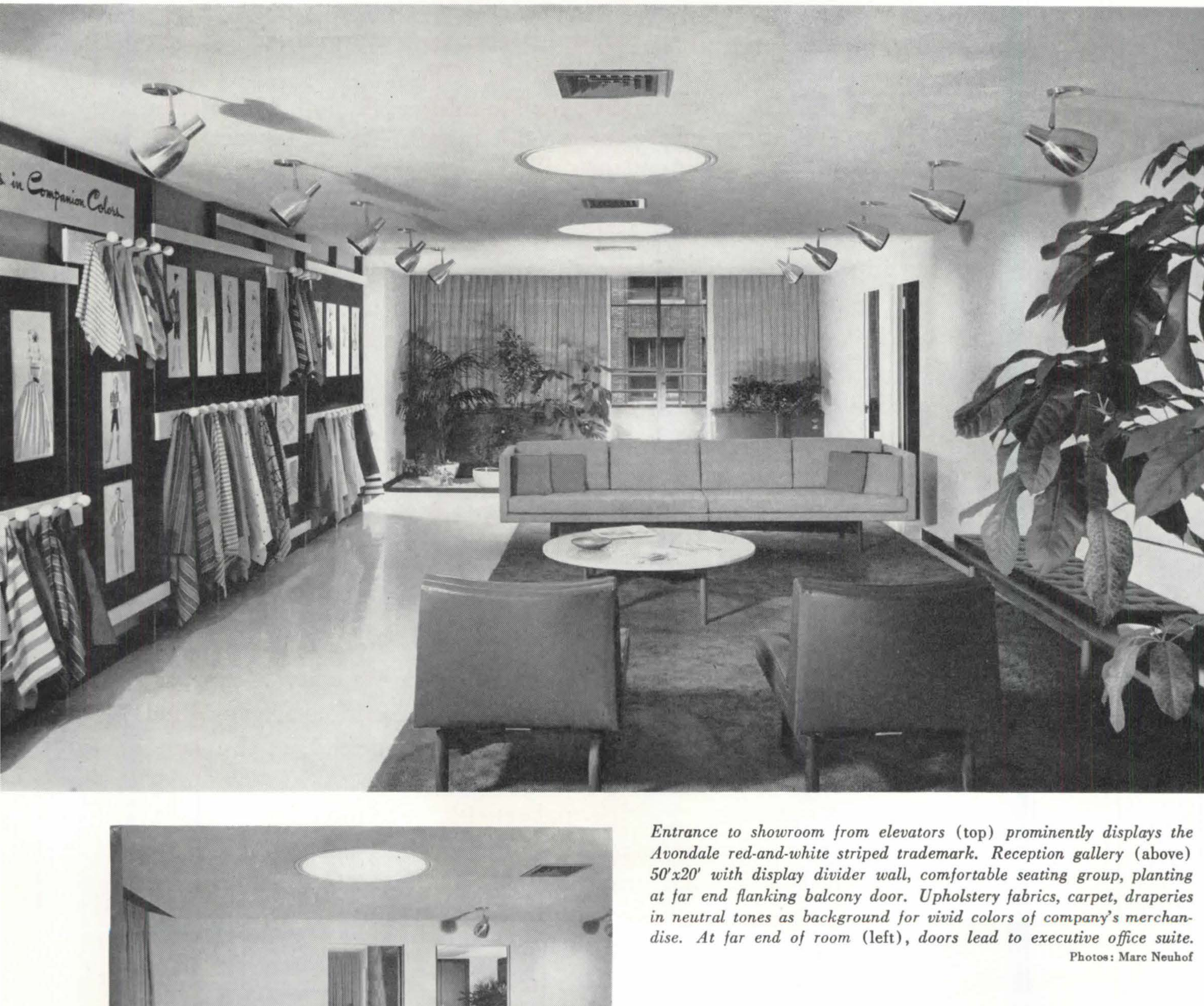
Color planning was approached with equal sensitivity to the client's needs. Since the merchandise itself is variegated and colorful, the basic color scheme is unobstrusively neutral—charcoal gray, sand, blacks, whites, and browns. Architectural surfaces, however, not in conflict with the fabrics themselves, introduce brilliant touches of cobalt blue, chrome yellow, orange red.

Skilful use of carpeting to contrast with hard surface flooring; noncommercial drapery and upholstery fabrics; furniture, lamps, and accessories of a residential nature, all contribute importantly to the friendly and inviting atmosphere. This kind of interior designing demonstrates graphically that a precision-engineered project, with maximum functional efficiency, may be warmly and pleasantly expressed.

showroom/offices

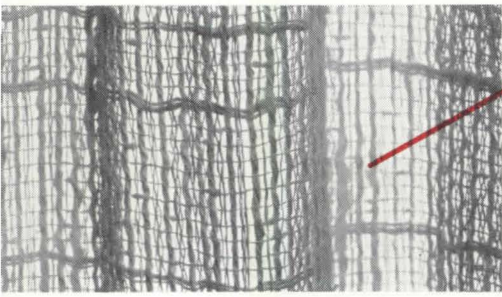
client | Avondale Mills, Inc.
location | New York, New York
designer | Designs for Business, Inc.

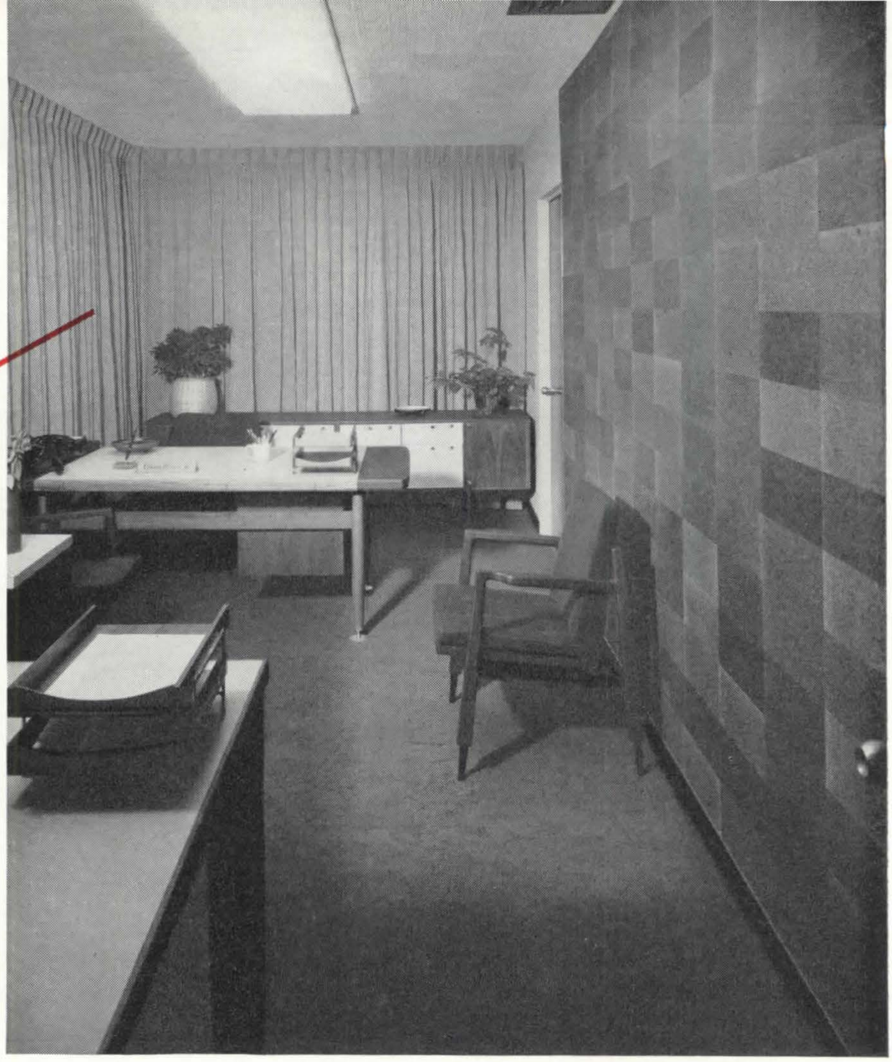




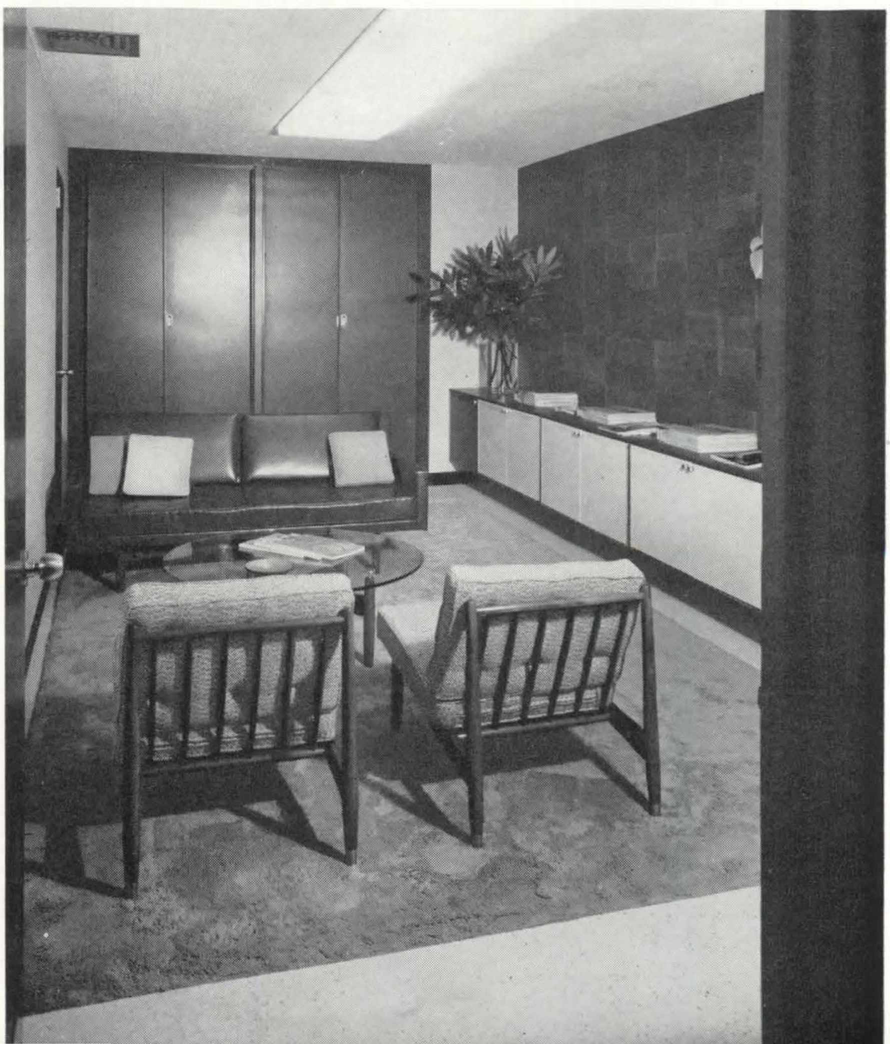
Entrance to showroom from elevators (top) *prominently displays the Avondale red-and-white striped trademark. Reception gallery* (above) *50'x20' with display divider wall, comfortable seating group, planting at far end flanking balcony door. Upholstery fabrics, carpet, draperies in neutral tones as background for vivid colors of company's merchandise. At far end of room* (left), *doors lead to executive office suite.*

Photos: Marc Neuhof

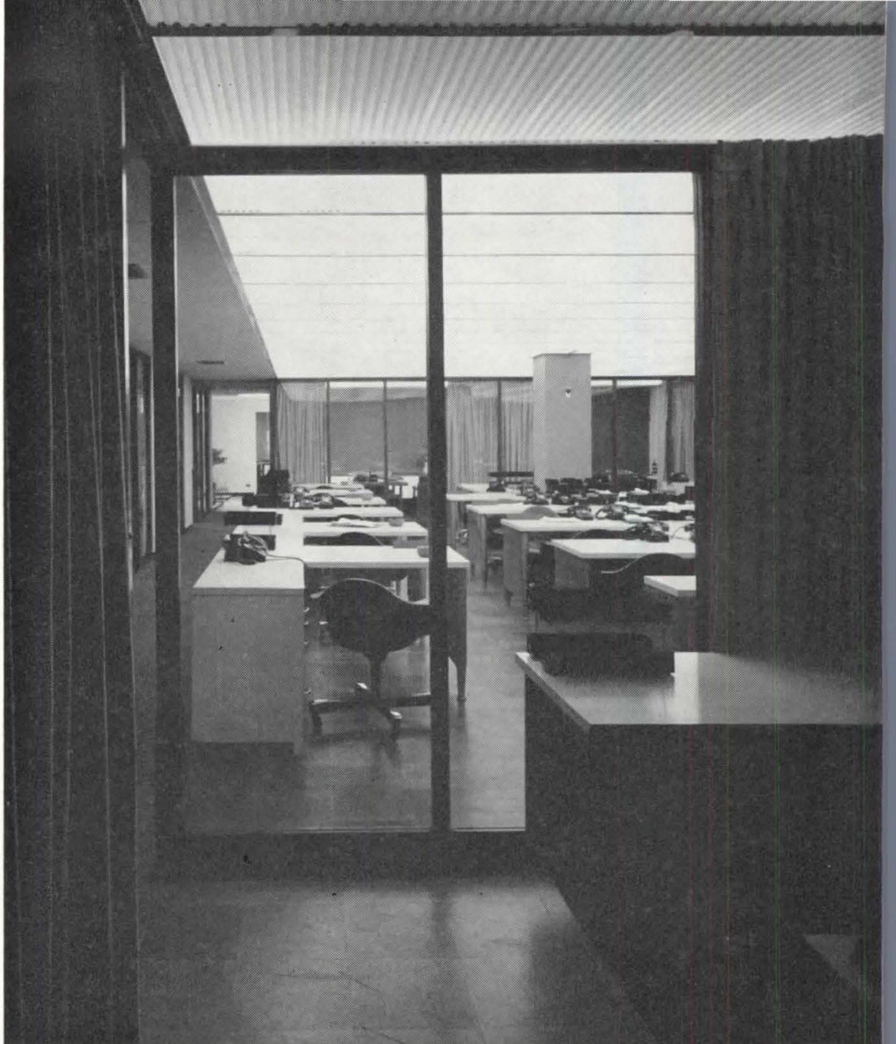




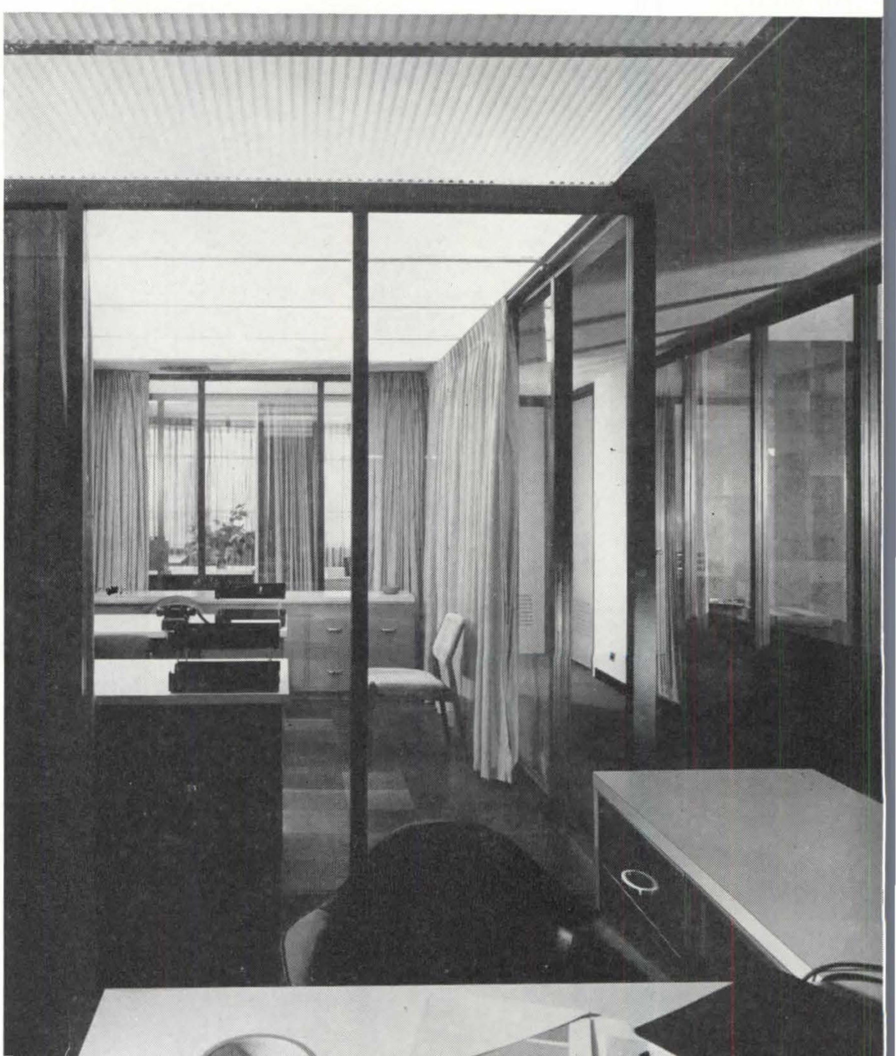
Executive office suite. Private conference room adjoins office of executive and his secretary. Floors are carpeted; ceilings, acoustical tile; wall, cork tile. Portable and built-in cabinets provide ample storage. The firm's own corduroy in brilliant colors covers cushions, used as accents against the leather sofa. Textured chair upholstery and sheer drapery are natural tones.



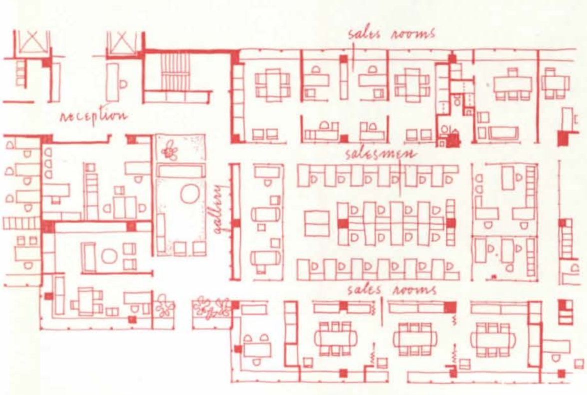
showroom/offices



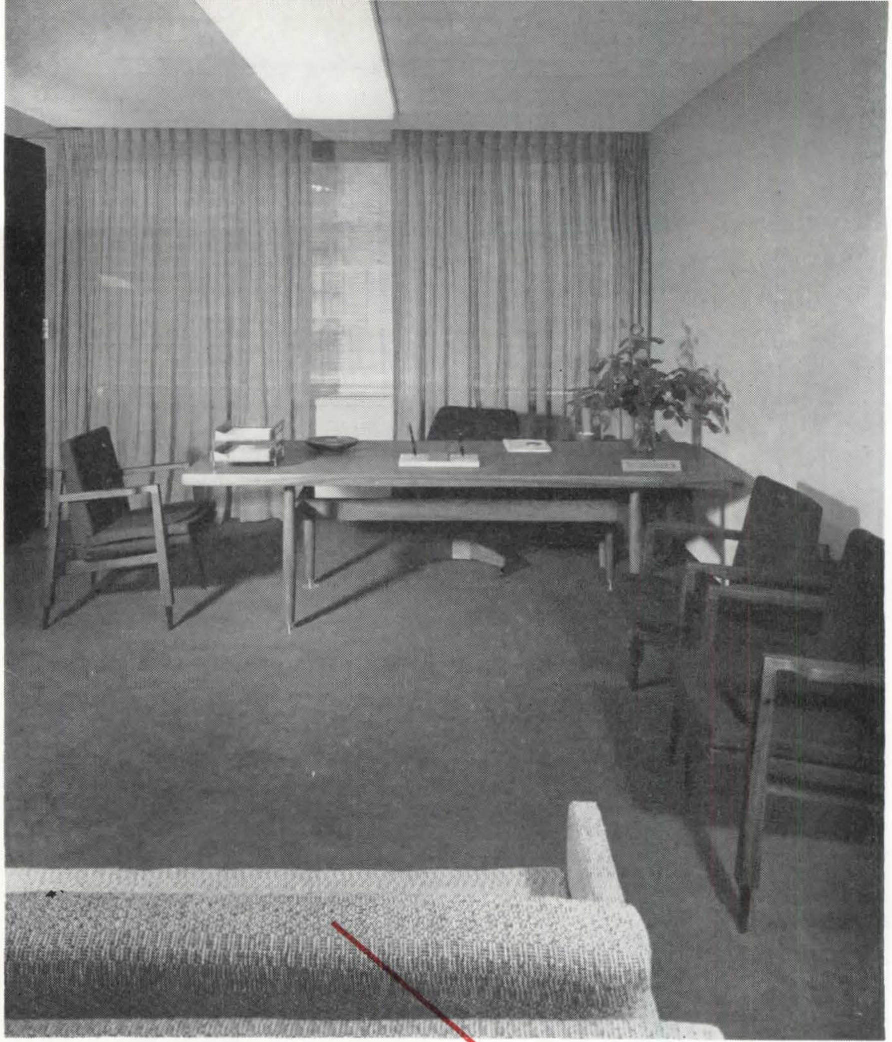
Glass partitions separate sales managers' offices from salesmen's area, but allow view. Ceiling of light blankets salesmen's area; three walls of surrounding daylight supplementing this create impression of over-all sunlit space. Metal-framed partitions are modular, movable, and therefore flexible.



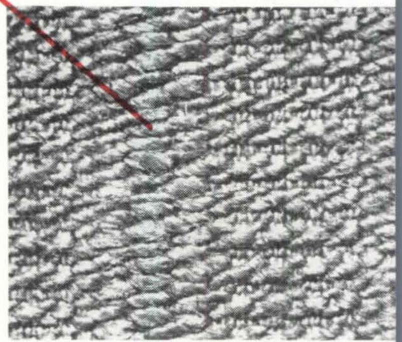
Conference-salesroom, with large table, caned chairs. Cabinets in lacquer and teak, with engineered interiors, custom designed for specific filing of sample-books, other necessary paraphernalia. Semisheer draperies may be drawn for privacy.

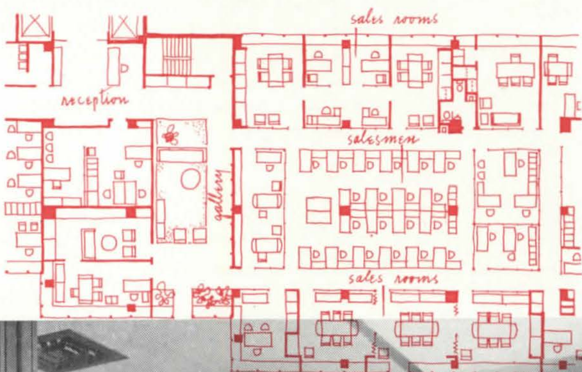


showroom/offices



On this page are views of a private office. Bank of offices (acrosspage) *is on perimeter of salesmen's area. Note dividing partitions with flush-wood-panel sliding walls, affording storage as well as serving as separators. Each office entrance door is painted a different vivid color. Aisles around salesmen's area, as well as interiors of offices, are all carpeted.*





data

cabinetwork

All Units: designed on 3-foot module, engineered interiors/ designed by G. Luss/ executed by Ezra Blank Associates, 117 Lombardy St., Brooklyn, N. Y.

doors, partitions, windows

Doors: flush hollow metal/ baked-enamel custom colors/ E. J. Boyle Division of Aetna Steel Products Corp., 14 Charlton St., New York 14, N. Y.

Partitions: flexible, movable/ metal and LOF glass/ E. J. Boyle Division of Aetna Steel Products Corp.

Bamboo Blinds: Superior Shade & Awning, Inc., 510 W. 126 St., New York, N. Y.

furniture and fabrics

Cane Chairs: George Tanier, Inc., 521 Madison Ave., New York, N. Y.

Executive Office Sofas, Lounge Chairs, Cocktail and Magazine Tables, Benches: designed by G. Luss/ Lehigh Furniture Corp., 16 E. 53 St., New York, N. Y.

Salesmen's Desks: Metwood Office Equipment Corp., 64 W. 23 St., New York, N. Y.

Upholstery and Drapery Fabrics: textured and sheer/ Isabel Scott, 17 E. 53 St., New York, N. Y.

Corduroy/ Avondale Mills, Inc., 1430 Broadway, New York, N. Y.

lighting

Salesmen's Area: Luminous Ceilings, Inc., 2500 W. North Ave., Chicago, Ill.

Recessed Lighting: Lightolier, Inc., 346 Claremont Ave., Jersey City, N. J.

Surface Spotlights: Century Lighting, Inc., 521 W. 43 St., New York, N. Y.

ceilings and flooring

Salesmen's Area: acoustical tile on slab over luminous ceiling; **Other ceilings:** acoustical plaster/ Owens-Corning Fiberglas Corp., Toledo, Ohio.

Flooring in Elevator Lobby, Reception Foyer, Reception Gallery, Corridors: vinyl tile/ Robbins Floor Products, Inc., Tuscumbia, Ala.

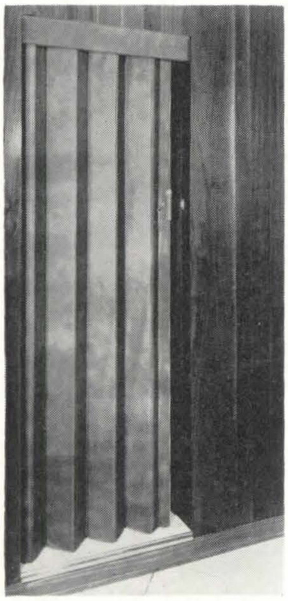
Flooring in Salesmen's Area: "Kencork"; **Flooring in General Offices:** "Kentile"/ Kennedy, Inc., 58 Second Ave., Brooklyn, N. Y.

Cotton Carpet: George E. Mallinson Importing Co., Inc., 295 Fifth Ave., New York, N. Y.

Rayon Spring Loop Carpet in Executive Offices, Showrooms: James Lees & Sons, Bridgeport, Pa.

p/a interior design products

Storage Unit: "FashionFab" (above)/packaged, semi-knocked down, all hardware in place, ready to assemble and install/unit shown is one wardrobe, 54" wide, and one linen closet, 24" wide/Philippine mahogany doors, drawers, and facings/ **retail:** $108; varying widths permit groupings from minimum of 5 ft to maximum of 12 ft/with redwood door and drawer fronts, fir facings ready for painting/**retail:** $89/**Tedrick Brothers Manufacturing Co., Kent, Wash.**

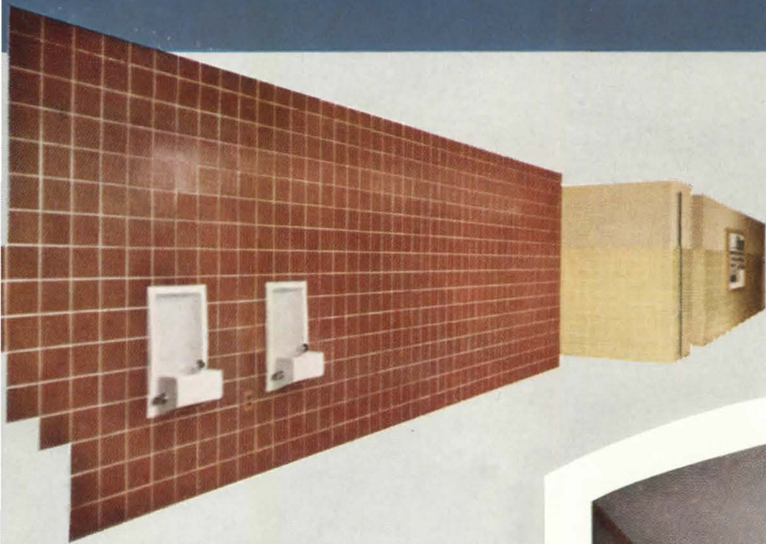


Steel Folding Door: "Amweld" (left)/four panels hinged in pairs/steel finished in flat, prime gray, over which paint or paper may be applied/in 3', 4', 5' widths, 6'-8" or 8' heights/projection distance into room, 5", 7", 9"/nylon pivot bearings and guides/**Building Products Division, The American Welding & Manufacturing Co., Dietz Rd., Warren, Ohio.**

Lockable Folding Door: "Accordofold" (above)/nylon security latch permits locking/matching cornice also available/vinyl plastic over light teakwood insert in door body/door folds to 13% of its extended length in a $4^1/_2$" width that fits flush with standard 4" partition wall/in nine colors/self-lubricating nylon slides/mildew- and warp-proof/**American Bamboo Corporation, 171-06 Jamaica Ave., Jamaica 32, N.Y.**

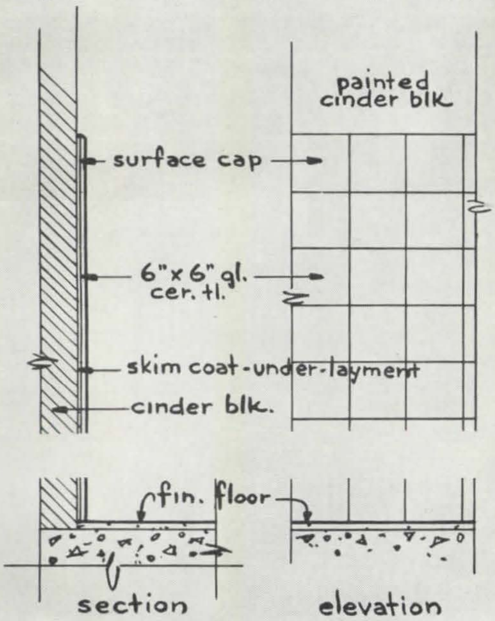
Accordion Door: "Decorfold" (right)/may be used for closets or between rooms/folds back to stack of only 1 inch for every 12 inches of door width/plastic surface in five colors/height $6'$-$8^1/_2$", widths of 2', 2'-8", 3', 4', 5'/vinyl hinge construction has no moving parts, is friction-free, doors operate on matching nylon clip-guides/**Curtition Corporation, 2227 Sawtell Blvd., Los Angeles 64, Calif.**

ROMANY *Real Clay* TILES



SPECIFICATION

This project is one where the masonry walls were specified to be as true and plumb as possible, but in case it was found necessary, a skim coat of cement or underlayment was to be applied by or under the direction of the Tile Contractor to receive tile. It was thought best to apply this skim coat, and underlayment was used to the height of the wainscot or wall to be tiled. Tile was applied after floor finish was in place, with no cove — except where floor was tiled.



for SCHOOL

CLASSROOMS — CORRIDORS
REST ROOMS — CAFETERIAS
GYMNASIUMS — AUDITORIUMS
STAIRWAYS AND OTHER AREAS

Illustrated is a corridor and reception room in the Tholl Street School, Norfolk, Virginia, for which Oliver & Smith, A.I.A., were the Architects. The Tile Contractor was Ajax Tile & Marble Co. of Norfolk. The wall tile in the corridor is ROMANY Nos. 741 Citrus Yellow and 787 Brown and in the reception room, ROMANY No. 741 Citrus Yellow. ROMANY Real Clay Tile possesses characteristics of exceptional value in school installation and maintenance, resulting from our long experience in supplying tile best adapted to school needs.

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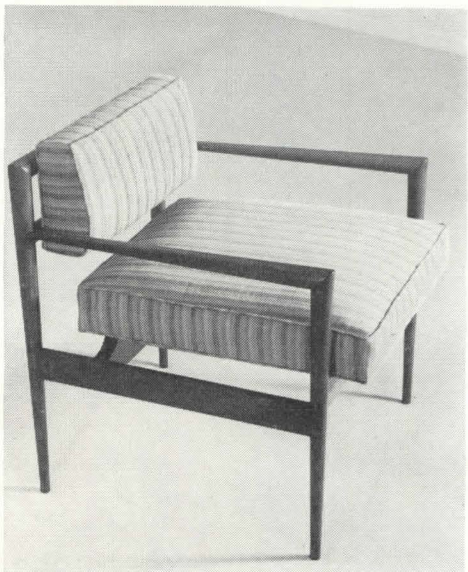
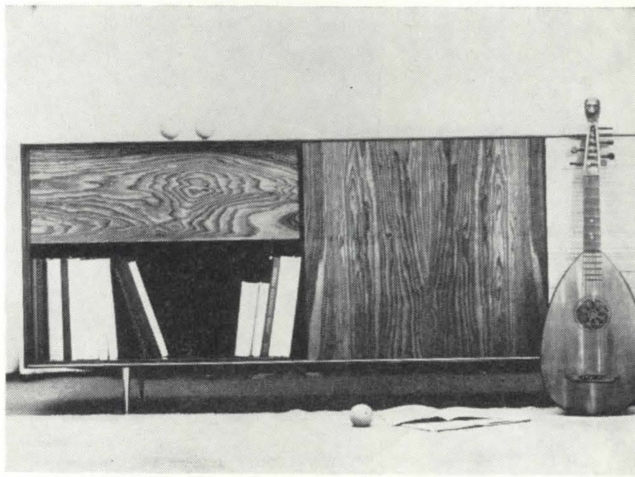


Chair: floating seat, walnut frame/tapered arms and legs/26" wide, 27" deep, 28½" high/**retail:** $175, in muslin/designed by Arnold Friedmann/**Mason Art, Inc., 350 E. 64 St., New York 21, N.Y.**

Stack Chairs: (left) contour-molded seats and backs, rattan/frame of gold anodized aluminum/plastic-tipped feet/**Troy Sunshade Company, Troy, Ohio.**

Hi-Fi Cabinet: (right) Rosewood or walnut/80" long, 23" deep, 35" high/phonograph pullout drawer on droplid/album storage space below radio face/sliding panels cover TV screen/cloth covered speaker panel/**retail:** rosewood, $590; walnut, $550, designed by George Nelson/**Herman Miller Furniture Co., Zeeland, Mich.**



Wall Units: (left) flexible cases, with or without legs, for custom combinations/ends and tops have exterior rectangular dovetailing/hand-rubbed finish on Siamese teak/group shown includes bookcases/**retail:** $87; sliding door cabinet/**retail:** $185; chest-desk/**retail:** $245; **Sidechair:** in teak with upholstered molded seat and back/designed by Peter Hvidt and O. Molgaard Nielsen/**John Stuart, Inc., Fourth Ave. at 32 St., New York 16, N.Y.**



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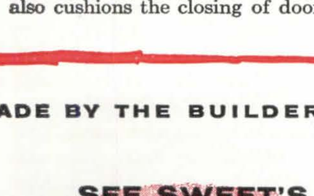

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