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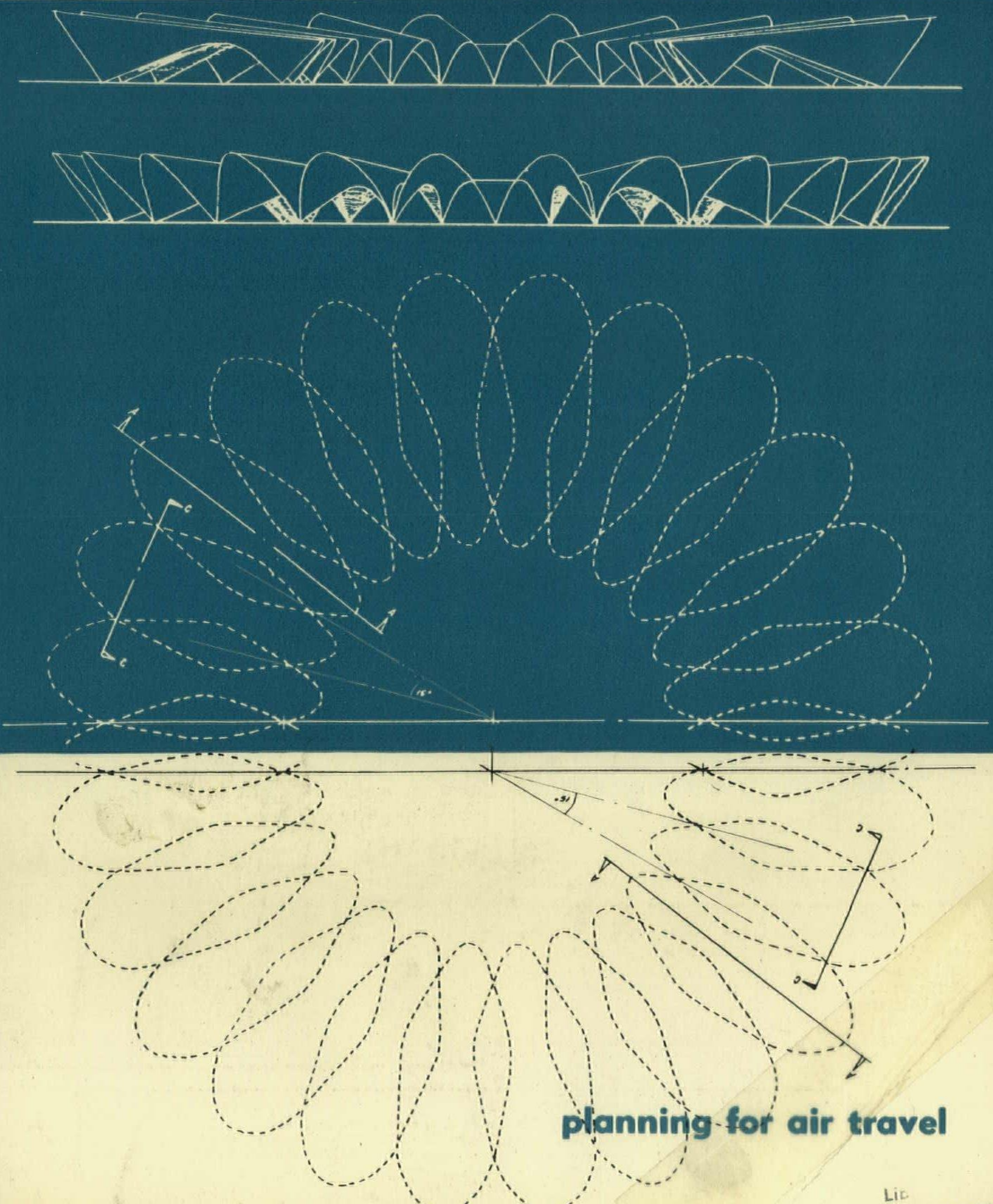

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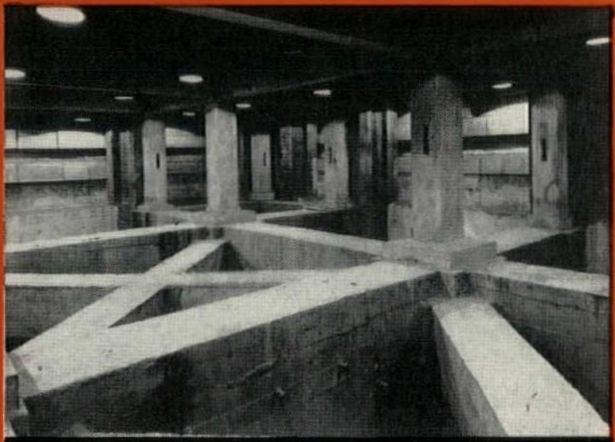
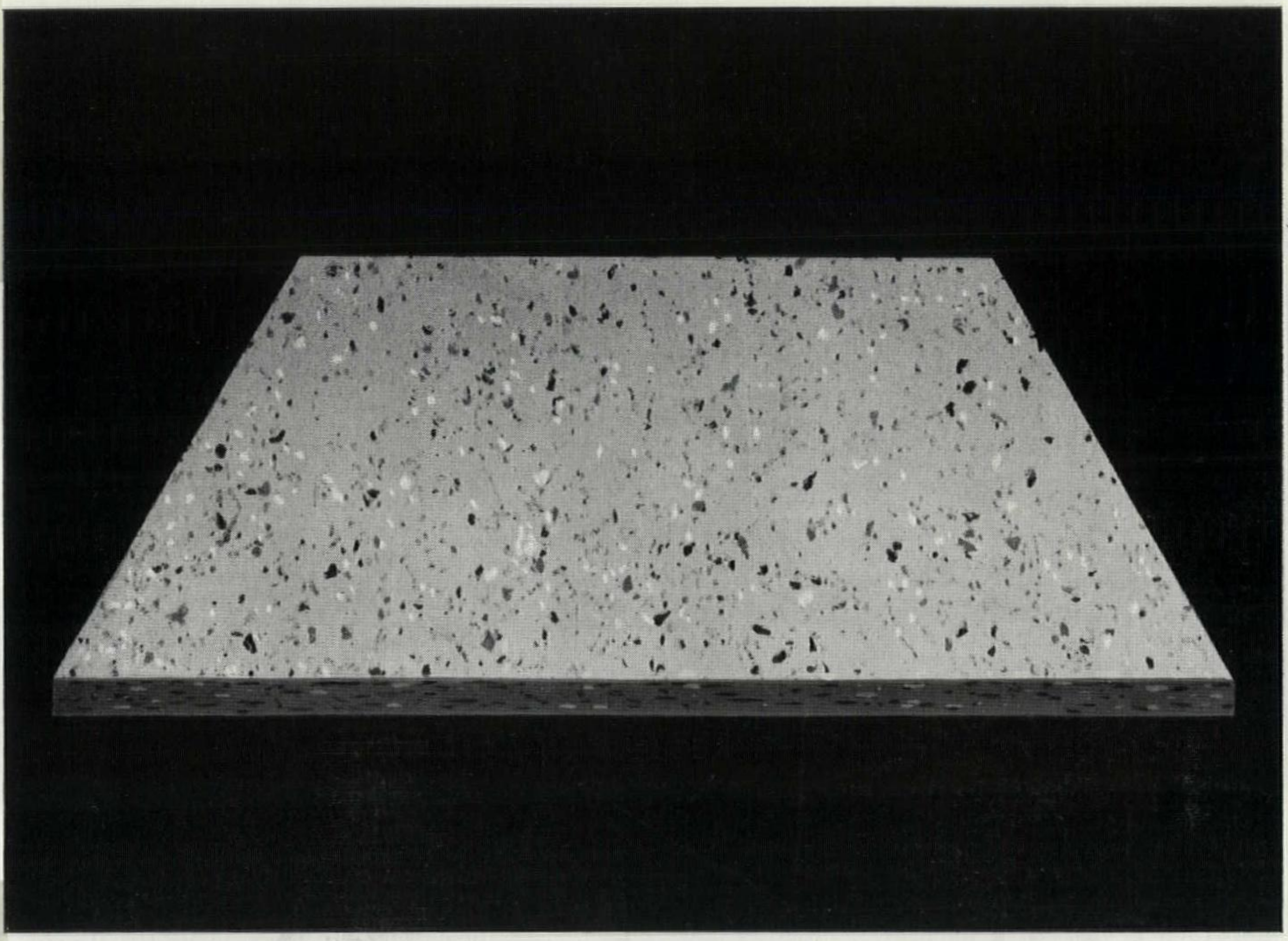
Torre Latino Americana, Mexico City, Mexico. Owner: La Latino Americana, Seguros de Vida, S. A. Engineer & Constructor: Ing. Adolfo Zeevaert. Consulting Engineers: Dr. Leonardo Zeevaert & N. M. Newmark. Consulting Architect: Arq. Augusto H. Alvarez. All of Mexico City.



Typical section of the foundation of the Latino-Americana tower, designed partly as a floating box and partly pile-supported, consists of concrete girders atop a base slab to make piles act as unit.



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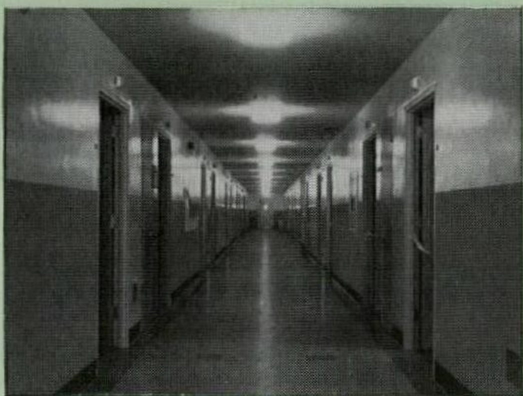

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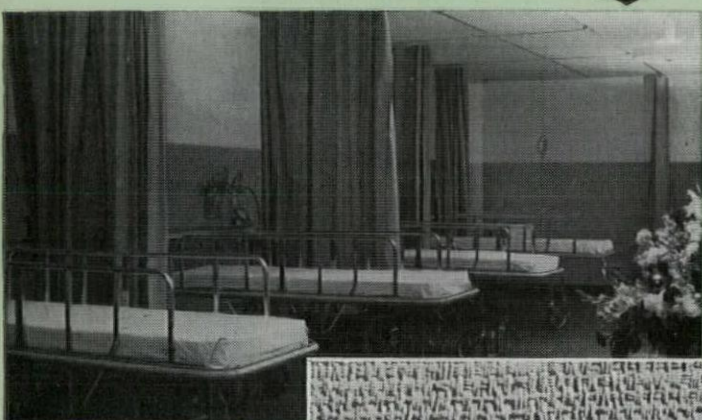

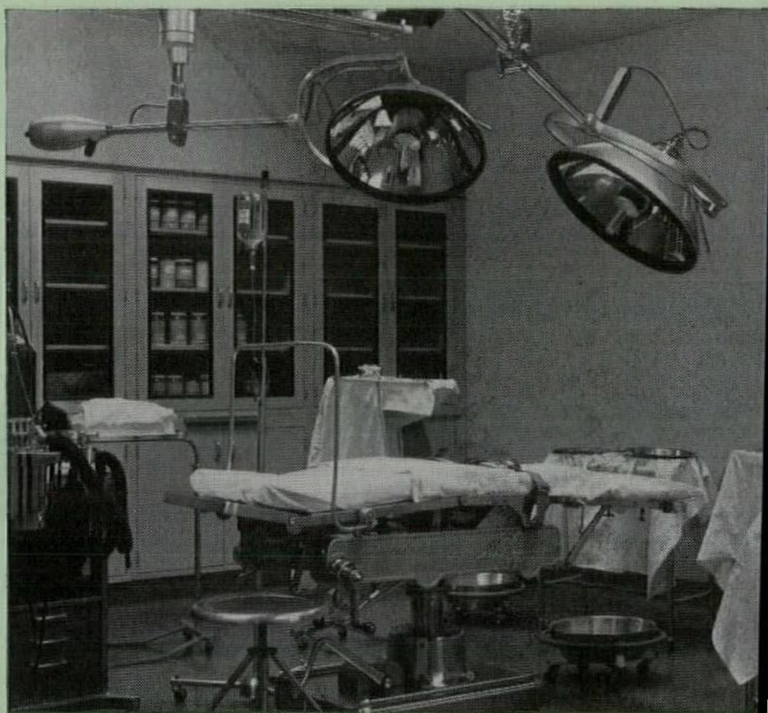

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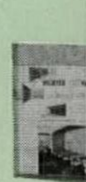

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It's the Law *by Bernard Tomson*

P/A Office Practice ***article continuing discussion of the Architect's role as arbitrator between Owner and Contractor.***

One of the best opportunities for the Architect to establish his leadership in the construction field is presented by the influence he wields in determining the terms and conditions contained in the building contract between Owner and Contractor. The Owner relies heavily upon the Architect in the preparation of the building contract. Under these circumstances, the Architect is in the advantageous position of recommending contractual provisions which will assist in establishing the appropriate status of the Architect in the industry.

It is doubtful whether full advantage has been taken of this position. For example, the Owner-Contractor agreement recommended by the American Institute of Architects, severely limits the status of the Architect as an arbitrator in respect to disputes which may arise between Owner and Contractor. Under this agreement, all of the Architect's decisions are subject to arbitration except those relating to artistic effect. As I have previously pointed out (IT'S THE LAW, June 1954 P/A, MAY 1956 P/A), the General Conditions of the American Institute of Architects do not permit the Architect to determine questions of law, nor to determine whether the contract has been breached. No factual decision that the Architect might make is final except one relating to "artistic effect."

From a legal viewpoint, the contract between Owner and Contractor may validly provide that many types of disputes which may arise between Owner and Contractor will be finally and conclusively determined by the Architect (IT'S THE LAW, MARCH 1950 P/A, OCTOBER *and* NOVEMBER 1951 P/A, FEBRUARY 1952 P/A). From the Owner's point of view, such a power in the Architect would be of great assistance in expediting the project. From the Contractor's point of view, such a contractual provision might be considered desirable as it provides an expeditious method of settling disputes, and the Architect is fully knowedgeable of the Contractor's problems. From the Architect's point of view, such a power would not only be of great assistance in supervising construction and in supervising the Contractor (IT'S THE LAW, SEPTEMBER *and* OCTOBER 1953 P/A), but would assist in establishing a status of leadership and respect to which he is entitled, and which would be of benefit to the entire building industry.

If the Owner and Contractor agree that the Architect shall finally and conclusively determine any and all disputes which may arise under the construction contract, it is possible that collateral questions involving ethics as well as legality might arise. For example, last month's column discussed a construction contract which was construed by the Courts to authorize the Architect finally and conclusively to determine all questions arising under a construction contract, including a dispute concerning the scope of the Architect's own drawings and specifications. If it is considered ethically or legally questionable for an Architect conclusively to determine a dispute which involves a construction or interpretation of his own plans and specifications, this does not negate the desirability of extending the area in which the Architect's decision or determination is final under the Owner-Contractor agreement. Those disputes which might arise in which the self-interest of the Architect might be involved (such as a dispute involving the interpretation of his plans) could be resolved by a separate arbitration. There is, however, no ethical or legal reason why the great majority of decisions and determinations which the Architect is called upon to make, should not be final and binding.

If the industry will not accept an expanded role for the individual Architect as an arbiter of disputes between Owner and Contractor, or if certain types of disputes should not be determined by the Architect because of his self-interest, who, then, should arbitrate and determine these issues?

At present, the American Institute of Architects provides a limited arbitration procedure in respect to disputes between Owner and Contractor. In substance, this procedure provides that the parties to a dispute shall agree upon an arbitrator, and if they fail to do so, the arbitrator or arbitrators are appointed by the American Arbitration Association, and the arbitration administered and conducted by that Association. Since the possibility of agreement in selecting an arbitrator is remote, the so-called standard procedure of the Institute of Architects merely "dumps" the entire question "in the lap" of the American Arbitration Association. This is an avoidance of responsibility, and a lost opportunity to gain prestige and recognition for the Architect. It is obvious that the American Institute of Architects, and not the American Arbitration Association is the best and most appropriate organization to determine disputes in the construction industry. The arbitration panels of the American Arbitration Association from which the arbitrators are selected contain lawyers, builders, and assorted members of various professions and occupations. Are these better qualified and more impartial arbitrators than architects?

The American Institute of Architects is in a position to provide panels or architects from which the arbitrator can and should be selected. The members of these panels would favor neither Owner, Contractor, nor Architect and would be knowledgeable of the issues involved in the disputes which arise in the construction industry. (*See* IT'S THE LAW, JUNE 1956 P/A.) Of equal importance to the Architect and to the American Institute of Architects, the status of the profession as a leader in the construction field would be enhanced and extended.

The natural leader of the construction industry is the Architect. In too many instances, this responsibility is not assumed by him. The Architect as an arbitrator is only one example of an opportunity of which the profession has not taken full advantage. Leadership must be deserved, and can only be achieved by direction and plan. Perhaps arbitration panels composed of architects, and establishment of arbitration procedures making construction contracts subject to arbitration by these panels, could be an important step in the right direction.

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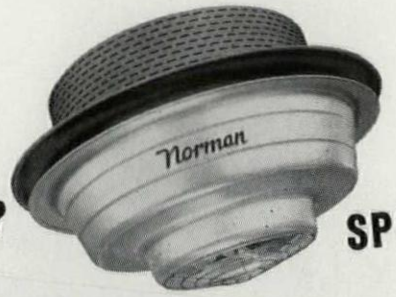

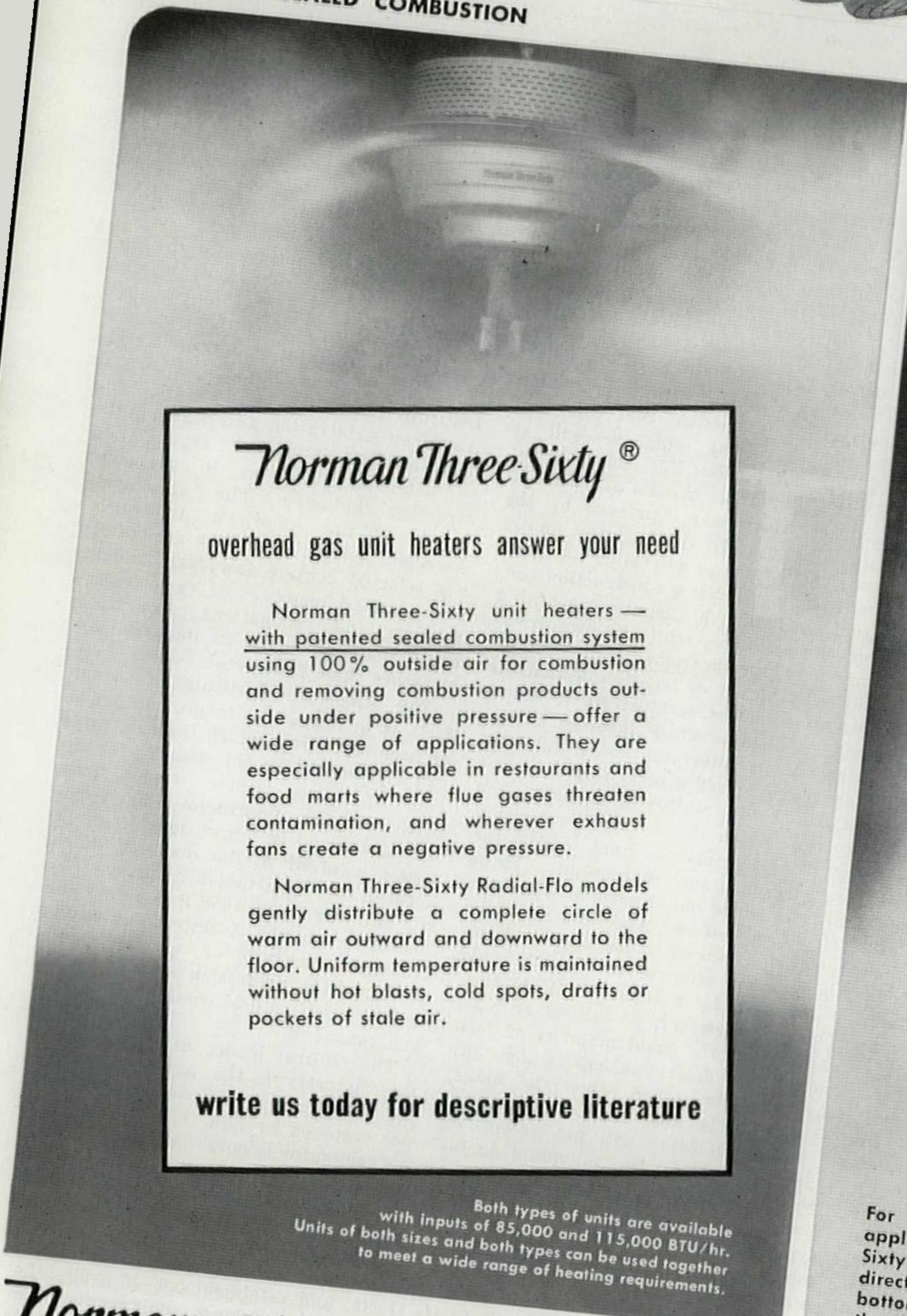

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Mechanical Engineering Critique *by William J. McGuinness*

P/A Office Practice ***column on mechanical and electrical design and equipment, devoted this month to a new kind of intercommunication system for office buildings.***

The narrow, slab-type office building affords daylight and view for all offices, but this kind of planning results in structures that are very tall and long. The new Ford Motor Central Staff Office Building, at Dearborn, Michigan, is 12 stories high and almost one-third of a mile in length.* Trips to remote offices could be very time-consuming. A good intercommunication system, however, can minimize this inefficiency. In planning its new building, the Ford Motor Company readily saw the advantages of an intercom system to supplement the normal telephone system. The planners realized that although the telephone would, at times, be used for inter-office communication, it was necessary to keep this system as free as possible for important outside calls. William Shuart, Ford's communications specialist, loaned his experience to Architects Skidmore, Owings & Merrill for the planning and building in of a speedy and effective intercommunications set up. The result was a box-like station with an audible speaker. By means of a switch, this device permits a person to address an associate immediately. The down-position of each switch connects the call; the up-position can actuate an annunciator or light; center position is for disconnecting. This principle, of course, is not new; it has been used with a limited number of circuits in industrial plants and offices. As a local link between receptionist and executive, it may almost be considered standard. Its adaptation for eventual use by 3000 people, however, is a startling development.

The intercom-station *(right side of desk)* contains the speaker, switches, and a central lever which is depressed to amplify the voice when addressing the person called. The small square to the left of the station is the microphone. Because this is the desk of a top executive, a hand phone, adjacent to the microphone, may be used for privacy. High-echelon personnel are summoned for calls by an annunciator and a quiet buzzer. They answer on the hand set when privacy is desired. All calls, however, are audible at once at the desk of the recipient. If desired, several people may be connected simultaneously for a conference. Everything is automatic; there is no central operator on this inside system; calls cannot be delayed.

There are facilities to permit placing a unit in or on every desk in the building. Underfloor ducts allow connections to be tapped at intervals of 18 in. on floor surfaces. Units may be added to, or removed from, the system without interfering with service. This provides maximum flexibility in offices where glass partitions are moved frequently to conform to administrative changes. Shuart's department maintains a running record of all units connected or removed. The units are stock items of the Webster Electric Company and require no special wiring except for unusual situations. Some intercom boxes have 480 stations, and more are possible.

At present the system can handle 1000 calls at one time and it is steadily being expanded. Eventually there may be a unit to serve or reach everyone in the building. A great problem is solved in the reception of vendors who arrive at the rate of 500 per day to call on purchasing agents of the Ford Motor Company. The girls who handle this operation say that it would be almost impossible if they had to dial and wait for an answer or receive a request from the agent to call back later. Under the new system, the visitor states his name, his company, and the name of the purchasing agent he wants to see. The receptionist addresses the agent at once. If he is free, the salesman is received. If he is busy with an outside call, or otherwise occupied, he says so. Later, when he is ready, he raises a two-position switch and an annunciator pops out at the receptionist's desk. The visitor is sent in.

Equal efficiency is found in the service category. When service is desired, the maintenance man is addressed through a unit in his room at the floor where he is working. If he is elsewhere, the caller raises the switch which lights a light above the maintenance man's door. This is easily visible if he arrives anywhere in the vicinity. It means "call back." By this method, calls do not "die" and vocal paging is eliminated.

Many convincing examples of the smoothness of operation occur every day. Suppose that a manager receives an overseas call for information which he needs to get from another person in the building. In using a conventional house phone, he might dial several times and find the line busy. Finally, he might be required to make a rush trip to his informant while the important call was being held up. In the worst case, he might have to terminate the overseas call and return it after obtaining the desired information. The new technique consists of pressing a switch and speaking directly to the informant. If he is already engaged in conversation, the caller can raise a toggle and, by "executive over-ride," break in on the conversation. Thus, important matters take precedence, and business is conducted without delay.

A method that leaves the telephone system essentially free for outside calls, obviates paging, can be tailored to the special needs of individuals and departments, leave a reminder of calls to be answered, is aggressive enough to break through calls of lesser importance, is indeed unique in the field of communications. It saves thousands of steps, much wasted time, and contributes to quietness.

* JUNE 1957 P/A.

Top executive's desk at Ford Motor Central Staff Office Building, Detroit; executive's intercom equipment is located at his right.

An Architect Looks at Contracts

by Louis Menk*

P/A Office Practice ***article dealing with the architect's responsibilities with regard to contracts, and the limits of his prerogatives in legal matters.***

The subject of contracts is an important branch of law. It deals with man's economic interests and the pursuit and protection of those interests; and the person who, by training and experience, is most competent to advise how best to secure those interests is the lawyer. Nevertheless, we, as architects, having gained some acquaintance with legal matters through our traditional and intimate connection with construction contracts, very often, unwittingly, infringe upon the function of the legal adviser to our clients. How far, then, should we involve ourselves in matters of contracts and other legal aspects of our profession?

Several years ago, a case arose in Michigan wherein an architect, using the AIA Form of Owner-Architect Contract, agreed, as part of his services, to "prepare contracts" and did prepare the contract between the contractor and his client—again using the Standard AIA form for this purpose. The trial court, in a preliminary hearing, held that the architect's agreement with his client was illegal, since the architect, thereby, undertook to perform a *legal* service; further, that, since this part of the agreement was not separable from the rest, the entire agreement was illegal and the architect could not recover under it.

The case never reached the Supreme Court. More recently, however, the Michigan Supreme Court rendered a decision permitting a *real estate broker* to prepare certain simple contracts, where the same are incidental to his business and for which no separate charge is made. In handing down this decision, the Court recognized that there was a split of authority on the subject and that, in many states, the activities which it sustained were considered the illegal practice of law.

Even though the Supreme Court decision—by inference from the real estate case—may extend our permissible activities, as architects, to include the drafting of simple contracts; even though, in our professional training, we receive instruction in contracts and, in connection with registration, we are examined on the subject; even though it can be said that, by virtue of long experience with construction contracts, we may be better informed than a lawyer who may be called upon to handle this particular subject on only rare occasions, we are on firmer and, certainly, safer ground, with the ever-increasing complexity of society, if we refrain from drafting contracts and even avoid, in our agreements with clients, anything which might indicate we undertook to draft contracts. We should limit our activities in this regard to *assistance* only.

Moreover, as the matter now stands, in Michigan—and, undoubtedly, in other states—we, as architects (even in regard to plans which we have drawn), may not prepare contracts for the use of others, since a contract is a legal document and the preparation of legal instruments is within the practice of law. And this is rightly so. The present AIA Form of Agreement Between Owner and Architect includes, among the services to be performed by the architect, "*assistance* in the drafting of proposals and contracts." Note the phrase: "assistance in." This is the wording of the June 1, 1953, revision. Prior to the time of the Michigan case referred to, the AIA Standard Contract Form read, "the *drafting* of proposals and contracts."

According to Webster, a contract has a number of ostensibly divergent definitions, yet they all have some bases of similarity; they all imply some sort of promise or agreement; and all such promises and agreements are voluntary. Yet, a contract, as we are familiar with it, is a special type of agreement. It has one important attribute—it can be enforced by law.

Frankly, there is nothing mysterious about a contract—whether between architect and client or between contractor and owner. Stripping it of the "whereases" and "now, therefores," it contains, despite its detailed terms and conditions, *two* basic elements: what one is to do and when he is to do it; how much the other party is to pay and when he is to make payment.

There is, however, an essential difference between the "architect-client" contract and the "contractor-owner" contract. The signed agreement between the architect and his client constitutes the *entire* contract. Either party may draw it up, since both are parties to the agreement. In the case of the contract between the contractor and owner, the agreement which they sign is only *one element* of the contract; no less important are the General Conditions and the plans and specifications which define what the contractor is to do and, to some extent, how the contractor is to do it, and which we, as architects, have prepared—even though we are not one of the signers to the agreement itself.

The plans, specifications, and General Conditions are as much a part of the contract between contractor and owner as the signed agreement itself. Still, I do not believe that the architect's case I have mentioned can be extended to bar us, as architects, from preparing plans and specifications; after all, these relate to the very essence of our professional skill. But I do believe the ruling could be applied to many of the provisions of the General Conditions. And I do not think that we, as architects, should resist that interpretation.

It is a firm rule of contracts that an instrument which is ambiguous will be construed against the party who drew it. Since we, as architects, are deemed to be agents of the owner, our drafting of a document containing ambiguity might render our client subject to an

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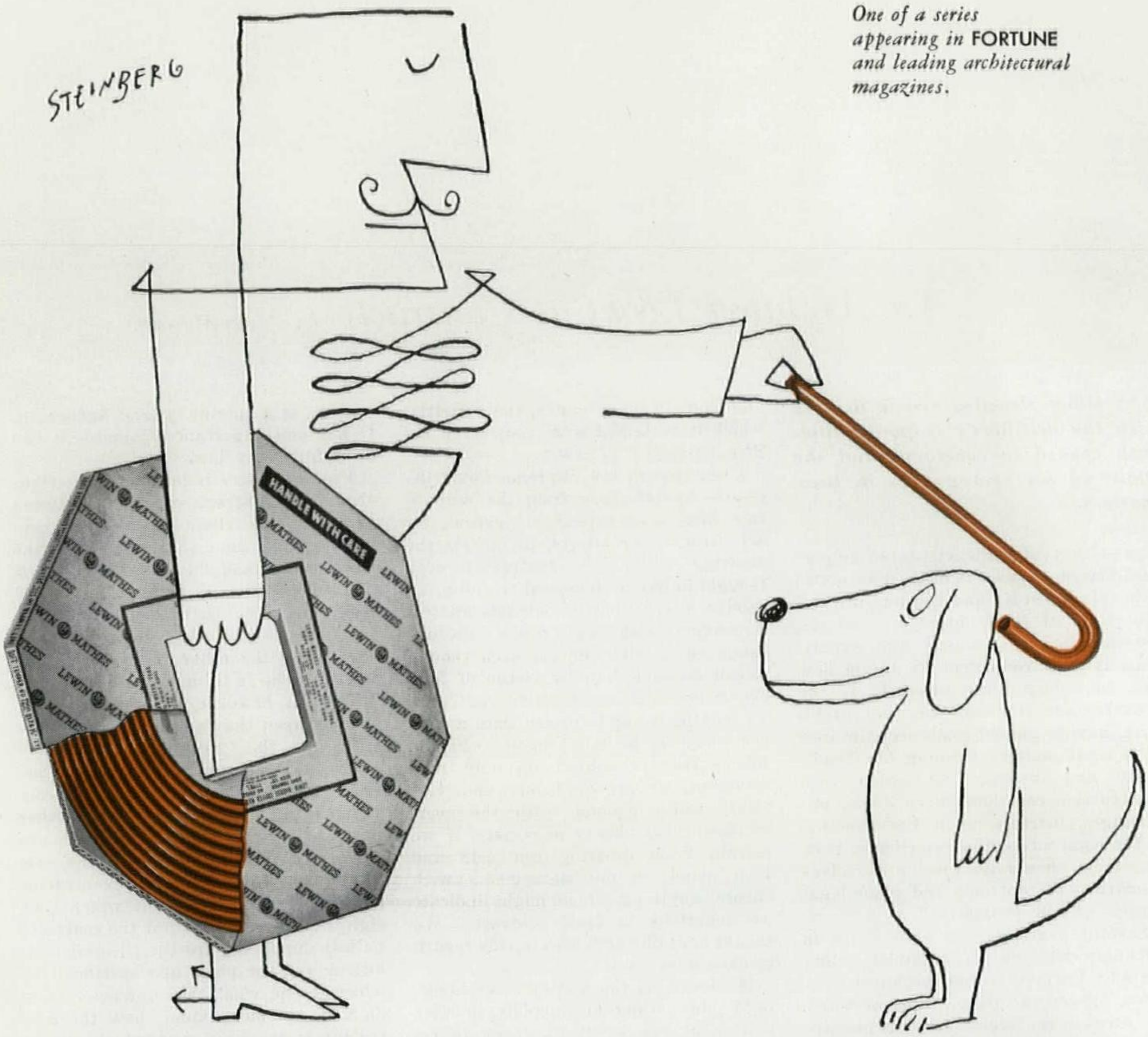

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An Architect Looks at Contracts

unfavorable construction. In those areas where we are qualified and licensed to act, such as plans and specifications and General Conditions—particularly those which relate to the technical aspects of the job—the application of this rule is obviously a fair one. However, we should not expose our client to an unfavorable interpretation on account of language used in an area which represents a different professional skill.

A client should not feel that he is deprived of full professional services from us when we insist that some matters, necessary to the General Conditions and to the final agreement, be referred to his attorney. Actually, the Institute's Standard Form for Architect-Client Contract requires that the Owner "... provide all legal advice and services required for the operation." Nevertheless, some of us utilize this provision of our agreement with our client only when the character of the project introduces legal problems beyond our experience.

I would have *all* provisions which deal with the client's legal rights, privileges and liabilities referred to his attorney, regardless of the character or size of the project. It is especially the smaller client—the individual who may not do more than the one building he has commissioned us for—who should have the full benefit of competent legal advice; and we, as architects, should persuade him to seek it.

I am not advocating the complete abdication of the contract aspects of the architectural profession to the attorneys. But the General Conditions do treat such matters as Insurance, Royalties and Patents, Protection of Property and the liabilities involved, Rights of Either Party to Terminate the Contract, Liens, Arbitration—to name a few—and all of these matters involve questions of law. Versed in these as we may well be because of our experience, our position should be one of *assisting* in the preparation of this document rather than preparing it on our own, with the lawyer having the final word, after review and evaluation, on those aspects not specifically dealing with our professional work as architects. What is involved in the review by an attorney is the evaluation of the legal consequences of the General Conditions and other contract documents; and, having submitted these documents to our client for such legal review, we have properly performed our function.

There is also still considerable left in the contract documents which indisputably belong to us. The preparation of plans and specifications and many provisions of the General Conditions are rightfully ours, and here is where we cannot escape our responsibility with respect to the construction contract.

It is in the honest pursuit of the respective interests of contractor and owners that disputes arise and bring with them such questions as "What does the contract say?" and, then, "What does it mean?" While these questions may be directed to the signed agreement or to the General Conditions, they refer, in many instances, to the other contract documents—the plans and specifications which we, as the architects, prepared. The answers to these latter questions as they relate to the plans and specifications—which must be given by us—cannot be based on our intent, on what we had in mind when we drew the plans and wrote the specifications—our answers must be based on what the plans clearly show and what the specifications clearly say.

Of the various disputes which arise under construction contracts, one which is not uncommon is in connection with subsoil conditions, wherein a contractor claims that the information furnished to him—and on which he had a right to rely in the bidding—was at variance with what he actually encountered. Even if the specification states that the information given is approximate only and that the contractor is to make his own investigations and be wholly responsible, under certain conditions he may still claim misrepresentation, especially if he has lost money on the job. This may sound harsh, but it is usually the opening gun in a dispute.

Then, there are claims which arise from our desire to improve the work during the checking of contractor's shop drawings, or the final selection of finishes, or the preparation of large-scale details. And where we do make changes which affect the cost to the contractor, the contractor may assert a claim which must be evaluated on the basis of what the contract plans and specifications clearly call for or what can be *reasonably* inferred from them.

Another avenue for disputes is in the matter of delays. The contract between the contractor and owner usually includes a specified completion date. That completion date—to the contractor—represents an important factor in establishing his cost; how long his salaried field organization will be tied up; how long his equipment will be needed; what other jobs he can bid on. Unless the General Conditions spell out, in no uncertain terms, that the contractor cannot have any claim for damages as the result of delays, delays by us in furnishing the contractor necessary details or in processing shop drawings in sufficient time for the contractor to maintain his work schedule may very easily be used by the contractor as a basis for claim.

Remember, entering into a contract is a voluntary act and, basically, either party is free to accept or reject the proposed terms before agreement is reached. We may draw anything and specify anything we want—we and our client (and let us include his attorney) can set up all provisions necessary to protect his interests (assuming, of course, we stay within legal bounds). We can require the contractor to assume certain responsibilities and we can deny him certain privileges, as long as the requirements *are clearly stated* and the contractor is willing to accept a contract on those terms, and as long as our client is willing to pay the price.

Up until the time the contract is signed, we and the owner are co-authors of the play. Once the contract is signed, there is no ad-libbing—the authors, as well as the cast, must adhere to the script.

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accurate estimates

Dear Editor: This letter to you is one of praise and supplication—and in that order

I am delighted that "Guaranteed or Reliable Estimates" appeared (JUNE *and* SEPTEMBER 1957 P/A) and I thank you for it. Some years ago I participated in a round-table discussion in New York, as a representative of AIA. I was severely taken to task by Zeckendorf, Dowling, and others for the general incompetence of architects in the matter of cost estimating! It was not suggested that architects be required to guarantee their estimates, but that they become proficient to the point where the professional would have a reputation for being as nearly right in the matter of estimating as it is humanly possible. Although, understandably, I could not refute the arguments of Zeckendorf and Dowling, I could at least set about to attempt to rectify the situation. To that end, we inaugurated our Cost Data Survey in the Department of Education and Research, with which you might be familiar. It is, I think, a worthy project and one which, certainly, if made use of, will contribute to the improvement of the architect's knowledge in this field. For several years, I must have wearied the Board and the membership also with my repeated preachings on this subject.

My supplication is for you to carry on the good work of drumming into the heads of the members of the profession that it is not only highly important for architects to become knowledgeable in cost estimating, but also that those who *are* will probably find it rewarding. And some day I hope the profession will have the reputation of being competent of giving satisfactory advice to a client in the matter of the expenses which the client is likely to incur.

EDMUND R. PURVES
Executive Director, AIA
Washington, D. C.

design in open space

Dear Editor: You published, some time ago, at my request, a notice of my receipt of a research grant from the Rockefeller Foundation. The purpose of the research is to assemble valuable material on all aspects of Landscape Architecture, with the twin ends of producing a basic literature for teaching purposes and of ultimately publishing a series of readers.

Having gleaned from 20 years of magazines and books, it is now necessary to appeal directly to designers for material demonstrating design in open space. Many of our research titles are vital to architects —plazas and civic spaces, playgrounds and parks, neighbourhood and shopping centres, open space in housing, fountains, sculpture out of doors.

I would be grateful if you would publish an appeal in your columns requesting that architects send plans, perspective photos, reprints or cutouts of their designs for open space. This material is vital for teaching as for practice. The literature in the design of open space is negligible. It is to be hoped that, through widespread response, a contribution can be made to the literature in this field.

IAN L. McHARG, Chairman
Department of Landscape Architecture
University of Pennsylvania
Philadelphia, Pa.

plastering equipment

Dear Editor: It was with great pleasure that we read the article in AUGUST 1957 PROGRESSIVE ARCHITECTURE, entitled Mechanization in Plastering." . . .

You may be interested to know that this association has a written agreement with both the Operative Plasterers and Cement Masons International Association, and the Bricklayers, Masons and Plasterers International Union, in which both of these Internationals agree that no restrictions will be placed on the use

(Continued on page 14)

p/a views

(Continued from page 13)

of plastering machines. Addendums have been added to this Agreement to include the plastering trowel. I am sure you will agree with me, that this a progressive look, for mechanization and automation to be accepted without question by both our Association of Contractors, and the two International Unions affected by the plastering machines.

ROBERT L. MAIDT
Chairman, Promotional Committee
Contracting Plasterers' International Association
Oklahoma City, Okla.

A number of readers have requested names of manufacturers whose mechanical plastering equipment was illustrated in "Mechanization in Plastering." They are: The E-Z-On Corp. (1725 W. Pershing Rd., Chicago, Ill.) makers of the mechanical trowel and Albert Karelius & Son, Inc. (909 S. Fremont Ave., Alhambra, Calif.) producers of the pumps and pumping machine.

Editor.

"unobtrusive" heating

Dear Editor: Proofs of "Heating Historic Structures" (AUGUST 1957 P/A) were promptly forwarded to our mechanical engineers, the Wilberding Company for comments. On follow up, Wilberding replies:

"Floors of all buildings wear out sooner or later and must be replaced. Radiant heat should be seriously considered when it is necessary to replace floors. Cast-iron radiant-baseboard heat also lends itself to the interior of restorations. I do not mean the pipe type of baseboard radiation, but rather the cast-iron sections designed solely for radiant heat without consideration of convection.

"Before advocating individual plants, fire hazards should be considered. Every individual boiler and flue is a fire hazard. Modern gas and oil burners with the multiplicity of electrical controls are still fire hazards, and therefore one of the con-

(Continued on page 16)

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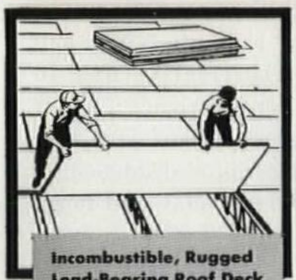
More Schoolrooms for your Money

INSULROCK THE MODERN BUILDING MATERIAL


Incombustible, Rugged Load-Bearing Roof Deck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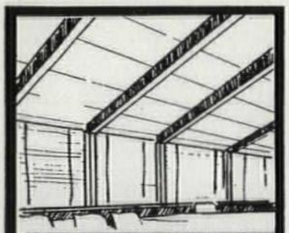
Good Looking, Acoustical Ceiling

Extra schoolrooms—no extra cost!
Insulrock Building Slabs, used for load-bearing, long-wearing, incombustible roof decks, sometimes cut building costs enough—by costing much less to buy, apply, maintain—to build extra rooms without extra appropriations.

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p/a views

(Continued from page 14)

siderations for central heat should be the fire angle.

"I do not think that one central plant need be inefficient. Ofttimes it is quite necessary, because of the inability to get competent labor and train men who are needed for the proper operation of any plant.

"Water as a medium of conducting heat should be considered, so as to avoid the deterioration of the underground piping. Water, if properly de-aerated and treated with chemicals, becomes an excellent heat exchanger. Pipes need not rust out when the heating medium is kept in proper condition.

"The heating and cooling of restorations requires great ingenuity. Split systems are used, coils in ducts, fan coil units to replace radiators, taking air from under windows and from the windows themselves, and all sorts of ingenious ways.

"You may recall one job we worked on together where we were able to supply the ducts on the outside and worked them into pilasters and other architectural features. In this particular case the problem was to preserve the inside appearance of the building.

"I am sorry I can't elaborate further on this problem. Each problem is a challenge."

The special case to which Wilberding refers was a Latrobe church of 1807—with buttresses not uniformly placed. Additional false buttresses served well for ducts, without disturbing the interior or injuring the exterior. In a current restoration of an 1800 house, heating risers visible in a main room were replaced by risers in center hall pilasters, with horizontal runs in baseboards to corner rooms. As of incidental interest, floors in this building had been sound-deadened by a subfloor mixture of clay and hogs' bristles.

HORACE W. PEASLEE, Architect
Washington, D. C.

notices

new addresses

ROBERT ZION & HAROLD BREEN, Site Planners-Landscape Architects, 302 E. 41 St., New York 17, N. Y.

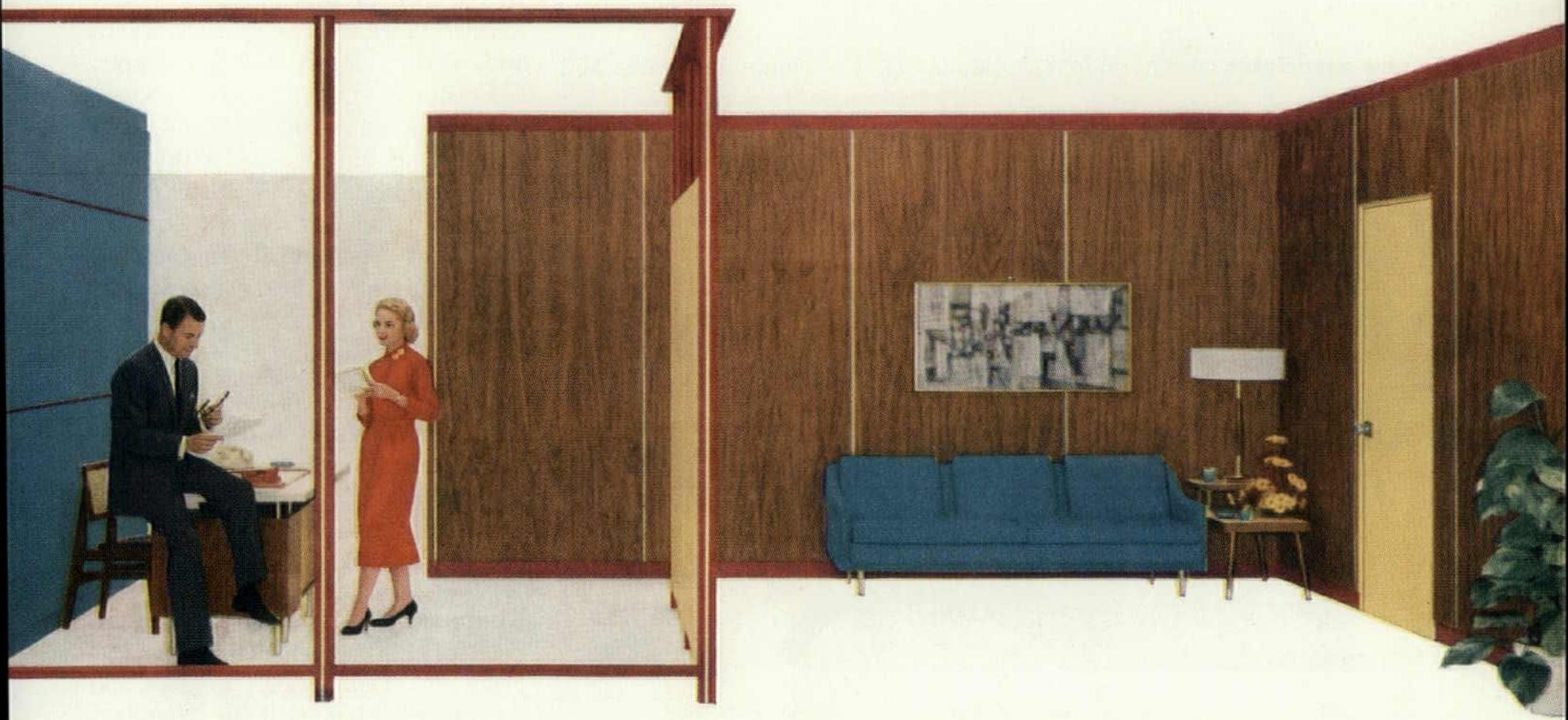
EMERY ROTH & SONS, Architects, 400 Park Ave., New York 22, N. Y.

WATTERSON & WATSON, Architects, and RICHARD T. LESLIE, Associate, 174 Mineola Blvd., Mineola, L. I.

BELAND & GIANELLI, Architects, Suite A, 1221 Monterey St., Vallejo, Calif.

ALFRED EASTON POOR, Architects, 400 Park Ave., New York, N. Y.

CARL FEISS, Planning and Urban Renewal Consultant, 1025 Connecticut Ave., N. W., Washington, D. C.



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greatest possible flexibility in design, function and materials

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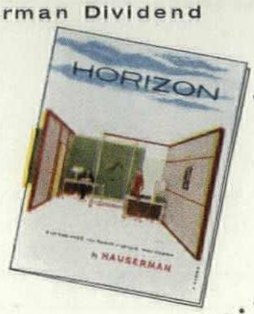


notices

new associates

S. Hart Moore, Project Engineer, and George J. Schwarz, Project Architect, in the firm of FREDERICK G. FROST, JR. & ASSOCIATES, New York, N. Y.

Joseph W. Laschober in the firm of FRED SCHMID ASSOCIATES, Food Service Designers, Los Angeles, Calif.

Mario E. Campioli, Associate, and the following Junior Associates: George E. Via, Jr.; Robert B. Pils; Dominick L. Urgo; Harold G. Collins; in the firm of ALFRED EASTON POOR, Architects, New York, N. Y.

George V. Whisenand, Architect, has become as Associate of WIMBERLY & COOK, Honolulu, Hawaii.

In the firm of NIELSEN & MOFFATT, Architects-Engineers specializing in design of institutional structures, Los Angeles, Calif.: John Lander, in charge of structural and civil engineering and liaison with planning commissions and other public agencies; Russell M. Ruggs, in charge of mechanical engineering and supervision of field construction; and Donald Wolverton, chief architectural draftsman.

David G. Murray, Robert Lawton Jones, and Lee C. Murray, Architects announce their new partnership. Firm will be known as MURRAY-JONES-MURRAY, 4238 South Peoria, Tulsa, Okla.

Gunther Heinzel, Architect, announces his association with Andrew T. Goettman, Professional Engineer. Firm will be HEINZEL-GOETTMAN, Architect-Engineer Associates, 151 W. Main St., Middletown, N. Y.

Carl W. Pirscher and Samuel P. Havis announce formation of partnership to be known as PIRSCHER & HAVIS, Architects, 23255 Woodward, Ferndale, Mich.

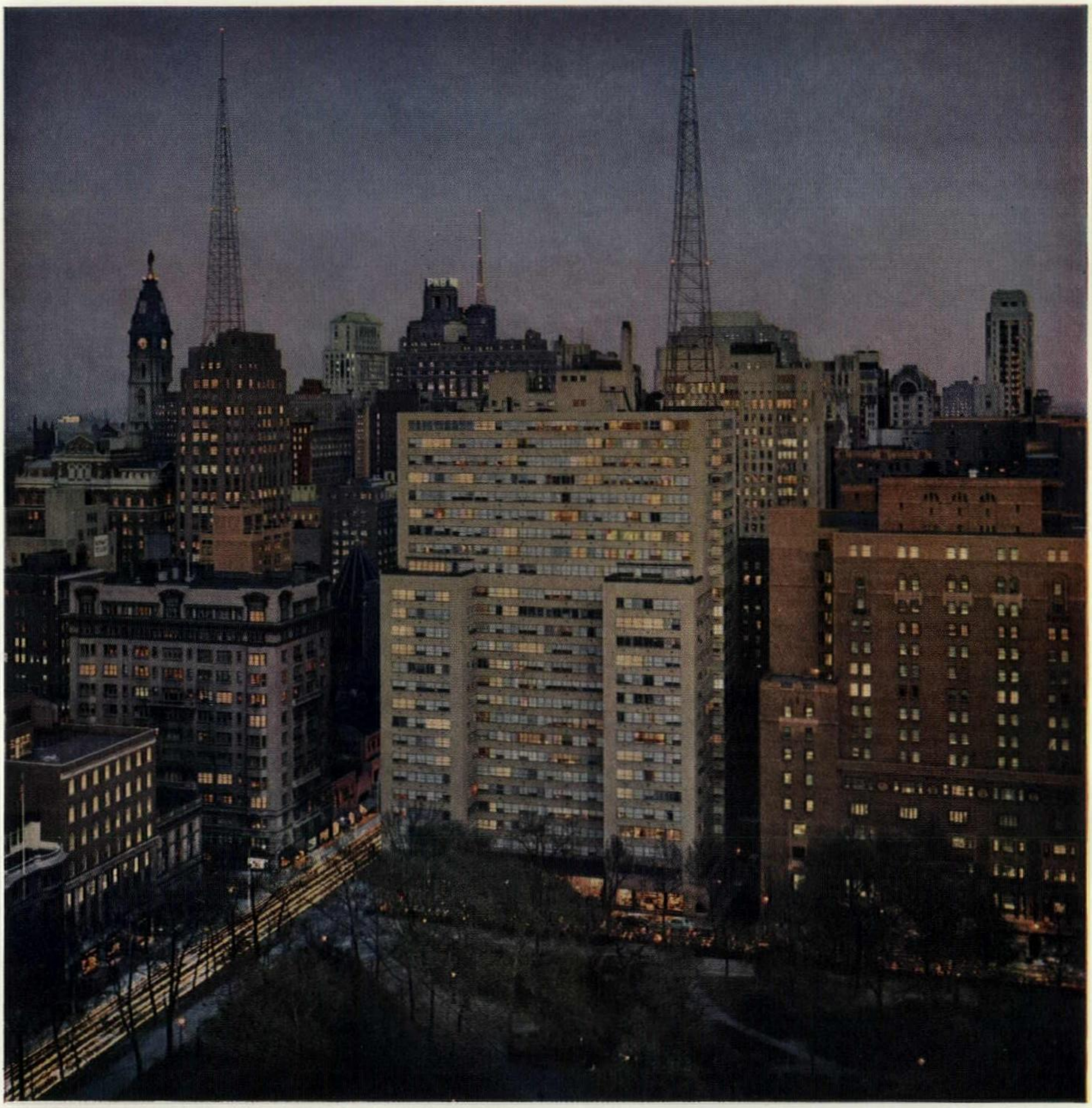
new name

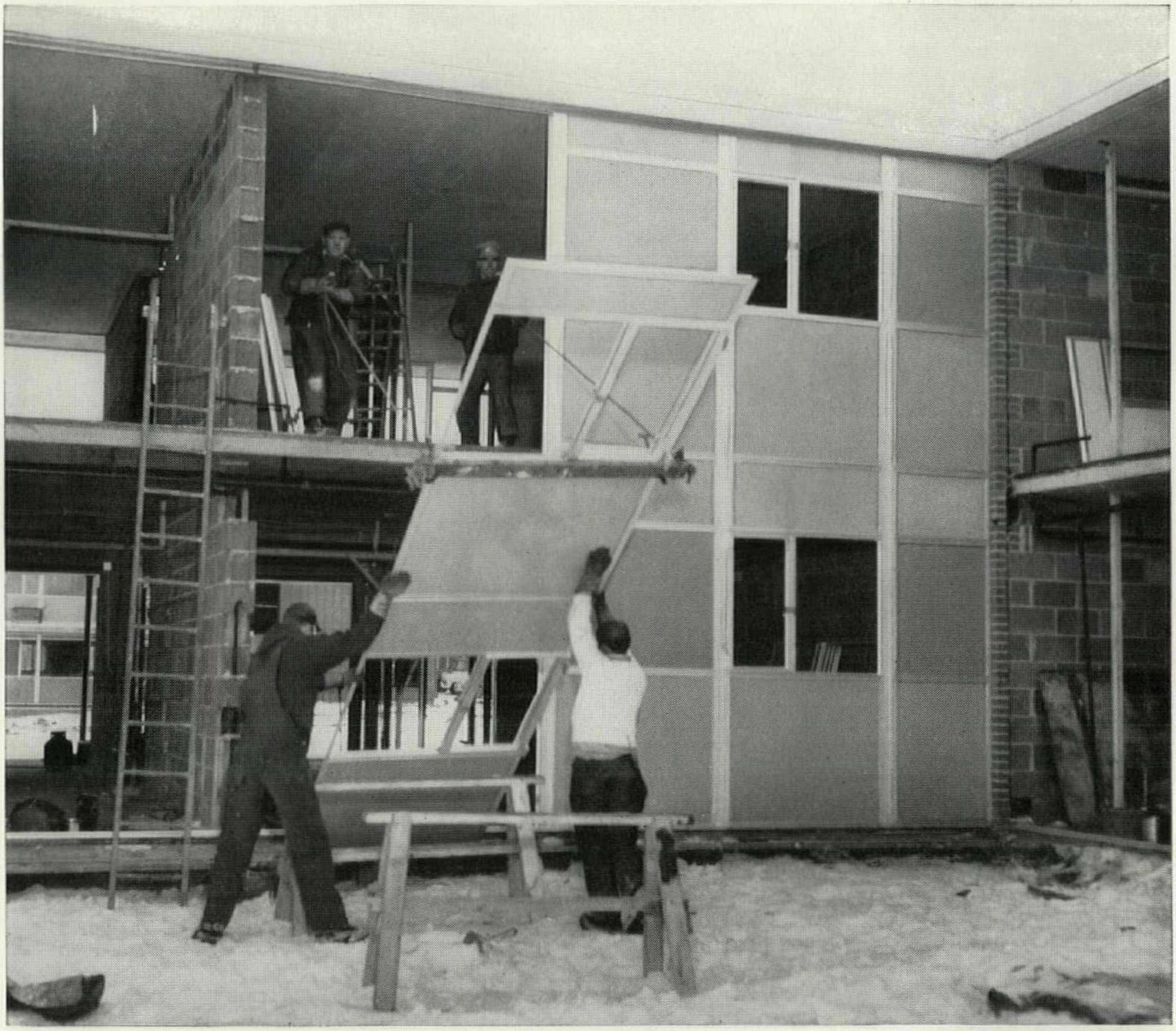
The names of CHAS. P. MORGAN & ASSOCIATES, INC., Engineers, and MORGAN & ADAMS, FRED G. ADAMS, Architect, has been changed to ADAMS, MORGAN, LATHAM, KRIPP & WRIGHT, Architects-Engineers, 608 F & M Bldg., 320 Pine Ave., Long Beach, Calif.

parnerships end

Serge Chermayeff and Heyward Cutting have ended their partnership agreement. Chermayeff will continue architectural practice, and may be addressed: c/o The Graduate School of Design, Robinson Hall, Harvard University, Cambridge 38, Mass.

Karl Krauss, Jr. and Alvin L. Farnsworth, Architect - Engineer, have ended their partnership agreement. Sole interest in their contracts is now assumed by KARL KRAUSS, JR., Architect, 214 W. Main St., Lansing, Mich.





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

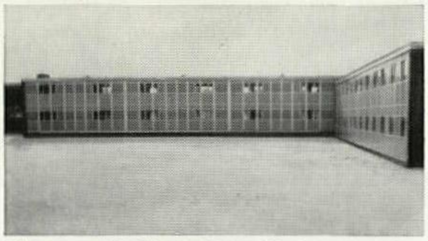
STYROFOAM*

FIRST IN PLASTIC FOAM INSULATION

*Styrofoam is a registered trademark of The Dow Chemical Company

Styrofoam* insulation chosen for housing project at Michigan State University

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



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

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

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

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

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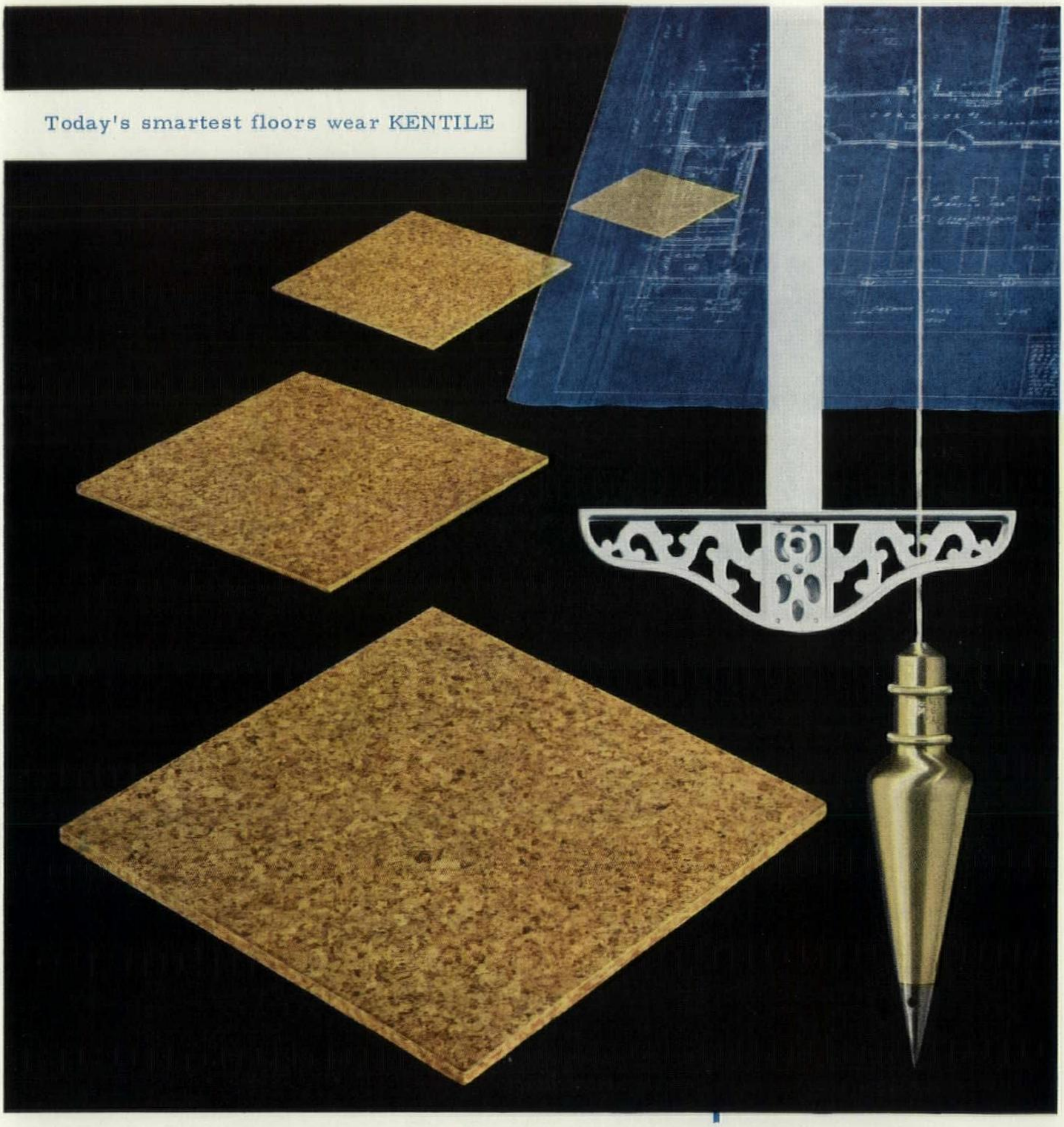


This is KENTILE® cork tile

for the most luxurious yet practical floors ever! So resilient! So slip-resistant! So long-wearing!

KENTILE FLOORS

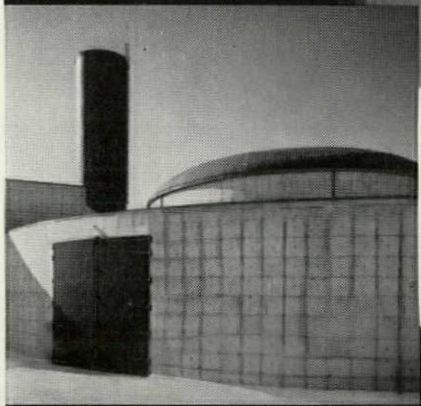
available in Cork, Solid Vinyl, Vinyl Asbestos, Cushion-back Vinyl, Rubber and Asphalt Tile...over 150 decorator colors.

SPECIFICATIONS

SIZES:
6" x 12", 9" x 9", 12" x 12". 12" x 24" (not available in 1/8" gauge.)

THICKNESSES:
1/8", 3/16", 5/16", 1/2" (on special order.)

COLORS:
Kentile cork tile (KenCork®) is available in separately packaged cartons of light shades, medium shades and dark shades. Has a factory finish--a specially prepared plastic fortified wax applied while hot, at the factory.



(above) Large Jamison Sound Reduction Doors in new Test Cell at Detroit Arsenal. Construction under the direction of the District Engineer, Detroit District, Corps of Engineers. (left) Part of circular wall and Jamison Sound Reduction Doors designed to conform to it. Architects: H. E. Beyster & Associates; and Leinweber, Yamasaki and Hellmuth. Contractor: A. J. Etkin Construction Co.; and Collins and Catlin, Inc.

Jamison Sound Reduction Doors meet unusual requirements in new arsenal

...special design fits curved wall; doors reduce sound, resist pressure and temperature

Once again the effective stopping power of Jamison Sound Reduction Doors is being demonstrated in the new Laboratory and Test Cell of the Detroit Arsenal. Here 22 sound reduction doors are in operation, and an additional 38 Jamison Sound Reduction Doors designed to operate under specific heat and pressure conditions.

After years of study and research on the myriad problems of unwanted noise, Jamison engineers developed the "Mass Principle" to effectively minimize sound transmission through a structure. This same principle, with certain refinements, is being used today in doors that are specified again and again by airlines, engine manufacturers and the military services.

If your noise problem ranges from a quiet room or TV studio to a test cell for a 23,000 pound jet engine, come to Jamison for authoritative analysis and help. Write today for new bulletin to Sound Reduction Door Division, Jamison Cold Storage Door Co., Hagerstown, Md., U.S.A.

For 50 years the leading builder of cold storage doors

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ENGINEERED DOORS

New Ultracoustic Ceiling Board captures all the rich, classic beauty of Travertine marble . . . opens up a whole new range of architectural design possibilities!

Photo courtesy Nelson Gallery-Atkins Museum (Nelson Fund), Kansas City, Mo.

New Ultracoustic Ceiling Board is the **only** ceiling board made of long, strong, textile-type glass fibers. It's incombustible and permanent. It's rigid — yet can be bent without breaking!

for suspended acoustical ceilings, an incombustible

New type of Glass Fiber Board

It's *incombustible.* It's *beautiful.* It's *tops* in acoustical (and thermal) efficiency. It won't break or chip. It's easier to apply because it's flexible in application, yet rigid in place. It's available in 24″ x 48″ x ¾″ and 24″ x 24″ x ¾″ panels *right now.*

It's Gustin-Bacon's Ultracoustic Ceiling Board, a completely new and different kind of glass fiber insulation board for use with all standard grid suspended ceiling systems of T-bar type. Ultracoustic is the only ceiling board that possesses all these desirable properties:

TRAVERTINE FINISH, now available for the first time in a glass fiber acoustical board. Ultracoustic's surface finish is an off-white with uniformly random-fissured texture.

SUPERIOR ACOUSTICAL EFFICIENCY. NRC rating of .85.

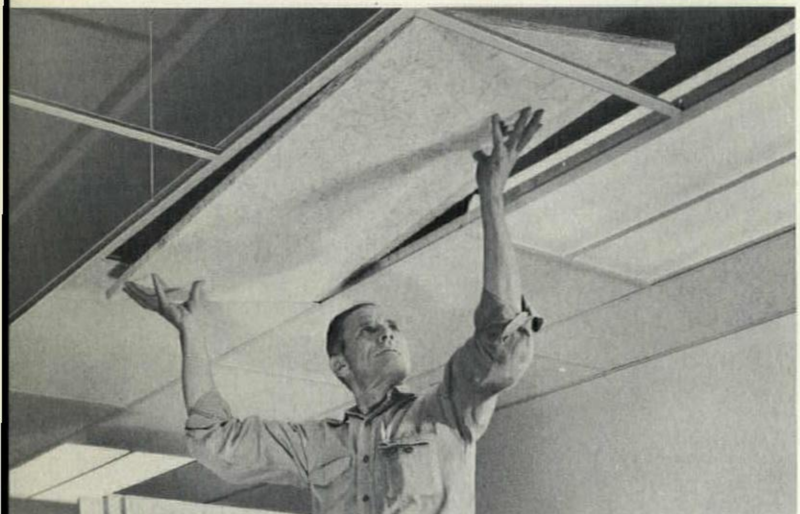
INCOMBUSTIBILITY. Class "A" rating and listed by Underwriters Laboratories as incombustible.

IMMUNITY TO DAMAGE. Ultracoustic is the only ceiling board of long, textile-type glass fibers. It's rigid *but not brittle*—won't chip or break. Its resilient toughness makes it more resistant to damage in handling, shipping and in service than other acoustical materials.

HIGH LIGHT REFLECTANCE . . . averages 85%.

EASY APPLICATION. Ultracoustic can be bent without breakage during application, is easy to cut and fit around diffusers or other obstructions.

OUTSTANDING THERMAL EFFICIENCY — an important bonus benefit. "K" factor is .23 btu at 75° F. mean temperature.



New Ultracoustic Ceiling Board goes up faster, easier. It need not be handled with special care, for it won't flake, break or chip.

WRITE TODAY FOR SAMPLES AND DETAILS

Far better than words and pictures, a sample of this new ceiling board will tell you how far ahead of the times it is. Write today for samples, prices and complete information.

GUSTIN-BACON
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Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Molded glass fiber pipe insulation

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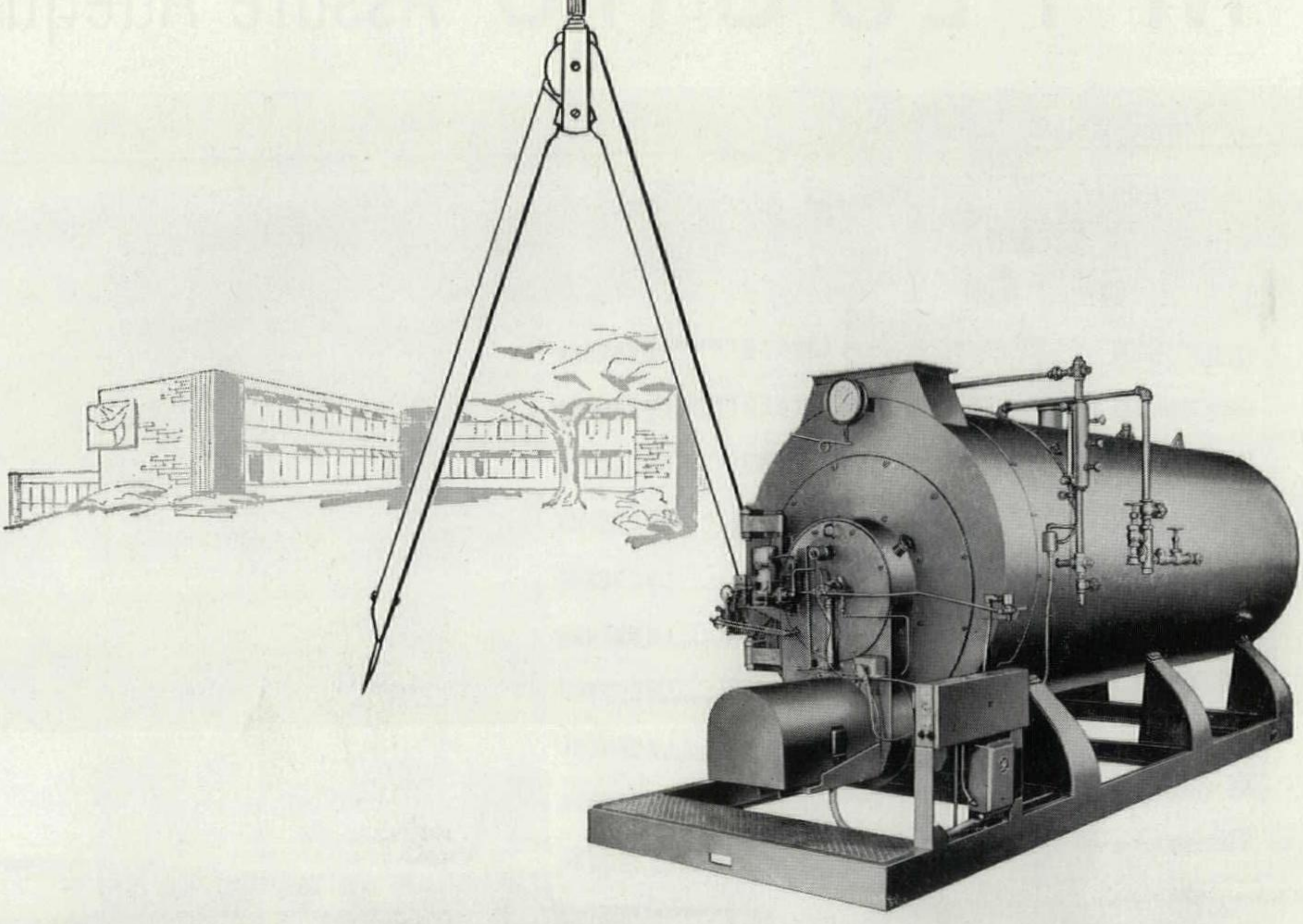

CYCLOTHERM will fit it!

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

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

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

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STEAM AND HOT WATER GENERATORS

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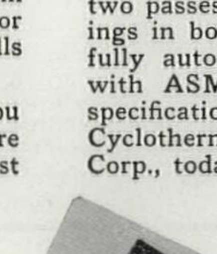

Gentlemen. Please send me, without cost, your complete new Cyclotherm booklet: *Cyclotherm Cyclonic Combustion.*

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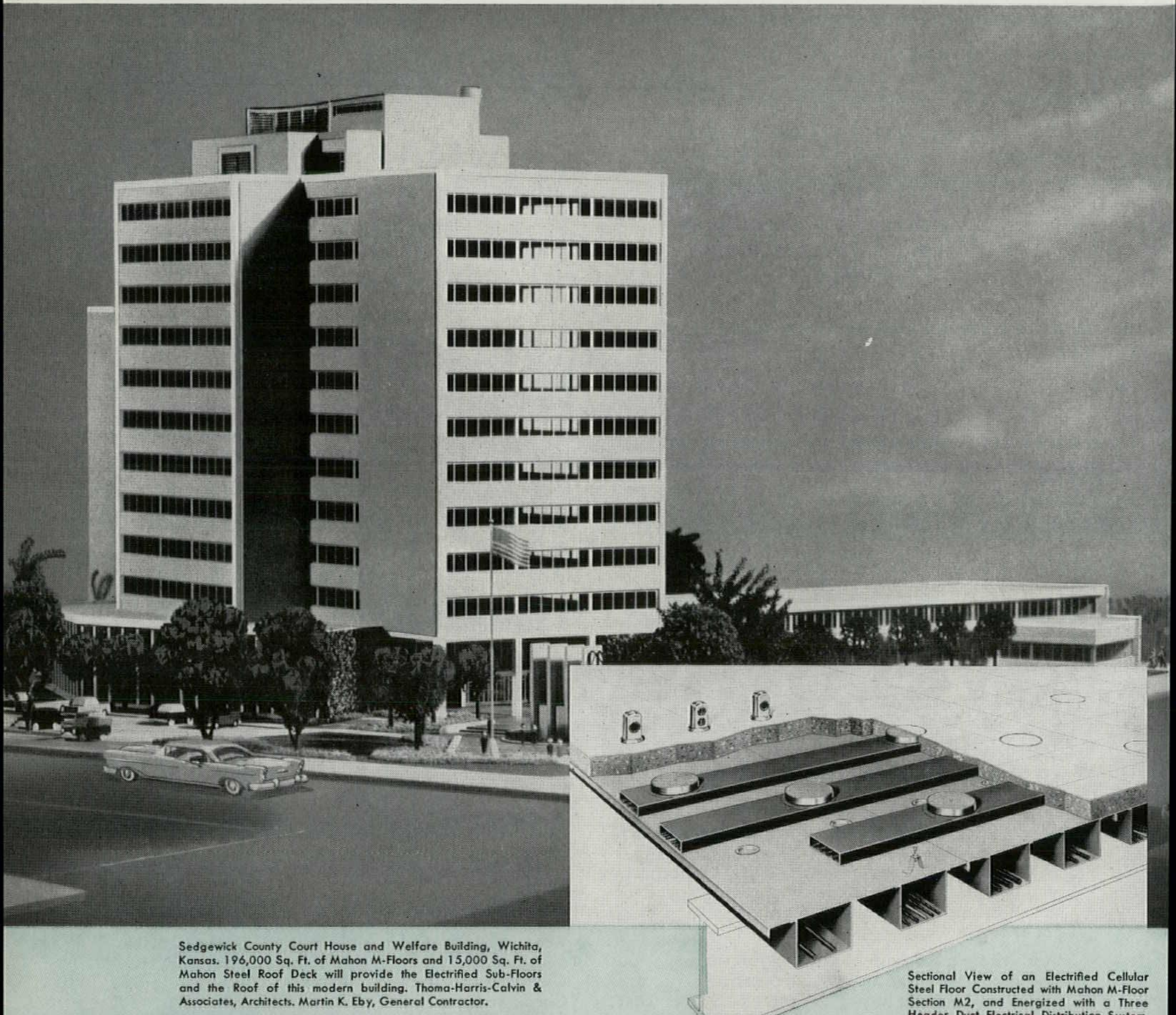
M-FLOORS Assure Adequate

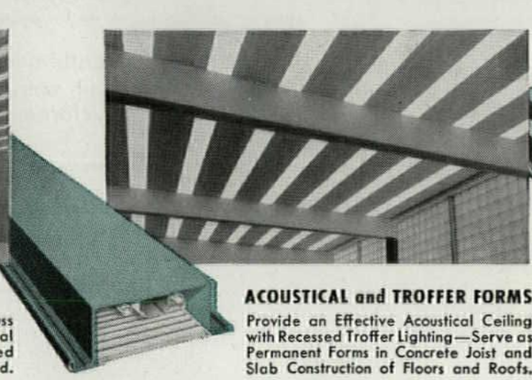


Sedgewick County Court House and Welfare Building, Wichita, Kansas. 196,000 Sq. Ft. of Mahon M-Floors and 15,000 Sq. Ft. of Mahon Steel Roof Deck will provide the Electrified Sub-Floors and the Roof of this modern building. Thoma-Harris-Calvin & Associates, Architects. Martin K. Eby, General Contractor.

Sectional View of an Electrified Cellular Steel Floor Constructed with Mahon M-Floor Section M2, and Energized with a Three Header Duct Electrical Distribution System.

LONG SPAN M-DECKS

M-Decks Span from Wall to Wall or Truss to Truss—Provide Combined Structural Roof and Acoustical Ceiling. Recessed Troffer Lighting may also be Included.



ACOUSTICAL and TROFFER FORMS

Provide an Effective Acoustical Ceiling with Recessed Troffer Lighting—Serve as Permanent Forms in Concrete Joist and Slab Construction of Floors and Roofs.

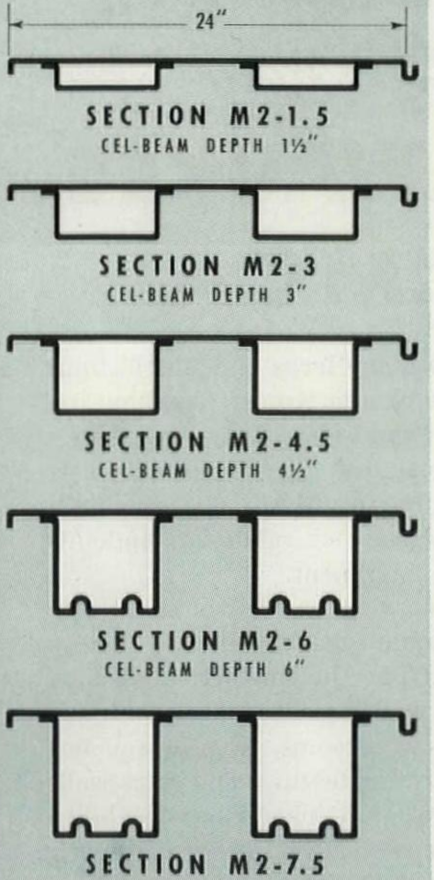
CONCRETE FLOOR FORMS

Mahon Permanent Concrete Floor Forms in various types meet virtually any requirement in concrete floor slab construction over structural steel framing.

Built-In Electrical Raceway Capacity in New County Court House and Welfare Building!

MAHON M-FLOOR SECTIONS

CEL-BEAMS, WHICH ARE UTILIZED AS ELECTRICAL RACEWAYS, ARE 6" WIDE



In the twelve-story County Court House and Welfare Building, illustrated at the left, Mahon M-Floors will provide the light weight structural sub-floors and the built-in electrical raceways so necessary in modern office buildings today. Through his selection of M-Floors for this impressive building, the architect assured himself and the using agencies of all-over electrical availability, year-after-year electrical convenience, and adequate raceway capacity to meet any electrical demands in future years.

The 6" wide Cel-Beam Raceways in M-Floor Construction provide further electrical advantages . . . they allow greater latitude in the location and installation of Floor Service Fittings, and they permit the use of 4" diameter Hand-holes between Electrical Header Duct Access Units and the Cel-Beam Raceways. This is important . . . the larger access hand-holes save time and labor costs, not only in the initial electrical installation, but year after year, whenever changes in electrical circuits are required or additional circuits become necessary.

In the M-Floor Cel-Beam Section you get a better balanced, more efficient structural unit . . . you get electrical availability in every square foot of floor surface . . . you get greater raceway capacity, greater latitude in location of floor service fittings, and greater convenience, electrically, for the life of the building.

When you select an Electrified Cellular Steel Sub-Floor for your next building, you will want all of the structural and electrical advantages that have been engineered into Mahon M-Floors. Comparison will convince you that the basic functional requisites of a Cellular Steel Sub-Floor are more fully realized in the design of Mahon M-Floor Cel-Beam Sections.

See Sweet's Files for information, or write for Catalogue M-58.

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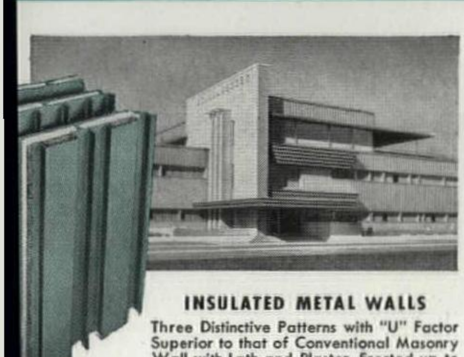

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Three Distinctive Patterns with "U" Factor Superior to that of Conventional Masonry Wall with Lath and Plaster. Erected up to 60 Ft. in Height without a Horizontal Joint.

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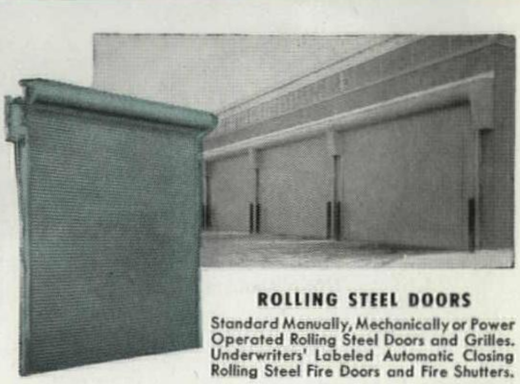
Mahon Metalclad Fire Walls carry two Hour Rating by Underwriters' Laboratories, Inc., for Use as Either an Interior Dividing Fire Wall or an Exterior Curtain-Type Fire Wall.



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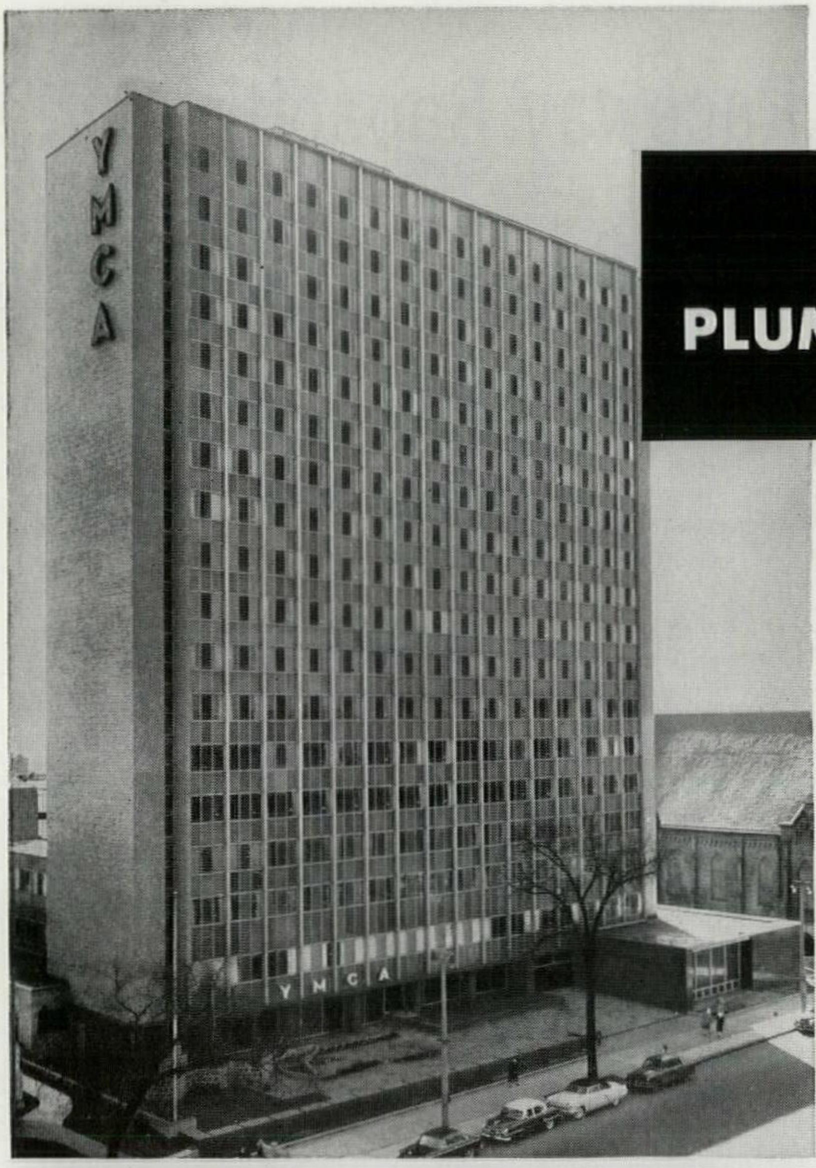
Standard Manually, Mechanically or Power Operated Rolling Steel Doors and Grilles. Underwriters' Labeled Automatic Closing Rolling Steel Fire Doors and Fire Shutters.

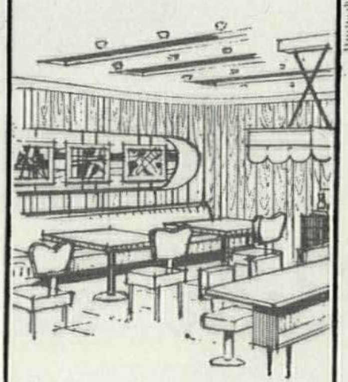


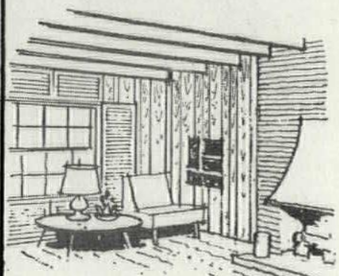
Juneau lavatories, Rinse dental lavatory

NOTES FROM AN ARCHITECT'S SKETCH BOOK

IN THE BETTER RESTAURANTS

NEW MASONITE SEADRIFT PANELS COMBINE WITH ALL OTHER MATERIALS AND FURNISHINGS TO CREATE SMART DECORATIVE SCHEMES. ECONOMICAL FOR REMODELING.





IN THE HOME

NEW MASONITE SEADRIFT PANELS COMBINE WITH WOOD, MASONRY AND FABRICS IN FAMILY ROOM, DEN, OR EVEN LIVING ROOM.

IN THE RECEPTION ROOM- NEW MASONITE SEADRIFT PANELS MAKE INTERESTING TEXTURAL CONTRASTS WITH ROOM FURNISHINGS AND ADD RICHNESS TO OTHERWISE DRAB DECOR.

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NEW SEADRIFT PANELS

Seadrift, a tempered hardboard, is ¼″ thick in 4′ widths, up to 16′ long. Authentic wood-grain pattern deeply embossed and random-groove pattern added. Butt joints provide a continuous pattern. Now distributed east of the Rockies, through lumber dealers.

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In Canada: Masonite Corporation, Gatineau, Quebec

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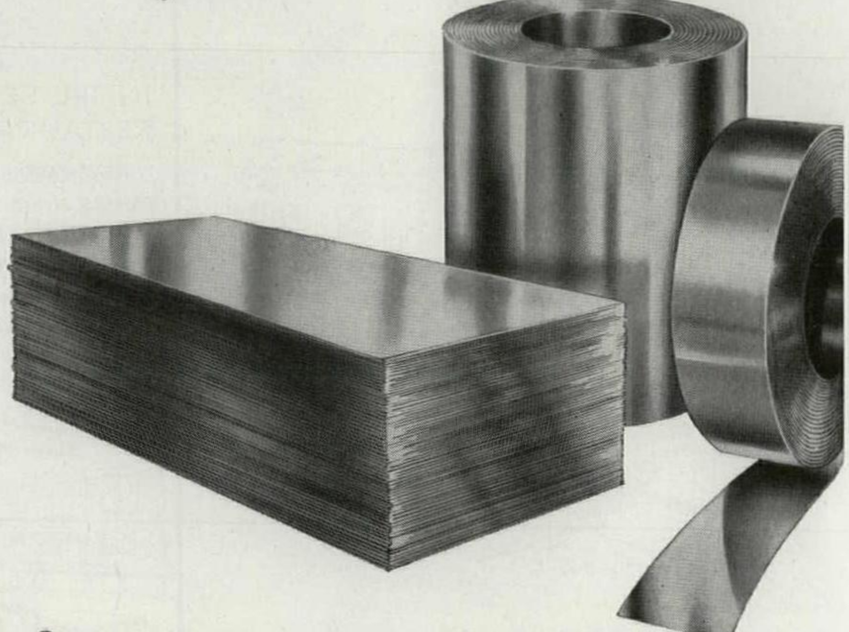
Wherever you are you get *quick personal service*



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SPECIFICATIONS

	WIDTH	THICKNESS
SHEETS	up to 36″	.005 to .109
	up to 48″	.010 to .109
STRIP	up to $23\frac{15}{16}$″	.0015 to .090
GRADES:	201, 202, 301, 302, 304, 305, 316, 321, 347, 403, 410, 430 and Micro-Mach (special extra-high-tensile aircraft grade)	

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BANK . . . LIBRARY . . .

PRACTICAL STYLING

The choice of Armstrong Rubber Tile for the floor of this bank was made for its durability as well as for its rich appearance. The striking "zebra stripe" design gives a "furnished" look to an otherwise open floor area. Adding to the effectiveness of the design is the coving of the flooring up the counter fronts — a smart decorating idea that also is an aid to cleaning.

The Commercial Bank of Salem, Oregon

architect: Bank Building Corporation, St. Louis, Missouri

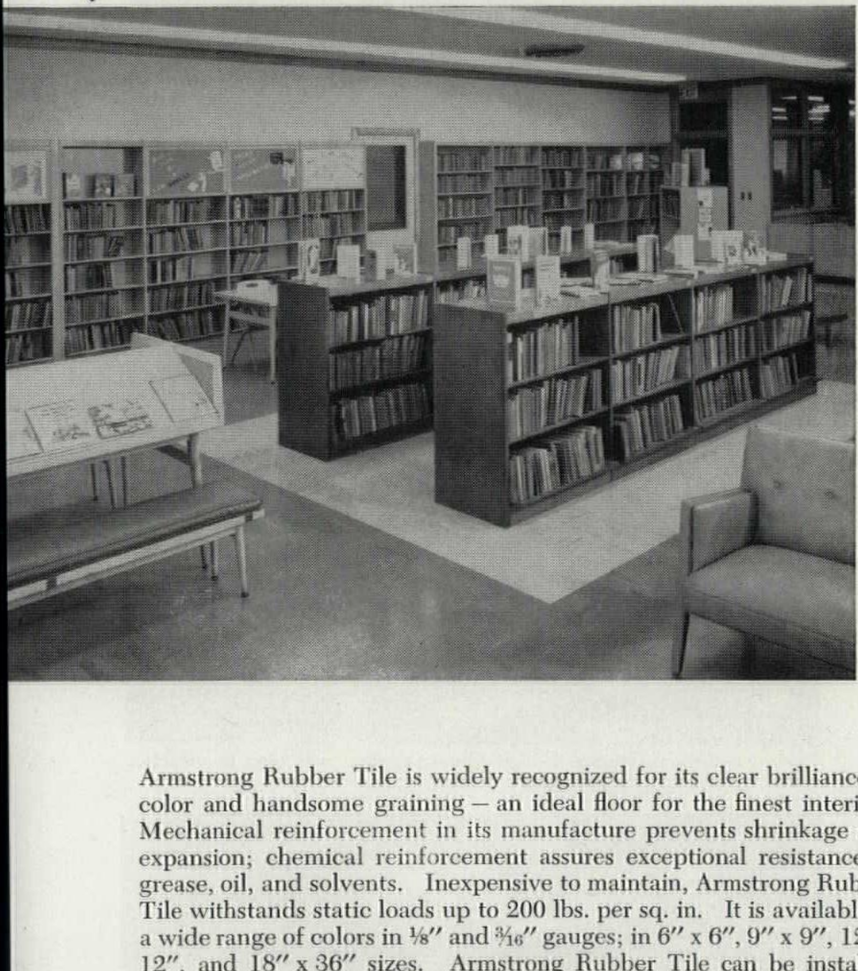
INTERIOR DESIGNERS' OFFICE . . .

the flooring spec: Armstrong Rubber Tile

QUIETNESS

Its exceptional resiliency makes Armstrong Rubber Tile one of the quietest floors to walk on, a natural choice for a library. Footsteps, chairs moving, things dropped don't disturb readers. In the children's reading room, shown here, Armstrong Rubber Tile withstands constant scuffing without permanent marks and indentations.

Maplewood Memorial Library, Maplewood, New Jersey
architect: Ray O. Peck, A.I.A. and Karl S. White, A.I.A., Associates



DECORATIVE BEAUTY

A modern custom floor is superbly achieved in thi designers' office. The crystal-clear colorings c Armstrong Rubber Tile add elegance. Ecru an beige tiles, installed in a handsome fret desig make the office seem more spacious.

Interior Design Office, New York, New York
designers: Kim Hoffmann, A.I.D. and Stephen Heidrich, A.I.D.

Armstrong Rubber Tile is widely recognized for its clear brilliance of color and handsome graining – an ideal floor for the finest interiors. Mechanical reinforcement in its manufacture prevents shrinkage and expansion; chemical reinforcement assures exceptional resistance to grease, oil, and solvents. Inexpensive to maintain, Armstrong Rubber Tile withstands static loads up to 200 lbs. per sq. in. It is available in a wide range of colors in ⅛″ and 3/16″ gauges; in 6″ x 6″, 9″ x 9″, 12″ x 12″, and 18″ x 36″ sizes. Armstrong Rubber Tile can be installed over any suspended subfloor and even below grade and on grade with specified Armstrong adhesives.

Because Armstrong makes all types of resilient floors, unbiased recommendations can be made for every flooring need. For help on any flooring problems, call the Architectural-Builder Consultant in your nearest Armstrong District Office or write direct to Armstrong Cork Company, Floor Division, 112 Watson Street, Lancaster, Pennsylvania.

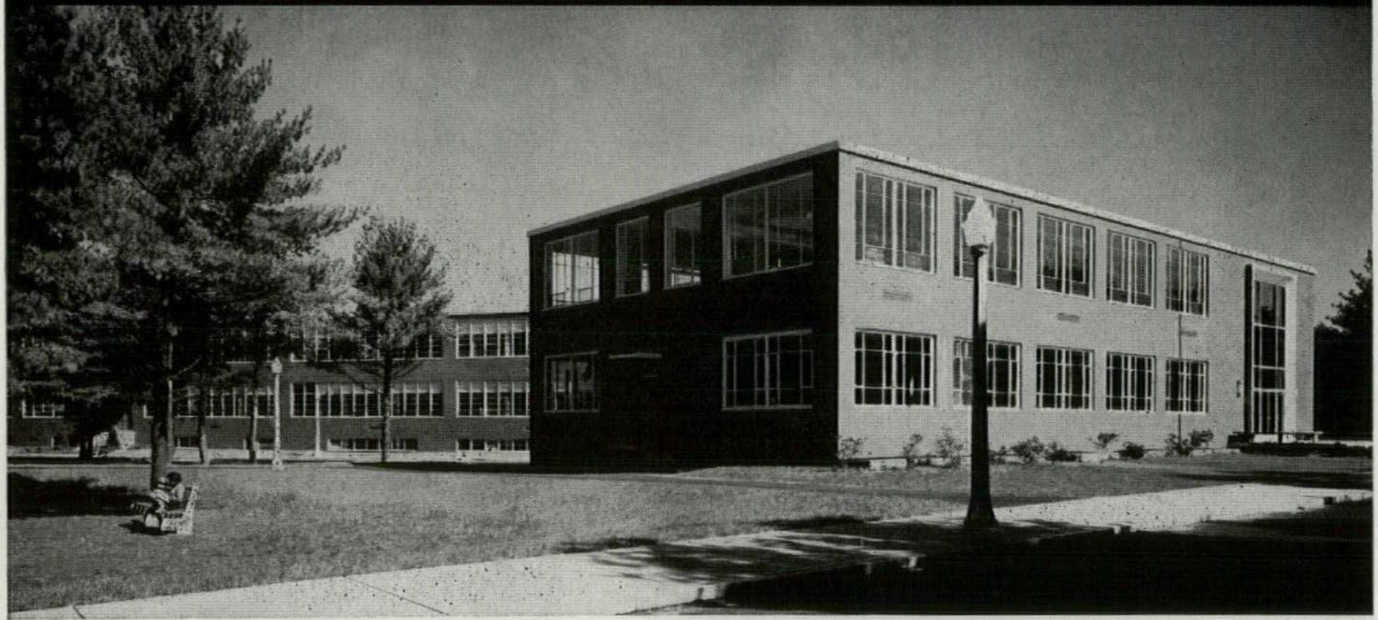
Armstrong FLOORS

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

20¢ to 35¢	Decoray® Linoleum Tile; Asphalt Tile, ⅛″ (A, B, C, D); Linoleum, light gauge; Asphalt Tile, 3/16″ (A, B)
35¢ to 45¢	Linoleum, standard gauge; Asphalt Tile, 3/16″ (C, D); Linoleum, ⅛″ ("Battleship"); Greaseproof Asphalt Tile; Cork Tile, 3/32″
45¢ to 60¢	Corlon® (Sheet Vinyl); Linoleum, ⅛″; Cork Tile, ⅛″; Excelon® Tile (Vinyl-Asbestos) ⅛″
60¢ to 70¢	Rubber Tile, ⅛″; Cork Tile, 3/16″; Linotile®; Corlon (Hydrocord® Back); Linoleum (Cushion-Eze® Back**)
70¢ to 90¢	Custom Corlon Tile (Homogeneous Vinyl) 3/32″, ⅛″; Cork Tile, 5/16″; Rubber Tile, 3/16″; Corlon (Cushion-Eze Back)
95¢ to $1.30	Custom Vinyl Cork Tile; Imperial® Custom Corlon Tile

**PATENT PENDING

"... LEHIGH MORTAR CEMENT gave us a high quality job..."



Classroom building of the new Westfield State Teachers College, Westfield, Mass.

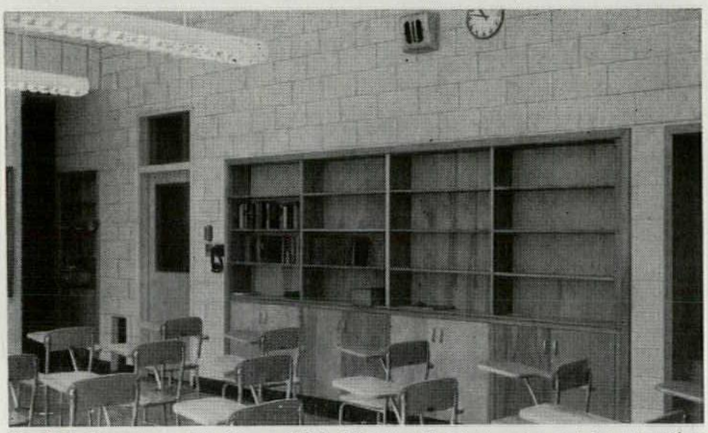
• "We were well satisfied with Lehigh Mortar Cement," wrote Mr. E. C. Connell of the Jefferson Construction Company, on completion of this classroom building.

"We achieved a uniformity of color and texture that was not possible with a cement-lime mixture.

"The workability and plasticity of Lehigh Mortar Cement gave us a high quality job and lowered masonry costs.

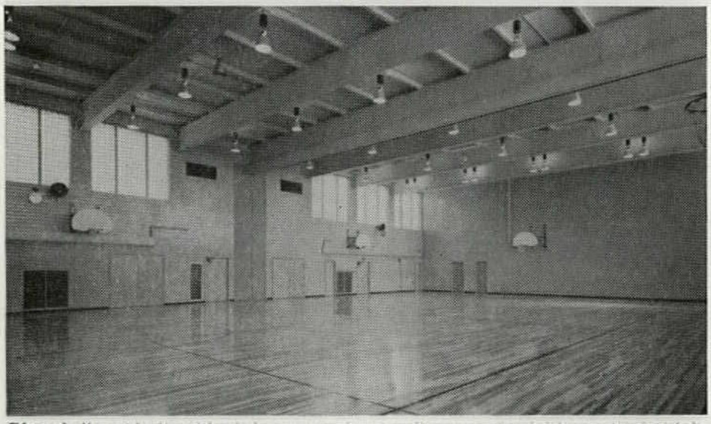
"The many compliments we received on the masonry work are due to good masons and to Lehigh Mortar Cement."

This is the kind of satisfaction Lehigh Mortar Cement is giving on countless masonry jobs all over America. You can approve its use with the assurance that it exceeds the most rigid Federal and ASTM specifications.



Typical classroom interior. Lehigh Mortar Cement was used in attractive concrete masonry walls.

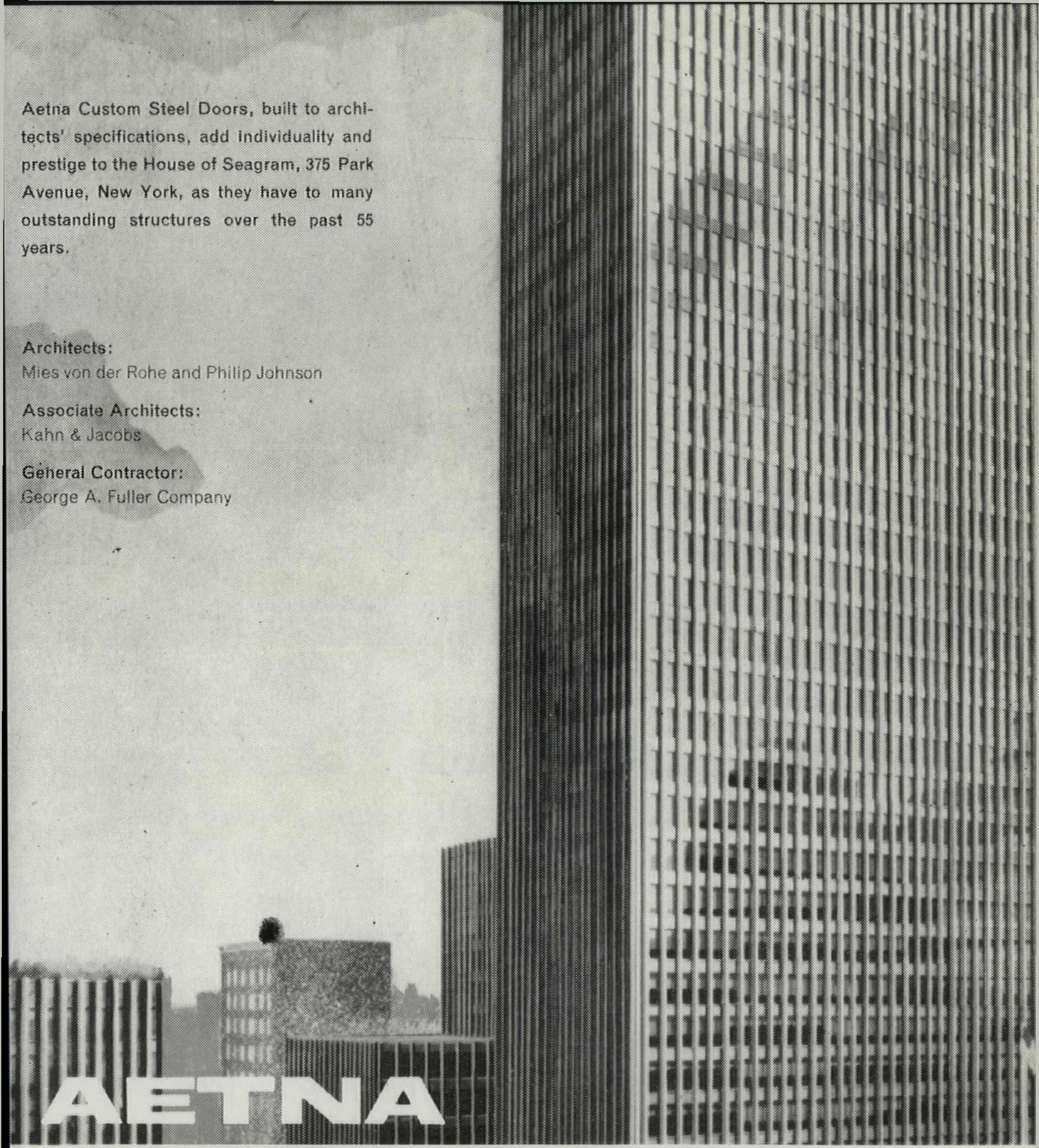
ARCHITECT: Abbott Associates, Boston, Mass.
CONTRACTOR: Jefferson Construction Co., Cambridge, Mass. and Miami, Fla.
DEALER: Cook Builders Supply Co., West Springfield, Mass.



Glazed tile and glass block in gymnasium walls were also laid up with Lehigh Mortar Cement.

LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA.



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Aetna, the most famous name in custom hollow metal products, now presents.........................

AETNAPAK ORDERED

CUSTOM-QUALITY STOCK STEEL DOORS FRAMES HARDWARE

to avoid custom engineering delay

AETNAPAK advantages boil down to this: custom quality with stock service at stock prices.

Here's what AETNAPAK means to you, design-wise and dollar-wise.

1. Over 200 type-and-size combinations of swing and slide doors—16 basic types in standard widths and heights.

2. Ready to install. Doors and frames shipped complete with your choice of AETNAPAK hardware.

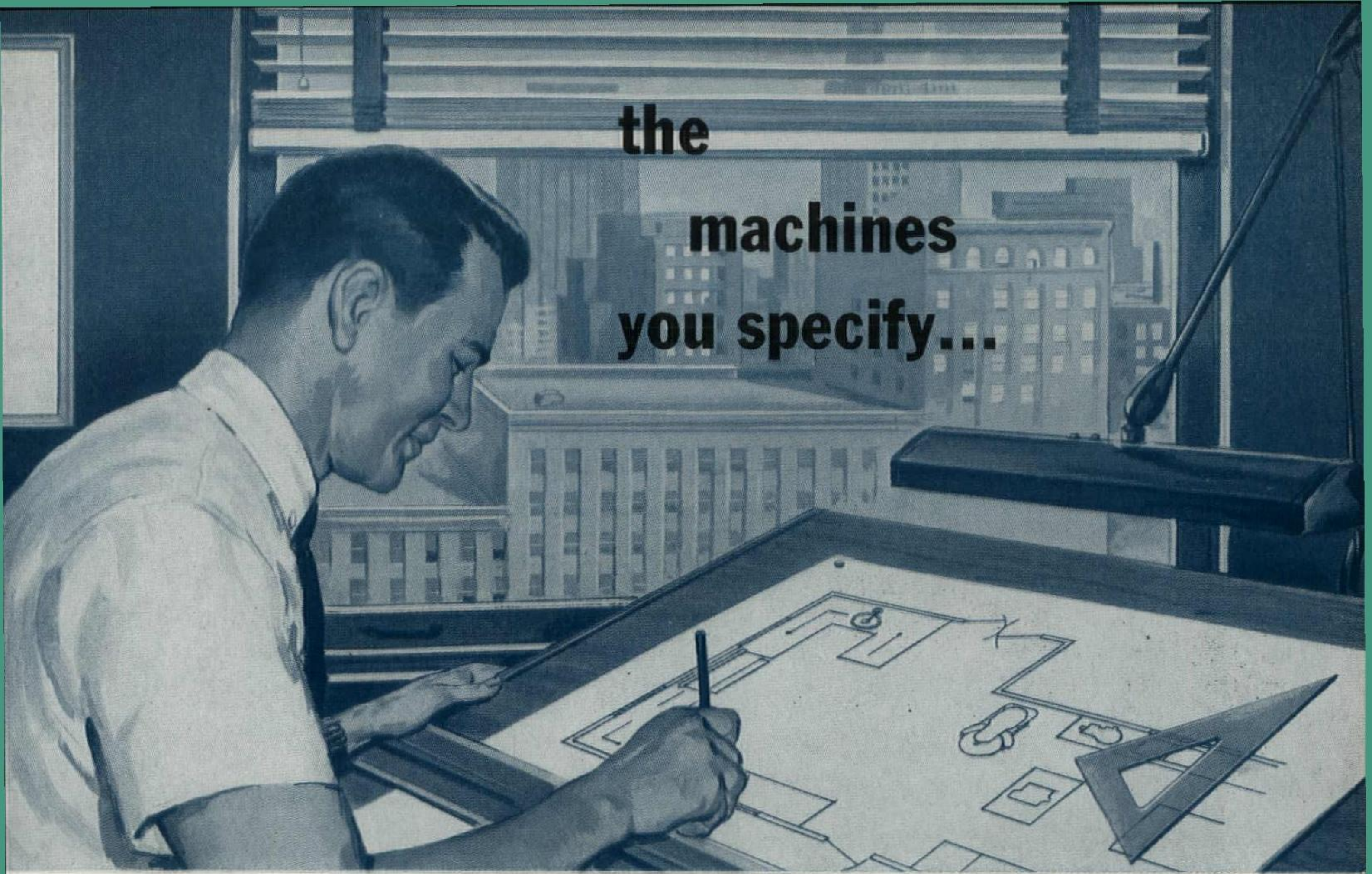
3. Available *now*—wherever you are—through nation-wide representatives. Aetna service is geared to meet your schedules.

4. Aetna quality has a leader's reputation to uphold. Refinements, like welds and seams dressed smooth and extra reinforcements, offer you stock packages with custom workmanship, appearance and features.

5. Custom features: completely flush design; uniform clearances; mortised flush bolts; furniture-grade steel in doors; standard bevelled door stiles; either knocked-down or set-up frames.

6. Choice of mortised or cylindrical locksets, hinges, push plates, closers, push bars, bumpers, panic devices, and other accessories.

The complete detailed facts are even more impressive. Be sure to get them for your files. Use the convenient coupon,



make your kitchen layouts work!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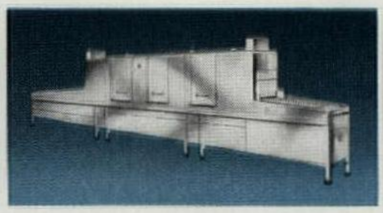
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An easy way to guarantee your kitchen designs is to say HOBART when you specify the food, kitchen and dishwashing machines that complete your layouts.

There are several distinct advantages to all concerned in specifying Hobart machines: one source of supply for all machines with local representation as near as the phone; a broad line that offers a variety of sizes, styles and capacities—layout flexibility; the backing of a manufacturer who has earned a reputation for building quality equipment over a span of 60 years.

When you specify Hobart, you are specifying equipment that is preferred by chefs and kitchen managers. Ask the man who has used Hobart machines...he'll tell you of their ruggedness, smoothness and economy of operation, and the unequaled dependability of Hobart-built motors—outstanding design and sanitation features.

As an architect you can appreciate these facts. Check Sweet's Architectural File for complete specifications and capacities on all Hobart kitchen and dishwashing machines. Or send the coupon for detailed specifications.

Hobart
machines

The World's Largest Manufacturer of Food, Kitchen and Dishwashing Machines

The Hobart Manufacturing Co., Dept. HPA, Troy, Ohio
Please send information and specifications on Hobart Food Cutters ☐ Dishwashers ☐, Glass Washers ☐, Mixers ☐, Peelers ☐, Meat Saws ☐ Slicers ☐, Tenderizers ☐, Food Waste Disposers ☐.

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City.......................... *Zone*..... *State*....................

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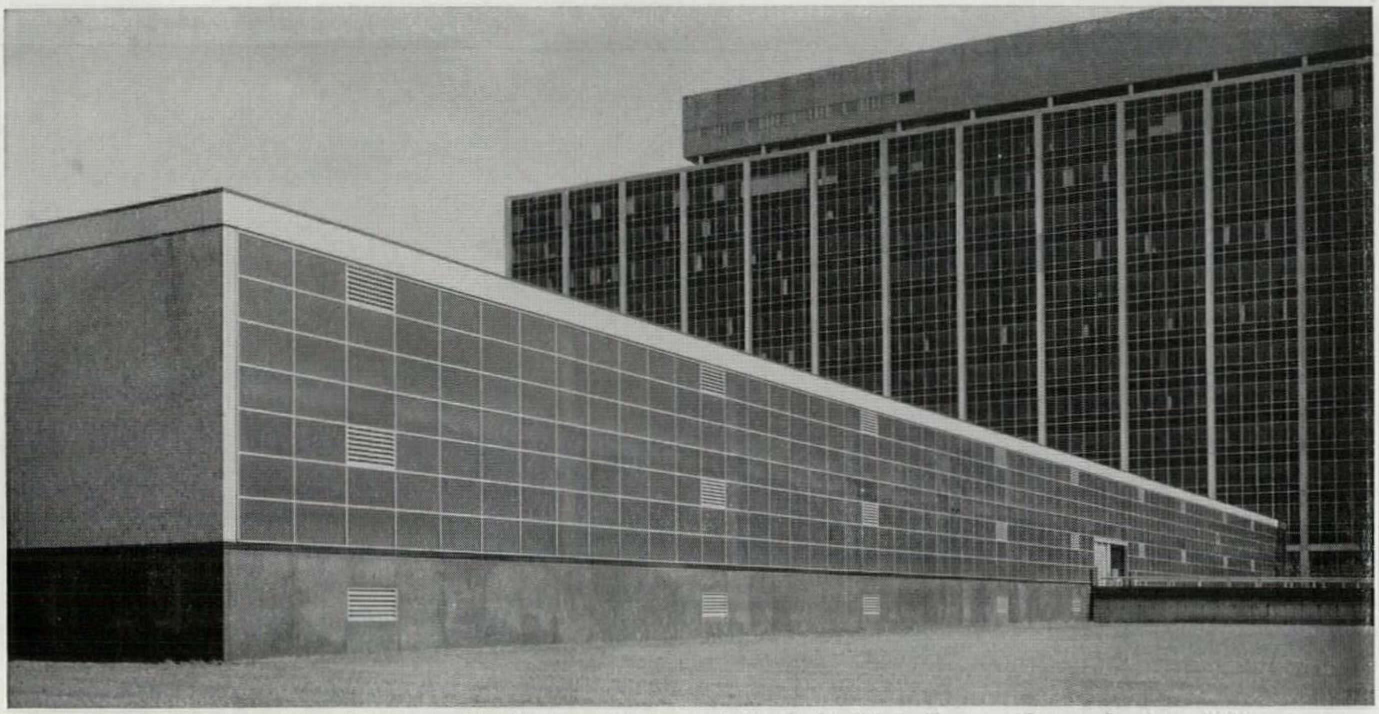
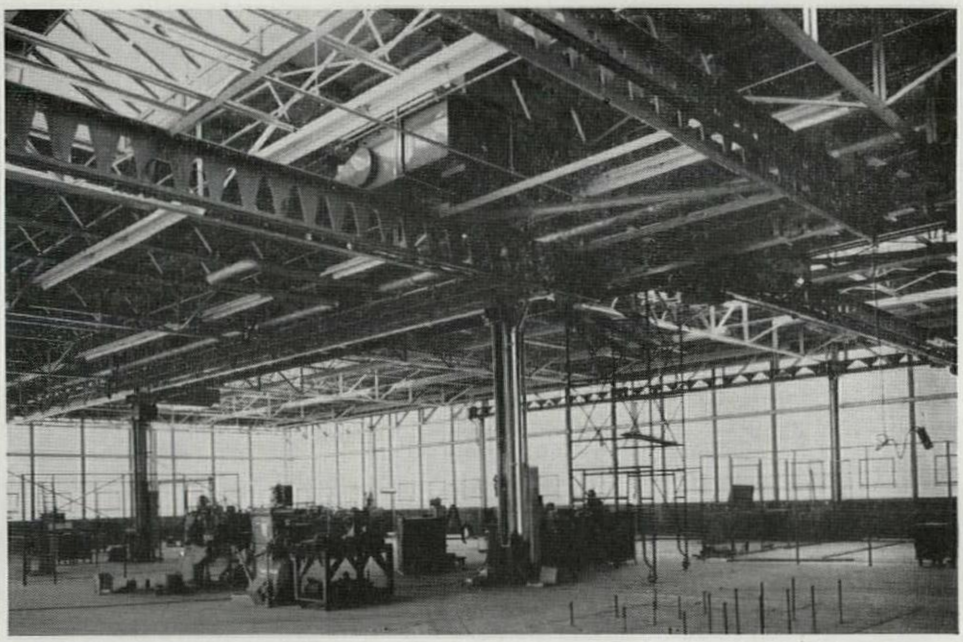


Glare reduced Coolite glass achieves high levels of illumination without heat and glare for Ford Motor Company Garage, Dearborn, Michigan.
Glazier: Pittsburgh Plate Glass Co., Detroit

Coolite, Heat Absorbing Glass, glare reduced on the pattern side, provides ideal daylighting for Johnson Motors, Waukegan, Illinois. Architect: Shaw, Metz & Dolio. Contractor: Campbell, Laurie & Lautermilch. Glazier: Waukegan Glass Co.



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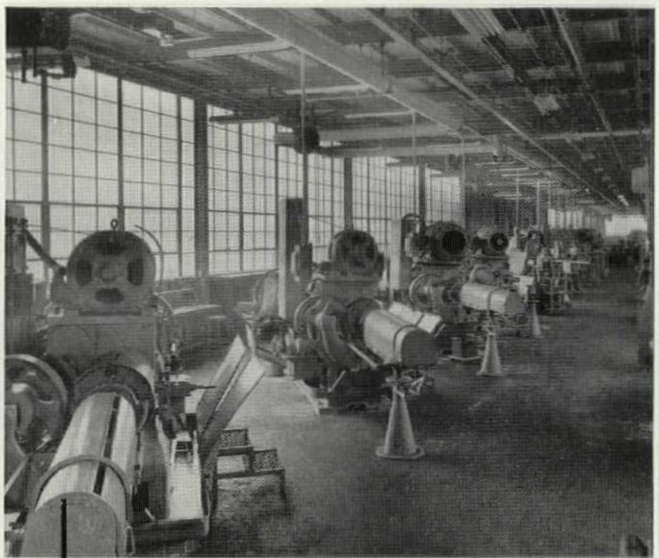
TRANSLUCENT GLASS

Modern Buildings Utilize Diffusing Glass to Make the Most of Daylight

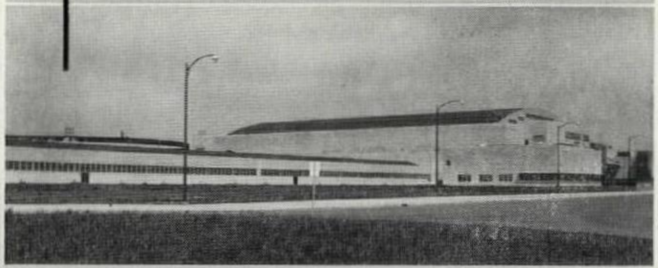
These outstanding buildings enjoy more and better daylighting per glazing dollar because translucent glass diffuses daylight deep into interiors to achieve even, comfortable, overall illumination at low cost. Areas are flooded with inexpensive, natural lighting, free of raw glare. Sharp shadows and contrasts are reduced to make seeing tasks easier. Translucent glass helps create a feeling of spaciousness and comfort. Occupants see better, feel better, work better under improved daylighting. The resulting efficiencies and improved morale make it good business to install translucent glass.

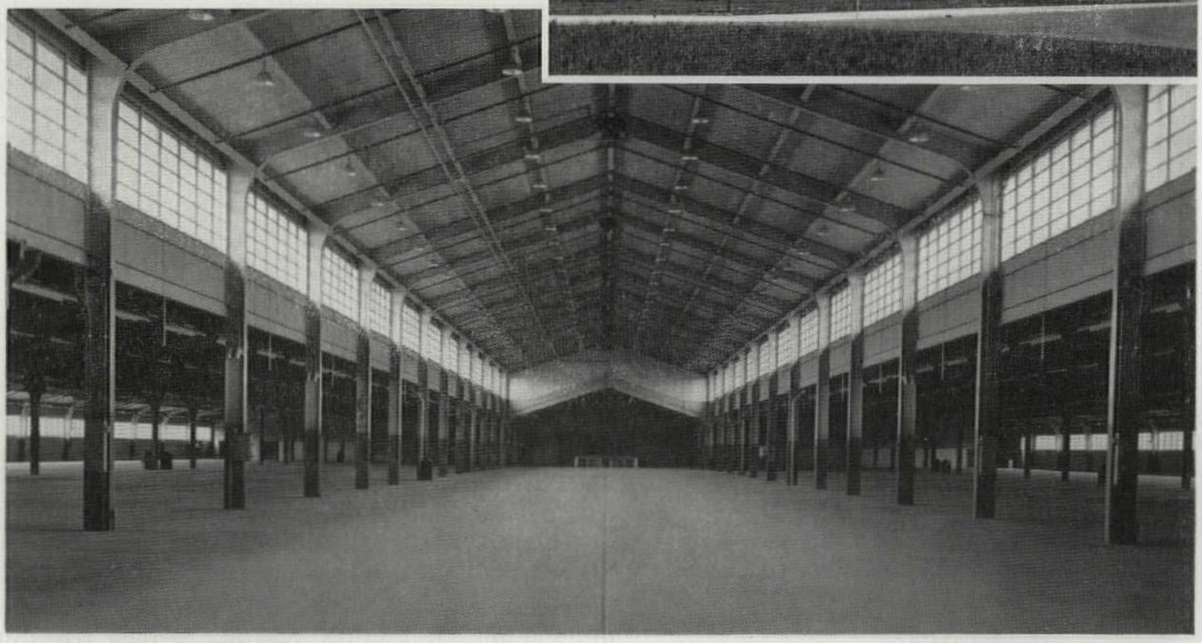
Today's leading architects are taking fullest advantage of translucent glass to achieve interesting, highly functional structures that provide high levels of low cost, natural illumination. Specify glass by Mississippi. Available in a wide range of patterns and surface finishes to solve any daylighting requirement.



Coolite, Heat Absorbing glass, glare reduced, installed in the Twin Disc Clutch Company, Racine, Wisconsin, floods work areas with conditioned daylight . . . absorbs up to 50% of unwanted solar heat. Glazier: Pittsburgh Plate Glass Co.

**35,000 sq. ft. of Smooth Rough glass in the Kentucky Fair and Exposition Center, Louisville, Ky., brightens entire interior.
Architect: Fred Elswick and Associates of Louisville
Photo by: Royal Photo Co.**



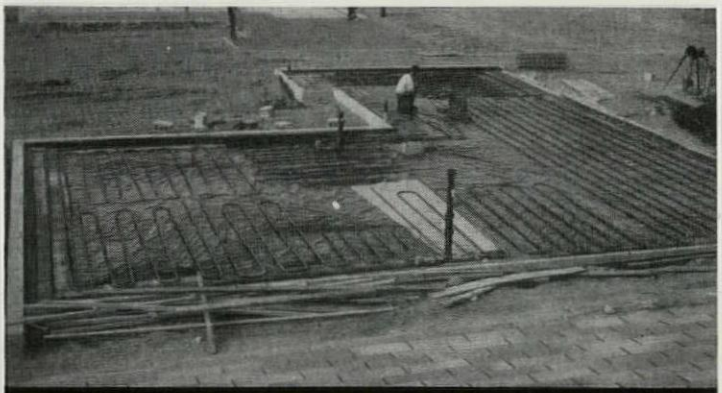


GLASS COMPANY

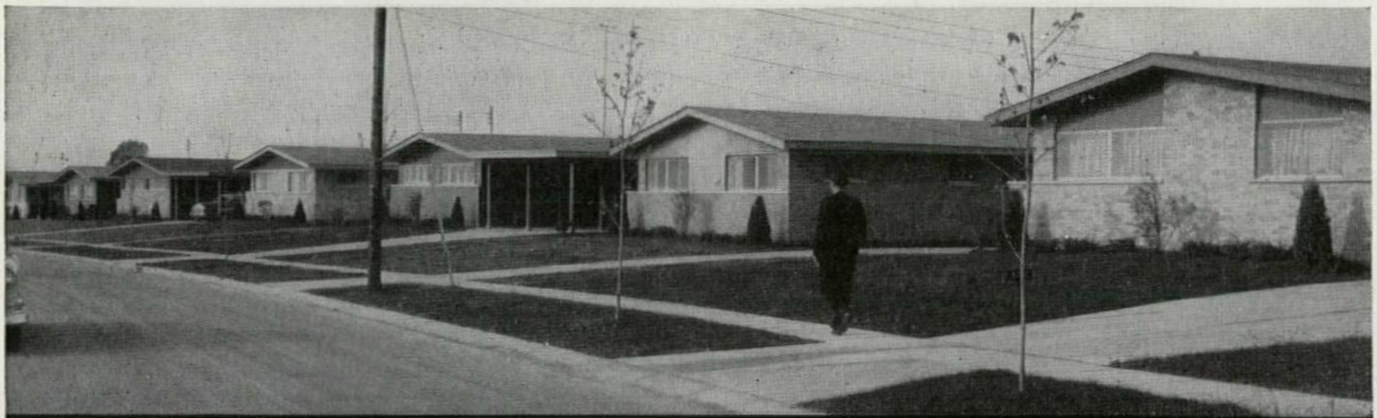
88 Angelica St. • St. Louis 7, Mo.

ROLLED, FIGURED AND WIRED GLASS

Youngstown steel pipe



. . . Gives Long, Maintenance-Free Life to Radiant Heating Installations



Youngstown Steel Pipe was installed by National Heating Co. in this 60-unit development of Modern Builders, Inc., both of Cincinnati, Ohio.

Specify Youngstown and secure these
7 Points of uniform goodness

uniform ductility	uniform wall thickness and size
uniform lengths	uniform strength and toughness
uniform threading	
uniform weldability	

uniform roundness and straightness

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
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Modern residential developments—like this 60-unit project off Cincinnati's Winton Road—demand only the most modern heating facilities. So, to afford these new homeowners warm, draft-free rooms of equalized temperatures, invisible radiant heating systems utilizing Youngstown Steel Pipe were installed.

For years Youngstown Steel Pipe has been specified by leading architects as well as progressive plumbing and heating contractors for its dependability and long life. That's because it's made of only the finest steel by steelmen with over half-a-century of steelmaking knowhow. All Youngstown operations from ore mining to finish threading are closely quality-controlled to give you the best piece of pipe obtainable anywhere. Why not make Youngstown your specification for long, trouble-free installations?

For additional information or service, contact your local Youngstown distributor—or phone our nearest District Sales Office, today.


Home
designed with
INSULITE
ROOF DECK
Architect:
Herbert L. Smith III
A.I.A.
Oliver & Smith
Norfolk, Virginia

Virginia architect's home built with Insulite Roof Deck is 10° cooler in summer

Although it does not have air conditioning, this handsome beam-ceilinged home designed for himself by Architect Herbert L. Smith III, A.I.A., Norfolk, Virginia, is often 10 degrees cooler in summer than older homes nearby.

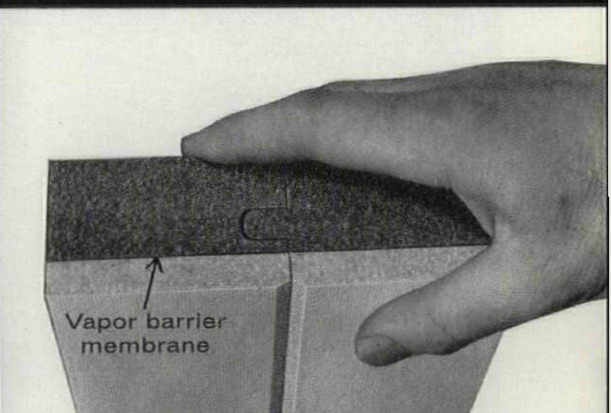
Credit for this built-in comfort goes to Insulite Roof Deck—a 3-in-1 material combining decking, insulation and finished, prepainted ceiling. With Insulite Roof Deck, no roof boards, no added insulation, no plastering or painting are needed.

Yet the comfort, beauty and character of Insulite Roof Deck are not expensive. For a 90-home project at Virginia Beach, Architect Smith has designed very striking $15,000 homes with similar open-beam ceilings. On these, builder Frank Whitehurst, Jr. reports that Roof Deck saves him more than $400 per home.

In warmest and coldest climates, Insulite Roof Deck is now being specified in homes priced from $10,000 to $100,000 . . . in schools, churches, auditoriums . . . and in many types of commercial buildings. Want more information? Write us—Insulite, Minneapolis 2, Minnesota.

build better and save with INSULITE

***INSULITE,** made of hardy Northern wood* Insulite Division of Minnesota and Ontario Paper Company, Minneapolis 2, Minnesota

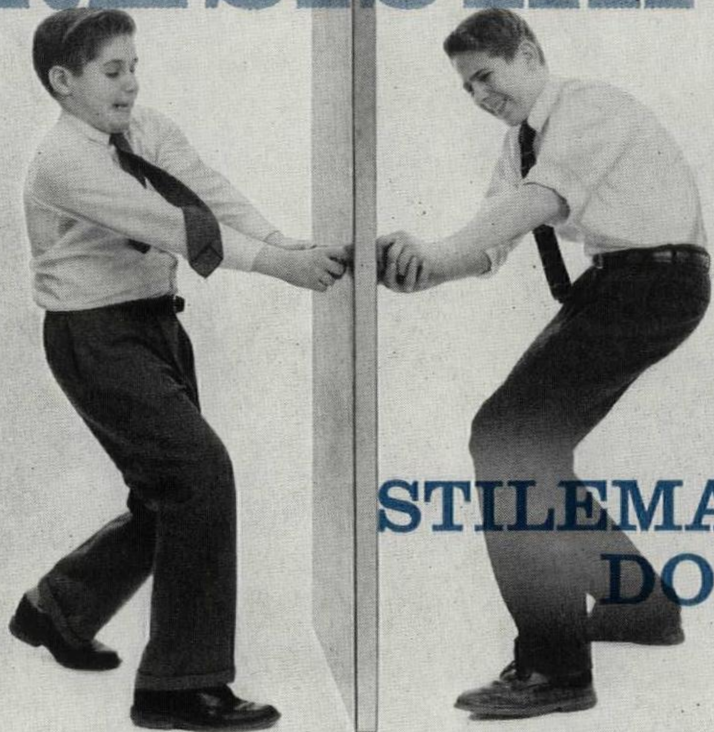


Three bedrooms, a living-dining room, kitchen, family room, 2½ baths and garage are included in Architect Smith's attractive home. All rooms except one bath and a corridor have open-beam ceilings. Roof is 2" Insulite Roof Deck, on beams made of double 2"x8"s with bottom closure.

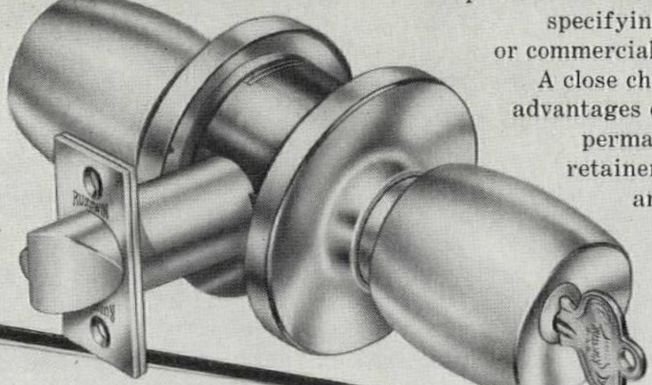
Easy-handling 2'x8' panels of Insulite Roof Deck are fabricated as shown in cross section at right above. Tongue-and-groove joints on long edges make snug fit. Ceiling surface, including bevels, is prepainted. Made 1½, 2 and 3 inches thick, with vapor barrier available in 2 and 3-inch sizes.

Architects *for the Beacon Mutual Indemnity Company's new home office building: Benham, Richards & Armstrong, Columbus, Ohio*

ROUGH RESISTANT



STILEMAKER DOORWARE



This heavy-duty cylindrical lock line has earned a schoolwide reputation for being *rough-resistant*... a point to consider when specifying doorware for any type of institutional or commercial building.

A close check of Stilemaker construction will reveal the advantages of such features as... a full ⅝" throw permanently lubricated latch bolt; concealed knob retainers; long knob shank bearing for knob rigidity and many others. All the facts are available in concise form. Consult your Russwin Specialist or write Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.

RUSSWIN®
distinctive doorware

This "man"

assures

The Quality Verification Program conducted by "the man in the white coat" is a continuing program of checking and inspection of member-company joist manufacturing processes and materials. This program is administered for the SJI by a nationally known testing laboratory. In the photo above, the inspector is measuring accuracy of fabrication at several points along the length of a Truscon "O-T" Steel Joist, Short-Span Series.

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World's Widest Range of Standard Steels

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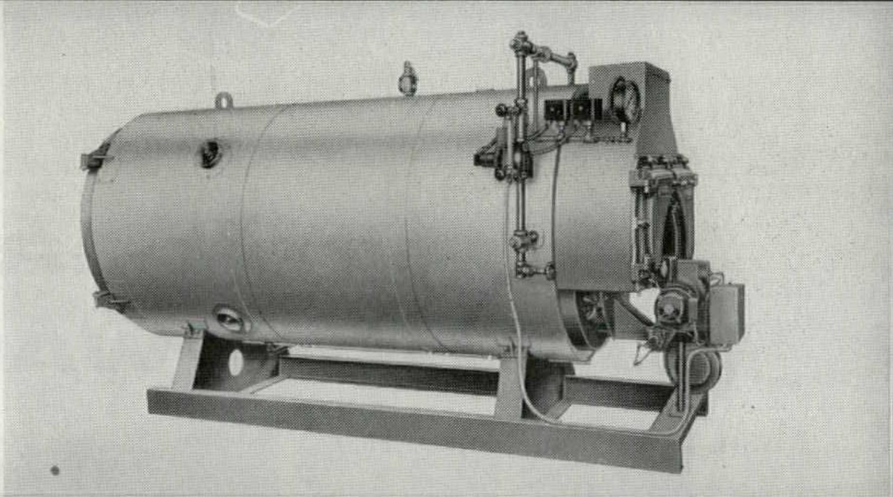
NEW 606,000 TO 3,060,000 BTUH CAPACITIES: Forced-draft package teams low pressure Kewanee Scottie Jr. Boiler with Iron-Fireman Micro-Mist Oil Burner. Exclusive burner principle completely atomizes and carburets No. 5 or lighter fuel oil before combustion.



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Now . . . 8 popular sizes are available in both high pressure and low pressure models.

Forced-draft firing keeps combustion air supply constant, regardless of location or atmospheric conditions. Vent pipe only is needed—eliminating added cost and unsightliness of a stack.

Fuel flexibility is offered by proved burners built on exclusive principles to completely carburet either light or heavy oils. Gas and gas-oil combination units are also available.

Kewanee factory-assembles the entire unit before shipping. Boiler is fitted with burner and controls at factory. Fire-tested if desired. Package is shipped complete—or if job conditions require, the burner may be field mounted at a later date.

The coupon at right brings complete information. Mail it today to your nearby Kewanee Man, or to: AMERICAN-STANDARD, KEWANEE BOILER DIVISION, 101 Franklin Street, Kewanee, Illinois.

On new tract site, Mr. Byrnes (left) discusses telephone service with Mr. Charles Wirtle of Cincinnati and Suburban Bell Telephone Company

"Concealed telephone wiring helps me stay on top of the market"

— says Mr. Chas. F. Byrnes, Builder, of Cincinnati, Ohio

"I believe in getting the newest features into my homes," says Mr. Byrnes. "One of those features is concealed telephone wiring. It helps me stay on top of the market.

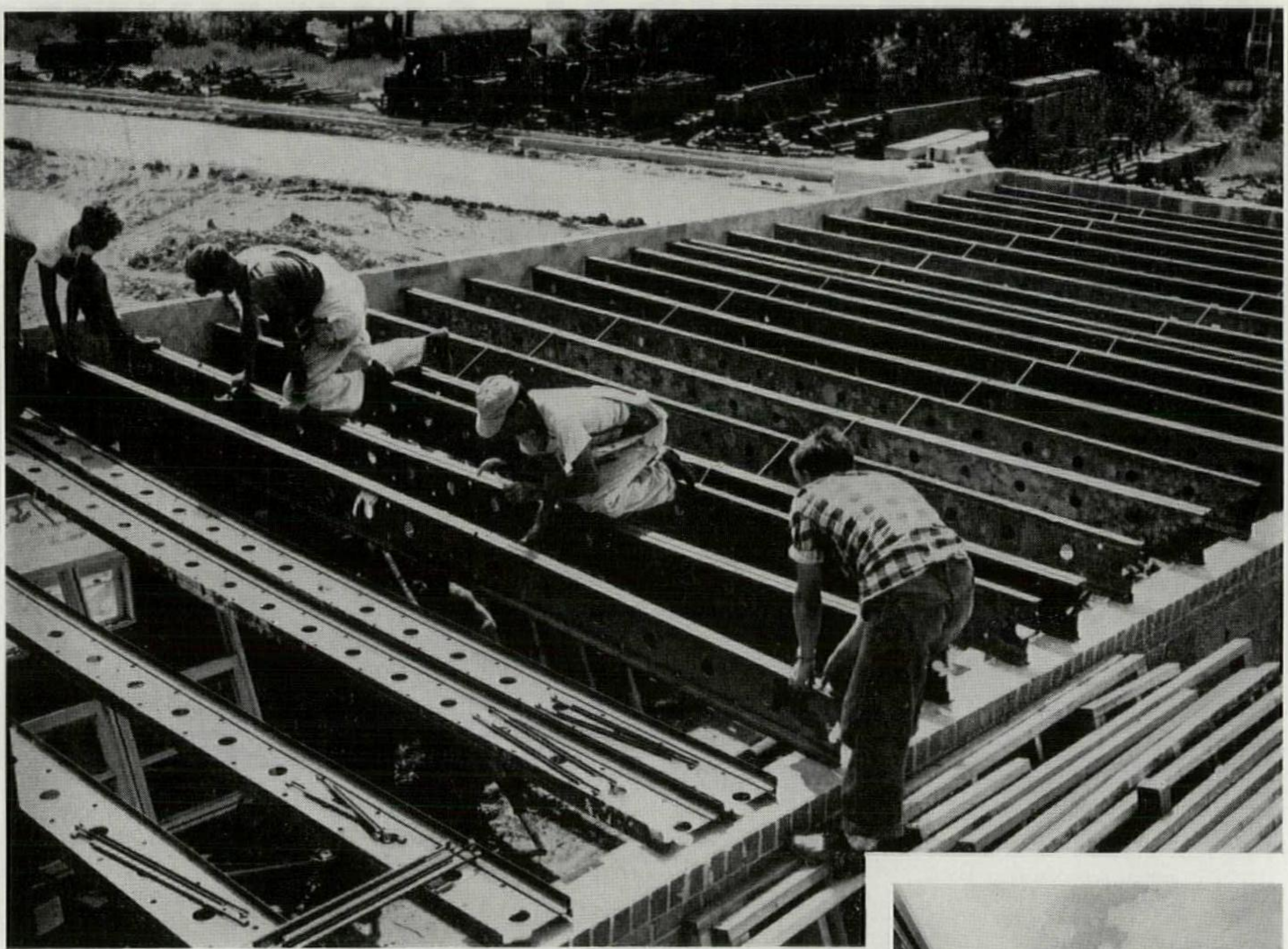
"Telephone outlets are a definite sales point. They're one of the first things we emphasize when talking with customers. Also, we mention concealed wiring and multiple outlets in our advertising, because we know they're conveniences that people are looking for. I wouldn't think of building a house today that didn't have telephone facilities built into it."

. . .

Your nearest Bell Telephone business office will help you with concealed wiring plans. For details on home telephone wiring, see Sweet's Light Construction File, 8i/Be. For commercial installations, Sweet's Architectural File, 32a/Be.

Working together to bring people together

BELL TELEPHONE SYSTEM



LIGHTSTEEL FLOOR SYSTEM
cuts 55% from insurance rates for apartment development

Architects: Corning & Moore
Structural Engineer: Milton Kellert

Fireproof construction offered twin advantages for the owners of the Shirley Park apartment development, Arlington, Virginia. It could mean big annual savings in the cost of insurance, and obvious rental benefits.

A problem was the type of floor system to use. Wood joists were out. Their initial cost was right but they did not qualify for the lowest insurance rates. The only possibility was a system utilizing steel and concrete – but economically.

Penmetal's LIGHTSTEEL floor-joist system did the trick. It afforded all the advantages of conventional steel joists, but without the waste and high costs of overdesign. Insurance rates were 55% lower than a system using wood. *In 13 years, insurance savings alone will pay off the small added cost of* LIGHTSTEEL.

And the owners saved in construction, too. Economies included: speed of erection, availability of materials, and light weight which eliminated the need for heavy erection equipment. The job superintendent's records show that an entire floor-joist system for one apartment building (area 75′ x 38′) was erected in two hours by four men.

M. T. Broyhill & Sons Corporation of Arlington, builders, owners, and operators of these ultra-modern apartments, feels that the LIGHTSTEEL system is the most economical for apartments, as well as for commercial and institutional buildings.

Architects: Here is a place you can design for real savings. For further information, send for catalog and technical manual.

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METAL MARK
Penmetal
1869
OF QUALITY

PM-95

Natatorium, University of Michigan, Ann Arbor, Michigan
Architects: Giffels & Vallet Inc., L. Rossetti, Detroit, Michigan
Tile Contractor: The C. J. Page Tile Company, Detroit, Michigan

Romany-Spartan Tile sparkles in new exhibition pool

Here, at the University of Michigan, is an outstanding example of forward thinking in competitive pool planning. Nothing has been overlooked in making this installation the country's finest. Its unique design—with the diving area adjoining, but outside the main tank—makes possible its uniform five-foot depth throughout the entire six-lane course. Both beauty and permanence were achieved through the use of Romany•Spartan small unit tile for runway and tank lining.

From natatorium to auditorium, classroom to kitchen . . . Romany•Spartan's wide range of colors, sizes and shapes, glazed and unglazed, offers tile for every purpose. For design help or information, call your nearby Romany•Spartan representative. United States Ceramic Tile Company, Dept. P-18, Canton 2, Ohio.

ROMANY SPARTAN

Member:
Tile Council of America
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UNITED STATES CERAMIC TILE COMPANY • THE SPARTA CERAMIC COMPANY

LATEX PAINT FACTS FOR ARCHITECTS

New 16-page booklet tells why and where to specify latex paints

Now in one easy-to-use booklet you can get answers to your questions on latex paints—their uses, benefits and limitations. "Why and Where To Specify Latex Paints" was written to serve as a helpful guide for architects, specification writers and contractors.

This booklet answers such questions as: On what interior and exterior surfaces can I specify latex paints? Where should they not be specified? Why can they be applied over freshly dried plaster? Why don't surfaces need to be primed before latex paints are applied? Can coats of latex paints and oil paints be applied alternately in successive coats? What controls chalking in latex paints?

Get the answers now to these and the other questions you have about latex paints. For your copy of this booklet write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1836VV-1.

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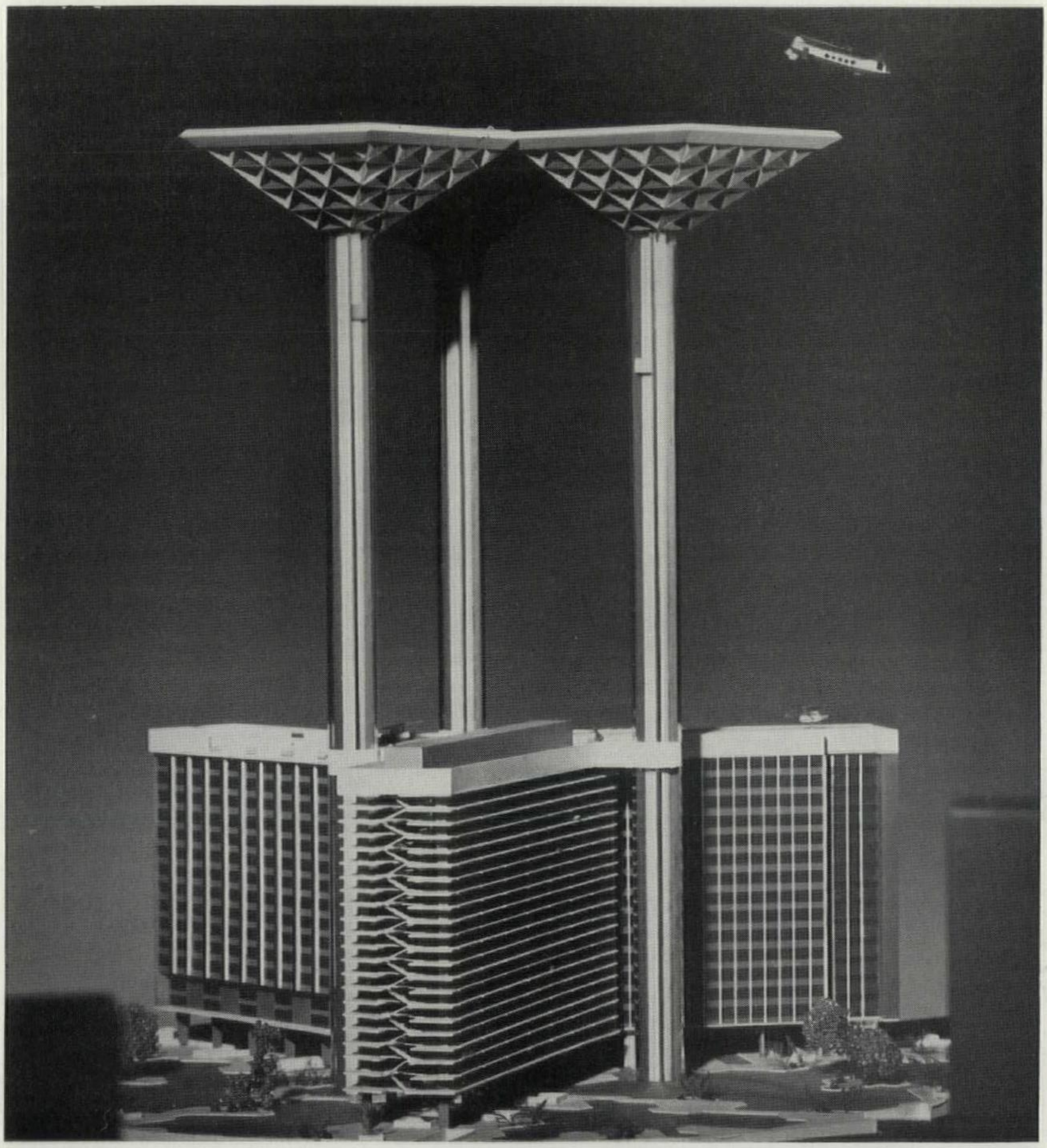
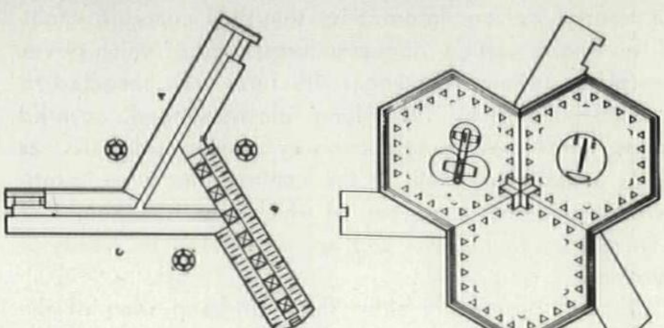
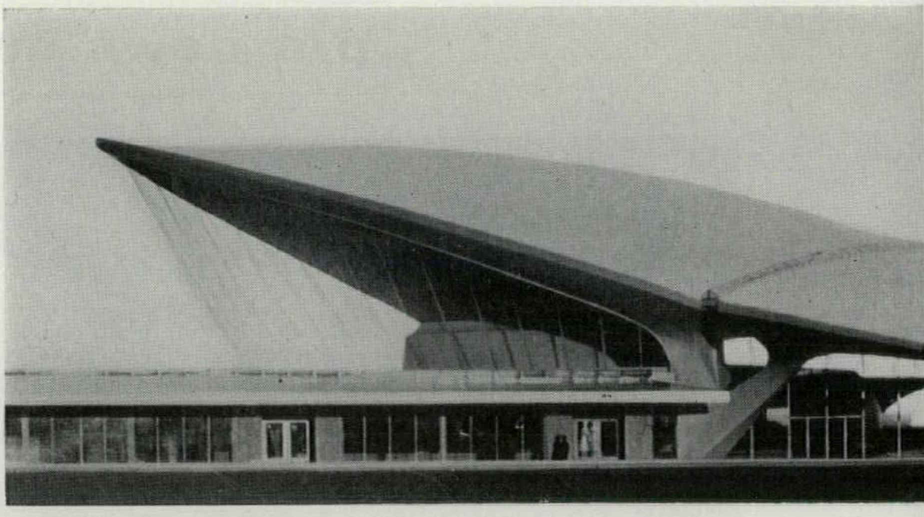


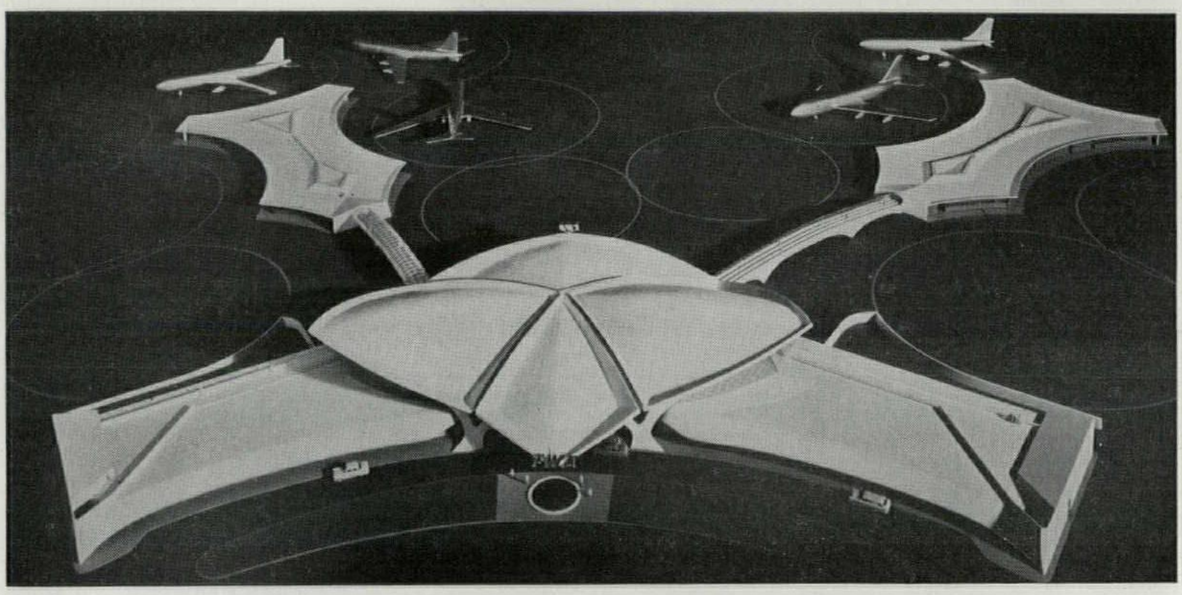
SKYPORT ONE



This project, designed by James Dartford, English Architect, on behalf of the Glass Age Development Committee*—sponsored by Pilkington Brothers, Ltd.—proposes architectural means of answering the air-travel requirements of tomorrow. It is assumed that aircraft capable of vertical landings and take-offs will be in operation by 2000 A.D., making it feasible then to locate air terminals in the center of towns. "Skyport One," prototype for a number of similar air-stops in the London area, was designed for St. George's Circus. The 500-ft high flight deck would be supported by three shafts. At its base the port might have hotel, office, and garage facilities, straddled by the massive shafts.

* G. A. Jellicoe, Edward Mills, Ove Arup & Partners.





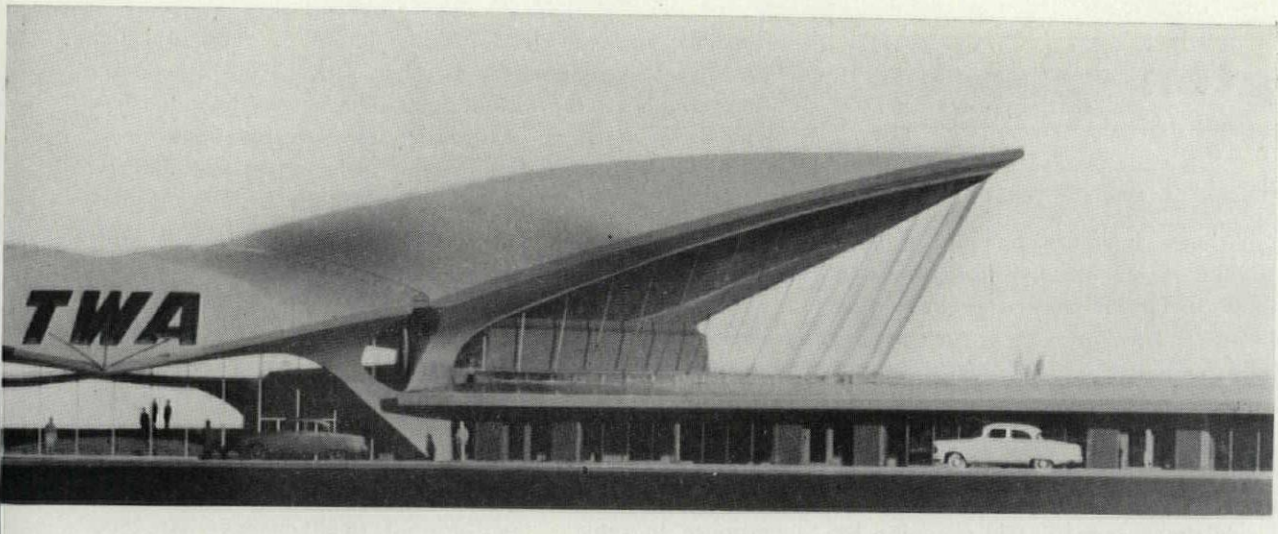
SAARINEN DESIGNS TERMINAL FOR TWA

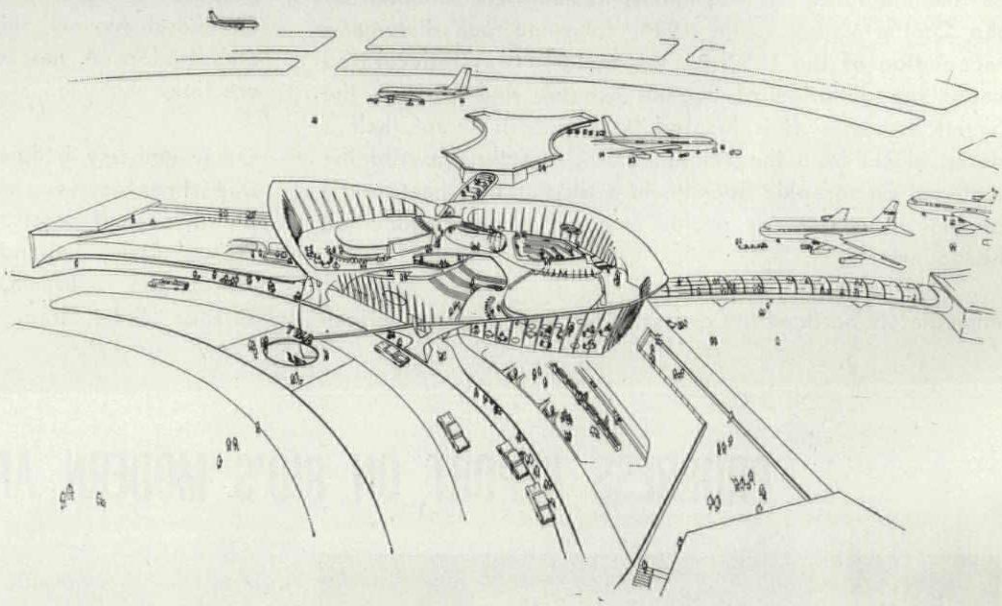
Plans for the new unit terminal for Trans World Airlines, to be built at New York International Airport (page 75) were heralded at a mid-November press conference in New York. Designed by Eero Saarinen & Associates, the reinforced-concrete, "bird in flight" scheme will occupy a prominent site at the port (No. 1 on site plan, page 79) immediately north of the central International Arrival Building and foreign-flag Airline Wing Buildings (page 86). Amman & Whitney are Structural Engineers for the terminal.

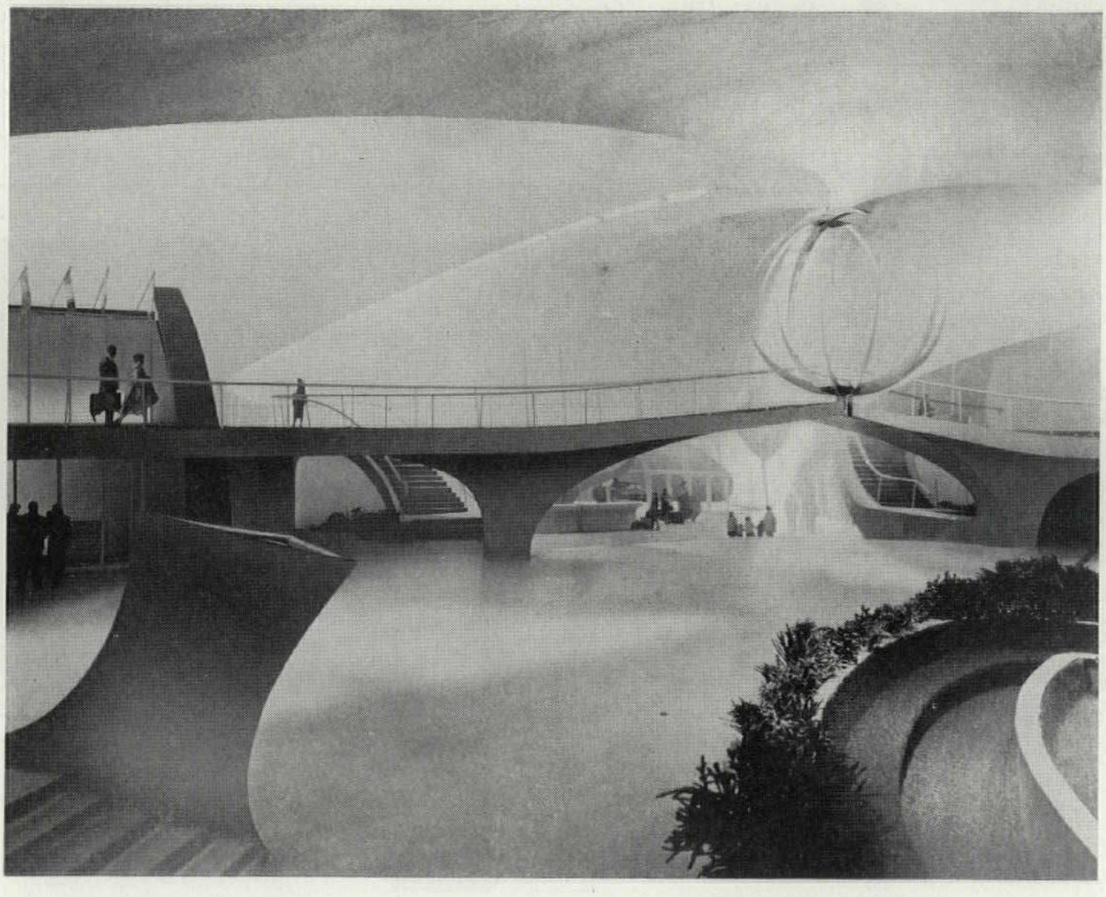
The scheme consists of a 315-ft-long, central, public-use area, roofed by four interacting, thin-shell concrete vaults and two finger, waiting-room structures, each of which serves seven plane stations. The finger structures are connected to the main building by 125-ft-long, glass-ceilinged, covered bridges, which will contain two-way moving sidewalks, as well as a stationary walk at the center. The huge, cantilevered vaults, the larger two of which soar to a height of 54 ft, rest on four points and are articulated by bands of skylighting.

Outbound passengers enter the right-hand wing of the building at grade beneath a 12-ft cantilevered canopy and check in along a 150-ft-long counter immediately inside the building. At the center of this level will be an information desk and bulletin board listing flight arrivals and departures. From this level, on gentle-rise steps, passengers ascend to the lobby level, the oyster-white terrazzo-finished walls and floors of which will echo the white-painted surfaces of the vaults above. On the side toward the field, in a sunken, plant-bordered waiting space, carpeted in TWA deep burgundy, they may lounge in upholstered chairs, arranged theater fashion, and watch field operations while awaiting announcement of flights. Along the entrance side of this main waiting area, organized beneath a balcony, will be a series of service shops. If time permits, passengers and their friends may continue to an upper-level coffee shop, cosmopolitan restaurant, bar, and Ambassadors Club.

When flights are announced, passengers proceed by the covered walkways to the appropriate boarding room in the finger structures, planned around landscaped, interior courts. Inbound passengers follow this same general procedure in reverse and claim their baggage and proceed to ground transportation through the left-hand wing of the terminal. Above the wings at either end of the main structure are observation decks for airport visitors.


TWA





Washington report

by Frederick Gutheim

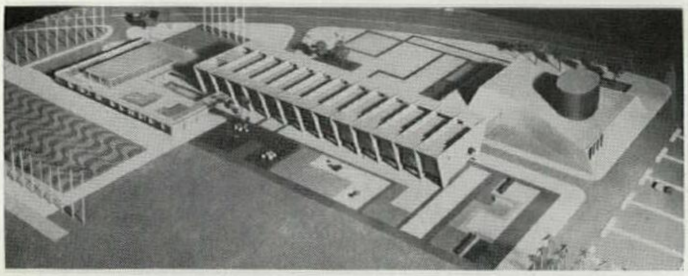
Among the new buildings announced here during the last month, the five-story annex to the present Soviet embassy is probably the most interesting. It will replace a much smaller part of the embassy, and add 5000 square feet of office space. An architect has still to be engaged for the addition, on which construction is to start next spring. The embassy was built in 1910 as a residence for Mrs. George M. Pullman, widow of the sleeping-car manufacturer, but was almost immediately occupied by the Czarist embassy. In 1934, following our diplomatic recognition of the U.S.S.R., the building was redecorated under the direction of Eugene Schoen, and became the Soviet embassy. It is located on Sixteenth Street, half a dozen blocks from the White House, directly opposite the National Geographic Society, in a district that has rapidly become a center for professional and trade association headquarters.

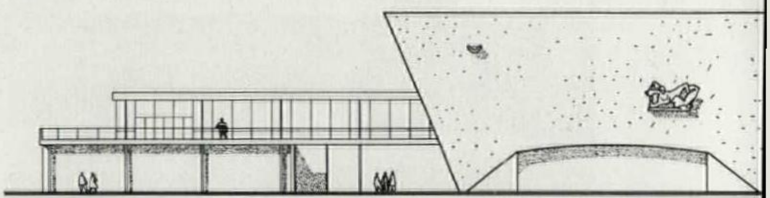
Immediately north of the embassy, for example, is American Chemical Society, whose building is about to be replaced by a new one designed by Faulkner, Kingsbury & Stenhouse. These architects recently designed the nearby headquarters building of American Association for the Advancement of Science—with automatic, movable, exterior, vertical louvers. The Chemical Society building is currently testing a prototype unit of horizontal louvers to be operated by a combination clock and photoelectric cell control.

Two other projected embassies almost certain to be of architectural interest are for the Danish and Swedish delegations. The Danes have acquired an outlying two-acre site in the 3900 block of Whitehaven Street and propose a combination embassy and chancery building for a 40-man staff. Plans are now being drawn in Copenhagen. The Swiss propose to replace their present small chancery at 2900 Cathedral Avenue, this spring, with a residence for their ambassador. A new chancery is being planned for later erection.

Other embassy building plans reported in a recent State Department survey, which includes work currently anticipated, even if construction is years off, are for Australia, France, Italy, Lebanon, New Zealand, Union of South Africa, and Venezuela. As we go to press, West Germany, Greece, India, Iran, Israel, Japan, Laos, Mexico, Saudi

PROGRESS REPORT ON RIO'S MODERN ART CENTER



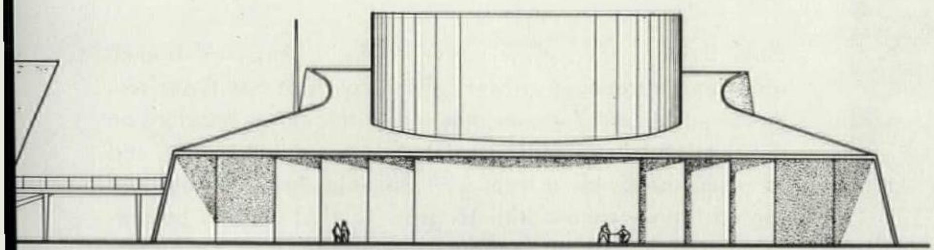


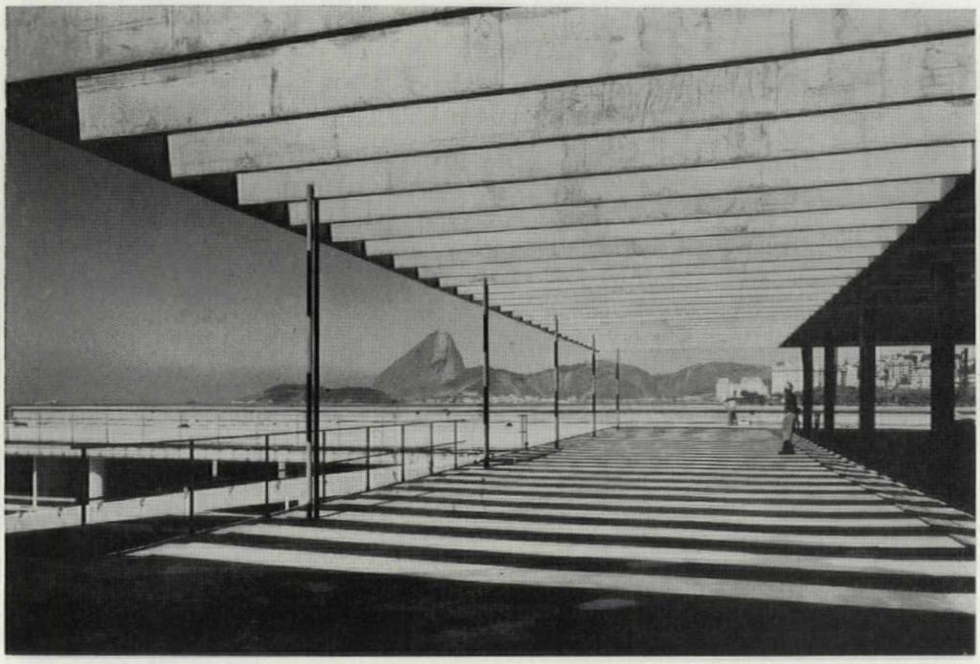
The "Museu de Arte Moderno" of Rio de Janeiro, presently housed in temporary space in the building of the Ministry of Education is about to open the first section of its new permanent home. The museum, being built on land reclaimed for the purpose from Guanabara Bay, is to be erected in three stages. The first, to be completed by January 15, 1958, will be a school providing facilities for a wide range of activities including music, ballet, theater, plastic arts, industrial design. There are also a restaurant, shown at top of ramp (right) and terrace (acrosspage right) with a spectacular view of Sugar Loaf Mountain and the Bay. Second on the schedule is a structure containing the exhibition hall, film library, auditorium, and administrative spaces. A third building, the theater, will complete the museum. Auxiliary services and educational workshops, the gallery, and theater (left to right, drawing above) are distinctly apparent on the east elevation. The entire building complex (model photo above) will cover 388,000 sq ft and is estimated to cost \$8.5 millions. Architect is Affonso Eduardo Reidy; Roberto Burle Marx, designer of the gardens.

Arabia, and Turkey were added to the list of countries reporting possible building projects in Washington. Most were in the site-selection stage: none had architects or formulated building plans. The survey was occasioned by unfavorable reactions to the building of the Canadian military mission, and the announcement of plans for a new addition to the British embassy. Both are office buildings located in residential areas of the city. Neither could have been built under existing zoning and building regulations. Little effort was made in design or the provision of off-street parking to minimize the impact upon the area in which they are located. Such embassy building plans are possible because of diplomatic immunity from local building regulations, a situation tolerable so long as embassies had inconsequential staffs, but objectionable in this day of large diplomatic delegations. This immunity, however, is a one-way street. Our own embassy program does not proceed with the freedom we allow other nations in Washington. The State Department is fully aware of the reciprocity possibilities of the survey as to intentions of foreign nations here.

• National Archives has announced expansion plans which illustrate how rapidly the growth of Government's essential records has outstripped the capacity of John Russell Pope's ceremonial building on Constitution Avenue. Now, in addition to the space in 11 regional storage centers throughout the country, a new building with twice the capacity of the main Archives building, is planned for the Washington area. One wonders if, before this project goes much farther, it would not be well to re-examine the idea that was in mind when the Pentagon was planned: its eventual use as a documents storehouse. It has always seemed to me far better for that purpose than it is as an office building.

• After a long period of relative inactivity, the Smithsonian Institution has embarked upon a comprehensive building program. Farthest along is probably its new building on Constitution Avenue that will house the Museum of History and Technology. The ambitious structure for the Air Museum, published two years ago, seems dormant for the present. Indeed, a bill to be introduced in the coming Congress will allocate its site facing the Mall south of the National Gallery of Art to a proposed National Auditorium. A third Smithsonian project, for which the Washington architectural firm of Mills, Peddicord & Mills last month began preparing plans, will extend by more than half a million square feet the area of the Smithsonian's Natural History Building. The original building designed by Hornblower & Marshall was completed in 1910, and was planned on a module based on the dimensions of a unique museum storage case, designed by G. Brown Goode, a pioneer museologist.





p/a news bulletins

• Nominations for 1958 R. S. Reynolds Memorial Award—$25,000 for architect making "most significant contribution to use of aluminum" in building field—will be received by AIA until Jan. 15, 1958. Competing architects must be nominated by AIA Executive Committee, recognized architects' society or group outside U.S., or any university or college. Final entries must be received by April 15, 1958.

• Industrial Designer George Nelson is currently giving lecture tour in Japan on life in America. . . . Arthur J. Benline, Technical Director, New York State Building Code Commission, will receive 1957 Sidney L. Strauss Memorial Award of New York Society of Architects, Dec. 12, for his service to architectural profession. . . . Hideo Sasaki has been appointed Associate Professor of Landscape Architecture, Harvard School of Design, announces Dean Jose L. Sert.

• International Council at The Museum of Modern Art, New York, has commissioned Philip C. Johnson, New York architect, to plan and decorate main conference room in UNESCO Headquarters Building in Paris on behalf of U. S. Formal dedication of building will be Sept. 1958.

• "A Century of City Views," exhibition of 50 Renaissance prints from De La Gardie Collection formed in 17th Century and now housed in Swedish Royal Library, opened Nov. 15 at Library of Congress, Washington, D. C. Prints show famous cities—Rome, Paris, Lisbon, Toledo, London—of 16th Century. Included in exhibit are copper engravings, etchings, woodblock prints. Exhibit will be circulated by Smithsonian Institution Traveling Exhibition Service.

• Architecture of Antoni Gaudi (1852-1926) will be exhibited at The Museum of Modern Art, New York, Dec. 18-Feb. 23. Examples of Spanish architect's work—surrealist and sculptural in concept—include unfinished Cathedral of Sagrada Familia, two apartment houses, public park—all located in Barcelona, and full-size casts of architectural details. Prof. Henry-Russell Hitchcock is assembling the exhibits, to be installed by Arthur Drexler.

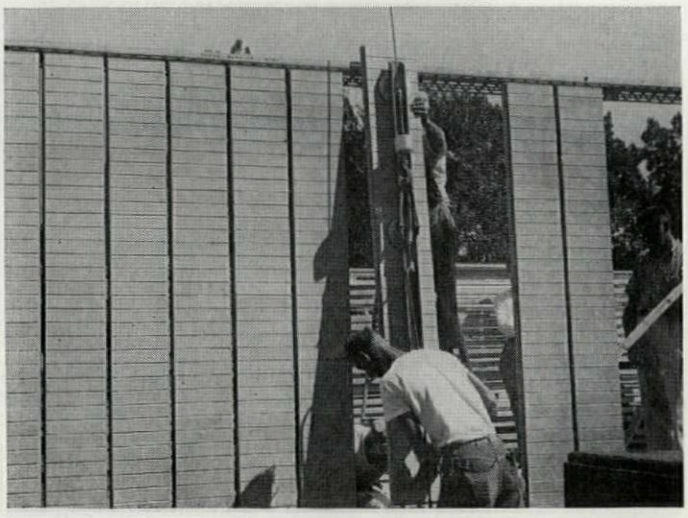
• Junior Council of Museum of Modern Art, New York, is gathering entries for 1959 exhibition "Recent Sculpture U.S.A." Sculpture executed since Jan. 1, 1950, in round or relief, by citizens or permanent residents of U.S., may be entered. Photographs must be submitted from which examples will be chosen. Entry cards, obtainable from Junior Council Sculpture Exhibitions, The Museum of Modern Art, 21 W. 53 St., New York 19, N. Y., must be returned by Jan. 6, 1958.

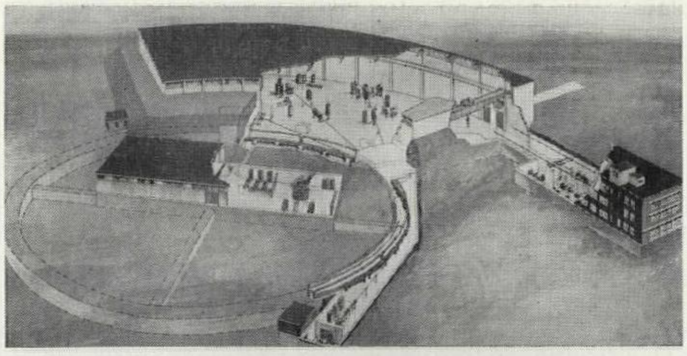
Yamasaki Warehouse Designed "To Be Seen"

Parke-Davis & Co. will occupy, in the spring, this branch office and warehouse at Menlo Park, south of San Francisco. Architect Minoru Yamasaki has raised the entire structure on a 200 x 160 ft podium (to compensate for a sloping site, and to place the building level with an adjoining highway) and roofed the warehouse with 16 groin-vaulted units to be prefabricated in quarter-sections. Separated from the warehouse area by a walk, the administrative section of the plant gains light from all sides. The structure is located in Bohannon Industrial Park—a planned, landscaped, light-industry sector.

Brick Industry Announces New Prefab Panel

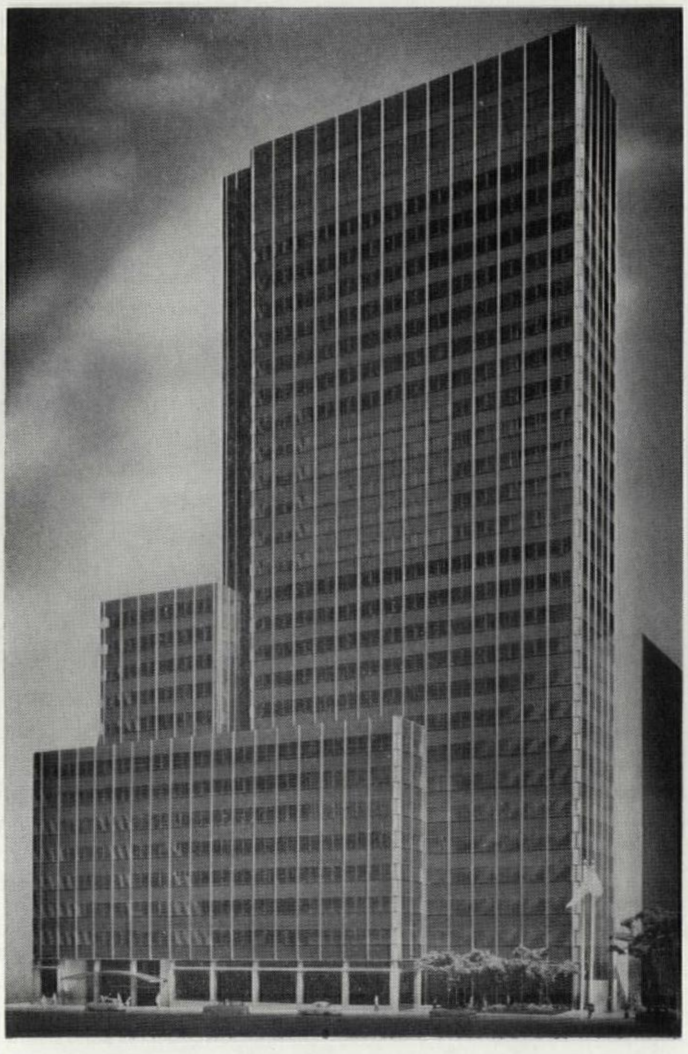
A new, prefabricated, loadbearing, brick panel, developed by Structural Clay Products Research Foundation, brings this most-common building material strongly into the Modular Assembly picture. As announced by Robert B. Taylor, Foundation Director, the new assembly, called the SCR Building Panel, is composed of 36 special Norman-face bricks, $2\frac{1}{2}$" thick, assembled into a unit, 1' x 8'. Photo shows use in a test house at Geneva, Ill., where loadbearing panels totaling 1200 sq ft were erected in eight and one-half hours by five men. Taylor calculates that this is equivalent to 30 cents per sq ft of erected and mortared wall. Panels were raised by a hoist with a vacuum device, and bolted to horizontal steel angles at top and bottom of wall. Thus roof trusses could be installed immediately, and interior and exterior joints between panels power mortared at appropriate times.





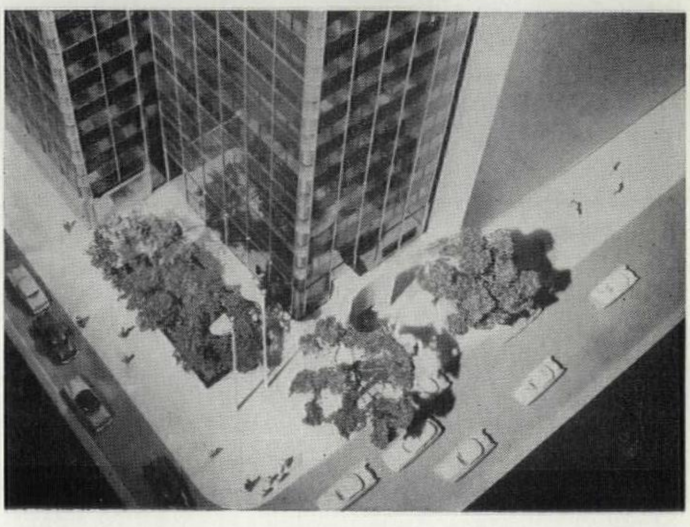
• Ground-breaking ceremonies recently took place for $6,500,000 Cambridge Electron Accellerator (left), to be operated jointly by MIT and Harvard University. Scheduled for completion Jan. 1960, accelerator will concentrate on basic, unclassified research on properties, forces of subnuclear particles. Synchrotron, formed by ring of magnets in circle of 236 ft diameter, will accelerate electrons to speed of light, increase mass 12,000 times. Circular tunnel building for accelerator will be below ground, covered with concrete; 5-ft earth fill above. Concrete blocks forming portion of wall can be arranged to allow narrow amount of radiation to flow into experimental building for tests. Radar techniques, new devices will be used. Design is being directed by Dr. M. Stanley Livingston, Professor of Physics, MIT, in conjunction with scientists from both schools.

• Excavation has begun on site of 18-story addition to The (Daily) News Building, New York. Proposed building (left) will be completely air conditioned, will give 50% additional space. From third-story, addition will be set back 40 ft from building line. Vertical lines will be emphasized by projected splayed piers, using gray-white brick face, aluminum sides. Pivoted-reversible type hung windows are planned. At same time, extensive modernization is taking place in original building. Addition was designed by Architects Harrison & Abramovitz; Mechanical Engineers—Meyer, Strong & Jones; Structural Engineers—Lockwood-Greene.



Corning Constructs Fifth Avenue Tower and Plaza

Construction has begun on New York's newest high-rise office building, sponsored by Corning Glass Works. Architects Harrison & Abramovitz & Abbe have designed a tall shaft rising above lower structures in such a way that a corner at 56th Street and Fifth Avenue will be left a landscaped plaza. Sheathed in a curtain-wall system using—for both vision and non-vision panels—green-tinted heat-absorbing glass in aluminum mullions, the building will be completely air conditioned. It is planned that lobby floor and ceiling, as well as draperies and hardware, will demonstrate new uses of glass.



p/a financial news

by William Hurd Hillyer

Purchasing power of the dollar has dropped 129 cents since 1896. This seems an impossibility: are today's dollars worth 29 cents less than nothing? No, the picture is not quite that bad. The figures are from the carefully wrought table prepared by the Research Council, American Bankers Association, and are based on a 150-year average of the Wholesale Price Index. Resultant dollar purchasing values are 46 cents for 1956 and $1.75 sixty years ago. This index, having to do with wholesale commodity markets in general, does not betray the yet more spectacular decline of dollar purchasing power in terms of building construction, particularly since 1932. The '32-'56 period reflected an average annual buying power decline of 0.033% as compared with 0.142% for 1860-65. Glimpsing the past decade, the 1947-49 dollar will buy 85 cents' worth of food or 94 cents' worth of apparel, but only 80 cents' worth of housing.

When these otherwise substantial percentages are laid alongside a Dow Jones Index chart of stock-market prices, we are impressed with how high security prices have been and how far they may yet fall before they reach a stabilized level. Even after an 80-100 point downslide, the Index still ranges above 430. Now that the sputnicks have sputtered and the Great Bear no longer terrorizes Main and Wall, economic common sense fosters the view that neither stock prices nor commodity prices can be artificially controlled, and that inflation is not an enemy to be fought but a symptom to be noted. As a symptom, it will disappear only when the causative condition is corrected. In plain language—we must save more, produce more, cut down wasteful spending, print fewer dollars. The American Bankers Association, at its recent convention, voiced the belief that "creeping inflaton" is not inevitable, as many would have us believe. Already this group's position is being justified by current facts. Call it by what name you will, a readjustment has set in.

• Aluminum, progressive construction material, is in serious oversupply; steel ingot output is down some 19% from a year ago, though construction orders are improving; general wholesale price index has declined 6% from last year, though still around 277 on 1930-32 basis; freight-car loadings have slid 14%; lumber production was 5% below a year ago, notwithstanding shipments up 11%, according to Dun & Bradstreet, Inc.; corporate profits and profit margins are leveling off and will doubtless close the year on the downgrade.

• Housing starts, after their long decline, seem to be increasing again with starts on private residences passing the one-million annual rate for the first time this twelvemonth, Chase Manhattan Bank reports in its latest business survey. The same authority expects a continuation of state and local spending for schools. Municipal bonds, large in volume, are holding up remarkably well.

• A $15-billions market in the home-improvement field is foreseen by Roy F. Cooke, Assistant Commissioner of the Federal Housing Administration's property improvement program. This agency is presently insuring more than 5000 loans a day. Since 1934, it has insured more than 20 millions of loans, totaling $10-billions net proceeds.

• Bank deposits are down $11 billions since the beginning of the year, principal decline being in demand deposits of businesses and individuals, reflecting strong deflationary trends. Nevertheless, deposits are still 1% above 1956 figures, according to most recent data of Federal Deposit Insurance Corporation. As a result, banks have the highest capital ratio since 1941. Dollar volume of new loans exceeds the '56 figures by 9%.

• "Unidentified Flying Objects" have invaded the architectural and banking fields simultaneously. Central Bank & Trust Co. of Denver has installed five "flying saucer" rooftops on its new island drive-ins as part of a $2-millions expansion program. These provide convenient shelter for customers, in addition to infusing the structures with an interplanetary spirit. Another definitly upward-looking bank is the First National of Menominie, Wisconsin, which has installed what its excutives call a "magic ceiling." Translucent fluted-panel sheets cover hundreds of fluorescent tubes and give to the ceiling a glow effect.

• Residential construction was first to feel the deflationary impact. It should therefore be the first to experience the upward trend of recovery. Highly placed banking economists look confidently for a 1958 dollar-volume 10% greater than in '57. The mounting pressure of population shift and increase must produce a residential rebound in the near future.

• "Are we overdoing the rush to suburbs and rural areas?" asks the Boston Banker and Tradesman in a recent editorial. That publication suggests a revival of interest in the two-family house, which could be built on urban odd-parcels to meet the double needs of those who want to own in the city and those who want to rent in the city. Rural (farm) population is decreasing at a 2 millions annual rate.

• Balancing the equities, as the law writers say, the general economic outlook is mixed, but not gloomy. A few things are fairly certain: 1958 will not be another boom year; neither will it be a twelvemonth of stagnation. In the building field, new mortgage terms and stiffer down-payment requirements have shaken loose the marginal buyers, and "the whole market is healthier," says a veteran New England authority. Meanwhile the perils of re-inflation are being stubbornly resisted by Federal Reserve Board. Total output of goods and services approaching a $440-billions annual rate, represents a 5% gain over last year.

• As we go to press: Federal Reserve discount cut will have stimulating effect on building construction; but bankers generally are cautious as to long-range effect of easier credit policy.

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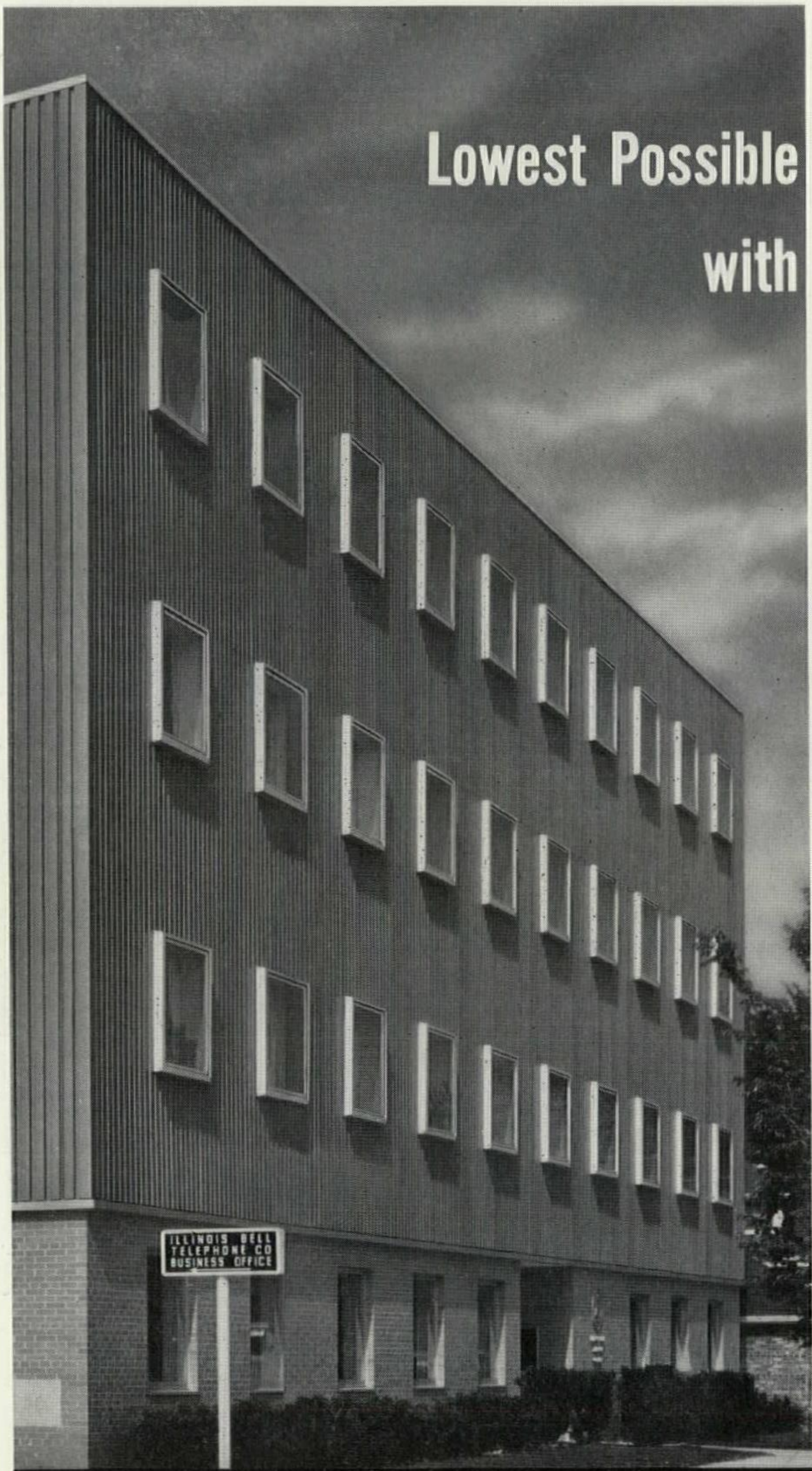

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The Port of New York Authority

NYIA

4900 acres
decentralized terminals
140 gate positions

Back in 1942, the Idlewild Golf Course occupied land adjoining marshy tideland meadows and the placid waters of Jamaica Bay, in the southeastern section of New York's Queens County, 15 miles from midtown Manhattan. Today, this vast, 4900-acre area is not only the setting for the continual air activity serving the New York International Airport, but also is the site of one of the most impressive construction projects ever undertaken. The N.Y.I.A. is operated by The Port of New York Authority, under a lease agreement with the City of New York.

Located within perimeter areas (*see site plan on following spread*) where runways, a federal building, a hotel, and huge hangar structures either exist or are under construction—is a central, 660-acre core, officially named Terminal City, which is served by an elaborate 10-mile intercommunicating roadway system. Terminal City was planned by the Port Authority's Aviation Planning Division, headed by Thomas M. Sullivan, in consultation with Architect Wallace K. Harrison, with detailed design and construction supervised by John M. Kyle, Port Authority Chief Engineer. In this area, in addition to numerous buildings (either existing or scheduled) that serve air passengers, are extensive landscaped areas, reflecting pools, fountains, and parking for 6000 automobiles, all of which will be bathed at night in a "blanket of never-ending daylight" by a specially designed lighting system.

Most prominent of the structures either built or planned for the core area are the 11-block-long International Arrival Building and Airline Wing Buildings (*above*) that serve all foreign-flag airlines and all passengers requiring customs clearance or other federal inspection services. Detailed discussion of this giant complex appears on subsequent pages.

Approximately in the middle of the area is a Central Heating and Refrigeration Plant (also shown on later pages) that serves the entire Terminal City area. On the perimeter of the roughly oval area, adjoining aprons that feed via taxiways to the runway systems, are sites for unit terminals to serve the domestic needs of major U. S.-flag lines. Reading clockwise from the huge International Arrival and Airline Wing Buildings (*site plan*), these sites have been leased to Pan American World Airways (Tippetts-Abbett-McCarthy-Stratton, Architects-Engineers; Ives, Turano & Gardner, Associate Architects. *See later pages*); Northwest Orient Airlines (Architect unannounced); Eastern Airlines (Chester L. Churchill, Architect); United Air Lines (Skidmore, Owings & Merrill, Architects); American Airlines (Kahn & Jacobs, Architects); and Trans World Airlines (Eero Saarinen & Associates, Architects).

Some critics have argued that such a system of decentralized terminals for the different lines inevitably results in difficulty for passengers arriving on one line and planning to transfer to another. But statistics indicate that a peculiarity of the New York port is that as many as 85 percent of the air passengers at International either begin or terminate their trips there; comparatively few travelers go through New York without at least a brief stopover. Furthermore, of the 15 percent who do transfer, two thirds of them change to flights operated by the same airline. Thus, only 5 percent of the total passenger traffic will have to take a taxi or other form of transportation to go from one unit terminal to another.

Advantages claimed for the scheme are that it allows each airline to express its own preferences in design of its terminal, and the passengers of each carrier will pass through the port without being thrown with passengers of other lines. For the present (none of the unit terminals is yet above ground), the various lines use a temporary, overcrowded terminal building. In all, the port will eventually provide 140 gate positions.

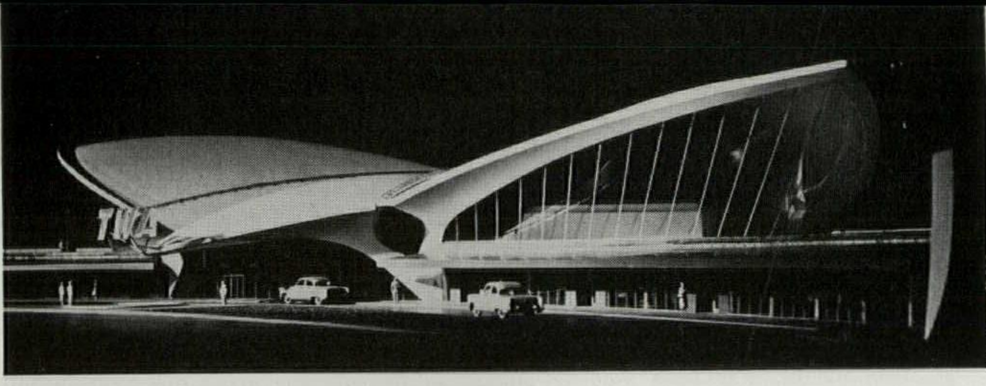
When completed, this 660-acre core of the N.Y.I.A. will, according to Port Authority figures, represent an investment of some $150,000,000, including $30,000,000 in the International Arrival and Airline Wing Buildings; $97,000,000 in individual airline terminals; $16,000,000 in roadways, taxiways, utilities, parking lots, and landscaping; and $7,000,000 in the Central Heating and Refrigeration Plant.

The lighting of the 6,000,000 sq ft of the Terminal City area—conceived by Thomas M. Sullivan, Chief of the Aviation Planning Division of the Port of New York Authority, and worked out with Abe H. Feder, Lighting Consultant, and General Electric Outdoor Lighting and Large Lamp Departments—is one of the most dramatic aspects of the port. It was early determined that a blanket-type illumination was needed, one that would be virtually glareless, provide sufficient illumination, and be as pleasing from the air as from the ground. To answer the problem, a new lamp was developed, a floodlight rated at 81,000 lumens that uses a 1500-watt mercury charge as a light source. The lamp, which provides approximately three times as much illumination as a 1500-watt incandescent floodlight, is housed in a 54-pound metal fixture, 22 inches in diameter. At N.Y.I.A., these fixtures, in clusters of from 6 to 12, are mounted on 75-ft painted steel tripod standards (*photo acrosspage*), 43 of which, supporting 338 of the floodlights, are spaced 320 ft on centers throughout the area. Depending on the area to be lighted, the maintained level of illumination varies from about 1.5 footcandles up to approximately 5 footcandles.

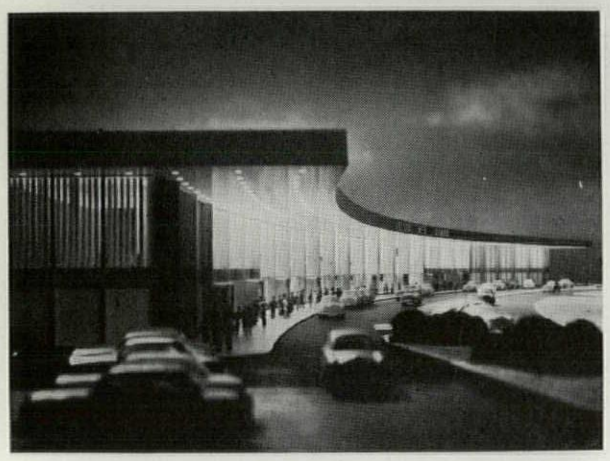
As with any major airport, the handling of passengers, mail, cargo, etc., at N.Y.I.A. has skyrocketed in a brief space of time. In the port's first year of full operation (1949), there were 18,115 plane movements; in 1956, there were 149,825. Passengers in this same period jumped from 222,620 to 4,490,050; and it is anticipated that by 1965, 11,000,000 passengers will use the port annually. Air cargo has zoomed from 9,159,766 pounds in 1949 to 131,202,600 pounds last year; and air mail, from 2,300,158 pounds to 41,211,700 in 1956. At present, 35 airlines are certificated to serve the port—15 United States-flag certified airlines and 20 foreign-flag lines.

The standards that hold the lights bordering the roadways at N.Y.I.A. are not unlike giant plant forms, some with single "blooms" (left); others sprouting in pairs (right of photo, acrosspage*). In front of the 11-story control tower, that is joined to the main concourse or "great hall" of the International Arrival Building, is a 220-ft-diameter pool, bordered by a spiral ramp for visitors. A fountain soars from 916 nozzles to a height of 60 ft and is illuminated at night by 308 lamps in five colors, installed on the floor of the pool. These produce an ever-changing spectacle on a repeating, six-minute cycle.*

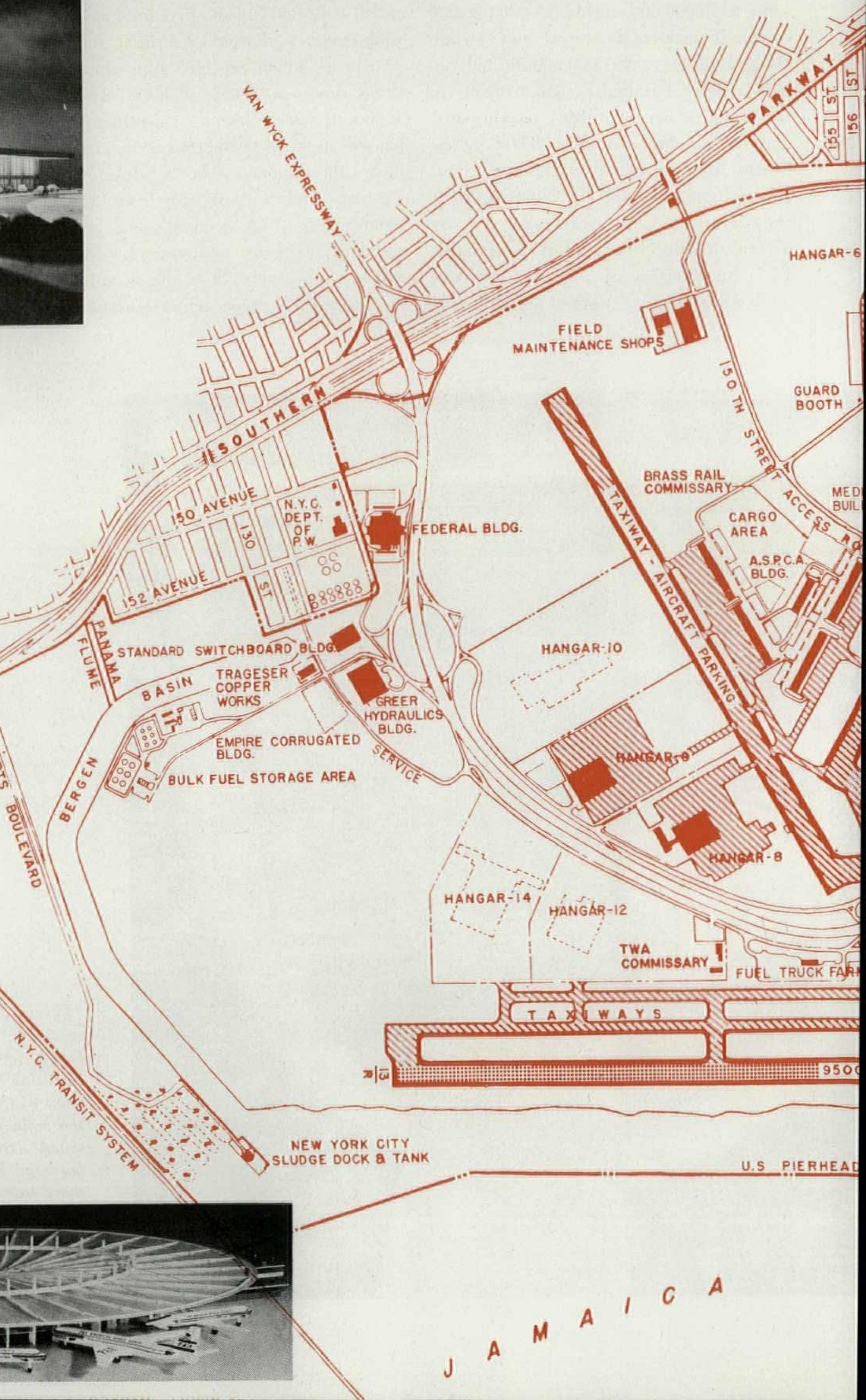
Photos: The New York Times (Ed Hausner)



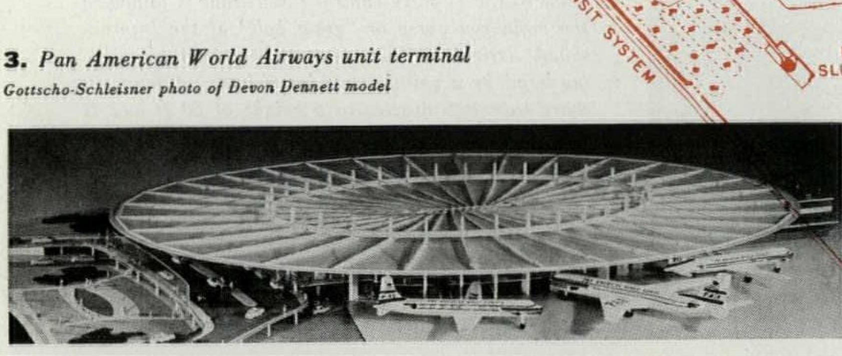
1. *Trans World Airlines unit terminal*
Korab photo of Architects' model

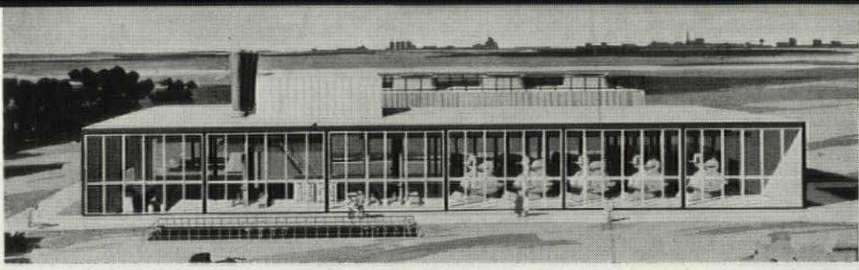


2. *United Air Lines unit terminal*
Louis Checkman photo of Theodore Conrad model



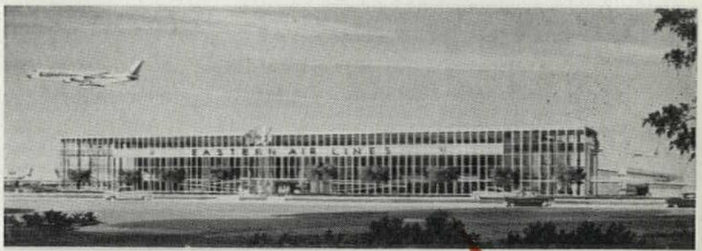
3. *Pan American World Airways unit terminal*
Gottscho-Schleisner photo of Devon Dennett model





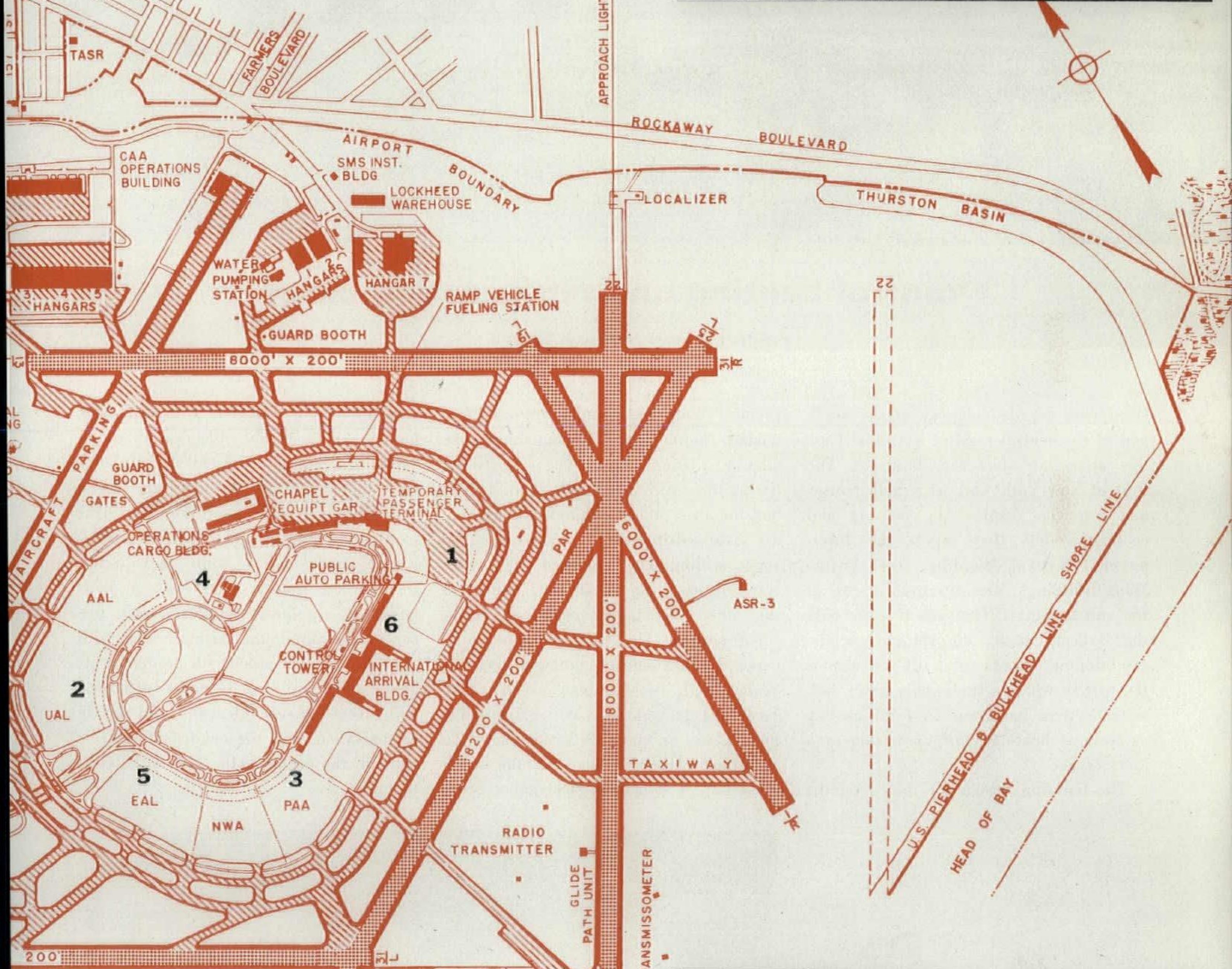
4. *Central Heating and Refrigeration Plant*

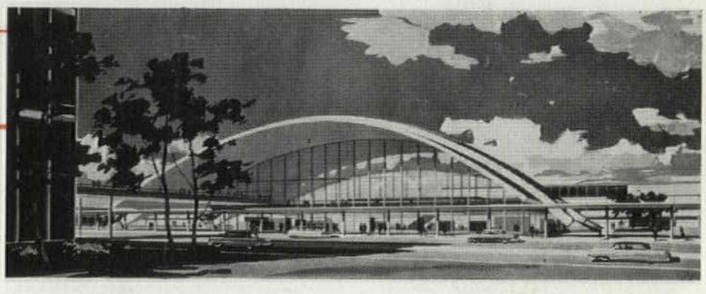
George Cooper Rudolph rendering



5. *Eastern Air Lines unit terminal*

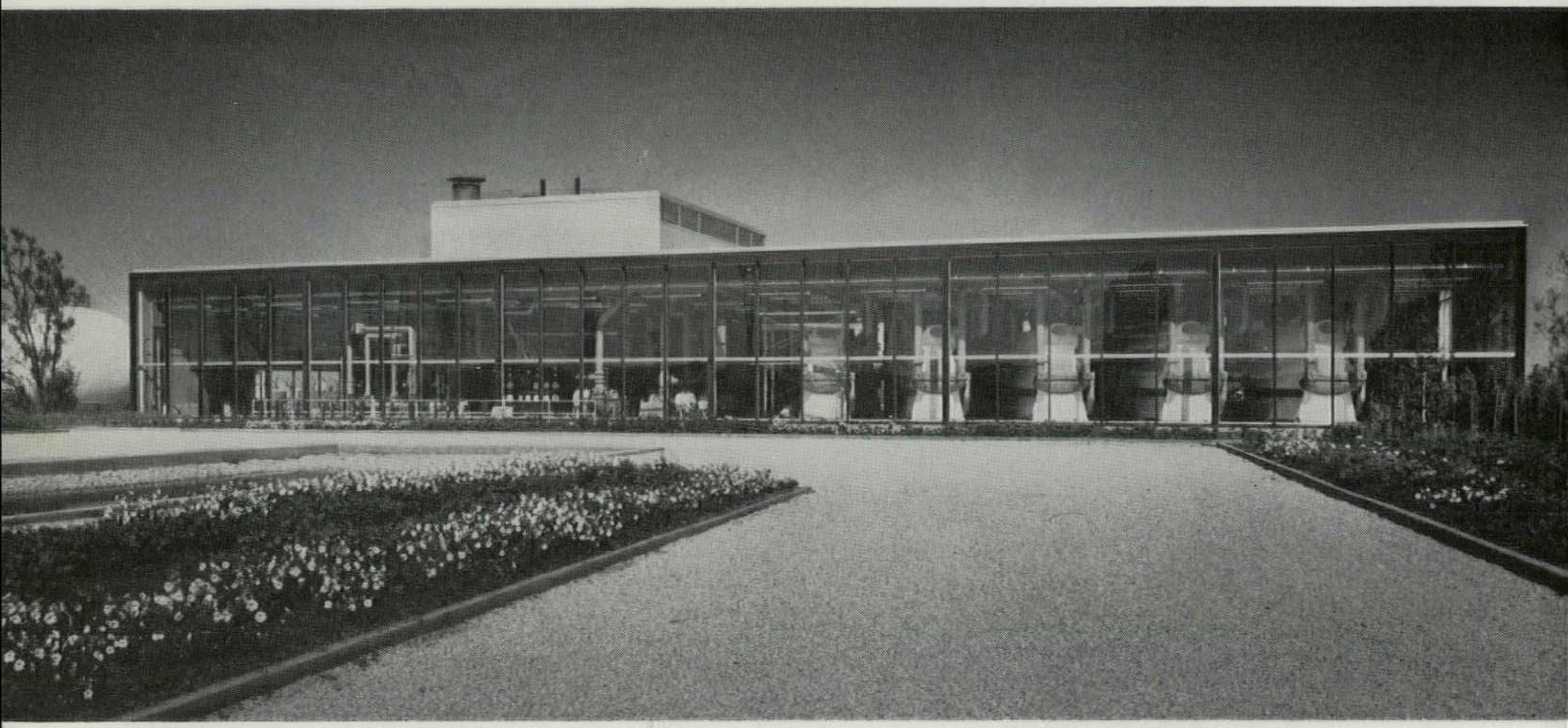
Adolph Studly photo of Furno, Kempa & Schwartz rendering





6. *Concourse of International Arrival Building*

George Cooper Rudolph rendering

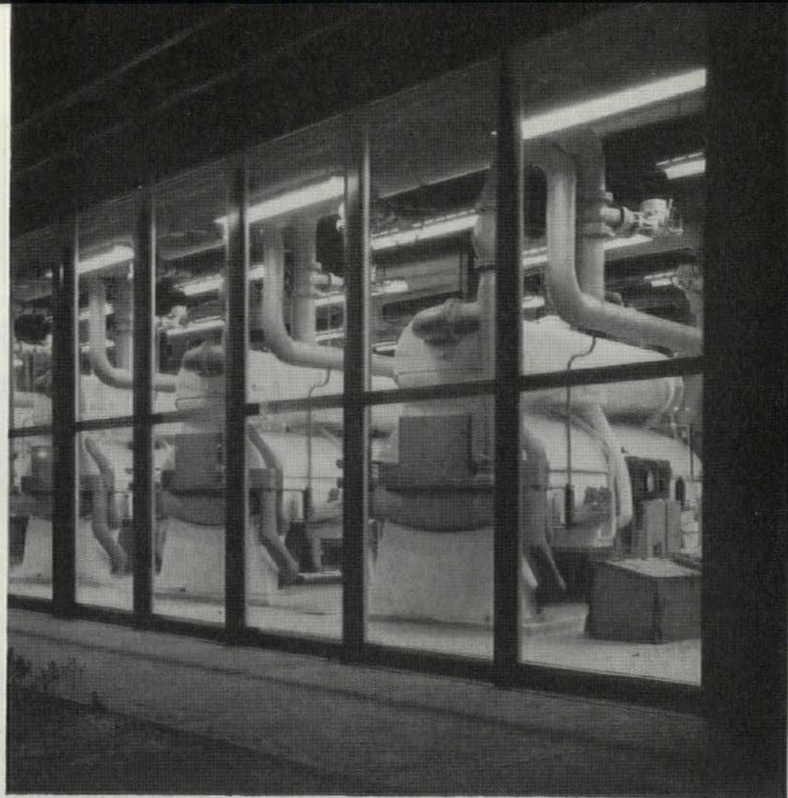


central heating and refrigeration plant

architects | Skidmore, Owings & Merrill
engineers | Seelye, Stevenson, Value & Knecht

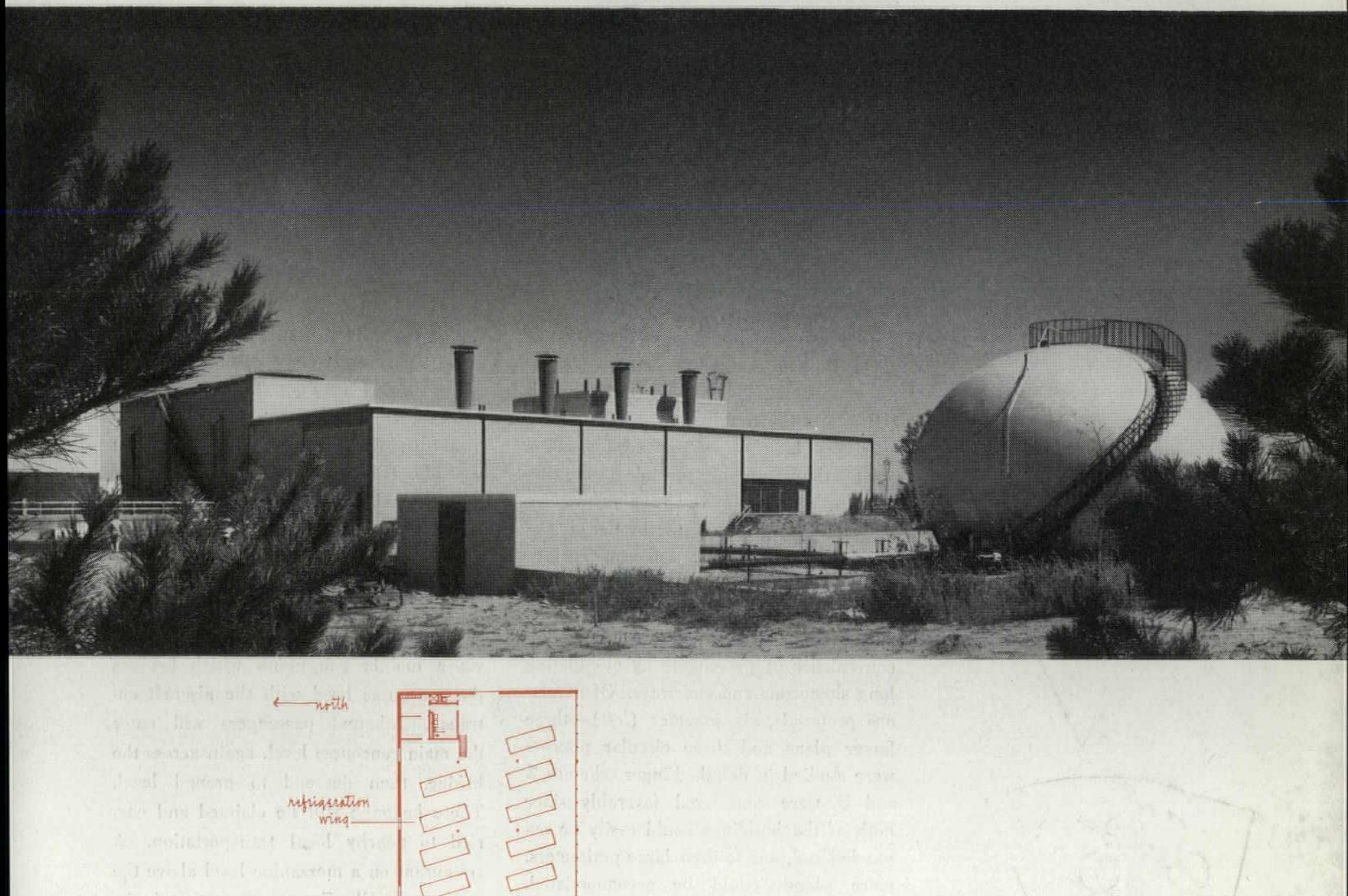
Occupying a prominent site at the north end of the central mall of Terminal City, this sparkling showcase, built by The Port of New York Authority, both houses and puts on display the heating and cooling system that serves the International Arrival Building; the Airline Wing Buildings; and (eventually) all of the unit terminals. The system is not only the largest, single, absorption-type air-conditioning system yet built but also is the first in which a high-temperature hot-water system has been used for cooling as well as heating (*full discussion in a later issue*).

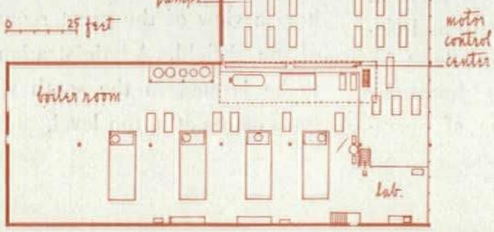
The building design was based on the premise that the clean operation of a modern power plant is something that airport visitors would enjoy viewing; hence, the entire south wall is windowed, and the absorption machines, pumps, etc., are arranged in orderly fashion along the space within. The L-shaped plan, with refrigeration units in one leg; boilers in the other, anticipates ready expansion when needed. The structure consists of exposed, black-painted steel columns and beams, with concrete-plank roof. Filler areas are gray-glazed cavity-brick walls, fixed glass, or operable sash panels. To withstand the wind load on the south glass wall, a structural steel junior beam was used as a stiffener, with the glass held in an assembly of stock aluminum extrusions behind the steel section. Release of heat within the structure was a conditioning design factor. To allow heat to dissipate through the roof, no insulaion is used, and a white marble-chip roof surface reflects solar heat. A penthouse, of aluminum cellular panels, has continuous aluminum louvers, which, with dampers opened, provides a positive draft action. The building is actually flashed both from outside elements and inside condensation, and the condensate travels through the cavity walls to weep holes at the base.

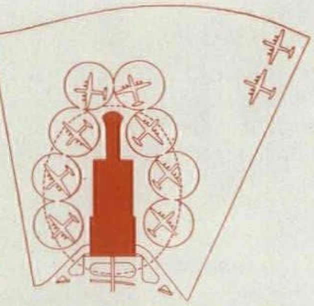


The various feed lines to the on-display mechanisms—condenser water, chilled water, hot water, wiring conduit—are painted in bold, distinguishing colors: blue, green, red, orange. Thus the entire "stage set" becomes a bright, colorful patern of fascinating shapes. The 5000-barrel fuel storage tank at one side of the building (below), an oblate spheroid 32 ft high and 40 ft in diameter is painted ice green.

Photos: Gottscho-Schleisner



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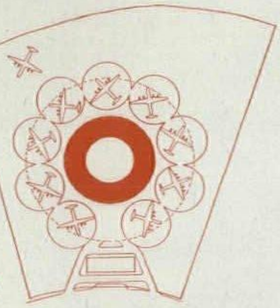
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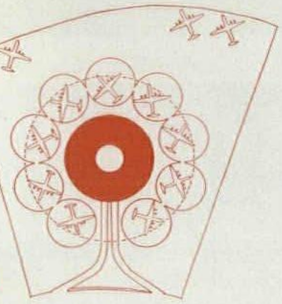
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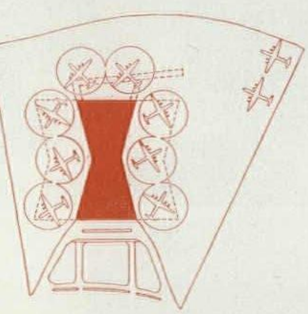
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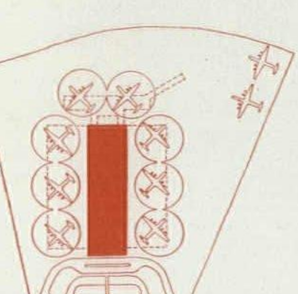
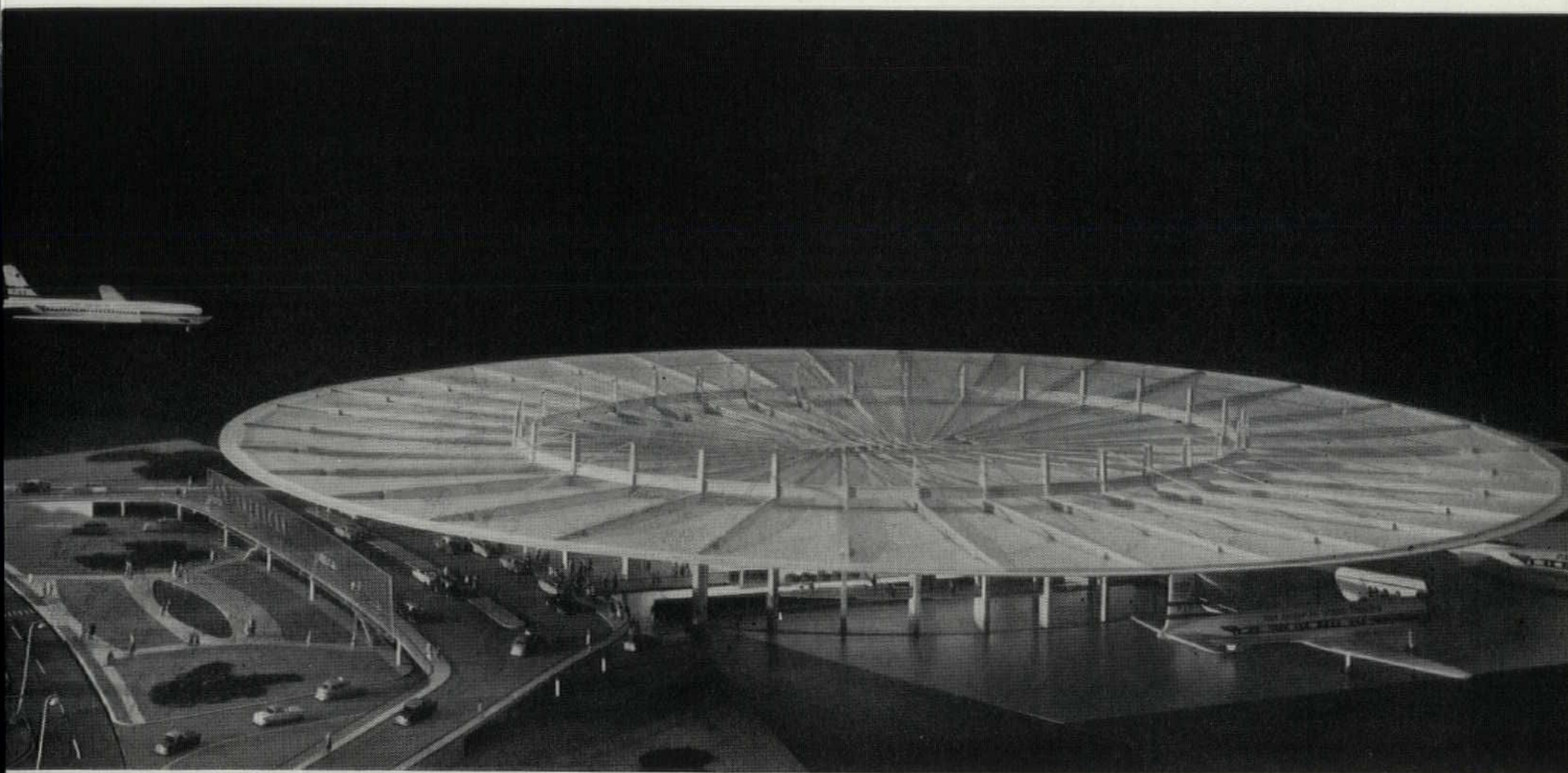

6

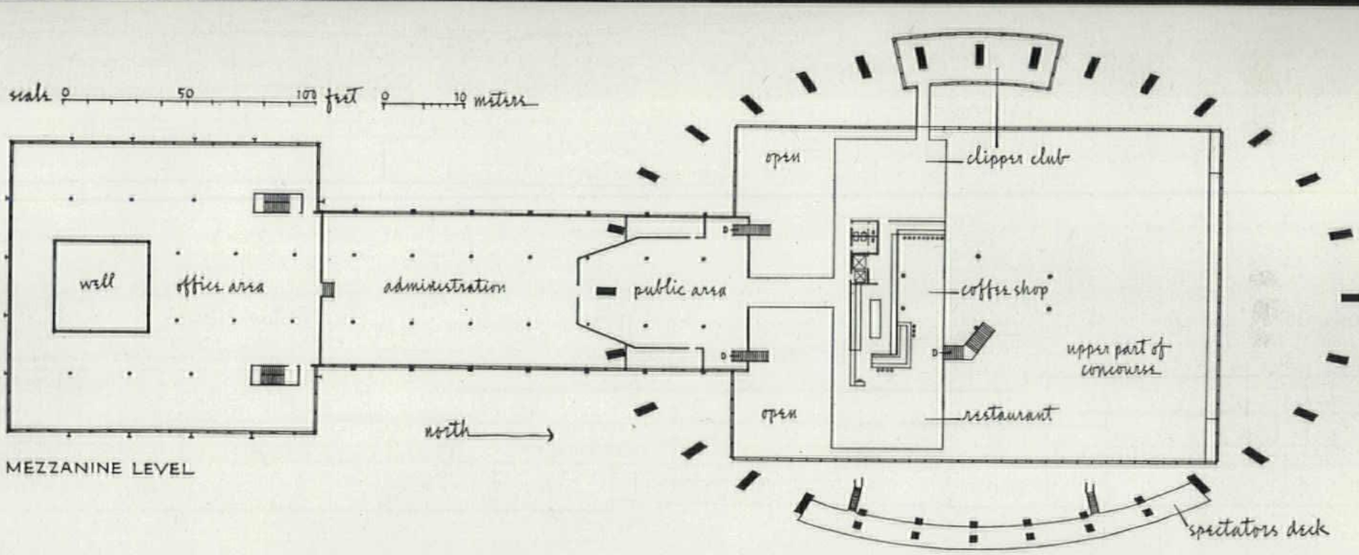
Model photo: P. E. Guerrero

umbrella for unit terminal

architects-engineers | Tippetts-Abbett-McCarthy-Stratton
associate architects | Ives, Turano & Gardner

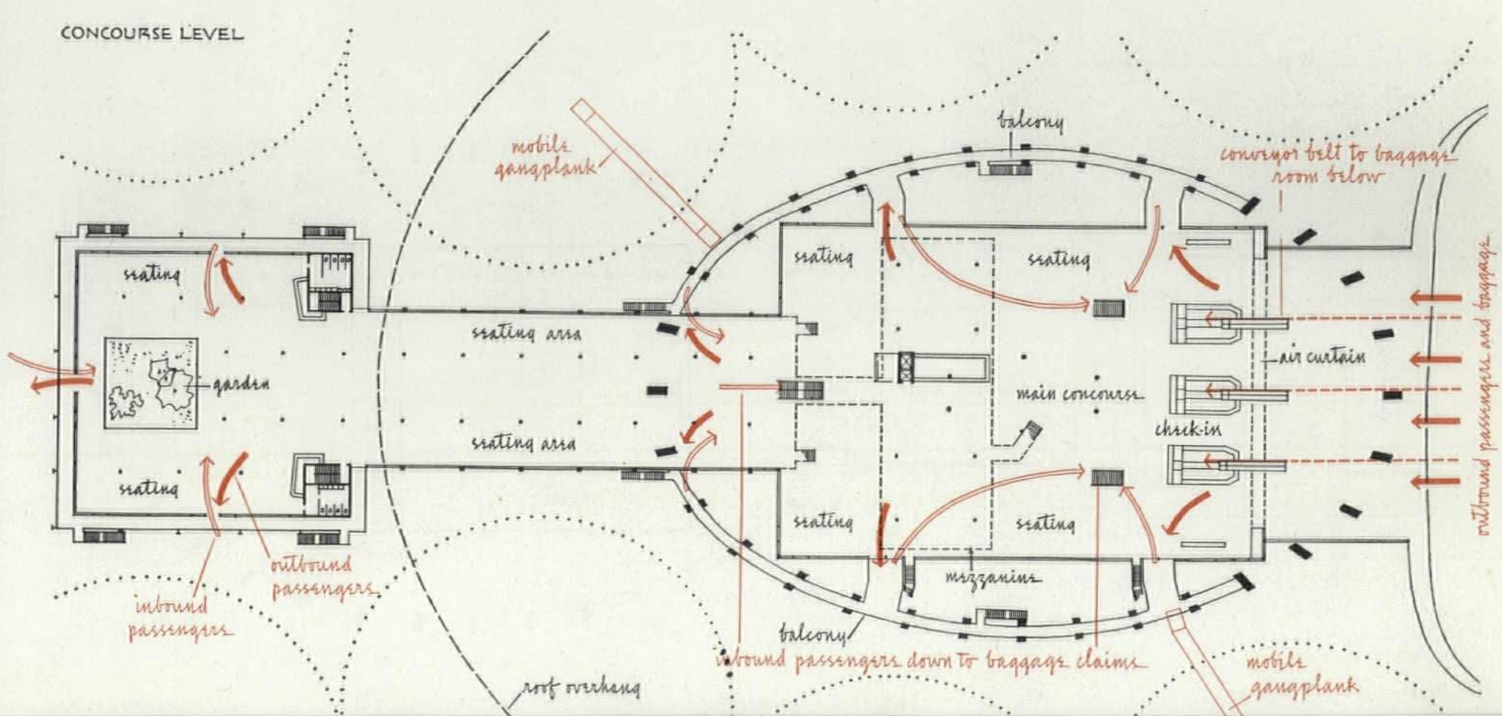
The unit terminal for Pan American World Airways, Inc. (*right of photo*), will occupy a 16-acre site directly west of the building for overseas travelers (*left of photo* and *subsequent pages*). In its initial stages the terminal is to have 9 gate positions, later to be expanded to 12—the maximum number possible on the site. The basic design of the terminal was influenced to a great degree by the client's wish (1) to provide permanent weather protection on the apron side for both passengers and the servicing of aircraft, and (2) his desire to contribute toward the convenience of passengers by eliminating long sheepruns and stairways. Of numerous proposals, six schemes (*left*)—three finger plans and three circular plans—were studied in detail. Finger schemes **1** and **5** were considered favorably since both of the buildings could easily be expanded and, due to their large perimeters, more planes could be accommodated. "Scheme **1** was finally chosen since it was inherently the most cohesive and elegant," write its designers, "and least interfered with the sightlines from the control tower." The planning of operations within the building was based on three major considerations: 1. complete separation of passenger traffic from operational traffic; 2. minimum walking distances and stair climbing for passengers; 3. separation of inbound and outbound passengers to the greatest extent possible. Outbound passengers will arrive by car, taxi, or bus at the second floor level, where tickets and baggage will be checked immediately on arrival. Passengers will then proceed to individual waiting areas near gate positions. Planes are to be boarded under cover of the canopy via a mobile gangplank which bridges the concourse level with the aircraft entrance. Inbound passengers will enter the main concourse level, again across the bridge, then descend to ground level. There baggage will be claimed and carried to nearby local transportation. A restaurant on a mezzanine level above the concourse will offer passengers and visitors a view of the great room as well as of the airfield. Administration offices are to be located in the south wing; operations offices at apron level.



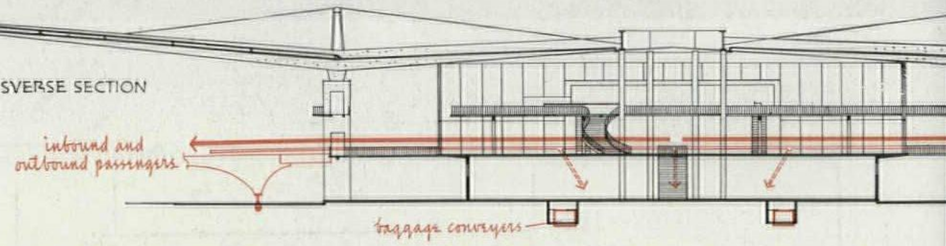


MEZZANINE LEVEL

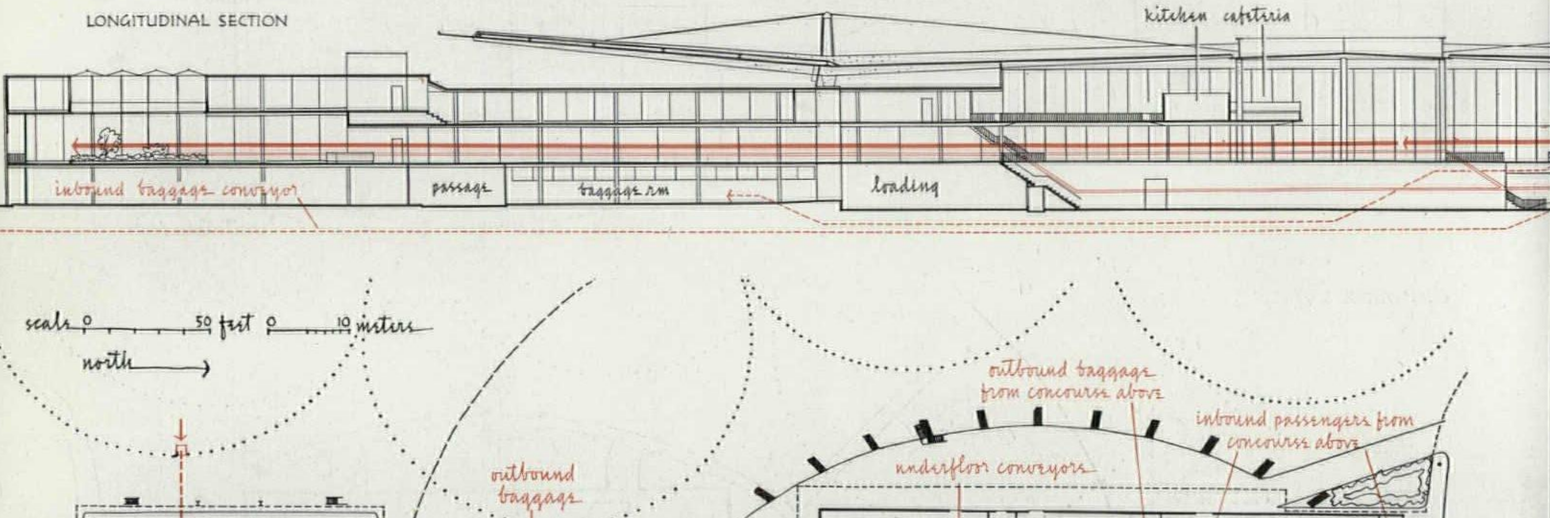
CONCOURSE LEVEL



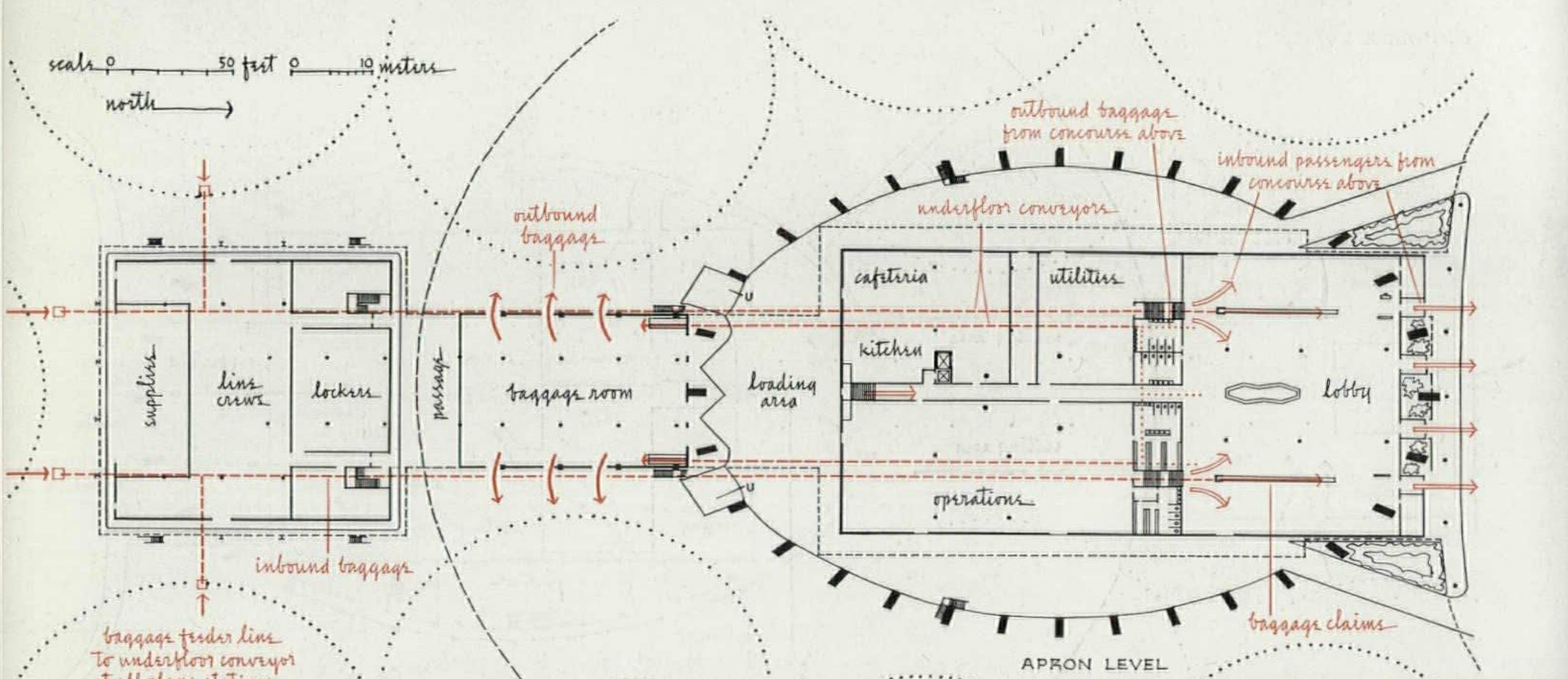
FRONT ELEVATION



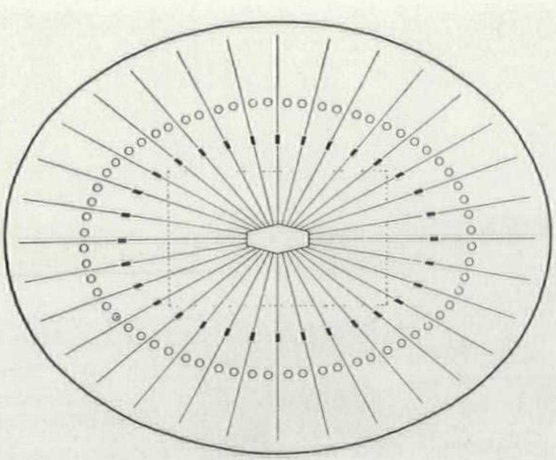
TRANSVERSE SECTION



LONGITUDINAL SECTION

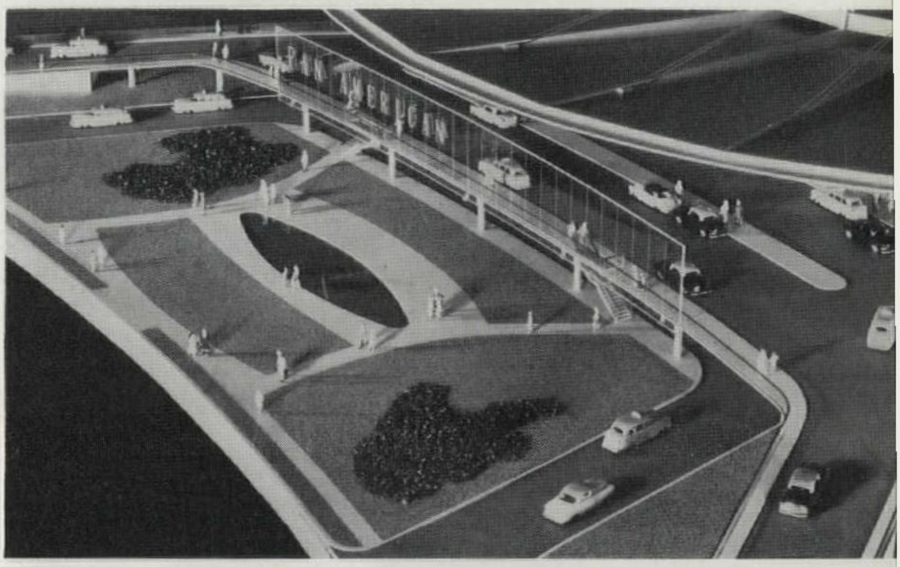


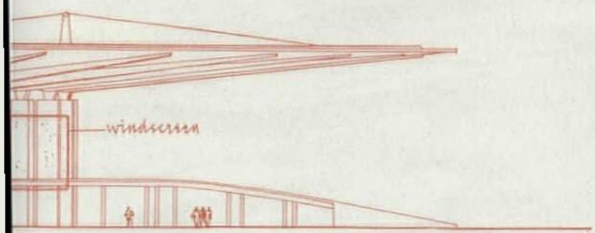
APRON LEVEL

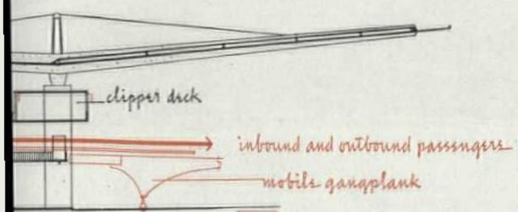


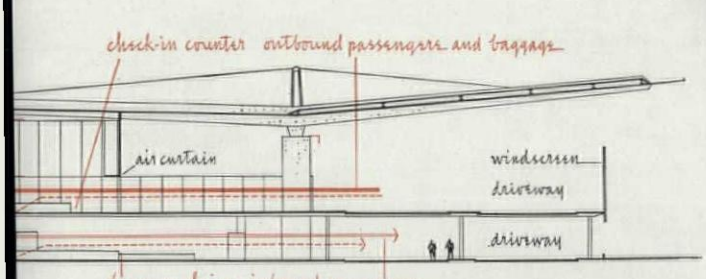
Particular effort was made in the design of the roof to make the 110-ft roof overhang seem as light as possible. To this end a series of skylights will pierce the reinforced-concrete roof slab. The openings are to be lighted at night to appear as a bright necklace from the air. Radial girders, supporting the vast roof, will be only partially visible on the underside of the roof. Purlins will also project above the roof slab—again to reduce the apparent weight of the roof. The girders are to be supported on 32 piers. The weight of the overhang will be resisted by cables carried from the end of the cantilever over a king post and back to the tension ring. Excess downward thrust of the large overhang will be made up by tension columns at the center of the building.

Model photo (acrosspage): P. E. Guerrero





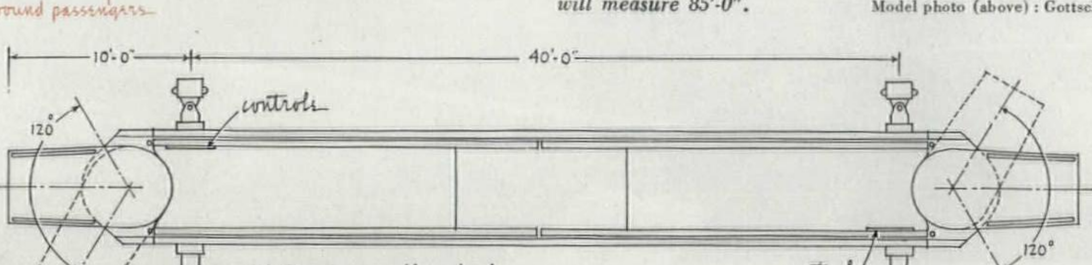


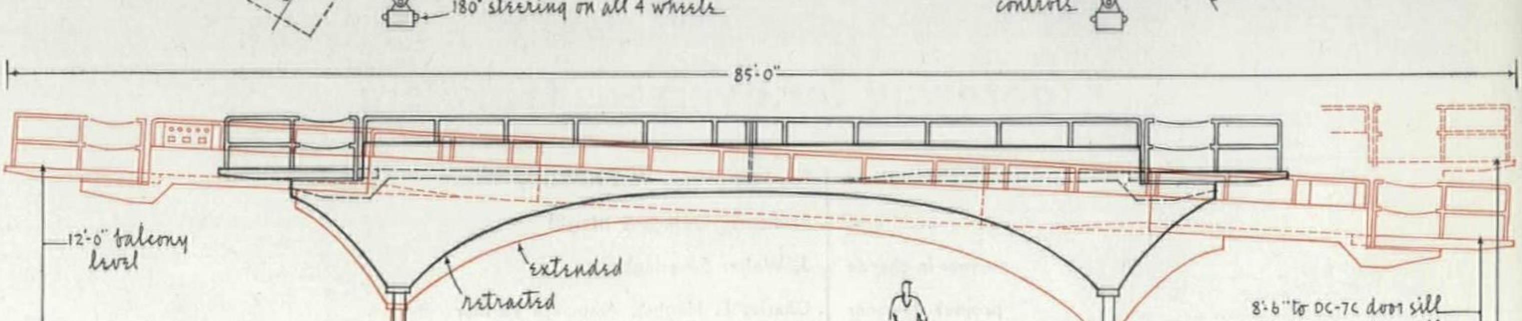


A 100-ft-wide air curtain will take the place of doors at the entrance to the main concourse (above). *The opening will be protected by a steel-framed glass screen which will bear the name of the airline as well as bronze castings by sculptor Milton Hebald.*

Mobile gangplank (below), *shown here in preliminary design stages, is required to bridge the gap between concourse level and aircraft door. Shuttles may be adjusted to the proper doorsill height of the various airliners. Fully extended, the shuttle will measure 85'-0".*

Model photo (above): Gottscho-Schleisner





gateway for overseas travelers

client	The Port of New York Authority
architects	Skidmore, Owings & Merrill
partner-in-charge	J. Walter Severinghaus
project designer	Charles E. Hughes, Associate Partner
project manager	Albert Kennerly, Associate Partner


Aerial photo: The New York Times

Major completed element at the New York Intenational Airport is the immense International Arrival Building, with its arched-roof main concourse and 11-story control tower, and the flanking, three-story Airline Wing Buildings, built by The Port of New York Authority. In all, the group, which is situated at the south end of the central mall of Terminal City, is eleven city blocks (2300 ft) long.

The twin wing buildings house the stations and offices of all foreign-flag airlines serving the port and will be used by all travelers departing on foreign-flag carriers. The huge central building and the wings extending out on the field side of the structure will be used by all incoming overseas flights or any passengers requiring customs clearance or other federal inspection services.

Enplaning overseas passengers come directly (by bus or taxi) to the individual stations in the wing buildings, proceed with ticketing details and baggage checking, go up to a second-story waiting room, and come down to the adjoining plane station when the flight is announced.

Deplaning passengers (plans, *overpage*) will be channeled into the field-side wings of the Arrival Building, through public-health and immigration offices, and so on to two-story-high customs space, where they pick up their baggage, have it inspected—and see friends meeting them who use a glass-enclosed gallery bordering the space at the second-floor level. After clearance, they join their friends and exit—or enter the USA, as you will—through the great arched-roof hall, from the ceiling of which is suspended a huge (40-ft wingspread) mobile sculpture by Alexander Calder.

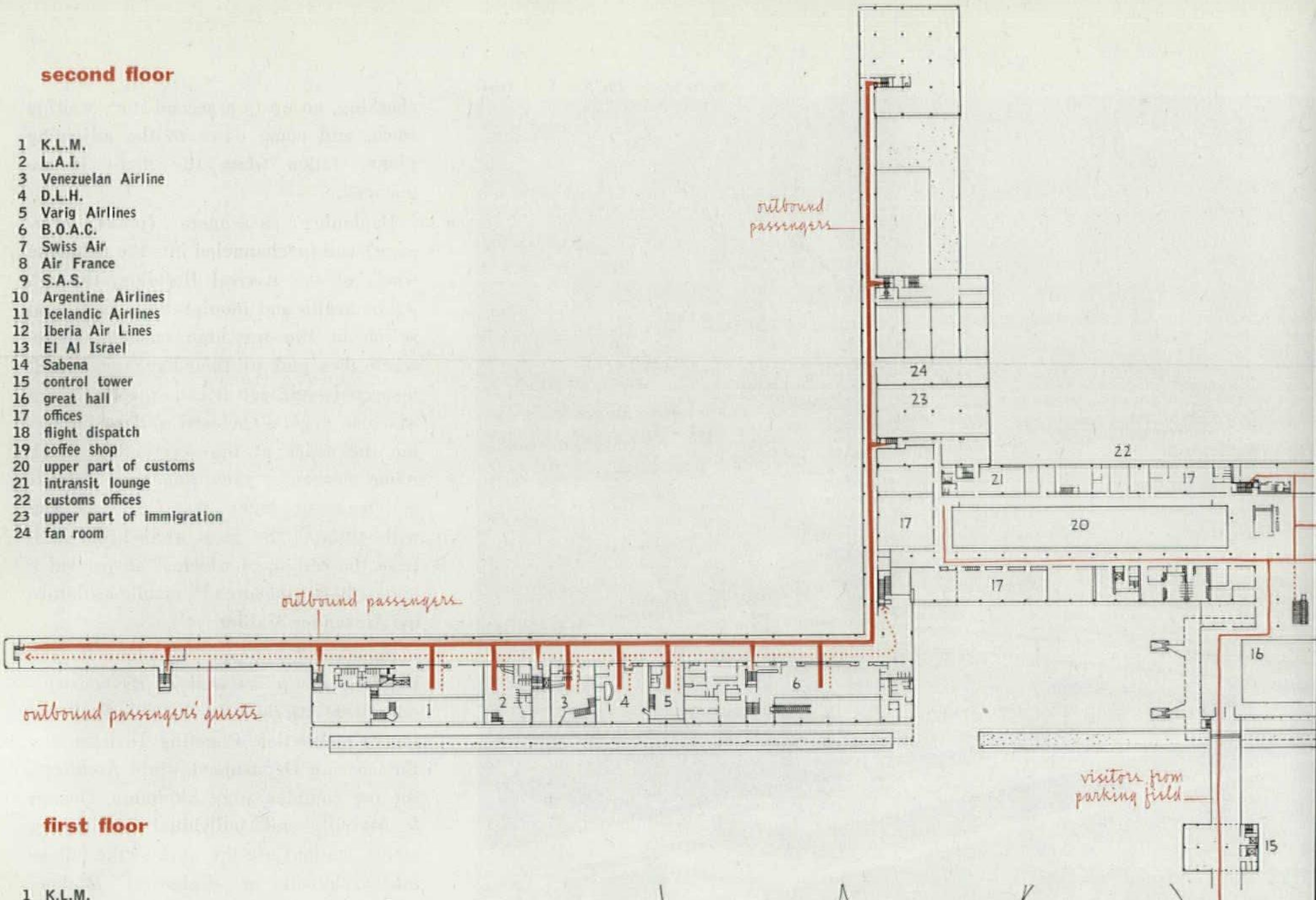
Functional and physical plans for the building group, as well as its construction, were carried out by the Port Authority's Aviation Planning Division and Engineering Department, while Architects for the complex were Skidmore, Owings & Merrill, and individual foreign-flag airline stations are the work of the following architects or designers: Michael Saphier Associates, Inc. (Sabena); Peter S. Hopf (L.A.I.); Kahn & Jacobs (S.A.S.); Itkin-Affrime-Becker Design Associates, Inc. (Air France, Argentine Airlines, Venezuelan Airline); G.B. & R.M. Ollinger (D.L.H.); LaFarge, Knox & Murphy (B.O.A.C.); Haefeli, Moser, Steiger and John R. Weber (Swiss Air); Kempa & Schwartz (Iberia Air Lines, Icelandic Airlines); Kelly & Gruzen (El Al Israel); Raymond & Rado (K.L.M.); and Charles J. Lane (Varig Airlines).

Visitors to the port may enter the group by means of a spiral ramp (adjoining parking lots) and so, at a mezzanine level, through the control-tower structure, over a bridge, and along a gallery bordering the great hall. From here they can ascend to the roof level, where they may watch field activities from a 4000-ft-long observation deck extending the full length of the buildings. Also at roof level is the terminal's bar and restaurant, which enjoy an unhindered view of the field.

Materials and equipment used in the construction of the steel-framed buildings are listed on a subsequent page. For discussion of the modular and prefabricated aspects of the curtain-wall system see NOVEMBER 1957 P/A.

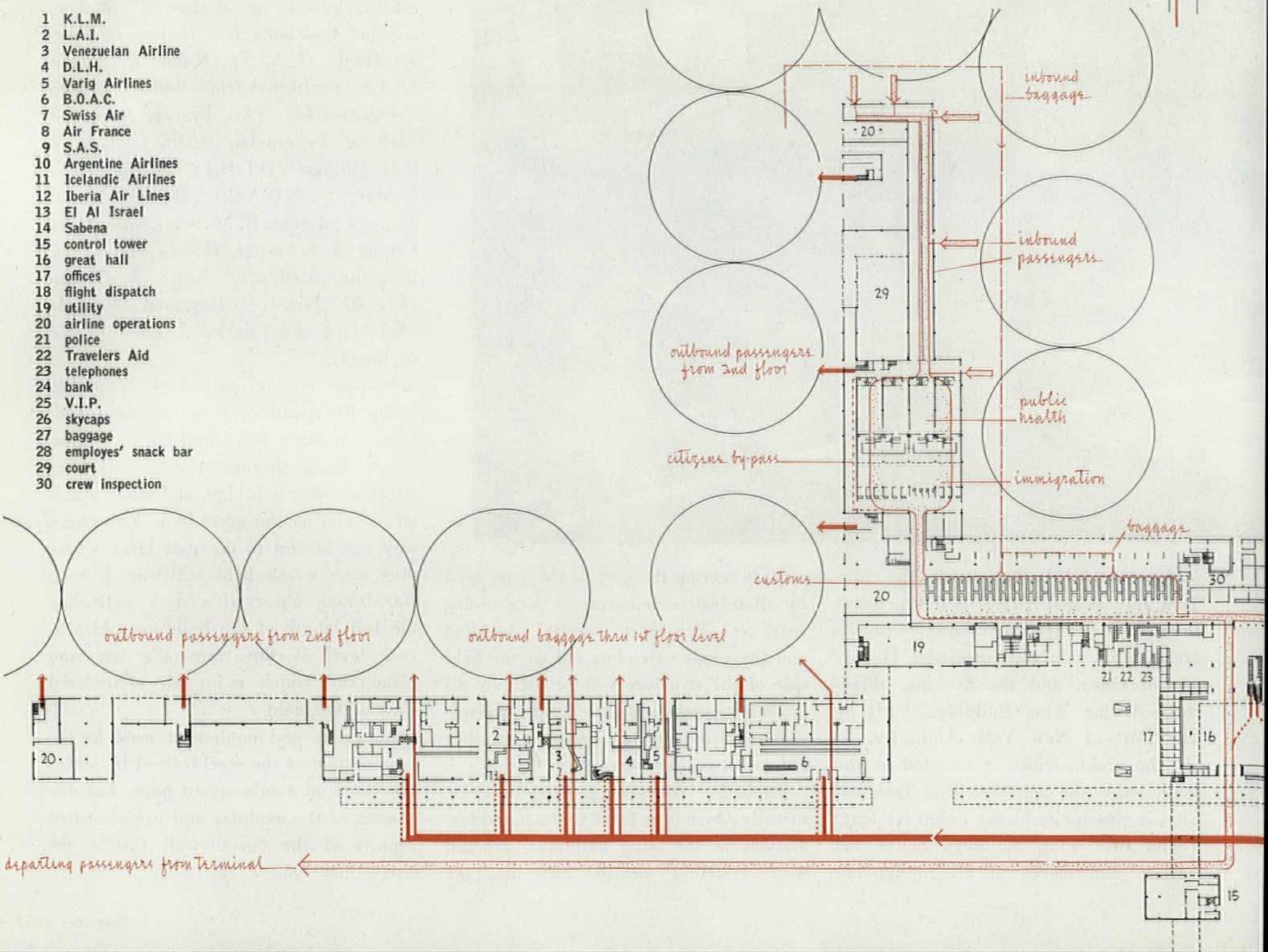
second floor

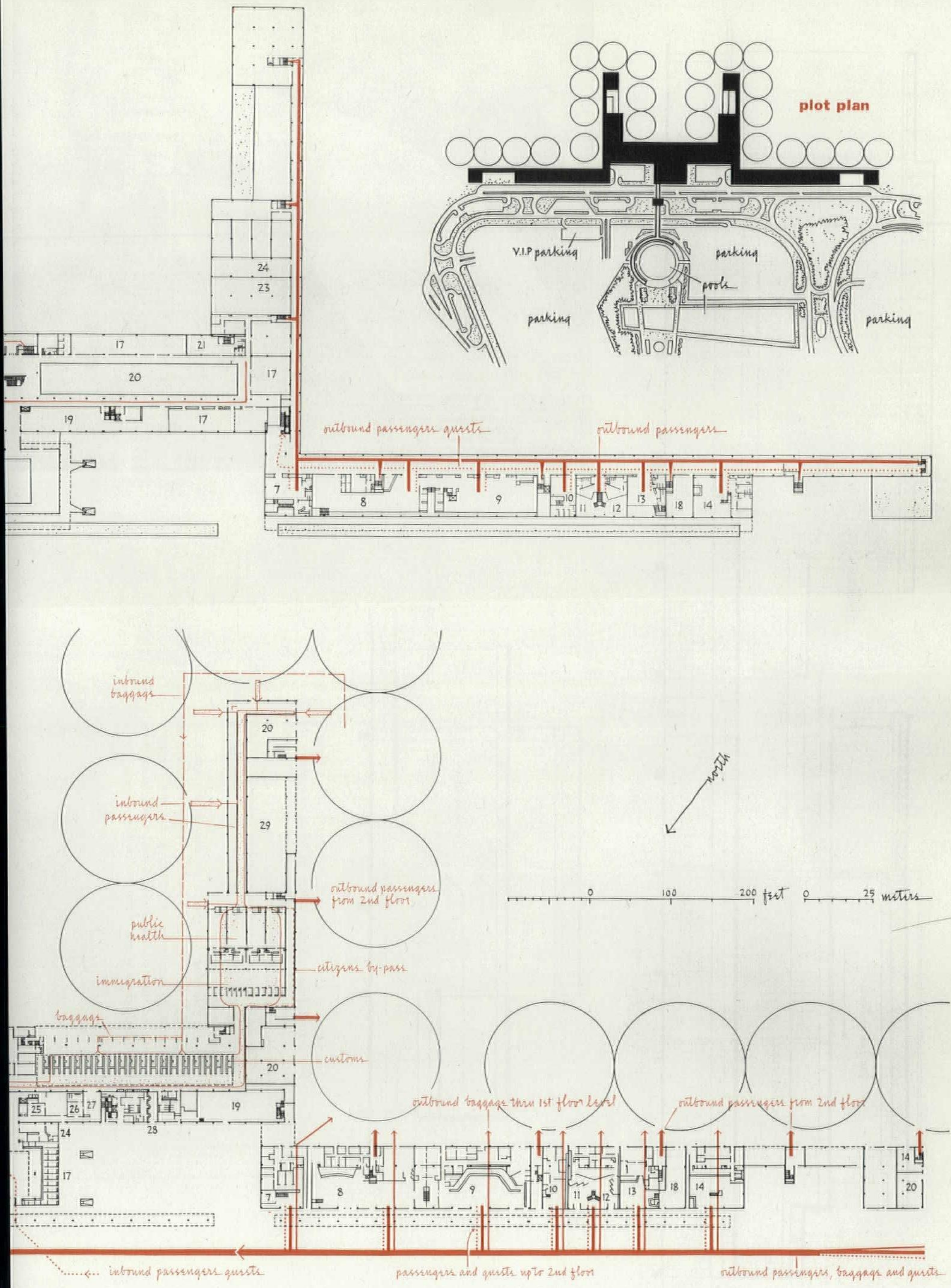
1 K.L.M.
2 L.A.I.
3 Venezuelan Airline
4 D.L.H.
5 Varig Airlines
6 B.O.A.C.
7 Swiss Air
8 Air France
9 S.A.S.
10 Argentine Airlines
11 Icelandic Airlines
12 Iberia Air Lines
13 El Al Israel
14 Sabena
15 control tower
16 great hall
17 offices
18 flight dispatch
19 coffee shop
20 upper part of customs
21 intransit lounge
22 customs offices
23 upper part of immigration
24 fan room

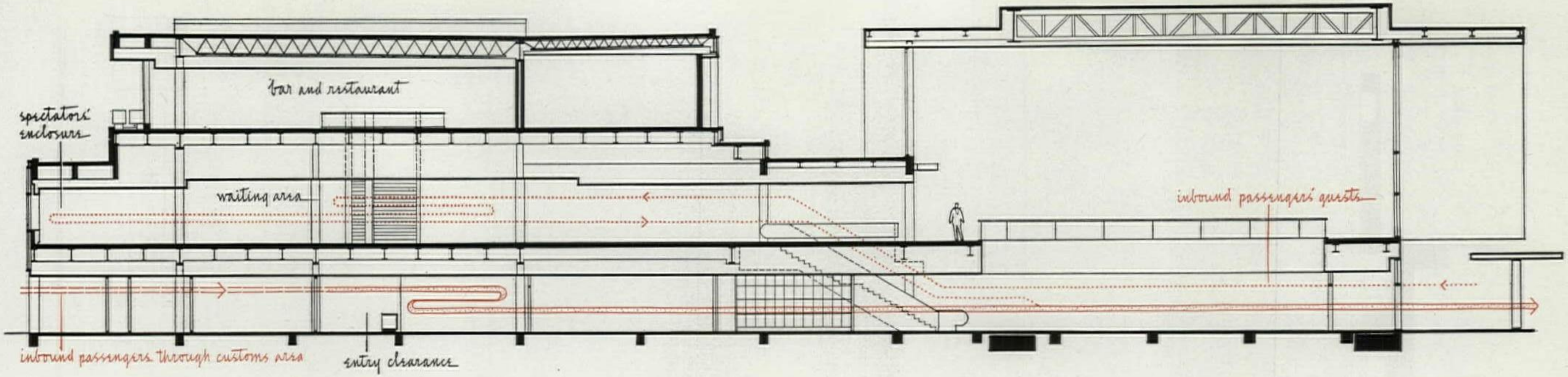


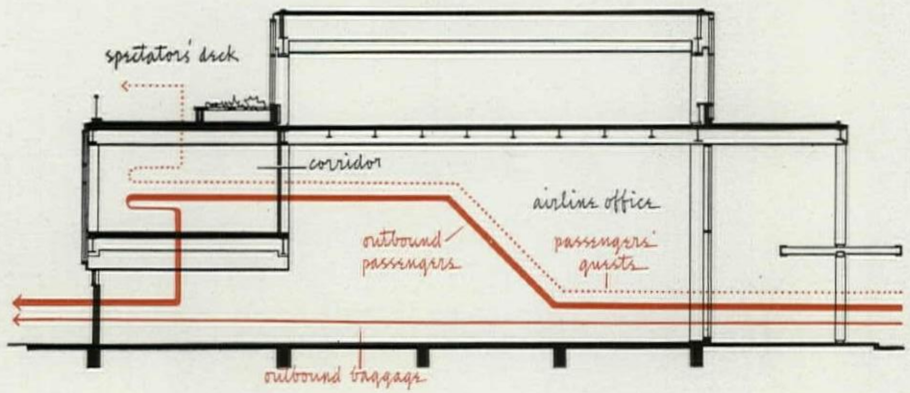
first floor

1 K.L.M.
2 L.A.I.
3 Venezuelan Airline
4 D.L.H.
5 Varig Airlines
6 B.O.A.C.
7 Swiss Air
8 Air France
9 S.A.S.
10 Argentine Airlines
11 Icelandic Airlines
12 Iberia Air Lines
13 El Al Israel
14 Sabena
15 control tower
16 great hall
17 offices
18 flight dispatch
19 utility
20 airline operations
21 police
22 Travelers Aid
23 telephones
24 bank
25 V.I.P.
26 skycaps
27 baggage
28 employes' snack bar
29 court
30 crew inspection




plot plan
V.I.P parking
parking
pools
parking
parking
outbound passengers guests
outbound passengers
inbound baggage
inbound passengers
outbound passengers from 2nd floor
public health
citizens by-pass
immigration
baggage
customs
north
0 100 200 feet 0 25 meters
outbound baggage thru 1st floor level
outbound passengers from 2nd floor
inbound passengers guests
passengers and guests up to 2nd floor
outbound passengers, baggage and guests



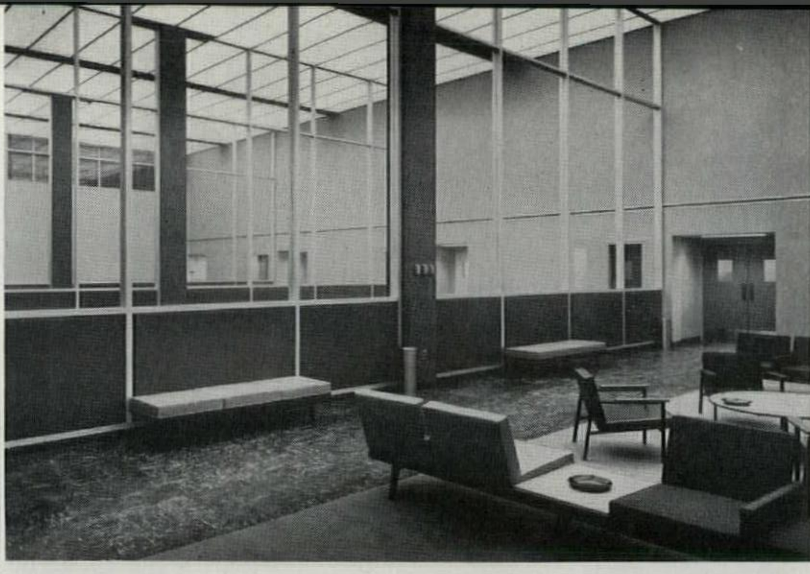


The larger of the two sectional drawings is taken through the central International Arrival Building and shows the routes followed by incoming passengers and their friends or relatives who come to meet them.

The other section, which is typical of either of the Airline Wing Buildings, indicates the routing of outgoing passengers and their guests.

On the following four pages are photographs taken by Gottscho-Schleisner in mid-November, when the buildings were nearing completion. Elements shown are the parabolic-roofed main concourse; public-health and immigration areas; and offices of one of the foreign-flag airlines.

In the two field-side wings of the International Arrival Building, there are duplicate facilities for inbound travelers—among them, public-health waiting rooms (right) *and immigration offices* (bottom).



For outbound passengers each foreign-flag carrier has facilities in Wing Buildings. First completed was for KLM (above) *designed by Architects Antonin Raymond & L. L. Rado.*

The Port of New York Authority

Materials & Methods

construction

Foundation: wood piles with reinforced—concrete caps and grade beams. **Structure:** framing: steel — Bethlehem Steel Company; permanent steel forms for lightweight structural grade concrete (floors), permanent steel forms for lightweight insulating concrete (structural roof deck)—Granco Steel Products Company. **Wall Surfacing:** exterior: column cover, window and spandrel enframement—Flour City Ornamental Iron Company; glass and tempered-glass spandrels — Pittsburgh Plate Glass Company; neoprene glazing channel—Pawling Rubber Company; granite base; face brick—Hanley Company, Inc., Entwisle Manufacturing Corporation; architectural cast stone—The Dextone Company; interior: ornamental metal—Capitol Bronze Corp., Trio Industries, Inc.; rest rooms, toilets, etc.; ceramic tile—American-Olean Tile Company; structural-glass partitions — Libbey-Owens-Ford Glass Company; structural facing tile—Natco Corporation. **Floor Surfacing:** terrazzo; quarry tile—Carlyle Tile Co.; ceramic tile—Cambridge Tile Manufacturing Company; asphalt tile—Johns-Manville Corporation. **Ceiling Surfacing:** acoustical mineral tile; acoustical metal; acoustical plaster—Zonolite Company. **Roofing:** white marble chips on built-up roof; asphalt decking; parabola: stainless-steel surfacing. **Waterproofing & Dampproofing:** molded-rubber water stops—Servicised Products Corporation; molded-plastic joints—W. R. Meadows Company; fabric flashing; dampproofing—The Flintkote Company. **Insulation:** roof and spandrels—Owens-Corning Fiberglas Corporation. **Roof Drainage:** drains — Zurn Industries, Inc. **Partitions:** hollow metal—E. J. Boyle, Inc. **Windows:** fixed sash—Flour City Ornamental Iron Company. **Doors:** interior: hollow-metal — Williamsburg Steel Products Company; overhead—North American Iron & Steel Company, Inc.; elevator — Dahlstrom Metallic Door Company; entrance: tempered glass and aluminum—Pittsburgh Plate Glass Company. **Hardware:** lock sets—P & F Corbin Div., The American Hardware Corporation. **Paint & Stain:** exterior—M. J. Merkin Paint Company.

equipment

Specialized Equipment: public address—Radio Corporation of America. **Elevators:** hydraulic —Burwak Elevator Company; hoisting equipment: winch type—Armor Elevator Company; cabs—Parkline, Rotary Lift Company, W. S. Tyler Company. **Moving Stairway:** The Peelle Company. **Lighting Fixtures:** office and lobby areas—Sylvania Electric Products, Inc., Litecraft Manufacturing Company. **Electric Distribution:** bus system and switchgear—Federal Pacific Electric Company; wire and cable—Kaiser Aluminum and Chemical Sales Company; conduit—Pittsburgh Standard Conduit Company. **Plumbing & Sanitary:** water closets —Eljer Div., Murray Corporation of America; lavatories—American Radiator & Standard Sanitary Corporation; toilet seats—C. F. Church Manufacturing Company; water heater —Patterson-Kelley Company, Inc.; flush valves —Sloane Valve Company; incinerator—Sargent Building Specialties, Inc.; cast-iron soil pipe; shower cabinet—Speakman Company; water-supply system: bronze screwed fittings—Acheson Manufacturing Company; valves—Jenkins Brothers. **Heating:** high-temperature hot water from central boiler plant—International Boiler Works Company; convectors—John J. Nesbitt Company; unit heaters—Modine Manufacturing Company; roof fans and centrifugal space fans—American Blower Corporation; pneumatic controls: Johnson Service Company. **Air Conditioning:** chilled water to high-velocity air-conditioning units; boiler-compressor—Carrier Corporation; boiler plant cooling tower—Philips Cooling Tower Company; diffusers—Barber-Colman Company; high-velocity fans and cooling coils—M. Blazer & Son; electrostatic filters—Trion, Inc.

*** Not including foreign-flag airline stations in wing buildings.**

one-level finger system: *Mexico, D.F.*

architects

Augusto H. Alvarez
Enrique Carral I.
Manuel Martinez Paez
Ramon Marcos
Guillermo P. Olagaray
Ricardo Flores V.

Architects for this international airport terminal were first-prize winners in a competition for its design conducted among Mexican Architects in 1949 by the Ministry of Communications and Public Works. Final design and construction were carried out by Architects Alvarez; Carral; Paez; Olagaray; and Flores.

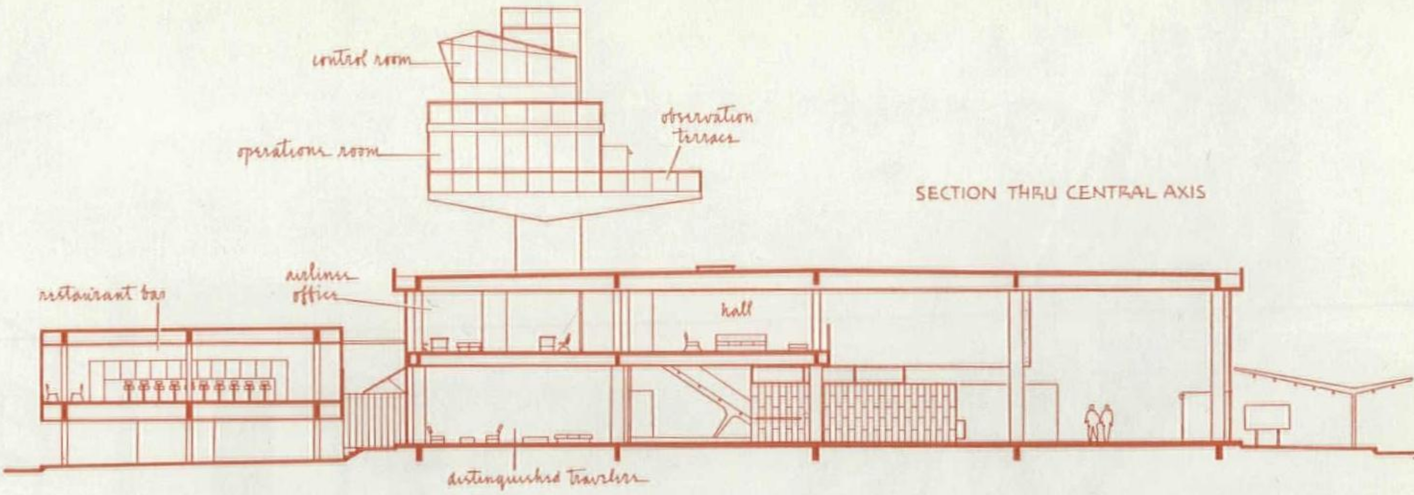
Initial concept called for a frontal scheme to accommodate 24 DC-6's parked in line along a 1500-ft building. For greater efficiency, a more compact rectangular building was developed, with fingers on the field side supplementing plane stations paralleling the terminal.

The 924-ft-long, reinforced-concrete structure is divided into three basic parts —a 132-ft-bay at the center which contains main entrance lobby, field manager's offices, waiting room for distinguished travelers, and (on the field side) restaurant, cafeteria, and bar; and equal spaces at either side (four 99-ft bays each) that serve local flights on the one hand, and international flights, on the other. For future expansion, additional 99-ft bays at either end would not disturb the basic organization, while more fingers could be added on the field side.

Departing passengers using the international side of the building check luggage at the pertinent counter and travel, with their friends, to one of the field-side waiting rooms. When time to pass customs and immigration arrives, they leave their friends, go through the required checks, and continue to a separate passengers' waiting room, where they can see their parties in the adjoining room through a glass partition. Arriving passengers follow the procedure in reverse. Similar large waiting rooms are provided in the other wing for local passengers.

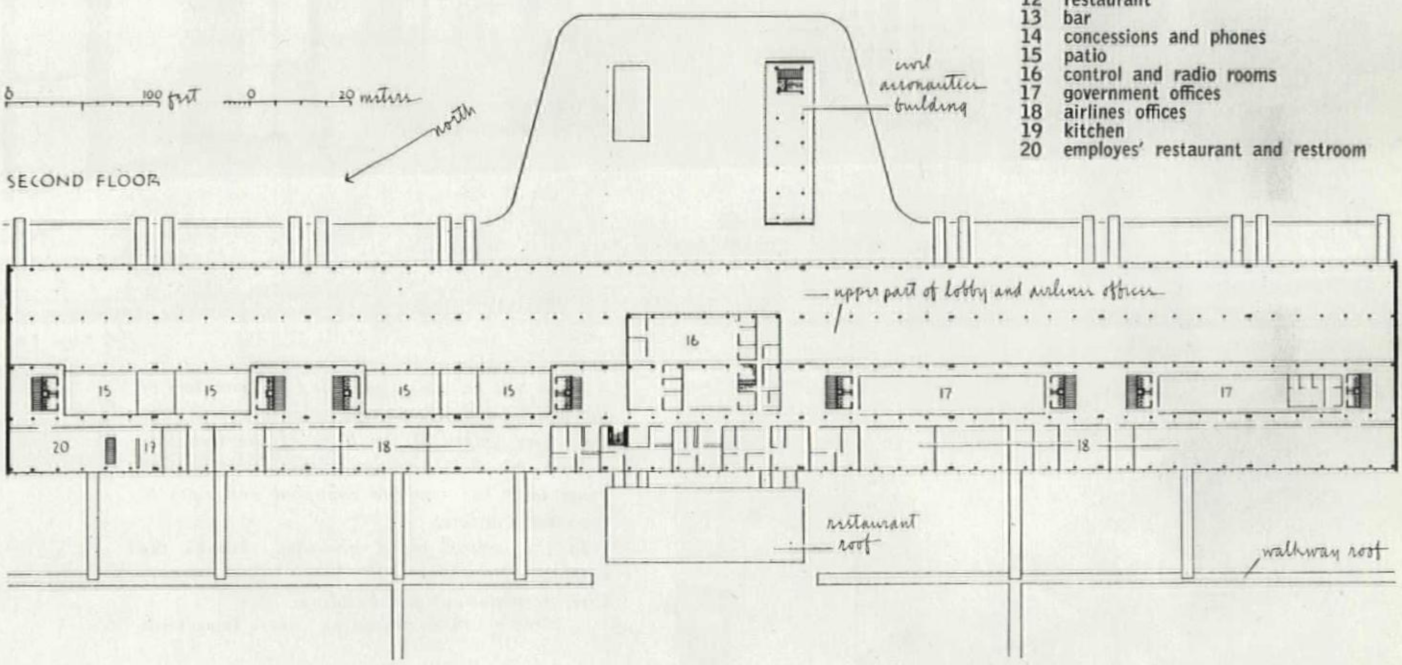
At the front of the building is ample parking space. Here, also, is a 4-story Civil Aeronautics office building, the open ground floor of which is used for official ceremonies and from which the main lobby is reached directly.

SECTION THRU CENTRAL AXIS

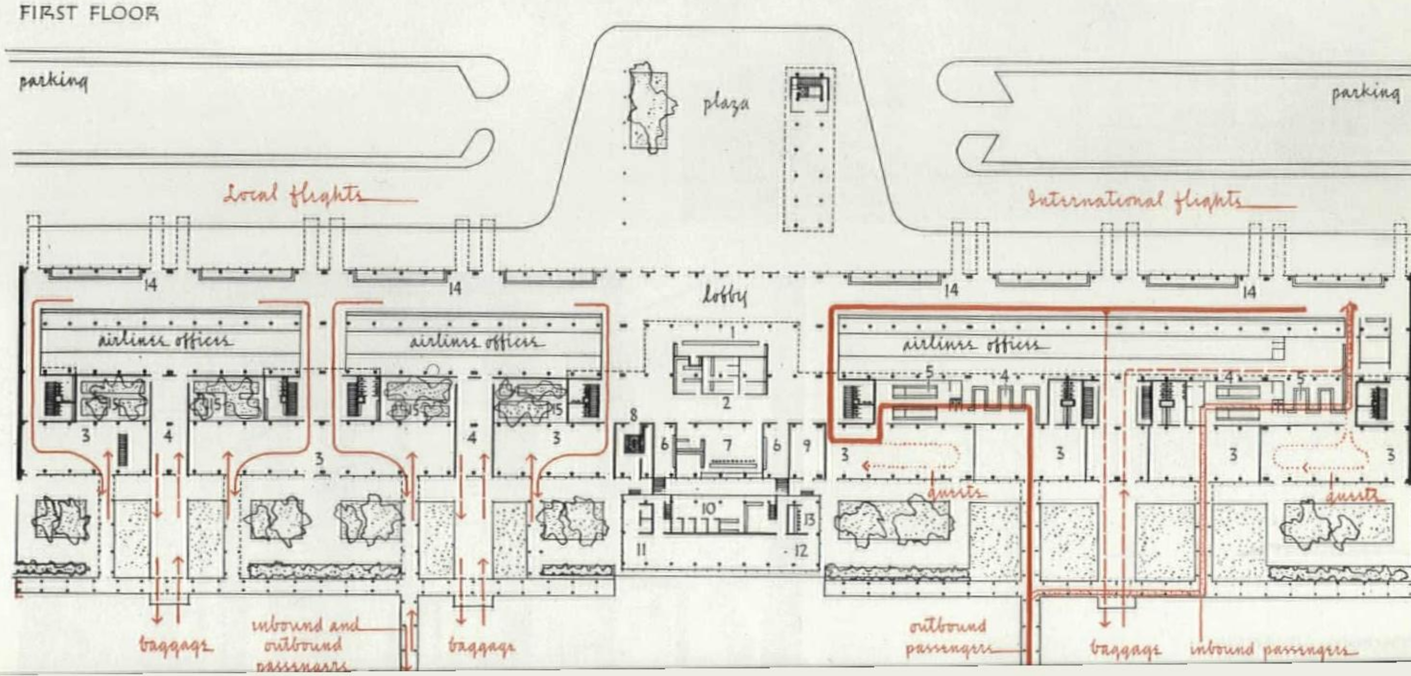


1 field manager's office
2 shops
3 waiting room
4 immigration
5 customs
6 lobby to upper restaurant
7 soda fountain
8 control tower stairs
9 "Distinguished Travelers" room
10 kitchen
11 cafeteria
12 restaurant
13 bar
14 concessions and phones
15 patio
16 control and radio rooms
17 government offices
18 airlines offices
19 kitchen
20 employes' restaurant and restroom

SECOND FLOOR



FIRST FLOOR



Erwin Lang

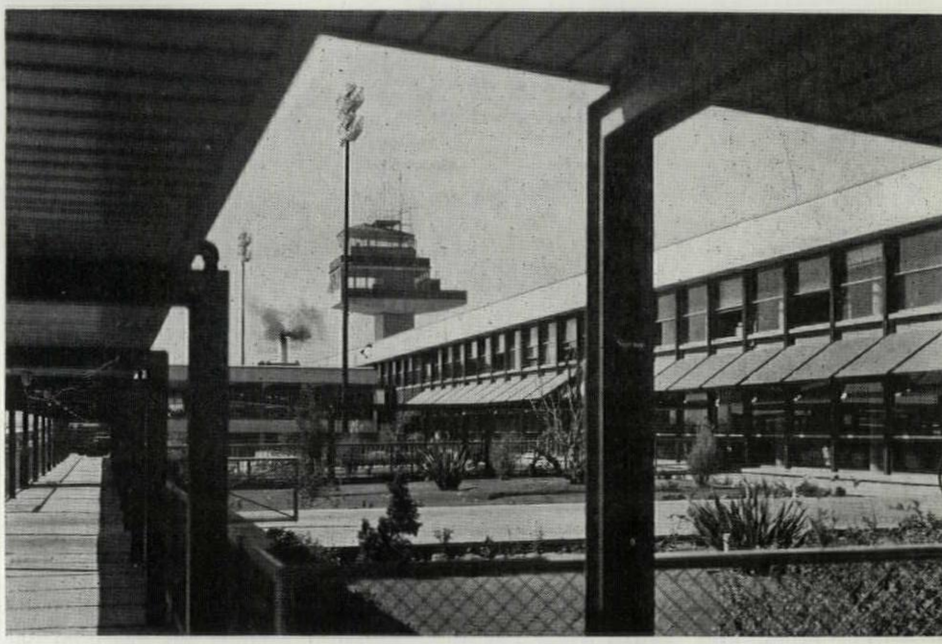
Erwin Lang

A great hall (above) *containing the counters of the various airlines, as well as concessions, runs the entire length of the front of the building.*

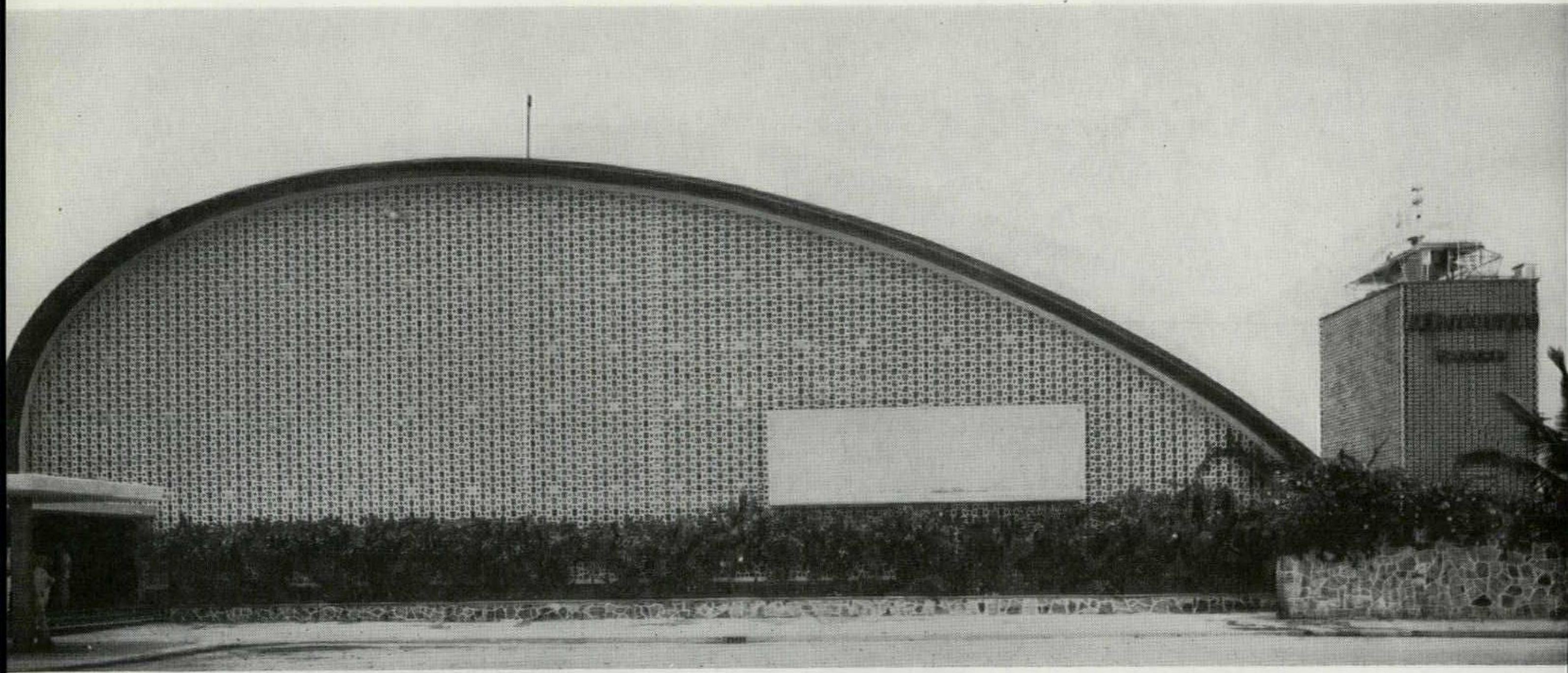
Each of the building wings (international wing, left) *has separate canopied entrances to the several airlines.*

In the central plaza, glimpsed through the windows of the great hall (below) *is the 4-story Civil Aeronautics office building.*

Photos (except as noted): Limon-Flores



Floor-to-ceiling windows on the field side of the terminal border waiting rooms of both local and international areas; landscaped gardens occur between the covered walkways that lead to the plane stations.



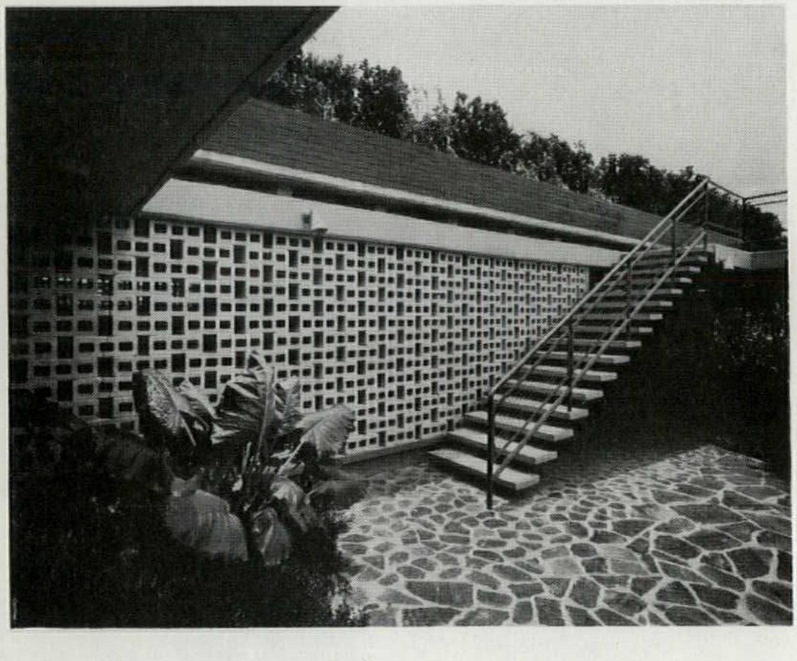
one-level frontal system: *Acapulco, Mexico*

Climate was an important, if not the most compelling, factor in the design of this new airport, which was needed to serve the fast-growing tourist traffic at this popular resort on Mexico's Pacific coast. Both approach and field faces of the building, developed within a lightweight concrete structure supported by two elliptical concrete arches, consist of double layers of hollow clay tile. These not only provide the desired cross ventilation, while screening out rain and strong sunlight, but they also constitute a highly decorative wall pattern.

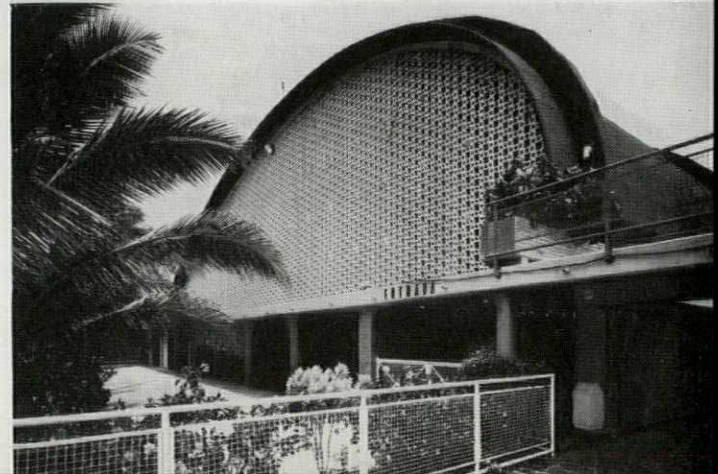
One end of the great hall beneath the elliptical shell is set apart for the required customs inspection and clearance for visitors from foreign countries; a wall of ochre-colored local stone separates this section from the larger space provided for passengers using local flights. A mezzanine above the customs space is occupied by the airfield offices. Flooring throughout is of stone.

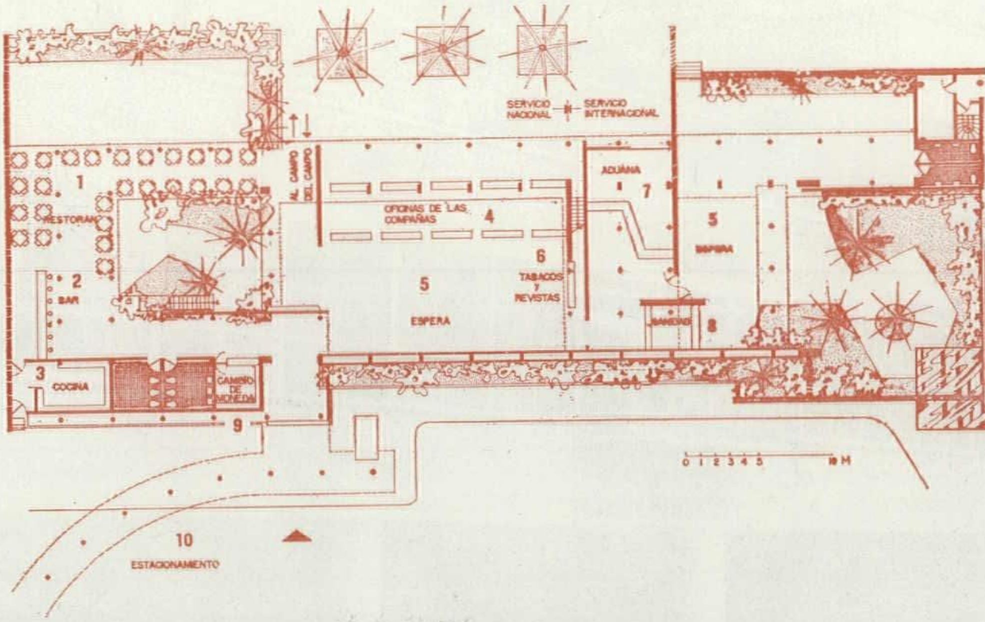
Beyond the vaulted enclosure at one end of the scheme is a patio, bordered by the airport restaurant and bar. On the flat concrete roof above is a visitors' viewing terrace. At the other end of the group is the freestanding control tower which, like the main building, is enclosed by pierced-screen walls.

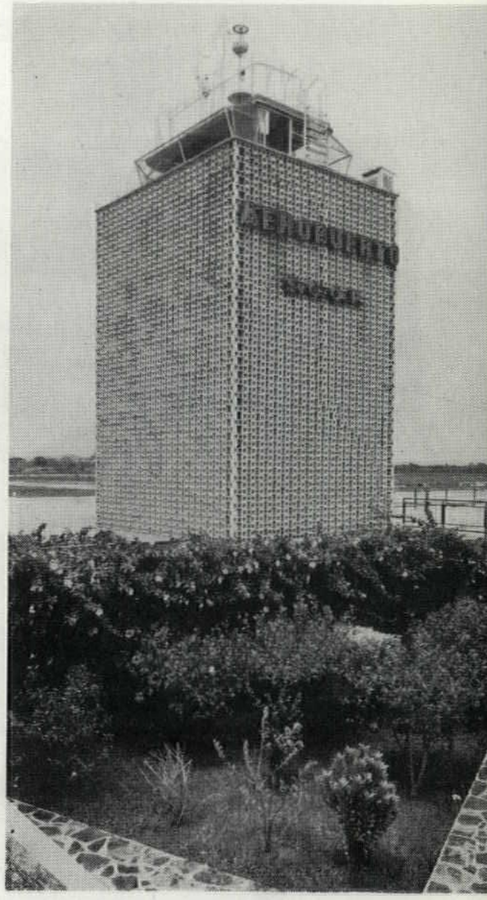
The port is located between the Lake of Tres Palos and the sea, and enough land was acquired to take care of foreseeable future expansion.



architects | Mario Pani & Enrique Del Moral

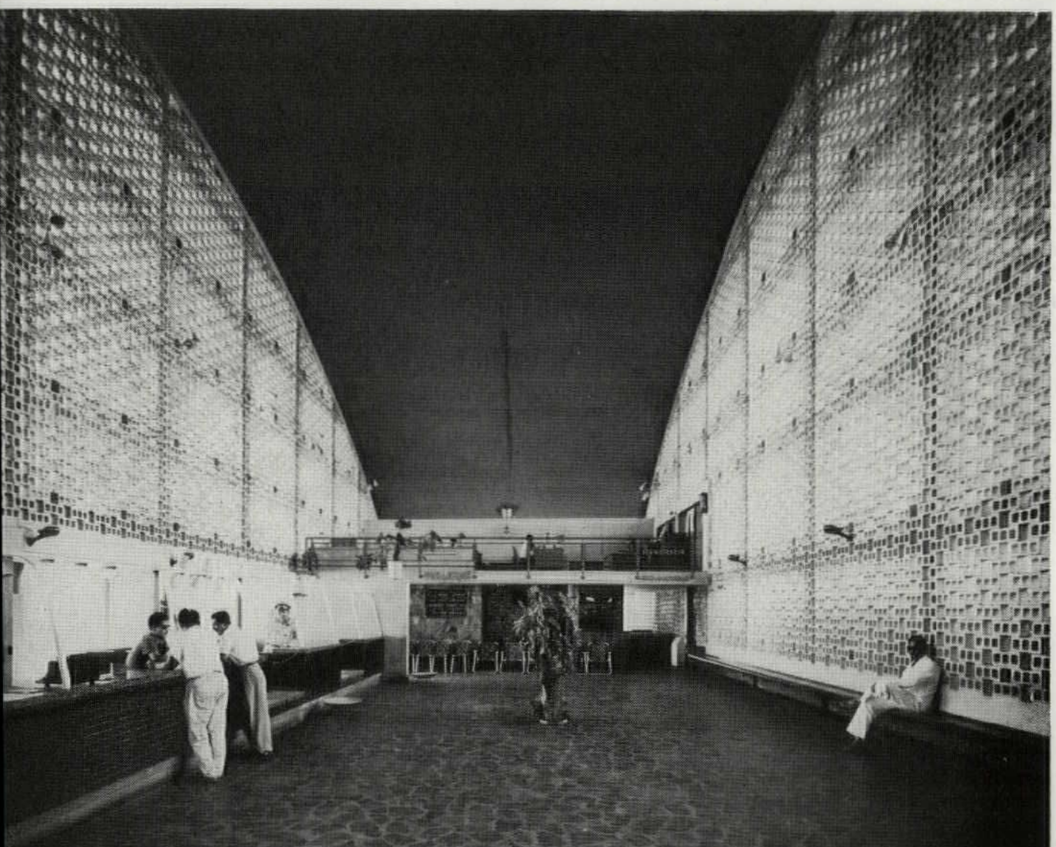


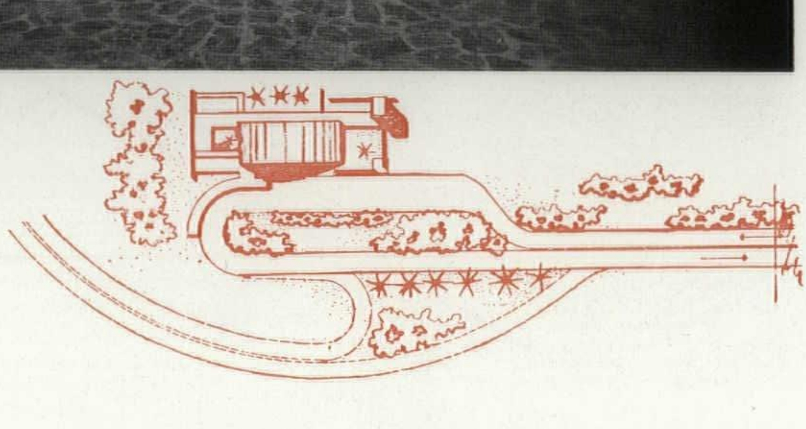




Traffic circulation is of the simplest sort for national travelers, who merely go to one of the five ticket counters, check their baggage, and walk out to the field. Plan key: **1** *restaurant;* **2** *bar;* **3** *kitchen;* **4** *counters for five airlines;* **5** *waiting room;* **6** *magazine stand;* **7** *customs;* **8** *health office;* **9** *monetary exchange;* **10** *parking.*

Photos: Erwin Lang

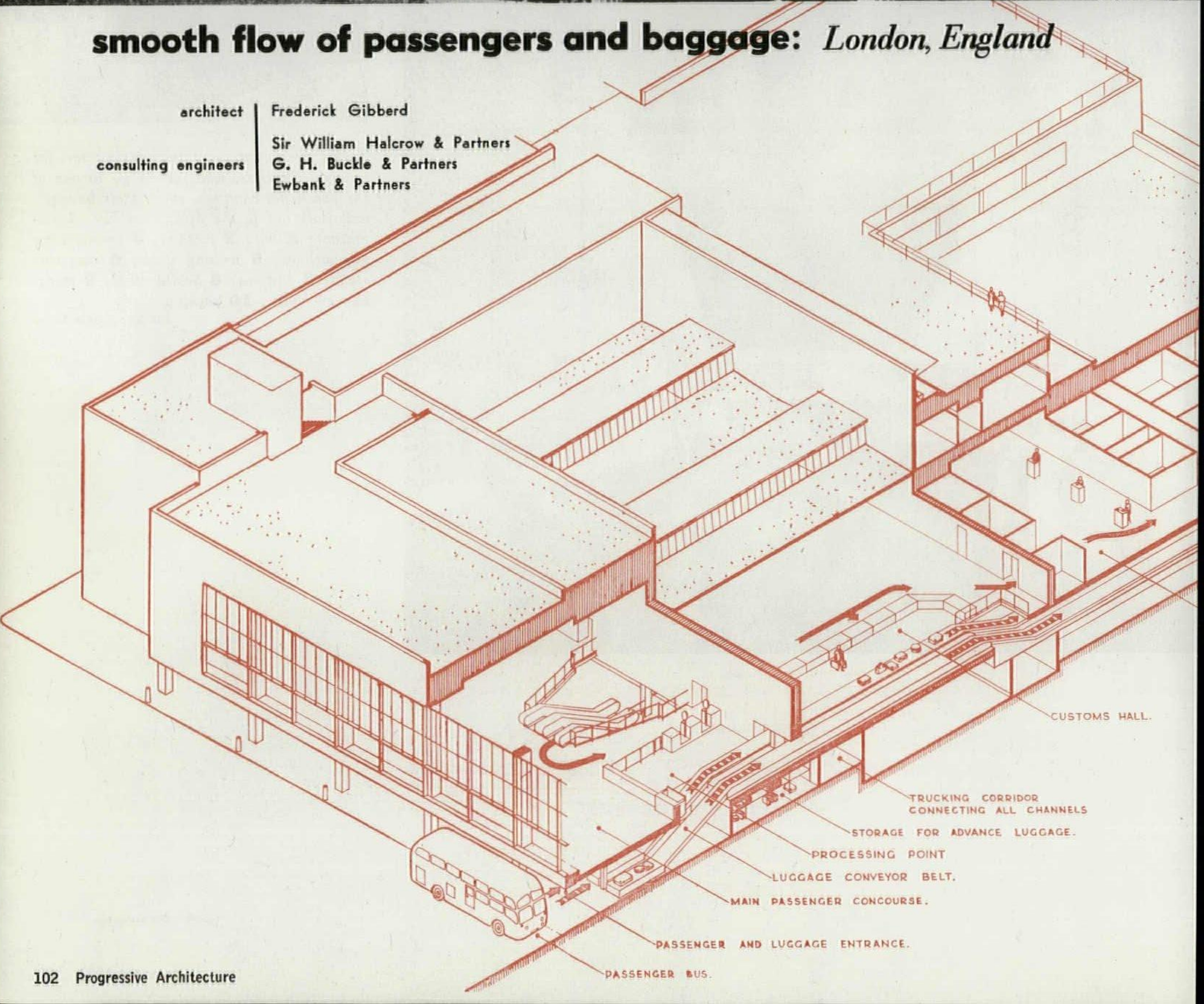




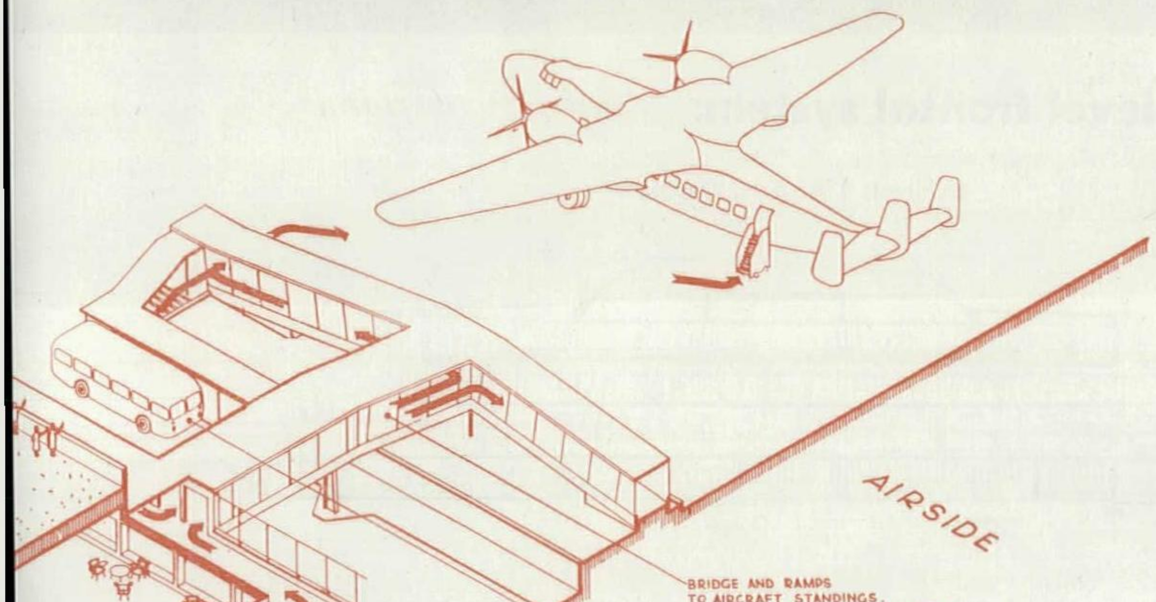
smooth flow of passengers and baggage: *London, England*

architect | Frederick Gibberd

consulting engineers | Sir William Halcrow & Partners
G. H. Buckle & Partners
Ewbank & Partners

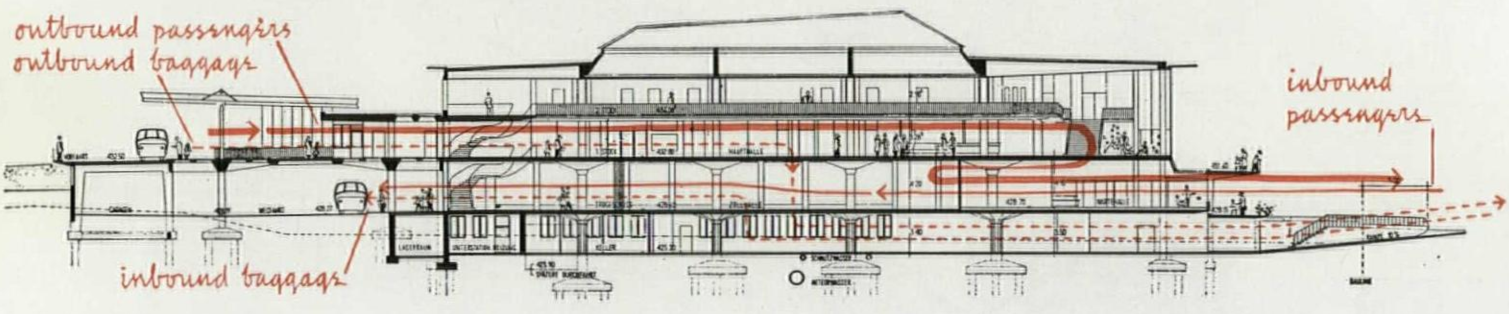


This building is a part of the central terminal area of London Airport which stands like a diamond-shaped island in the midst of the 2827-acre airfield. A 680-yard tunnel runs beneath the runways and connects the terminal buildings with the outer road system. The South East Face Passenger Building (*shown here*) is equipped to handle 1,250,000 passengers a year. Passengers comprise three categories: 1. those traveling on overseas routes, subject to clearance through customs, health, and immigration formalities 2. transient passengers; 3. those traveling within the United Kingdom. The building also provides offices, restaurant and service facilities, storage and minor maintenance space for aircraft, and areas for the accommodation of spectators. The ground floor is devoted to baggage handling, rooms for technical staff and equipment, food preparation, and other services. The main functions of passenger handling are concentrated on the first floor. This level is subdivided into a series of transverse bands, containing in sequence, the concourse, customs, immigration, health and waiting rooms. Ten parallel passenger handling channels (*as shown in the isometric drawing, below*), cut through these bands at right angles between the landside and airside of the building. Channels are self-contained, the route being unmistakable and free from interruption by cross flow. Each channel is served by a baggage conveyor belt which runs beneath the first floor but ascends to the first floor for customs inspection. Channels are paired to be used in tandem for unusually large passenger loads. Since inbound and outbound traffic peaks seldom coincide, channels are reversible. Two separate lanes appended to one end of the building serve local travelers not requiring customs inspection. Transit or inter-line passengers have their own suite, containing restaurant, shops, and rest rooms, at the field side of the building. Restaurant and roof gardens on the third floor are intended for visitors and spectators.

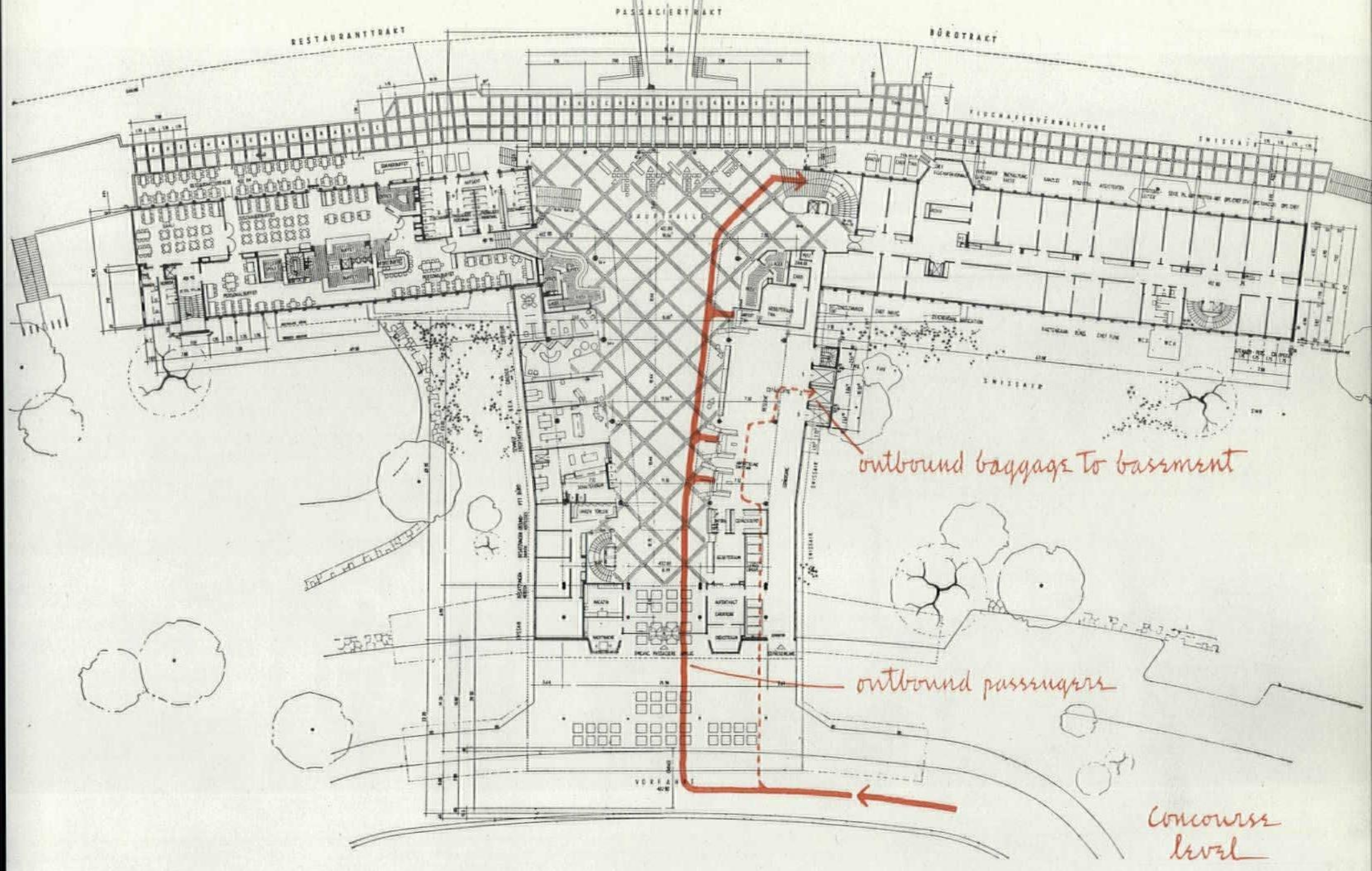


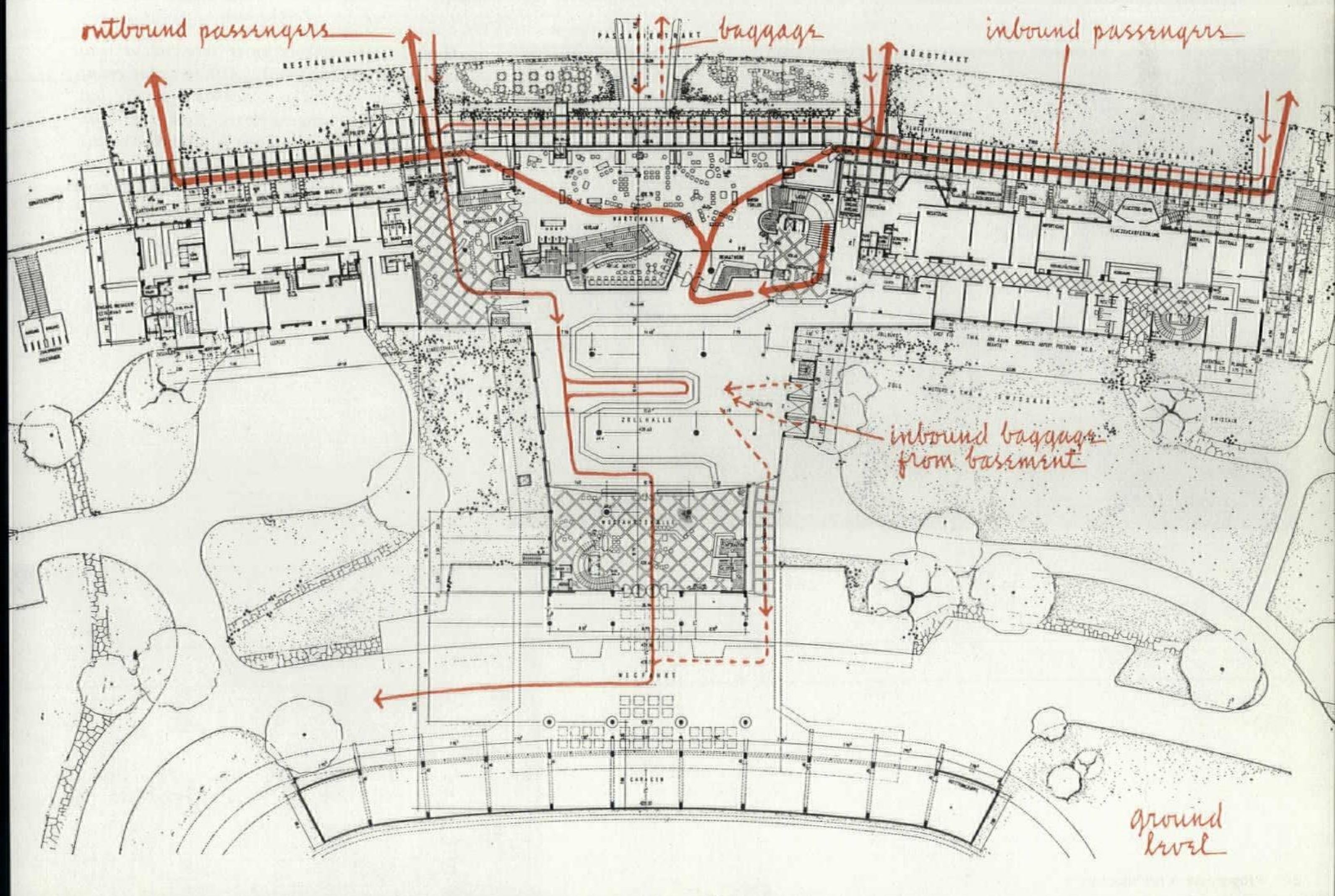
three-level frontal system: *Zurich, Switzerland*

architects | A. & H. Oeschger



Passenger and baggage circulation is particularly well organized in this Swiss terminal designed to accommodate up to 3000 passengers per hour, the equivalent of 40 plane loads. Outbound passengers enter the terminal building under the protective cover of an aluminum canopy (*below*), check tickets and baggage on the main concourse, proceed through the great hall, then down stairs to the ground level, and into the waiting room for outbound and transient passengers. Shortly before take-off time travelers are collected into one of two departure rooms. Meanwhile, outbound baggage has been dispatched from the ticket counter via the basement to the aircraft. Inbound passengers enter at ground level, go through a centralized customs inspection station to which their baggage has been forwarded, and pass through a lounge to local transportation. The wings extending from this central building portion contain restaurants and offices. In the design of such architectural elements as the observation terraces, outdoor dining areas, the skylighted central hall, dramatic stairs, the architects kept in mind not only the passengers who must pass through the building but also the many visitors who come to the terminal for pleasure and entertainment. Of equal importance to the designers was the siting of the terminal and its related structures. The buildings have been consciously decentralized for best adaptation to the natural setting. New landscaping and forestation will further minimize the scale of the structures, and at the same time diminish the noise.

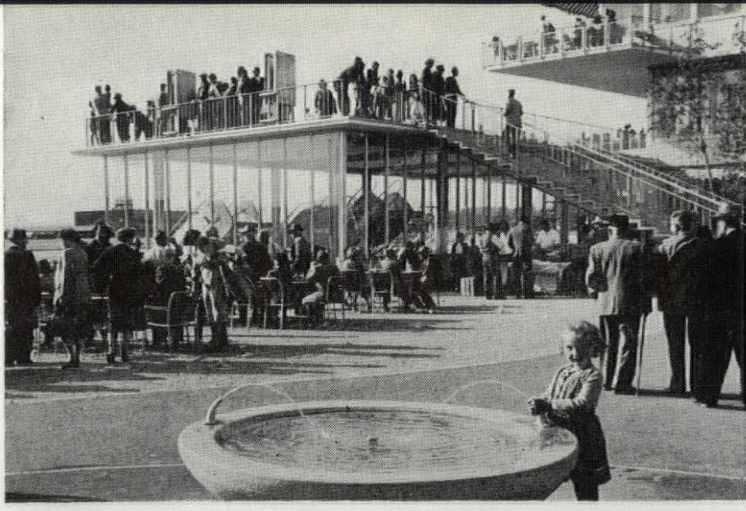

RESTAURANTTRAKT
PASSAGIERTRAKT
BÜROTRAKT
outbound baggage to basement
outbound passengers
VORFAHRT
Concourse level


outbound passengers
baggage
inbound passengers
RESTAURANTTRAKT
BÜROTRAKT
ZOLLHALLE
inbound baggage from basement
GARAGEN
ground level

Outbound passengers enter terminal at main concourse level (above). *Airline ticket counters are to the right, concessions to the left.*

Inbound passengers leave from the lower level (left) *where baggage is claimed and customs inspection takes place.*

Rest room (below) *is part of waiting area for outbound and transient passengers.*



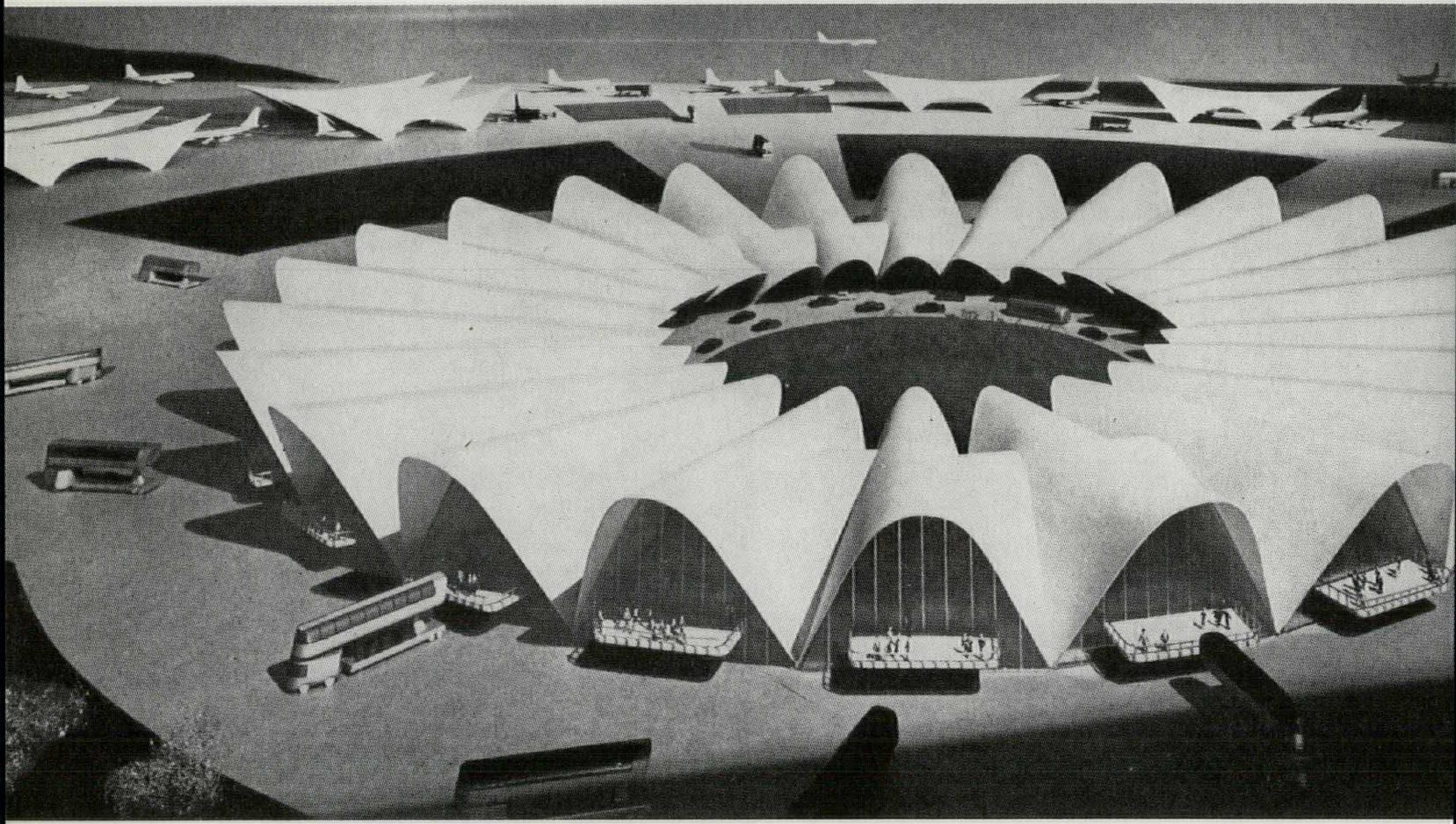
Outdoor restaurant (above) *is connected by stairs to observation terrace.*

Restaurant (right), *on mezzanine level, overlooks airfield and main concourse.*

Stairs (left) *descend from main concourse to waiting room for outbound passengers.*

Tower (below) *is control point for aircraft take-offs and landings.*

Damora



tomorrow's airport

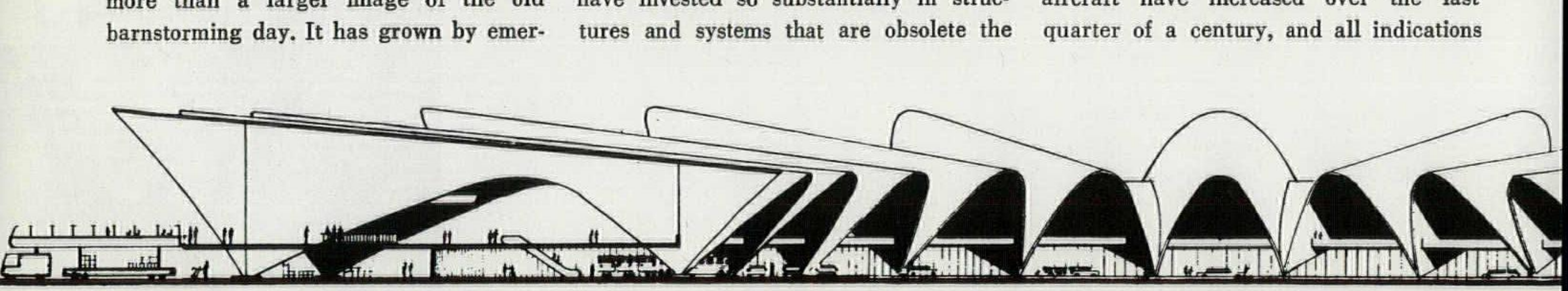
This project was prepared for Universal Atlas Cement Company as part of a promotional program to explore new structural possibilities for reinforced concrete. The data presented focuses more specifically on the basic ideas of this scheme. The Editors feel that this proposal may influence the design of future airports and revise the present pattern of planning for the Age of Flight. Victor Gruen, Architect, whose work greatly affected the development of another 20th Century building type—the shopping center—is author of this scheme. Excerpts from a report by Edgardo Contini, Associate-in-Charge, follow:

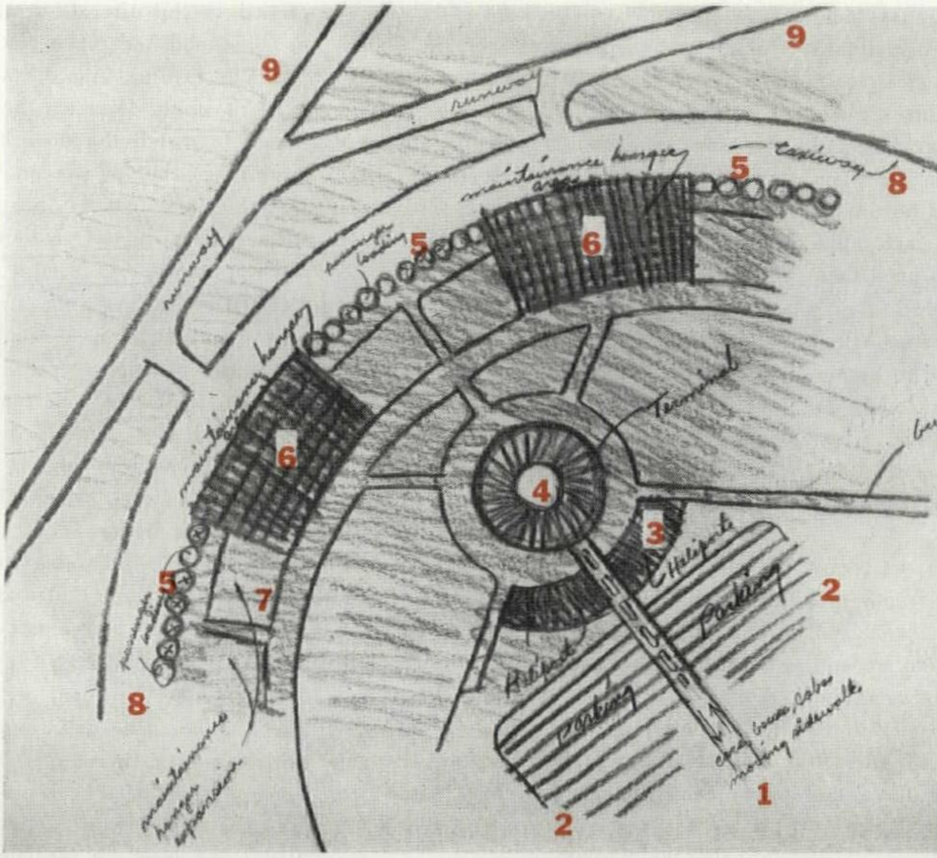
PREMISE Today's airport is not much more than a larger image of the old barnstorming day. It has grown by emergency measures rather than by local evaluation of its functions and potentials; to accommodate increasing volumes of passengers and larger airships, it has become bigger and more complex, at the expense of passenger convenience and operational efficiency. Ultimately, when dimensional growth has defied reason (as in Idlewild), it renounces its function of a centralized terminal and explodes into a series of satellite junior terminals loosely connected by parking lots.

Had the growth of the airport been guided by, and paralleled more closely, the development of the railroad station of half a century ago and, at the same time, had a more perceptive self-analysis anticipated the needs and demands of the fast approaching future, we would not have invested so substantially in structures and systems that are obsolete the day they are open for service; we would not face with apprehension the operational effectiveness of our air terminals in the coming age of jet engines and vertical take off.

PRINCIPLES 1. The terminal space required by one 100-passenger aircraft is today approximately 60,000 sq ft. (Jet planes and vertical take offs will, in all probability, require more terminal space.) On the other hand, the corresponding terminal space for 100-passenger railroad car is approximately 2000 sq ft, and for a 50-passenger bus it is approximately 1000 sq ft. (The ratio of terminal space per passenger between airport facilities and railroad or bus facilities is approximately 30 to 1.)

2. Physical dimensions of passenger aircraft have increased over the last quarter of a century, and all indications





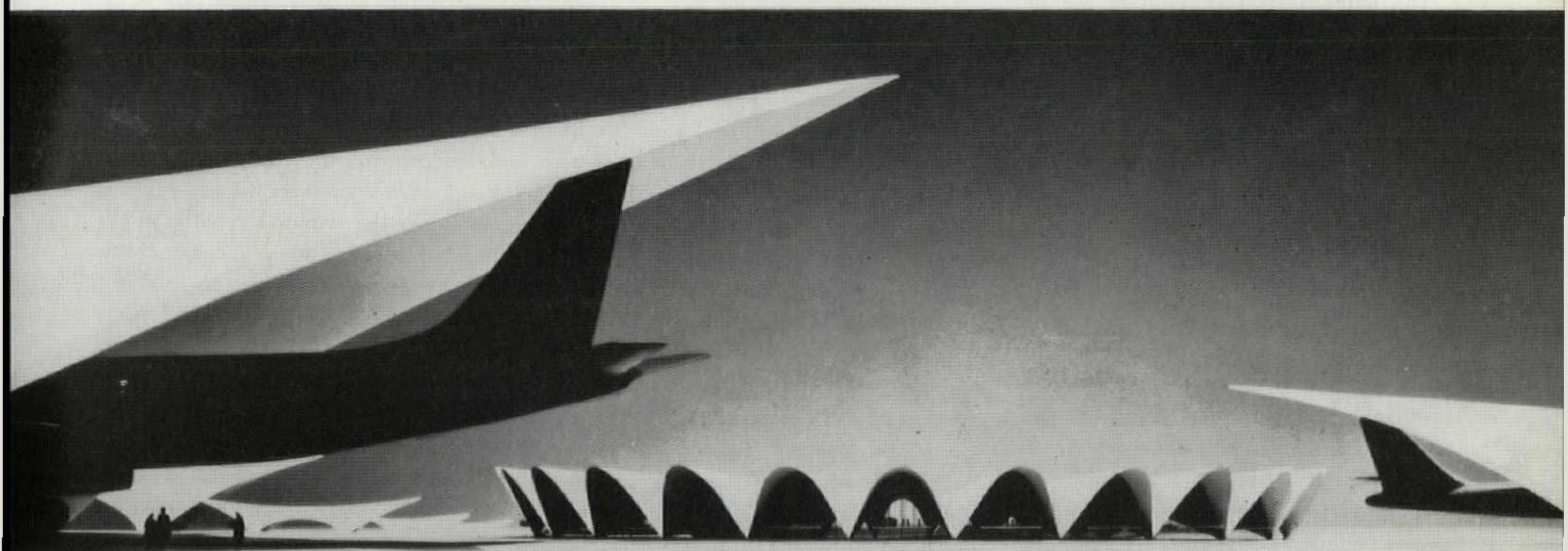
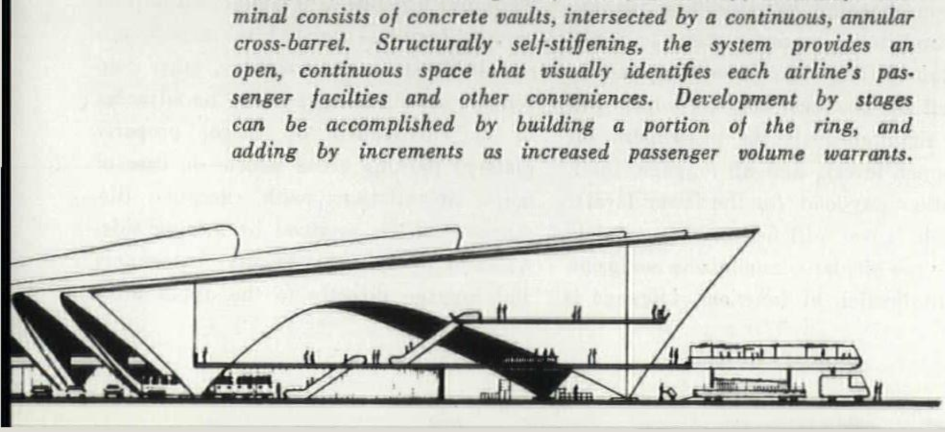


Diagram of proposed air terminal (above): **1** *approach, exit roads for cars, buses, taxis and path of moving sidewalk;* **2** *parking;* **3** *heliport;* **4** *terminal;* **5** *passenger loading;* **6** *maintenance-hangar areas;* **7** *maintenance-hangar expansion;* **8** *taxiway;* **9** *runway. Terminal consists of concrete vaults, intersected by a continuous, annular cross-barrel. Structurally self-stiffening, the system provides an open, continuous space that visually identifies each airline's passenger facilties and other conveniences. Development by stages can be accomplished by building a portion of the ring, and adding by increments as increased passenger volume warrants.*



are they will continue to increase; concurrently, terminal-operation techniques will vary greatly as new types of aircraft, especially jet engines, come into service.

These two principles seem evident and elementary; their influence on the planning of an air terminal should have been obvious. In fact, however, we have failed either to formulate them or to heed their significance.

SIGNIFICANCE 1. With the growth of air traffic, the space required to accommodate the number of simultaneously departing or arriving aircraft soon forces intolerable dimensional extension (excessive walking distances) from terminal to planes.

2. In the complex of an airport terminal, facilities dedicated to passenger processing are relatively permanent and, given reasonable opportunity to expand, need not reflect the rapidly changing aircraft dimensioning and operational techniques. On the other hand, aircraft landing and servicing facilities are subject to a rapid rate of technological obsolescence.

The only satisfactory solution for tomorrow's airport plan will be based on the concept of *physical separation of the two functions, combined with proper operational connection.* Unless this is accomplished, the entire investment in new terminal facilities will be subject to the rapid obsolescence dictated by technological advances.

CONCLUSIONS The major air terminal should include:

1. A permanent passenger-processing terminal, located near (though not necessarily within) the landing field, and planned for maximum passenger convenience and operational efficiency.

2. A relatively nonpermanent installation of facilities for landing, parking, and servicing of aircraft, planned for maximum operational flexibility.

3. A transfer system between the passenger terminal and aircraft facilities.

ADVANTAGES OF SEPARATION 1. The passenger terminal, proper, insured of a longer effective life, will be easier to finance and will acquire far greater civic significance than under present conditions.

2. The terminal—designed and developed with maximum compactness and minimum waste of space for intercommunication—can process, in a concentrated area, an extremely large volume of passengers (as, for instance, in Grand Central Station in New York). The passenger in transit will be able to find his transfer destination easily; the passenger seeking available space on alternate airlines will be spared long runs through corridors or separate buildings.

3. It will be possible, conveniently, to develop the passenger terminal by stages, as passenger volume demands.

4. When the terminal is freed from the immediate proximity of aircraft (with its high noise level), it will lend itself to becoming the center of a new civic core—the air-terminal nucleus—just as half a century ago the railroad station became the core of much civic growth. Around the permanent passenger terminal could be developed not only the usual restaurant and other service facilities but also hotels, motels, office, and other buildings, and their related commercial installations. Thus, the passenger terminal building could become the catalyzer for one of the most lively cores of suburban activity.

5. The aircraft will be able to reach the terminal pads on its own power, regardless of engine type, with a minimum amount of taxiing and maneuvering.

6. Each airline's terminal pads can be located in the immediate proximity of its hangars and servicing facilities. By keeping the aircraft available for servicing until the last minute before loading, servicing operation will be more economical and scheduling time reduced. The proximity of the service hangars will minimize delays when last-minute mechanical checks are required.

7. When properly planned and co-ordinated, the transfer system will do away with the swarm of little vehicles descending on the aircraft to bring mail, luggage, and lunches to the airplane. (Bring, in fact, everything but the poor passenger who is expected to walk, often unprotected from weather, exposed to the noise and wind created by departing aircraft, and climb long ramps or stairs to board his plane.) The transfer system can be effected by two-level carriers which will carry simultaneously the passengers (at the upper level), and all luggage, mail, and other pay-load (at the lower level). A single driver will deliver the complete load to the airplane, minimizing confusion and duplication of functions. Luggage is carried to the aircraft arranged on detachable pods or racks suitable for expeditious loading into the airplane. The carrier's upper level can be adjusted in height to match the door height of the aircraft, so that passengers can transfer directly from carrier bus to airplane without exposure to weather or walking steps or ramps.

PROBLEMS As with any change of operational method, a number of problems will be encountered: the primary obstacle will be overcoming inertia created by the existence of a prevalent pattern of operation and by the existing investment in such system. It is difficult, however, to believe that air transportation industry—so young and vigorous—will resist a change that would provide it with immediate and long-range benefits.

A BASIC SOLUTION In this scheme, the passenger terminal will consist—at its ultimate stage—of an annular building with two operating levels. At the upper levels are all passenger processing facilities for each airline. Passengers reach the upper level by escalators or, in the case of major airports where this is dimensionally feasible, by ramps leading passenger vehicles directly to the upper level. On the lower level are all servicing facilities (personnel, luggage, mail, etc.) and independent direct access is easily available. *On departure*, the passenger is processed by the terminal facilities of the airline he is using; his luggage is transferred by chute to the lower level for stacking in the appropriate racks. After processing, passengers board the upper level of the bus while luggage is simultaneously loaded in the lower level. From the moment a passenger has boarded the bus, he is officially checked in.

On arrival, passengers dismount the bus at the upper level of the terminal; luggage is simultaneously discharged at the lower level and carried by conveyor belt to the upper level's receiving area where it is picked up without any wait. Terminal building will contain all normal service facilities related to airport terminals (restaurant, drugstore, other convenient installations); it can be adjacent to or surrounded by large, properly planned parking areas which—in case of major installations with excessive distances—can be serviced by moving sidewalks or jitney trains to carry passengers and luggage directly to the upper level.

In recent years, a tremendous amount of new information about soil mechanics has been accumulated. One area of study which has resulted in data of immediate importance to the majority of architectural practices in this country is that of expansive clays. Since their shrinking and swelling are evidenced as structural damage, the architect and engineer must know how to design structures to avoid or minimize these effects. In this article, the author discusses "active soils," forces and movements, influences which cause movements, identification of active soils, recommended design and construction practice, and repair of damaged structures.

Expansive Clays: Their Effects on Structures

by David E. Greer*

In many areas of the United States—as well as in many other countries—the soils which support the foundations of structures have the very important (and distressing) property of swelling when they become wet, and shrinking upon drying. This soil property affects all types of structures, from the frame residence and the corner filling station, to the multistory building downtown and the factory that is being built in the country near-by. Since these effects cause structural damage, often of a very unsightly and detrimental sort, it is important for both structural architect and engineer to know how and why the damage occurs; how to design their structures to avoid or to minimize these effects; and what remedies or treatments should be applied to structures where damage has already occurred.

"active" soils

"Active" soils—as the materials under discussion are called—have an affinity for water far beyond their mere ability to receive and contain it in their voids. This affinity belongs to the clay portion of the soil, so that a soil's tendency to swell and shrink with wetting and drying depends upon the proportion of clay particles present. There are many kinds of clays, however, and some are more active than others; so the kind of clay, as well as its proportion in the soil, has much to do with the activity of a soil. Further, a clay can be altered in its degree of activity by chemical treatment (base exchange); this is what the farmer does when he "sweetens" his land by spreading lime. Reasons for the tendency of some soils to swell and shrink are, therefore, very complex and not entirely understood. But some aspects of the phenomenon are very familiar; for example, everyone has noticed the shrinkage cracks that appear in a mud flat as the surface dries.

forces and movements

The soils engineer is often asked: "How much pressure will this soil develop on swelling?" or "how many inches will it expand if it is unrestrained?" Unfortunately there is no definite answer to this kind of question: it is like being asked "how far it is to the end of a one-in. rope?" The answer, of course, depends on where you start. A highly active soil, at the end of a long rainy season, may be fully expanded and capable of developing no further expansive pressure; at the end of a long dry summer, the same soil, if it is immersed and confined, might develop an expansive pressure of several tons per sq ft; or if it is allowed to expand freely, might increase 30 percent in volume.

The important fact for the designer or builder to realize is that the forces which can develop, if an active soil is expanding from a very dry condition, may be very large: pressures of five or six tons per sq ft are not unusual, and pressures twice that magnitude have been observed in the laboratory. Similarly, volume change that may take place between a very dry and a very wet state may be suprisingly large: changes of 10 percent in volume are not unusual, and three or four percent are very common. Comparing these forces and movements with the vertical loads on footings, grade beams, and floors, and considering the limited tolerances for structural distortion implicit in most structural designs, it is easy to see how serious structural damage can be produced by soil activity.

influences causing movement

Any event, natural or man-made, which produces a change in the moisture content of an active soil, will cause the soil to change in volume, or to develop pressure against resistance. Let us list some of these influences:

Weather: Rain, wind, sunshine, heat and cold, snow and ice—all of the phenomena of weather affect soil moisture. Most important, the long-term weather cycles produce temperature and moisture variations which reach deep into the soil mass. The difference between a rainy season and a dry spell may cause moisture differences five ft below the surface; between a wet year and the end of a sequence of dry years, 10 or even 20 ft below. Because of shrinkage-cracking, the effects of wet and dry weather extend very much deeper in soils of high activity than in inert soils.

Drainage: Building or earth-moving operations which change the rate of runoff, or which create temporary ponding conditions where none existed before, will quickly affect the moisture content of shallow soils. Changes in the moisture content of deeper soils, not only directly below the pond but also at considerable distance laterally, will take place over a long period of time.

Grading and elevation changes: By affecting evaporation, grading work may produce radical changes in soil moisture conditions. Soil which was once deep but is now near the ground surface, may dry out or may become subject to seasonal moisture changes. Soil which has been recently covered by fill may swell or shrink, depending upon its condition before the fill was placed.

Gardening or lawn-watering: A very common cause of soil movement is the establishment of a flower garden or lawn next

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to a new building. Frequent watering of the planting, especially because it is continued through what would normally be periods of evaporation and loss of soil moisture, produces swelling of deep soil and differential upward movement of adjacent foundations. This trouble is especially common in semi-arid regions.

Lowering of water table: Any construction operation which results in a lowering of the water table near a structure supported by active soils, will result in a reduction of soil moisture, with consequent shrinkage of soil beneath nearby foundations. Some of the operations which can produce this result are: road or railroad cuts; tunneling operations; street-level changes; sewer construction; drainage of nearby marsh; basement excavations; stream diversion; or even heavy withdrawals of well water.

Growth or removal of vegetation: Deep-rooted plants, especially trees, are very effective in removing soil moisture. As an illustration, it will always be found that the soil moisture content at four to 10 ft in depth, beneath a large tree in an open area, will be lower than that at the same level in the open a 100 ft away. In areas of active soils this phenomenon often shows up very strikingly in the form of a dip in street and sidewalk pavement, adjacent to each shade tree along the street. Conversely, when a large tree is removed and its site covered by a building, active soils which had previously been partly desiccated by the roots of the tree will begin to take on moisture from below by capillary action, and will swell slowly.

Plumbing leaks: Rapid and disastrous changes in soil moisture content can be caused by leaks in water or sewage pipes, either beneath or outside a building. Since the backfill around pipes is rarely compact, water from a leaky pipe may travel some distance from the leak, producing soil heave under remote footings. The resultant heave of the structure may produce more pipe breaks, with consequent acceleration of the damage.

Covering by building or pavement: An active soil, in equilibrium with its environment—vegetation, weather, climate, etc.—will have some depth through which seasonal moisture content changes will be perceptible. Below that level, moisture content will be virtually constant, at some value which is governed by the averaged effects of rainfall infiltration, capillary rise, and evaporation. When a large area of such soil is covered by an impervious barrier, such as a building or a pavement, the average soil temperature is changed and both infiltration and evaporation are reduced, but capillarity is not affected. As a result of capillary action, thermal gradient, and vapor-phase movement, there is usually a tendency for the protected deeper soil to become wetter and to swell. Because the capillary movement of water through clays is very slow, the resulting soil-heave is also slow. Damage in the form of lifted floors, interior footings, and partitions, may not show up for many years. Since soil under the exterior footings of the structure is only partially protected from weather and seasonal effects, the outside footings may not move at all, and will almost certainly move less than those within the building. Consequently, the reasons for the interior wall cracking and floor movement, occurring many years after the building is completed, are often completely misunderstood and the trouble is attributed to settlement of the outside walls. The appearance, of course, would be the same for either case: heave of center, or settlement of outer walls.

Exposure during construction: For various reasons, it sometimes occurs that a building or footing excavation becomes flooded at some stage of construction. Where the exposed or underlying soils are expansive clays, this flooding usually results in movements which are, at best, troublesome, and which can be disastrous. While the swelling that occurs in these circumstances is usually apparent immediately, it should be remembered that the action can continue for long periods, as moisture migrates under the influence of capillary forces. In some cases, sand or gravel fill under footings or floors can become saturated, and act as a reservoir to feed water to underlying active clays for weeks or even months afterward. The most common cause of this difficulty is lack of care in disposing of surface drainage during construction.

There is also a construction practice, common in some areas, and even required by the specifications of some architects, which will usually produce trouble if the soil at the site is an active clay at a low moisture content. That is the practice of flooding or "puddling" a sand or gravel fill, which is to support some structural element, in order to densify it. The saturated fill provides a reservoir of water, which can keep underlying clay swelling months after construction.

An equally damaging, though less sudden, sort of movement, can result from the exposure of a completed excavation to drying. The dried and shrunken clay will, subsequent to construction, swell again. Result: heaving floors; broken walls; and general structural damage.

Drying from hot-process units: There are many recorded cases of settlement of boiler foundations or boiler-room floors, where furnace heat has been transmitted to foundation clays through foundation elements or combustion chamber floors. This danger is present in any installation where hot-process units are supported by active clay soils, or where other structural elements are in contact with such soils, which can receive heat from hot process units. Because drying from such sources can be more severe than that produced by weather cycles, foundation movements can be very large.

Use of active clay fill: Where granular-fill soil is scarce, floors are sometimes supported on fill composed of active clay soils. Although subsequent swelling or shrinkage can be minimized by care in controlling moisture and compaction, this is often—or usually—neglected and trouble results. The trouble often appears as floor-heave or settlement before construction is complete, but it may not develop until long afterward.

identification of active soils

As explained earlier, expansion tests on undisturbed (or compacted) soil samples cannot be used directly for predicting pressures or movements after construction, unless the test conditions accurately duplicate the moisture content, density, and conditions of confinement which will affect the soil before, during, and after construction; this is usually difficult or impossible to do. This means that design and construction measures to eliminate or compensate for the effects of expansive soils must be applied empirically. The soils engineer's first problem becomes one of identifying soils which are active enough to cause trouble under the climate, weather, and construction conditions that will probably prevail.

Two of the most useful tests for this purpose are the routine determination of plasticity index (PI) and shrinkage limit (SL). Since these test results have to be correlated with the natural moisture content of the soil at the time of construction, and then considered in relation to the climatic cycle of the region in which the structure is to be built, no fixed limits can be set for distinguishing between "active" and "inactive" soils per se. In general, if the PI is greater than 20, or the SL less than 10 percent, the soil is likely to be troublesome; but soils outside these limits can also cause trouble under certain conditions.

A word of caution should be injected here: Some soils are considerably altered (usually decreased) in their activity by oven drying. For this reason, the tests mentioned above, when they are to be used for judging the relative activity of soils, should be run from natural moisture content rather than on samples which have been oven-dried and pulverized as required by ASTM or AASHO tests.

It must always be remembered, in judging the activity of a soil, that consideration must be given to climatic and construction conditions as well as to the properties of the soil itself.

soil action on structures

Case I: A school building in the Texas Gulf Coast area was constructed in a dry summer, in an area of deep active clay. Footings were drilled and belled out, at about eight-ft depth below final outside grade; exterior walls were carried on grade beams, poured on a one-ft sand "cushion" resting on natural soil at two-ft depth; the building floor was poured on top of a two-ft sand fill. Just before the floor was poured, the contractor flooded this sand fill to settle it, then poured the floor immediately. Lightweight masonry partitions were then started; when some of them were half-built, the contractor went home for the weekend.

When he returned on Monday, the floor had heaved, rising varying amounts between ⅛" and 1½". All of the interior partitions were broken, some with cracks ½" wide at the top. The contractor was baffled, the school board furious, and the architect frustrated.

Case II: A brick church building in Central Texas was constructed in a region of very hard dry active clay. The water table was several hundred ft below the surface. Activity of the surface clay was demonstrated by the tilted positions of the tombstones in the adjacent graveyard (frost action was not a factor). The structure was supported on continuous footings about eight ft below the surface; the floor, of concrete, rested on fill composed of dry clay taken from the surface of the ground adjacent to the church. The fill was compacted, dry, by tamping; however, the fill outside the footings was not compacted at all. Roof drainage was not carried away, not even by sloping the ground away from the structure. At the time of the writer's inspection, a year after construction, the drainage water had begun to find its way into the under-floor fill by capillary action; the floor had risen amounts varying from ½" to 2"; one outside wall was out of plumb by about ¾"; and the floor, in swelling, had lifted a cloakroom partition, which in turn had lifted the bell tower, cracking its brickwork in tension about 30 ft above the ground.

Case III: A series of eight boilers in a steam-generating plant, supported on footings resting at various depths in a hard clay, were converted from oil to gas as fuel. Because of the difference in construction of the burners, the floors of the combustion chambers were now subjected to the flame, whereas before, they had been cooled by the air entering the chamber. Although they had operated satisfactorily for over 30 years before the change-over, soon afterward they began to settle. After they had been repaired and releveled many times, with corrections accounting for differential settlements as high as two in. between front and back of the same boiler, an investigation was made. It was found that heat from the boiler floors had completely desiccated the underlying clay to a depth of 20 ft, and that shrinkage in the clay had reached a total of more than four in., leaving the boiler-room floor supported only by casual contact with footings, walls, etc.

recommended practices

1. *Soils Investigation and Report*

Obtain a complete soils investigation and report. This study should give the following information:

a. Horizontal and vertical distribution of soils, over the entire building site and to the greatest depth that will be appreciably stressed by building loads.
b. Natural moisture-content profile for each boring.
c. Liquid and plastic limits for each stratum of cohesive soil encountered.
d. Special expansion-pressure and volume-expansion tests, where liquid and plastic limit tests, or local experience, suggest that expansion and contraction may be a problem.
e. Consolidation and strength test data as required by details of structure.
f. Depth of water table, at the time of the investigation; with data on water-table variation, if available.
g. Climatological data—rainfall records, etc.—if the site is unfamiliar.
h. Records or observations of behavior of nearby structures.
i. Engineering analysis from these data, giving recommended design data, and construction practices.

2. *Footing Depths and Pressures*

If practicable, footing depth should be below the zone of seasonal moisture change; and even this may not be deep enough, since clays are sometimes desiccated by average climatic conditions, to depths far greater than those reached by seasonal variations. In such a case, a structure which changes the moisture equilibrium over a large area, or even a small building with a large paved area adjacent—may cause a slow swelling of deep clays, with consequent heave of footings which would have been at a perfectly safe depth under a small structure. Where there are deep, continuous, foundation clays, in an arid or semi-arid climate, it is sometimes prudent to take footings to extraordinary depths. In San Antonio, Texas, for example, footing depths of 40 or even 60 ft are not uncommon, although seasonal moisture variations probably do not reach more than half that depth.

In many instances, it is impracticable or uneconomical to take footings down to soil that will not try to expand. An alternative is to place them at higher levels, but to keep footing pressures high enough to impede expansion. This is an instance where expansion tests on undisturbed samples taken from proposed footing depth can be useful. It must be remembered, however, that the high-expansion pressures developed in tests under conditions of no volume change, are often very much reduced if very slight expansion is permitted. Because of this, the expansion-test values should not be taken too literally, in design.

It must be remembered, further, that the expansive tendencies of an undisturbed sample of soil, even if it is taken from exact footing depth, are representative only of the moisture condition of the soil at the time the sample was taken; some weeks or months later conditions may be quite different.

As a general rule, the nearer the surface, the greater the effect of seasonal moisture change; and, therefore, the higher the unit pressure on the footing must be to prevent seasonal movement.

Interior footings can be put at shallower depths than exterior, or can have lighter unit loads if at the same depth, if constructed when the soil is at its peak moisture content. If construction is done when the soils are dry, interior depth and loading conditions should be the same as for the exterior.

A continuous footing around the outside of a structure can be founded at a somewhat shallower depth than equivalent spot footings, since its continuity has some effectiveness in diminishing seasonal moisture variations in the supporting soil. Spot footings are of negligible effect in this direction.

3. *Protection of Footing Columns*

Deep footings in expansive-clay soils, which were discussed in the preceding section, are usually poured in a drilled and belled-out hole, a type of construction which is particularly economical because such soils can always be drilled by means of a large-diameter auger machine. In many parts of the country, notably Texas and California, this construction is very common. Machines are available for drilling the shafts to as much as 200 ft in depth, and "belling out" to diameters of 108 in. or more.

However, the fact that the belled footing is deep enough to be safe from soil movement does not necessarily assure that the footing column will be stable at its top; for, if the column is poured in contact with the ground (i.e., without forms), the frictional hold of the soil on the column will be very high; and on swelling, the soil may even lift the column, breaking it in tension.

To avoid this, a variety of expedients have been used. The one which is, in the writer's opinion, the most satisfactory, is to pour the footing and let it take its initial set; then center a cylindrical fiber form of suitable size, but several inches smaller than the shaft hole, and pour the column; then center a larger cylindrical fiber form around the column, spacing it with blocks, and fill the annular space with a plastic compressible material. Suitable filling materials are: asphalt; vermiculite; pellet-type mineral wool; or glass-fiber insulation. Sand and pea-gravel are sometimes used, but are of questionable value, since repeated cycles of movement could pack them to a tight condition.

4. *Use of Piles*

When piles are used to transfer loads down through expansive soils to more stable materials, they are subject to exactly the same action as that described in the preceding section: seasonal uplift and downdrag due to expansion and shrinkage of the soil through which they are driven. It is rarely, if ever, possible to relieve a pile completely of this reversing frictional force. The use of properly designed footings is usually cheaper than driven piles under these conditions, and will result in a safer and more stable foundation.

5. *Grade Beams*

A common and very economical type of construction, particularly in those areas where large-diameter auger machines are available for filling and belling-out footing holes, is that of supporting walls on reinforced-concrete grade beams, which transfer the load to the drilled footings.

Although the footings may be taken as deep as is necessary to avoid the effects of expansive soils, the grade beam is necessarily placed close to the surface of the ground. When this beam is poured, it is usually supported by the ground until the concrete sets. If the pour is made at the end of a long wet season, when the ground is as wet as it will ever be, then soil activity will not damage the completed structure by uplift on the grade beam. But if it is poured on an active soil when the soil is dry—and it need not be completely desiccated—then, when soil moisture increases again, the soil will swell; uplift pressures are generated; and something has to give. Usually the result is that the grade beam is broken upward, halfway between footing columns; sometimes the footing columns themselves are broken in tension.

The most common attempt to avoid this takes the form of placing, below the grade beam, a layer of sand, which is usually eight to 12 in. in depth. This is usually referred to as a "sand cushion," and it is commonly supposed to compress with the uplift of the underlying clay when it swells, thus relieving the grade beam of uplift pressure. No doubt it serves this function to some extent but the "cushioning" effect is very slight and many failures occur in spite of the "sand cushion." Probably its principal effectiveness is to replace an equal volume of expansive soil by an inert material.

Because of the general unsatisfactory behavior of the "sand cushion," a number of other devices have been introduced in attempts to avoid uplift on grade beams. One of these, a "V" bottom on the grade beam, is supposed to cleave and deflect the rising soil. Unfortunately, this does not work. Another device is to support the grade beam on a loose course of light-weight hollow-clay tile, which may be laid either with the axis vertical—so that the soil pushing up from below will fail in bearing under the thin tile edges, and force itself up into the hollow of the tile—or horizontally—so that the tile will crush before lifting the grade beam. Considerable force may be required to accomplish either result; whether this force will be sufficient to damage the grade beam should be examined carefully before reliance is put on either system.

The logical solution to this problem is to support the grade beam on something that will just support the weight of the fresh concrete, but which will compress appreciably under any additional forces. Several means for accomplishing this have been found recently, and are coming into general use in the southwest. One of the most satisfactory is the use of cardboard support forms.

6. *Earth-supported Floors*

The effects of moisture changes in active soils below soil-supported of fill-supported floors can be vertical movements of the order of several inches; and such movements are never uniform throughout a large floor area.

Design and construction means to eliminate or minimize such effects should include:

a. Removal of as much active soil as practicable.
b. Replacement by fill of inactive soil, which must be properly compacted.
c. Completion of fill to floor level with properly compacted inactive soil.
d. Separation of floor slabs from contact with walls, footings, etc.
e. Support of floor slabs on cardboard-carton forms, which crush under upward expansion pressures.

Because inactive fill soil is scarce and expensive in many areas where active soils are prevalent, compromises are often made to reduce the amount of high-grade fill required, at the expense of risking the possibility of small floor movements later. Such measures include:

Ponding the stripped area, either before or after the foundations have been constructed. This will saturate the in-place soils, and allow them to swell before the fill is placed. If ponding is continued too long, it may cause so much swelling that the softened soil will reconsolidate and settle under the weight of the fill and floor. This should be closely supervised by a soils engineer.

Use of local soil for the fill, with interruption of capillary rise into the fill by making the bottom foot or two of the fill of clean granular material; then continuing upward with cheaper local material; and topping off with a course of sand at least eight in. thickness, just below the floor. In this case, the undesirable portion of the fill should be compacted to 90 percent of Modified AASHO optimum density, and at two to three percent higher than optimum moisture content. In cases where unusually high floor loads are anticipated, as in some warehouses, compaction should be to a minmum density of 95 percent Modified AASHO, and at the same moisture content as above.

In compacting under-floor fills, special precautions have to be taken to avoid breaking the enclosing walls outward; for the lateral pressures developed by such compaction are very high.

7. *Hot Process Units*

A variety of means can be used to prevent the heat from furnaces, etc., from desiccating underlying or adjacent clay soils. These include: the use of insulating materials; provision of air space, with forced or natural circulation; use of cooling water; and even irrigation of the surface clay to prevent its drying out.

8. *Bench Marks*

It is not generally realized that most bench marks, in areas of shallow active clays, are unreliable for elevation measurements. Since usual plant or municipal bench marks are rarely founded more than three or four ft deep, they are subject to seasonal vertical movement due to the swelling and shrinkage of soils below that depth, and even to some extent from those above that level. This movement is very commonly more than ½", and may, in some instances, be two or three in. Such movements, of course, confuse settlement observations hopelessly; unless the bench mark can be relied on to remain stable, any attempt to determine vertical movements of building elements is useless.

To obtain a reliable bench mark for level observations in active clay areas, it is necessary (1) to found the bench mark at a level below the effect of seasonal moisture variations and (2) to relieve the vertical shaft of the bench mark from contact with the surrounding active soil. A satisfactory and inexpensive installation can be made by drilling a hole, using drilling rig or auger, to a depth sufficient to reach nonactive soil; then driving a ¾" pipe, or rod, into the ground at the bottom of the hole to serve as the bench mark proper; then slipping a larger pipe over the first one, to protect it from contact with the sides of the hole. The shield pipe should extend within one ft of the bottom of the hole, at which point it may rest on a cushion of sand poured in after the first pipe is driven. Annular space between pipes should be filled with grease or heavy oil. The top of the reference pipe must be far enough below the cap so that it can never come in contact with it as the casing moves up and down. In some climates or in areas of deep clay, it is necessary to take such bench marks to 40 or 50 ft in depth, in order to be sure of their reliability.

repair of damaged structures

Building damage due to the action of swelling clays is likely to be very unsightly. Often it appears as diagonal cracking in the outer masonry walls, the cracks sometimes opening up so wide that one can "see daylight" from inside. There is a tendency, on the part of the building owner, to insist on immediate repairs, which involve filling the cracks with mortar. This is often a mistake.

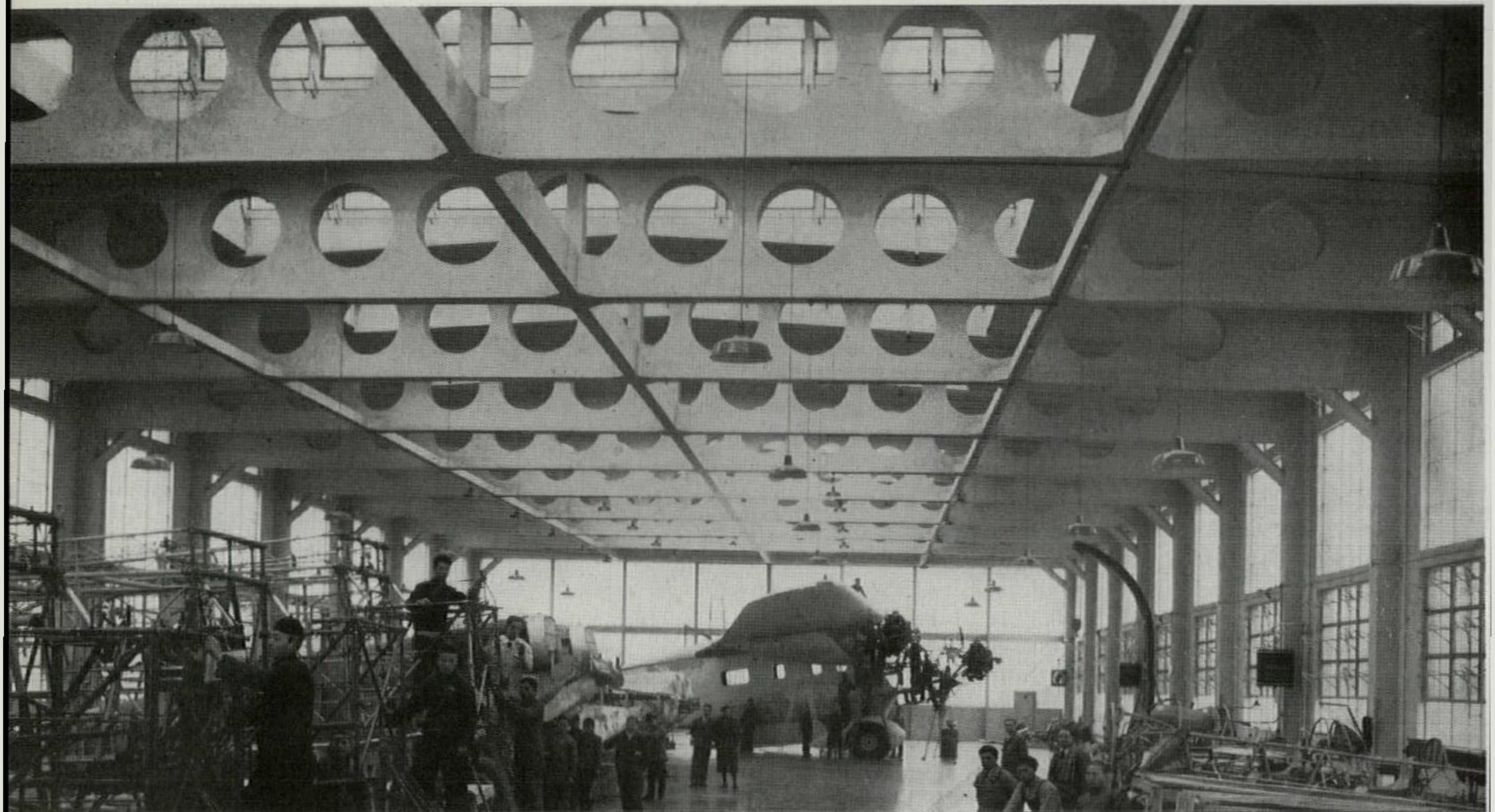
It should be recognized, when building cracks appear, that motions which produced them may be continuing, or may be reversible. Immediate filling of cracks may be followed by further opening so that the repair has to be repeated. More important, in case the movement which produced the damage is capable of reversing itself, as for example when it is caused by seasonal swelling or shrinking of clay soils, the reversed movements acting on mortar-filled cracks will produce a new set of cracks at roughly 90 degrees to the original set; structural damage is compounded.

What, then, should the building owner do when cracks appear? Obviously, the first requirement, before any repairs are attempted, is an accurate determination of the cause of the movement that is producing the trouble. This is a task for a soils engineer—not an architect, or a structural engineer, or a contractor, but a specialist in the behavior of soils and foundation media. Crack patterns produced by settling of footings with respect to grade beams may be identical with that caused by lifting grade beams by swelling soil, where the footings do not move. Actions required to cure the two kinds of fault are entirely different.

At best, the cure of structural damage due to expansive clay action is likely to be expensive. Repair measures may include underpinning; removal of contact between soils and grade beams; correction of drainage conditions; location and repair of water leaks; establishment of evaporation barriers; alteration of thermal gradients; and a variety of other operations—followed, finally, by structural repairs.

In some cases, where foundations are too shallow, or where other conditions are unfavorable, adequate repairs are too costly and the building has to be abandoned; more often it is given a quick surface treatment, and sold quickly.

Many roof forms exist for wide-span structures. Two of these, the funicular (as in suspension systems) and the antifunicular (represented by the shallow arch) are the essence of this discussion; not when acting alone, however, but when working in combination. Here, the author reveals the motives that led him to a study of "suspenarch" systems, states his views on elasto-mechanical design, and suggests future applications for supporting units composed of axially-stressed arch and suspension components.



Axially-Stressed Wide-Span Structures

by Paul Chelazzi*

When the roof-structure designs were being developed for China's War Air College Plant in 1931, a structural-steel version of the bridge-type, single-web, inclined upper-chord truss was considered a satisfactory competitive solution. Only three years later, however, such a design proved to be uneconomical for similar wide spans on a major Chinese aircraft manufacturing plant. A more economical solution was evolved in specially designed reinforced-concrete tee-girders *(Figure 1)* featuring round openings in areas of lower shear stresses; reinforcement was placed in the solid sections to resist whatever shear that would develop *(Figure 2)*. Immediate advantages were: 30 percent reduction in dead load and greatly improved natural lighting. This kind of design (over-all span was 85 ft), perhaps, extended conventional concepts of co-action to a maximum, since co-action had to be assumed to exist not only between the upper and lower zones of the rib, but also with a width of the roof slab. Even though these girders behaved remarkably well under actual load tests, there has been some question whether the application of these principles would still be as valid for the ever increasing spans of contemporary hangar design.

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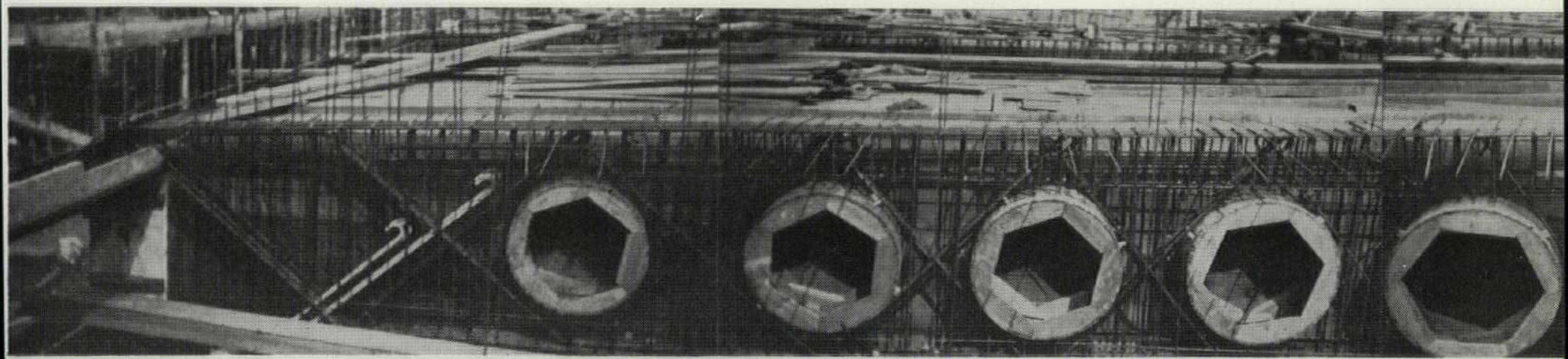


Figures 1 and 2—aircraft manufacturing plant built in China (left) *during early 1930's had specially designed tee-girders spanning 85 ft; shear reinforcement was placed in solid sections between round openings* (above). *Its limitations for wider spans led to investigations of axially-stressed structures.*

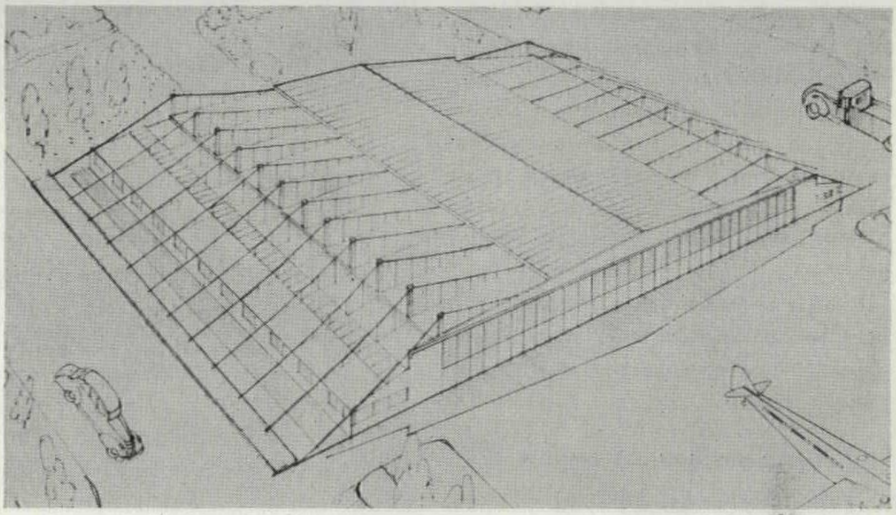
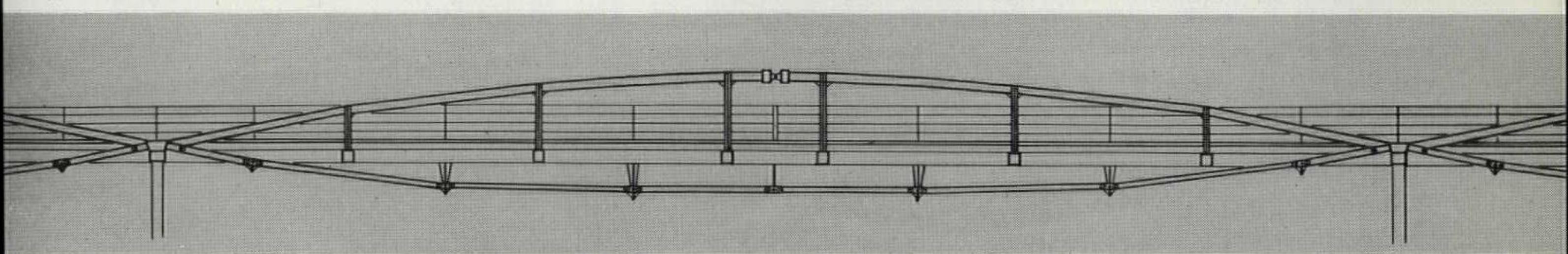


Figure 3—early investigation of axially-stressed structures produced a hangar design (above) *featuring suspended roof with skylight over central area.*

Figure 4—marriage of arch and suspension systems was first embodied in design for multipurpose truss. Suggested application for continuous bridge trusses of elevated highway (below).



Due to this uncertainty, an incentive to investigate the potentials of axially-stressed structures was established. As the behavior of these structures becomes intuitively clearer, their advantages—provided they are properly shaped to follow pressure lines of carried load—become a self-evident fact in mechanical economy.

An initial step in this investigation was a tentative hangar design featuring a suspended roof with a skylight over the central area *(Figure 3)*. Later a tied-arch system with a reinforced-concrete ring was considered. Eventually, mating two established structural concepts—the arch and the suspension system—bred a "suspenarch" approach to design.[1]

The suspenarch principle, as applied to wide-span structures, was first embodied in multipurpose truss types including a 1936 design for bridges *(Figure 4)*. One-half of the gravity load is supported by a three-hinge arch while the other half is carried by a suspension system. The latter is connected to the arch by hinges at the supports so that the two systems should, under prevailing loading conditions, produce reversed-balancing, horizontal components of thrust.

For hangar structures, bent-type framing has disadvantages, since the span

[1] *"Structures in Membrane on Co-Acting Ribs," July 1956 P/A.*

must accommodate maximum wing spread —normally larger than nose-tail length. It was reasoned that if planes could be housed tail-to-tail, shorter free spans would be required. This led to the concept of symmetrical, centrally-pivoted arched structures connected by loadbearing cables and stabilized longitudinally by tie-downs *(Figure 5)*.

Pursuing this same idea in yet another study, an upper suspension system was combined with a lower three-arch system to form the principal supporting units for a multilevel air-marine terminal *(Figure 6)*.[2]

Similar approaches in more recent years have led to the realization of impressive developments in contemporary wide-span design *(Figure 7)*.

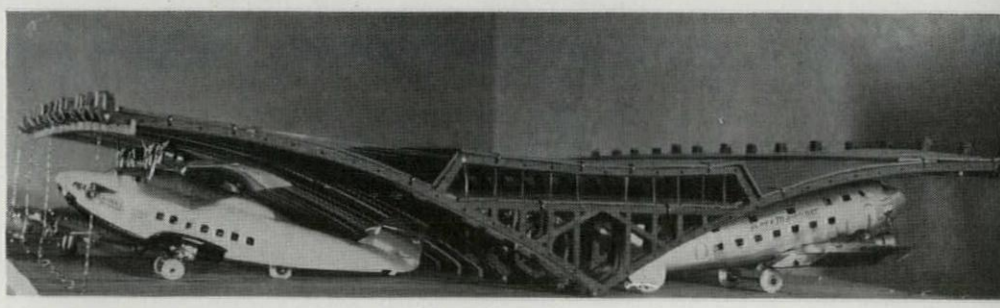


Figure 5

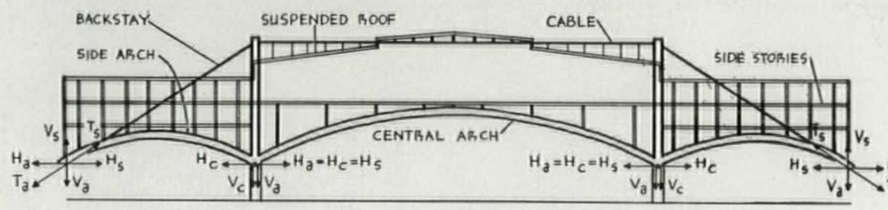
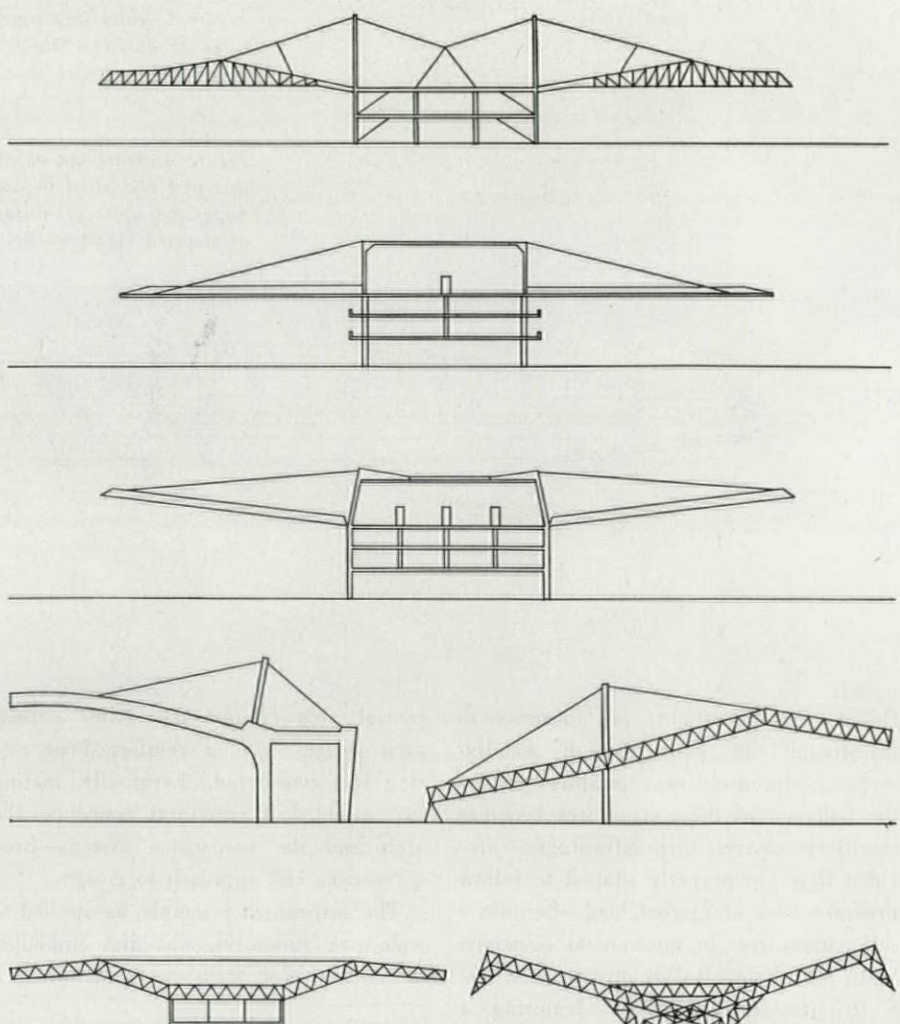


Figure 6

Figure 7



elasto-mechanical review

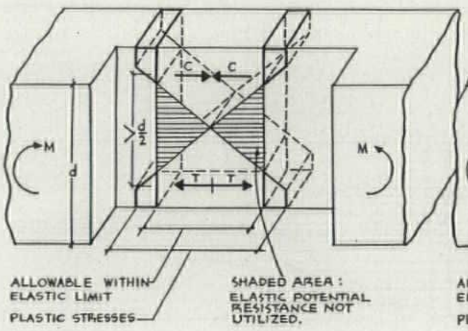
Postwar research has produced some significant developments in suspenarch structures. In order to gain a clearer understanding of these later studies, a review of basic elasto-mechanics should prove helpful.

Means of supporting gravity load along free spans—evolved intuitively through the ages—are of three basic categories: (1) solid-section beams made of naturally or artificially homogenized material (stone, timber, steel, reinforced or prestressed concrete); (2) open-web structures (represented primarily by statically-determinate types of trusses—still based on Palladio's concepts of triangular rigidity—and secondarily by quadrangular-indeterminate trusses); (3) arches and suspension systems.

Let us examine some of the advances in research aimed at a higher utilization of resistance potential for structures in the first two categories. In an earlier discussion by the author, the geometrical and elasto-mechanical facts restricting the utilization of the potential resistance in homogeneous material sections—particularly reinforced concrete and prestressed concrete—were reviewed.[1] An attempt to explore further possibilities for tapping

[2] *In 1941, the author was granted patents from the United States Patent Office on the structure illustrated in Figure 6 and two other variations of the suspenarch principle.* — *Editor*

Figure 8—partly plasticized section of a homogeneous-material beam (below).



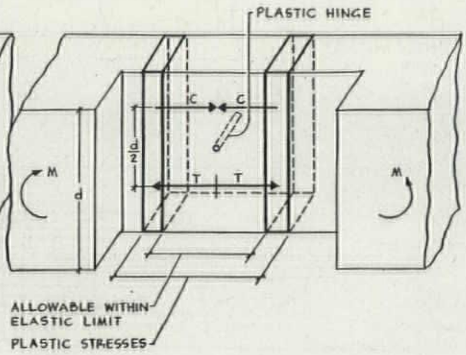


Figure 9—fully plasticized section of a homogeneous-material beam (above).

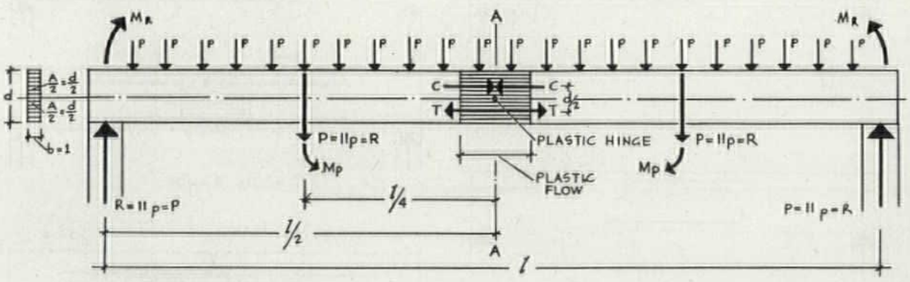


Figure 10

additional resistance potential has led to concepts of limit design. [3] When analyzing homogeneous or homogenized sections prior to the idea of limit design, a material was generally considered capable of working at the maximum allowable stress below the elastic limit set by the stress-strain ratio. However, beyond that point there still remains a substantial margin of resisting forces that over-conservative building codes deny to the structural designer. By challenging these restrictions, limit designers deserve high commendation—even though some of the theoretical concepts advanced are, perhaps, not so evident to those who may be accustomed to search for a confirmation of the validity of principles in evidence of real, physical behavior, as intuition may visualize it.

Let us approach the subject from this angle: Assume a section of a homogeneous-material beam, loaded so that bending produces maximum elastic stresses in top and bottom fibers. If a further increment in loading would cause stressing in the plastic range, then, according to limit designers, the section becomes partly plasticized *(Figure 8)*. However, as shown, there still remains a substantial elastic resistance potential which is unused; whereas top- and bottom-fiber stressing has reached values in the plastic range. Such a reservoir of wasted internal resistance may not amount to much in I-beam sections; in rectangular sections, however, the quantity is appreciable. When further loading causes maximum plastic stresses in all fibers, the section becomes fully plasticized *(Figure 9)*. A plastic hinge apparently forms making the beams unstable, since the two halves rotate around a point on the most stressed section. Let us visualize this stage of behavior in the sequence of stressing and failure. Assume a beam with a width, $b = 1$, is made of a perfectly elastic, homogeneous material breaking at the same stress—whether in compression or tension—when loaded as shown *(Figure 10)*. Loading can be increased virtually up to the split second preceding the appearance of the first cracks or other indications of failure. Only in that instant is the section about to become fully plasticized, yet still physically performing its loadbearing function as a homogeneous-material beam. At that moment all fibers are supposed to flow freely, the total resistances C and T have reached a near-limit ultimate stress, and the arm has decreased to d/2—smaller in comparison with arms contributing to resistance during the partly plasticized stage of stressing shown *(Figure 8)*. Because $b = 1$, the area A/2, of each half-section above and below the neutral axis, is equal to d/2 *(Figure 10, section A-A)*. Should c be the value that the ultimate stress attains immediately before failure occurs, the resisting moment would be

$$M = cd/2 \times d/2 = cd^2/4$$

which has to balance bending moment

$$M_R - M_P = Pl/2 - Pl/4 = Pl/4;$$

so that for stability: $Pl/4 = cd^2/4$, or $Pl = cd^2$ (Equation 1).

Now, let us increase our load just enough to cause the initial appearance of cracking. This effect should extend an equal distance from both the top and bottom of the section—provided that the ultimate strength of the material, in tension or compression, is actually the same. Should there be no additional loading, the beam may continue to be serviceable—as is often the case in actual construction—and can still perform its loadbearing function in spite of having lost some broken-fiber layers *(Figure 11)*. The

[3] *"Limit Design,"* Mario G. Salvadori, April 1955 P/A. *Editor*

actual depth of the beam is reduced from d to d′ with a consequent arm of d′/2, while the moment due to loading is larger even though by the small amount caused by the load increment. At this point, intuitive mechanics would lead one to consider that resisting resultants C′ and T′ should be larger than C and T before the first cracks began to appear *(Figure 10)*. In fact, resultants C and T could not prevent the cracks from appearing, whereas C′ and T′—representing resistance on a reduced section—and a smaller arm are required to produce a moment that will resist a larger loading and arrest cracking. As a result of further increases, one might expect the broken-fiber layers to extend further toward the neutral surface and even smaller arms $d'/2 > d''/2 > d'''/2 \ldots > d^{n-1}/2$ multiplied by correspondingly larger resistances $C' < C'' < C''' \ldots < C^{n-1}$ and $T' < T'' < T''' \ldots < T^{n-1}$ would have to produce the necessary resisting moment which lets the beam perform *(Figure 10)*. Thus, one may be led to the conclusion that in the split second preceding total collapse of the beam, the single remaining fiber layer has to develop infinitely large couple forces, $C_n = T_n \cong \infty$, which, when multiplied by an infinitely small arm, $d_n \cong 0$, could produce an internal resistance of such magnitude to carry the ultimate load.

If such an analysis is acceptable, it would then follow that the so-called neutral-surface fibers—which in conventional elasticity have so far been regarded as unstressed, even under ultimate loading—actually become the most stressed ones in the split second preceding total failure. Would one not be further justified in considering a "hyperplastic" range of stress which commences when the plastic range ends (at appearance of initial cracking) and is concluded at the moment preceding total collapse? An asymptotic-curve diagram *(Figure 12)* may represent this "hyperplastic" range.

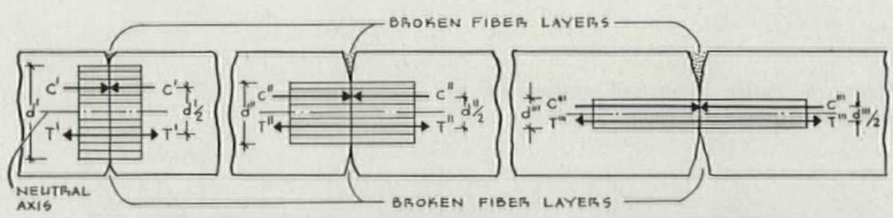


Figure 11

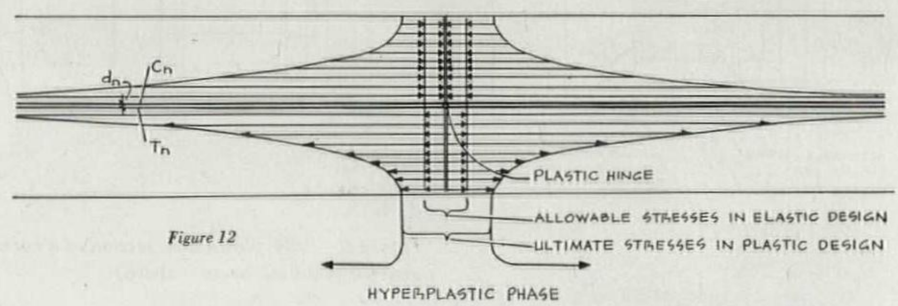
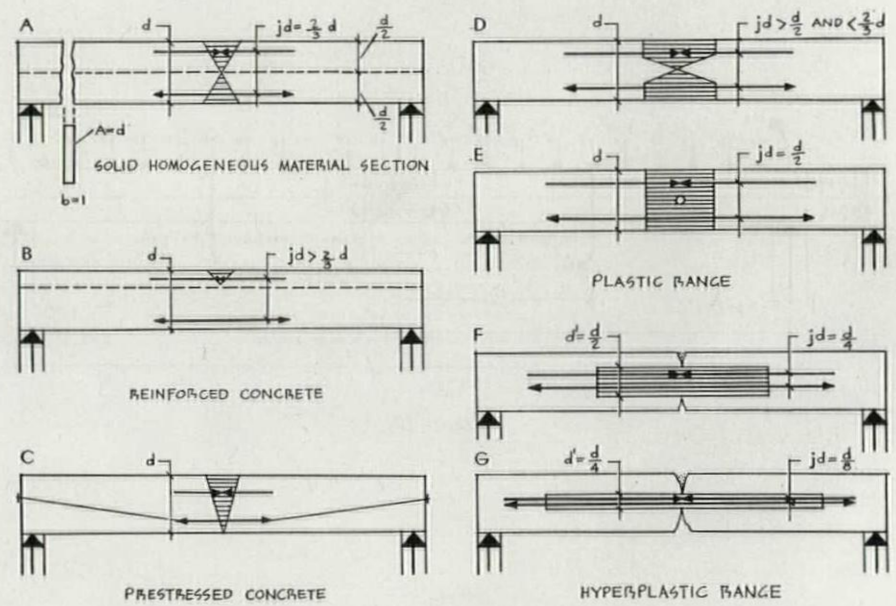


Figure 12

Figure 13



Even though the cut faces of broken fibers are the only physical evidence, failure might have been caused by higher stressing than the plastic limit.[4]

resistance potential

As shown *(Figure 13)*, increased utilization of resistance potential in solid sections results in a reduction of arms. On the other hand, developments in open-web structures (category two, above) have followed the concept of combining larger arms and smaller sections axially stressed. Under the latter conditions, the resistance potential can be totally utilized within the allowed limit below yield point.

Thus, there remains in the section a margin of safety that may be considered far too conservatively by some building-code regulations; however, a realistic and long-overdue re-evaluation of the governing codes could permit a further use of this resistance potential. The immediate advantages that could result from the application of this concept may be readily observed by comparing a beam of solid, natural, homogeneous material (A *in Figure 13*) with an open-web beam hav-

[4] In this connection, the author has made an interesting though controversial speculation. "If such be the case, could failure be visualized as a 'bombardment' of a 'nucleon'—represented as internal hyperplastic resistance by a 'neutron' in the form of a bending moment due to external load? And, could the thunderous sound marking rupture of fibers be the audible evidence of energy release? This hypothetical reaction is expressed by Equation 1, $Pl = cd^2$. Is the similarity of this equation with Einstein's, $E = mc^2$, purely coincidental?" Further investigation along this line might lead to elaboration on nuclear physics which is far beyond the province of this author. He does believe, however, that the problem might be approached from the viewpoint of Newtonian mechanics by applying the "principle of least work" in visualizing possible changes in the beam behavior after the initial cracks have appeared. Editor

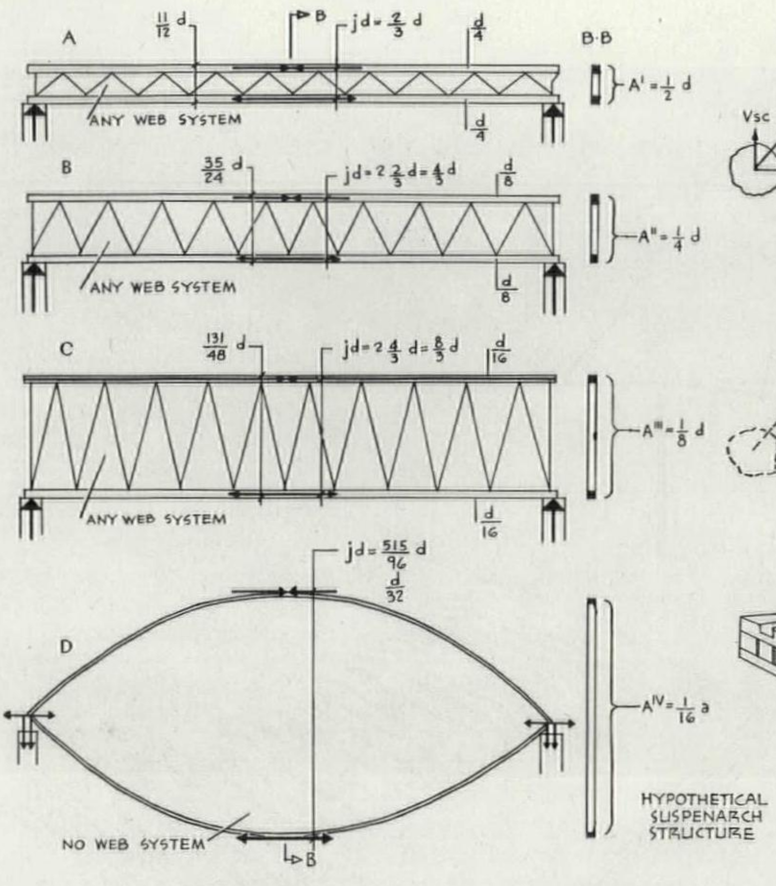


Figure 14

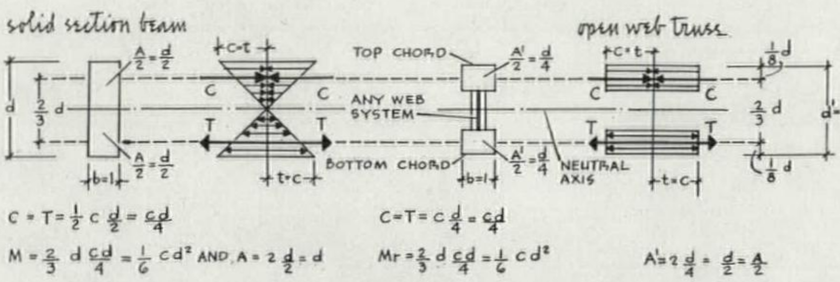


Figure 15

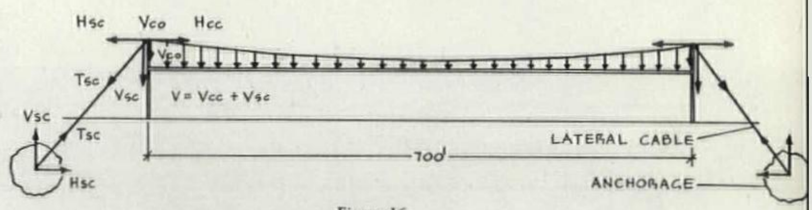


Figure 16

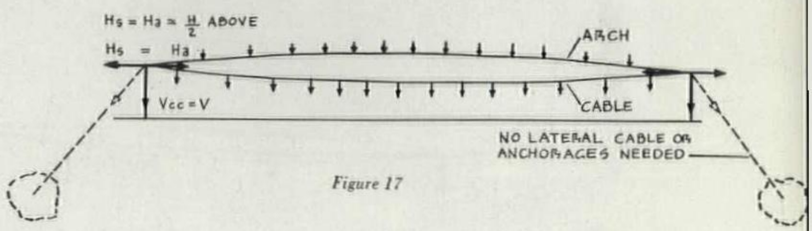


Figure 17

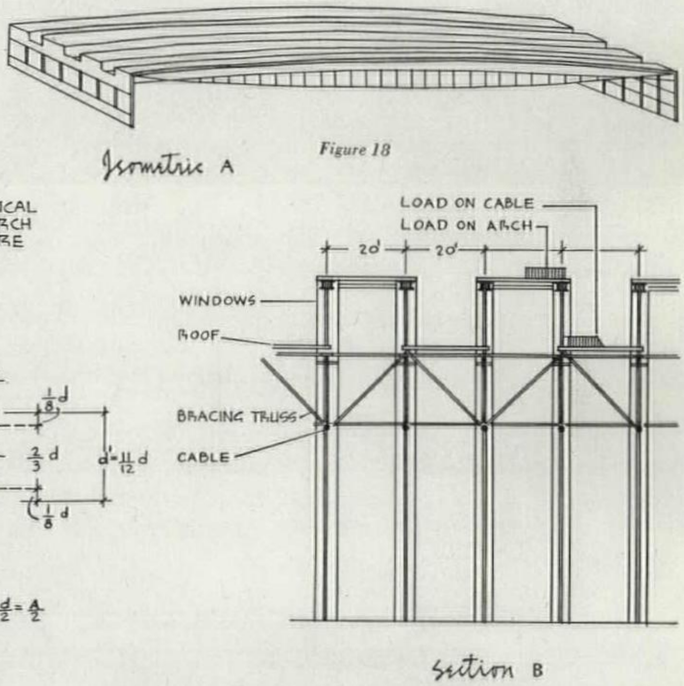


Figure 18

ing the same arm of resistance (A *in Figure 14*). As shown *(Figure 15)*, the total sectional area, A′, required for the two chords of the truss is one-half of the area, A, needed for a solid-section beam equally resistant.

In the truss, of course, the connecting-web system that must be provided partly offsets the above savings in material; furthermore, the remainder of the savings is mostly expended when wider-span requirements must be satisfied by deeper panel depths necessitating heavier webs and bracing *(Figures 14B and 14C)*. By uniting axially-stressed arch and suspension systems in suspenarch, or similar types of supporting units, the arms may be extended considerably, no web-work is theoretically required, and smaller sections are adequate.

future applications

A comparative study was made between such a hypothetical structure (D *in Figure 14)* and a hung roof spanning 700 ft, supported on a conventional suspension system *(Figure 16)*. The disadvantages of the latter—heavy lateral cables and anchorages—are immediately evident. If the same load were distributed between the component arch and suspension system of a suspenarch supporting unit *(Figure 17)*, a mechanically economic structure could be formed requiring no lateral cables or anchorages, since reverse thrusts would balance horizontally (A *and* B *in Figure 18*). This design would also prove to be advantageous for roof structures in the 100- to 150-ft span range *(Figure 19)*.[5]

Although expressed in other geometrical forms, similar mechanical concepts could be incorporated in a proposed hangar design *(Figure 20)*. In this case the cables, supported on two central columns and connected to two twin arches, are shaped to produce external balanced co-reaction

[5] *A design of this kind was demonstrated and successfully tested on a 1:20 scale model at the laboratories of John A. Roebling's Sons, Corp., last summer;* SEPTEMBER *1957 P/A.*

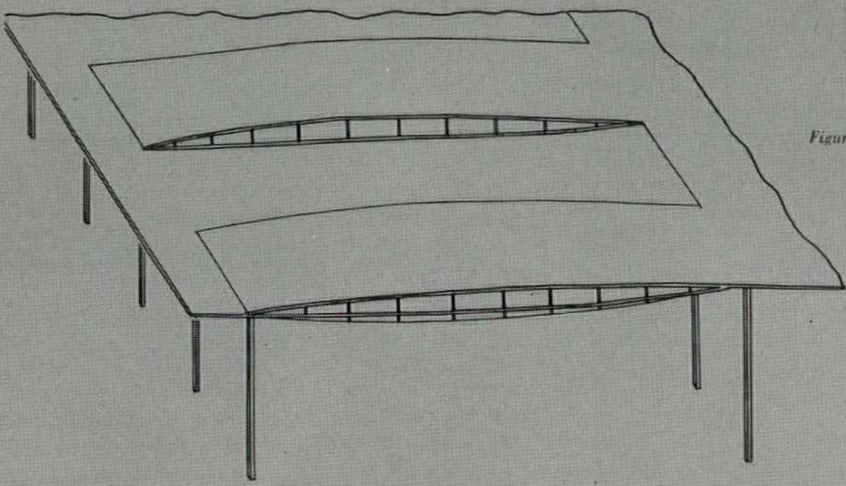
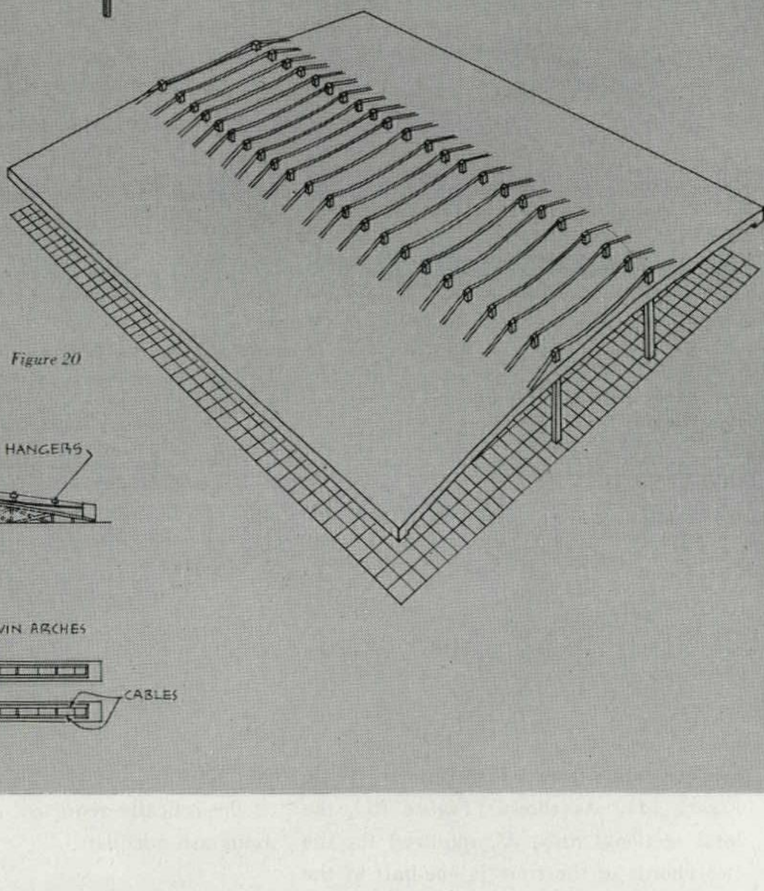


Figure 19



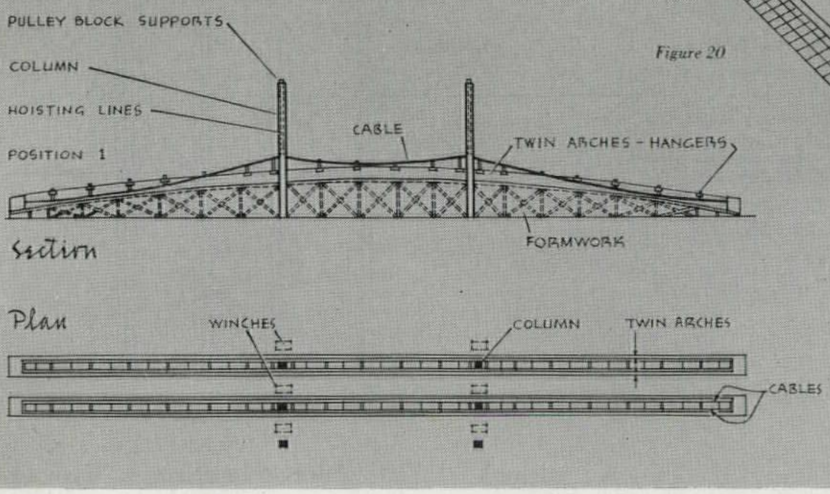


Figure 20

in the supporting unit. Thus, each of the component systems becomes stressed evenly under loading. On site prefabrication is intended and the units would become elastically adjusted while being hoisted into position. Another mechanically similar structure is shown *(Figure 21)*. In a study for an international airport terminal building, it was found possible to eliminate the middle arch, since the weight of the floors in the central core of the building could be supported on inclined struts producing outward horizontal thrusts required to balance those of the lateral arches *(Figure 22)*. As shown in the structure the lateral arches are connected to the inclined struts by collars which permit the site-prefab units to be lifted into place. The weight of the central floors, being transferred to a system of connecting tie-down cables, provides the stabilizing forces under prevailing load conditions.

An overhanging type of structure *(Figure 23)* features a diamond-shaped framing plan and is suggested for the support of a hung roof over a grandstand for race tracks, or for covering a hangar building. Also axially stressed are the members of a cable structure supporting the roof covering for a sports arena, circular in plan *(Figure 24)*. The principal, radial supporting cables are strung over peripheral, curved reinforced-concrete struts and then continued down their exterior surfaces to subsurface anchorage.

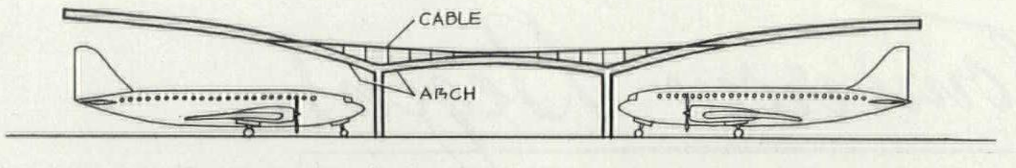


Figure 21

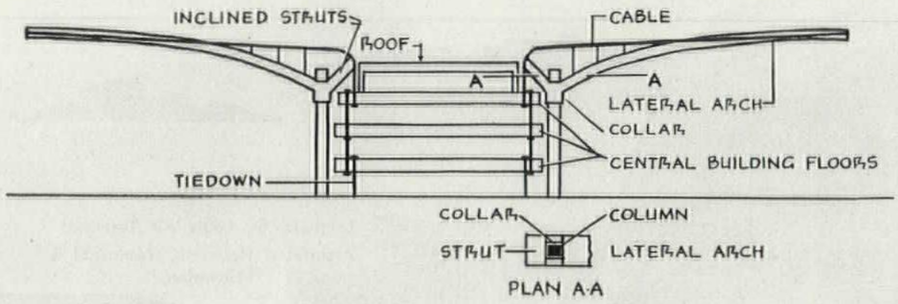


Figure 22

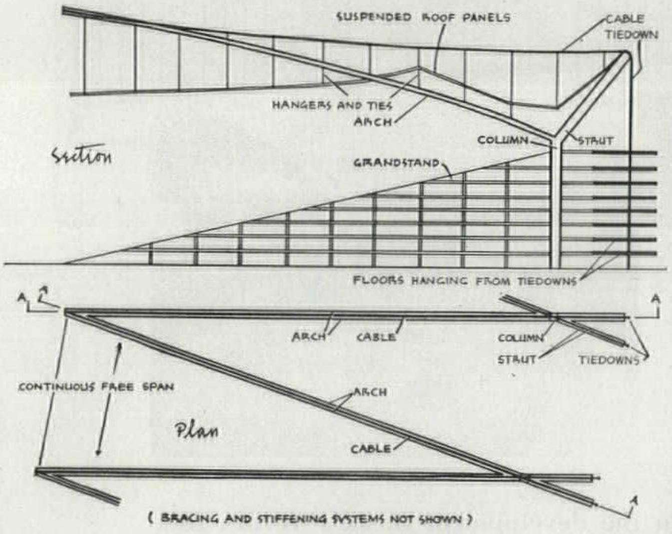


Figure 23

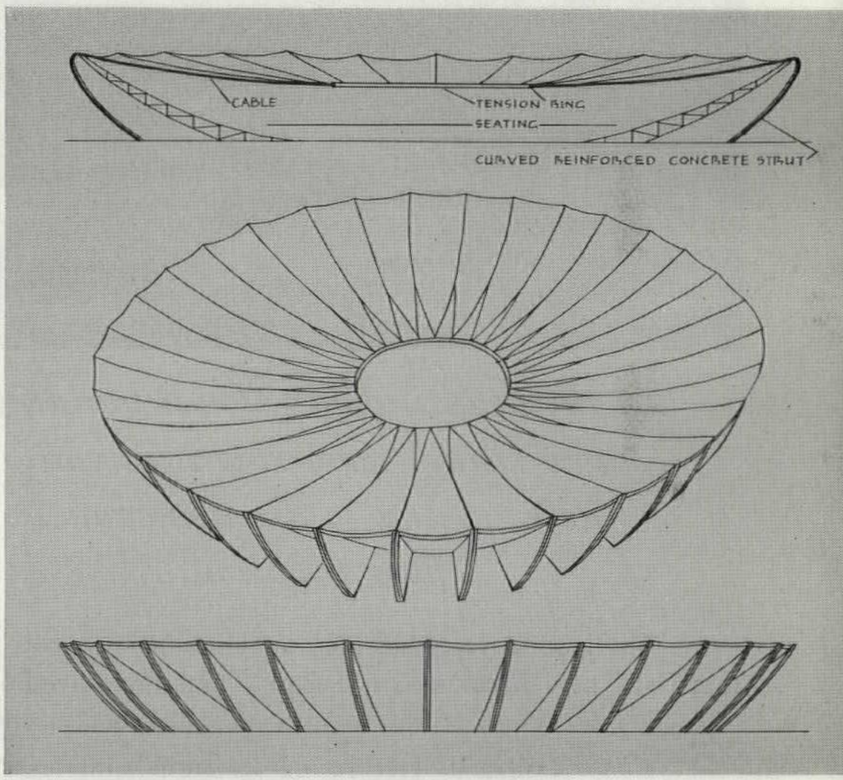


Figure 24

No outer compression ring is necessary and the dome may be opened in fair weather.

conclusions

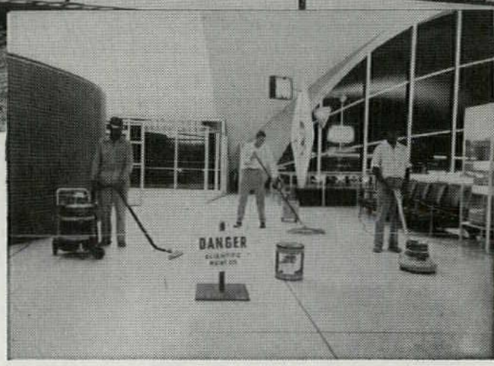
Let us compare the diameters of three sections of steel bars: structural steel, 0.332″; high-strength steel, 0.192″; and experimental steel, 0.094″. Maximum tension load that can be sustained is the same for each bar—all basically made of the same material. Concrete still lags behind steel in strength/weight/cost ratio. Developments in cement manufacture, advances in mixture design, and new concreting techniques, however, justify the expectation that concrete may still remain usable as a compression component of resistance, when present cable wire is utilized for tension members of axially-stressed structures.

Yet, should an experimental steel of such a high strength prove convenient for architectural structures, would plastic resins, or other modern materials, respond more efficiently to that elasto-mechanical function in the higher than present ranges of stressing?

Or, should future structures be conceived as having a framework of all-tension members to carry the load along the span, with anchorage, towers, and/or vertical means for transferring it to the foundation where the cheapest compression material component of stability can be provided?

Where Tomorrow Begins..

Lambert - St. Louis Air Terminal
Architects: Hellmuth, Yamasaki & Leinweber



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BRANCHES AND WAREHOUSE STOCKS IN PRINCIPAL CITIES

Weathering of Porcelain Enamel *by Harold J. Rosen*

The use of porcelain enamel in curtain-wall construction has gained considerably in recent years, with the trend toward color in modern architecture increasing its use over other materials. A timely test report on the weather resistance of porcelain-enameled steel panels—evaluating the results of 15 years of exposure at four different sites—has been issued by National Bureau of Standards in *Building Materials and Structures Report No. 148* (June 1957) entitled "Fifteen-Year Exposure Test of Porcelain Enamels." This report should aid manufacturers of porcelain enamel in the preparation of frits which will prolong the life of porcelain enamel, increase the color stability, maintain its initial gloss and its ease of cleaning. The report should also guide specification writers in specifying porcelain enamels which will have these additional attributes.

The more important requirements of a porcelain-enamel finish that is to be exposed to the weather are (a) corrosion protection, (b) color stability, (c) ease of cleaning, and (d) absence of major changes in initial gloss.

To increase corrosion resistance, the 15-year exposure test shows that two coats of enamel should be applied to the back surfaces of panels subjected to weathering. In addition, attachment clips should likewise be enameled. This latter provision was brought home forcibly when several test panels at Atlantic City were blown away in a storm. This occurred when attachment clips which had been spot-welded to the panels prior to enameling did not receive adequate enamel coverage, with resultant corrosion and loosening of the clips from the panels. Where panels had but a single ground coat of enamel applied to the backs, spalling of the enamel on the face side occurred after the corrosion on the back though the inadequate ground coat had progressed only part way through the thickness of the steel.

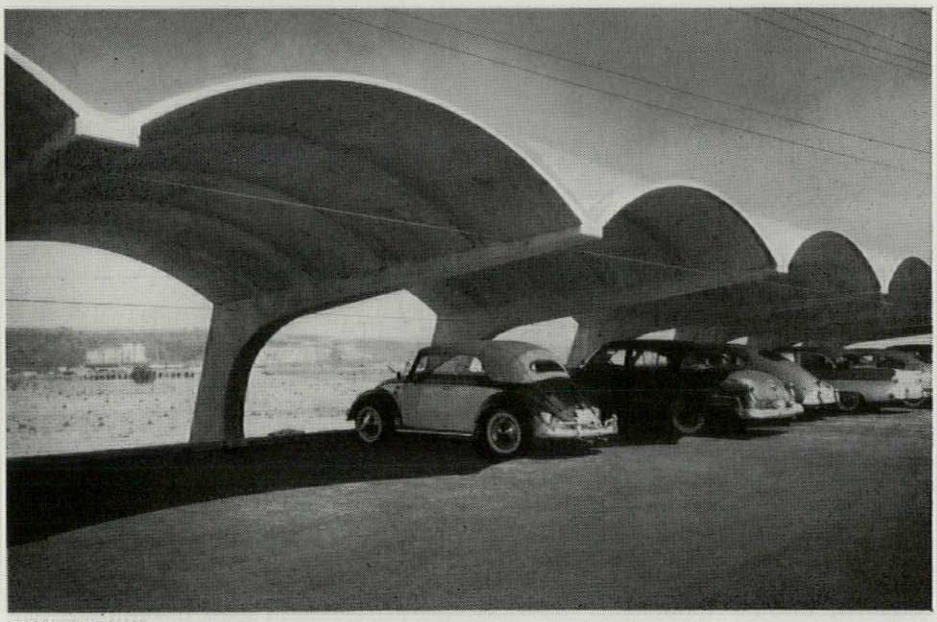
Color stability was determined by comparing the exposed test panels with panels that had been stored at the National Bureau of Standards. Change in color is apparently due to three causes. Color fading results first from the slow leaching of soluble materials from the porcelain enamel. This is especially true in enamels of poor acid resistance. Solar radiation also has an effect on the color of porcelain enamel. The third factor is the oxidation of pigments used for coloration. Use of ceramic pigments which are chemically stable should result in colors which are more resistant to fading.

Ease of cleaning porcelain-enamel surfaces after long exposure is a feature which makes this material popular for architectural installations. Most full glosses and semi-mat finishes clean easily when first installed. Full-mat surfaces do not possess this characteristic. As exposure time increased, it was noted that the ease of cleaning varied with the acid resistance of the enamel, the surfaces of high acid resistance being easier to clean than those of poor acid resistance. As exposure time increased, the finishes of poor acid resistance became etched and cleaning became more difficult. However it was noted that cleaning was not a problem even on those finishes of panels located in areas where there was little atmospheric contamination by soot particles.

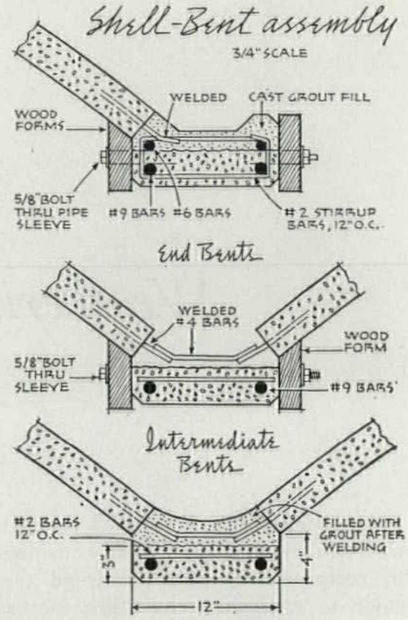
Changes in initial gloss were found to bear some correlation as to its acid resistance. Except for some isolated cases, the percentage of gloss retained was considerably higher for enamels of high acid resistance than for the non-acid types. It was also noted that the gloss changes at a faster rate in the earlier stages of exposure than it did later.

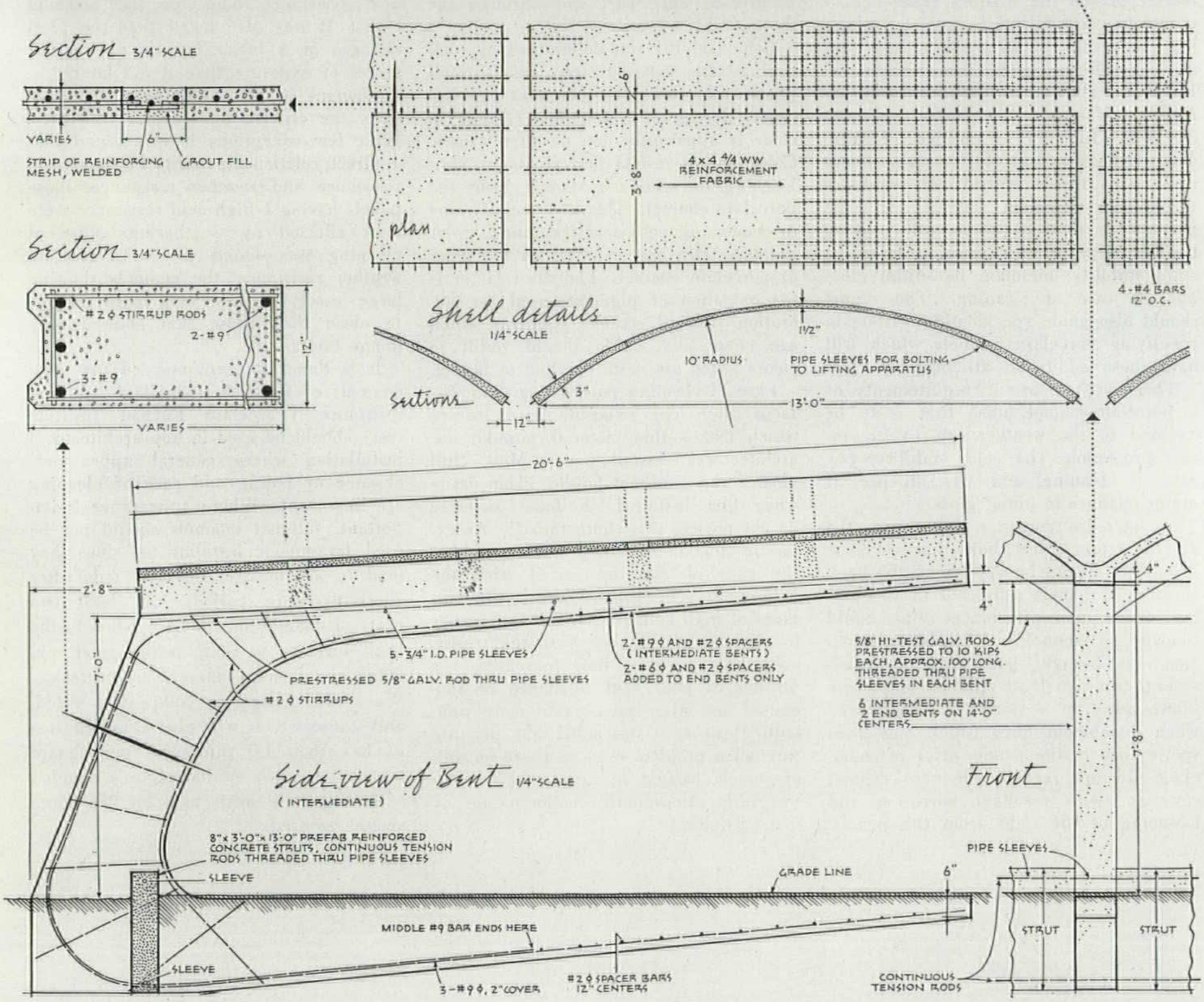
Changes in gloss and color are obviously the criteria for weather resistance. With few exceptions it was found that a direct relationship exists between acid resistance and weather resistance, those panels having a high acid resistance were least affected by weathering. Ease of cleaning was found to be related to weather resistance, the enamels showing large losses in gloss being more difficult to clean than those that showed only minor losses.

It is therefore recommended that only enamels of Class A and Class AA acid resistance (Porcelain Enamel Institute test) should be used in any architectural installation where general appearance, absence of fading and ease of cleaning are important. Where appearance is important, full-mat enamels should not be used for outside installations, since they tend to accumulate dirt and fade after short exposure periods. At least two coats of enamel should be applied to the back surfaces so as to insure good coverage and prevent damage by corrosion. When red, orange, or yellow is selected, only those which will give a weight loss of less than 1.0 milligram per square centimeter when subjected to a solution of boiling 10% nitric acid for 2½ hours should be used.



DEARBORN-MASSAR

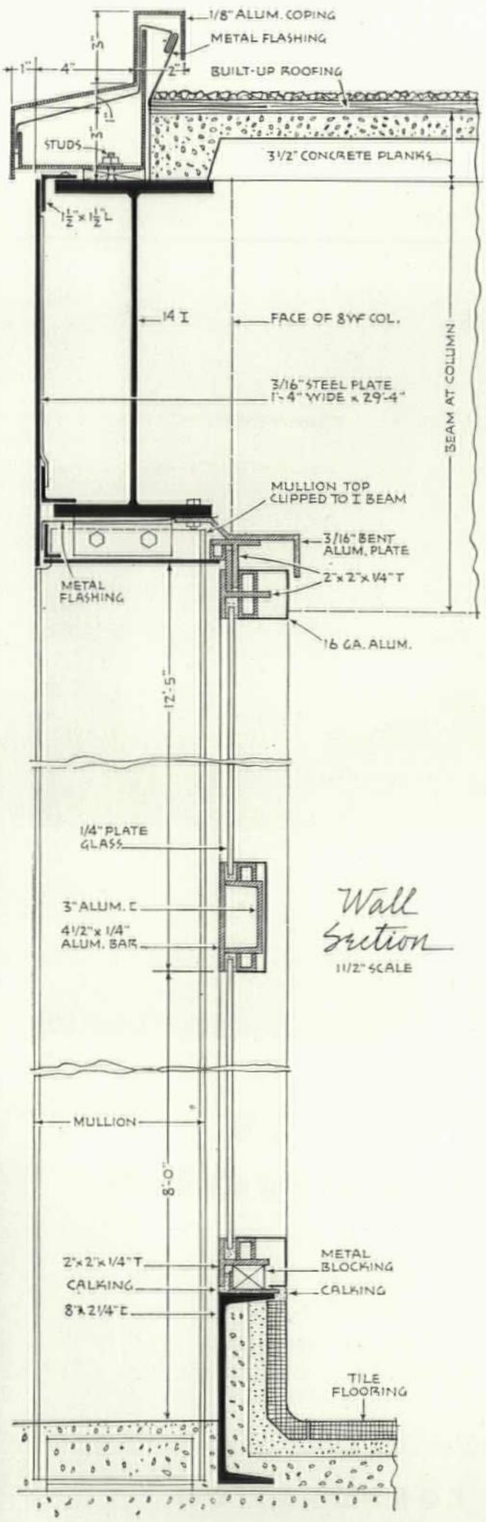




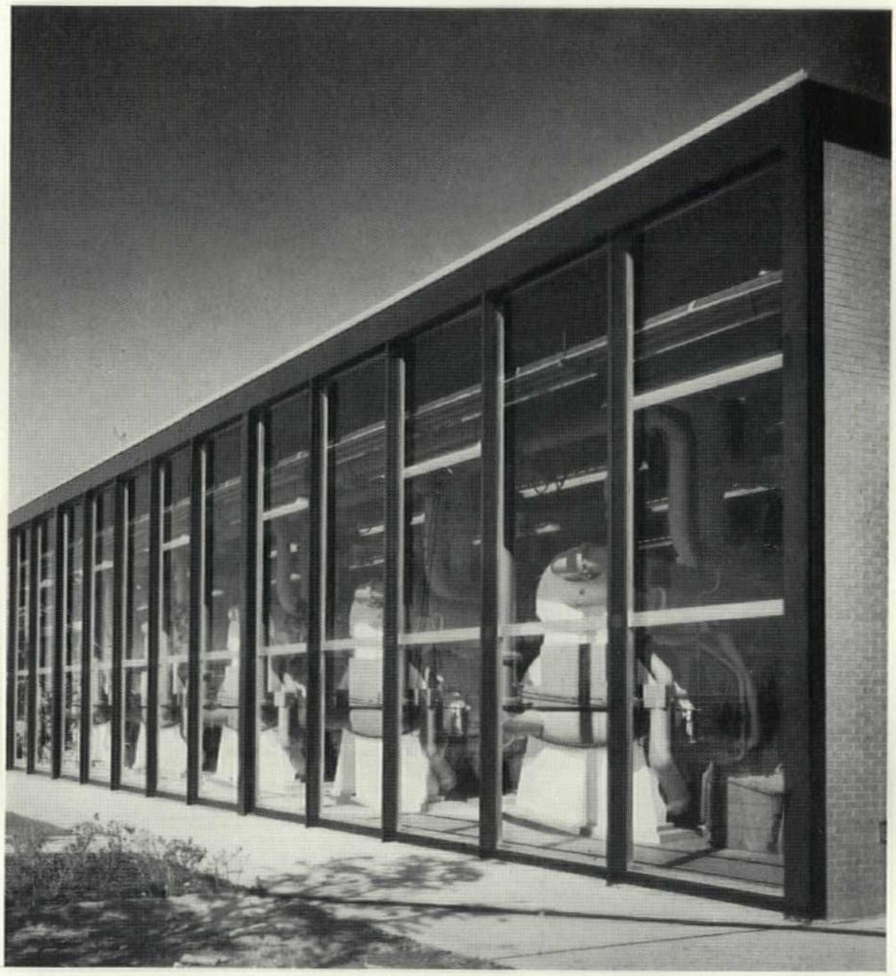
CONCRETE TECHNOLOGY CORPORATION PLANT, Tacoma, Wash.

Anderson & Anderson, Engineers

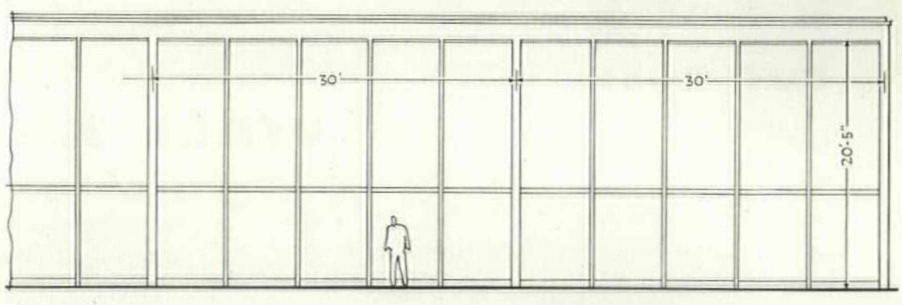
window wall



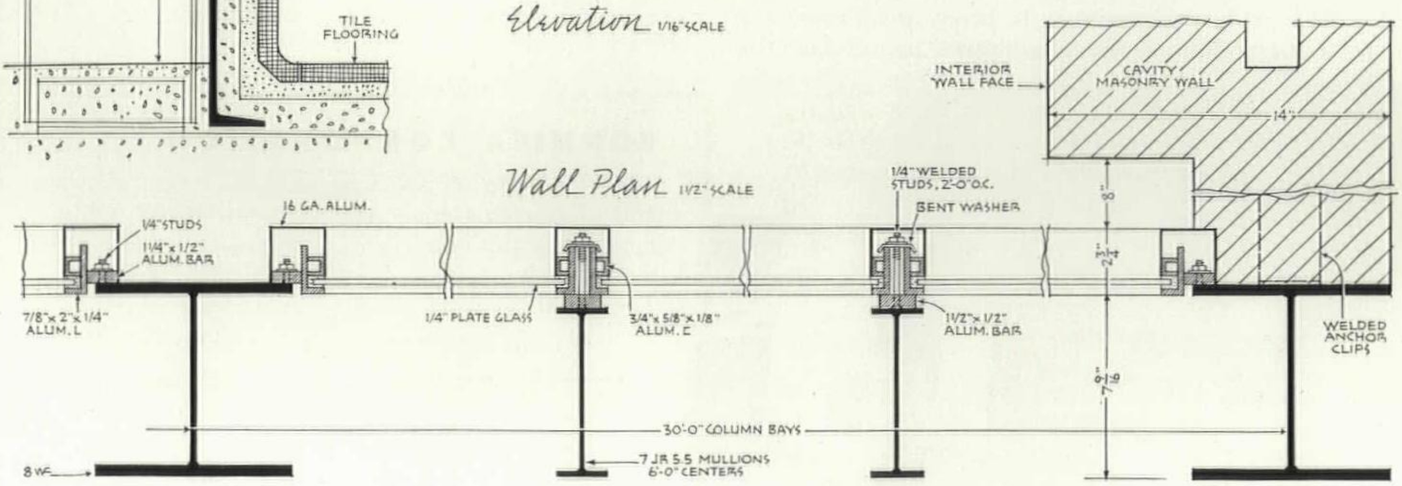
Wall Section 1 1/2" SCALE



GOTTSCHO-SCHLEISNER



Elevation 1/16" SCALE



Wall Plan 1 1/2" SCALE

CENTRAL HEATING AND REFRIGERATION PLANT, New York International Airport, N. Y.

Skidmore, Owings & Merrill, Architects

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Louise Sloane

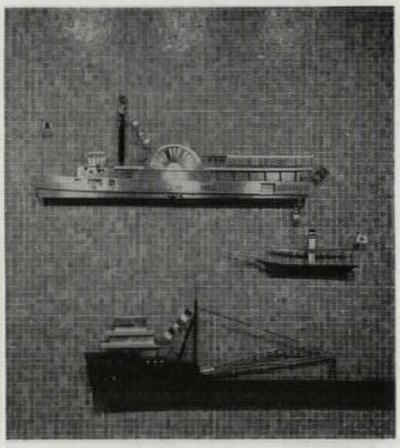
shopping center stores

From the new Eastland Shopping Center in Detroit, Michigan, Victor Gruen Associates, Architects, we show interiors in four stores: J. L. Hudson and Siegel's, designed by the Gruen office; Englander Furniture Shops, with interiors by Staff Decorator Andre de Grohe; and Phillips Shoe Store, interiors by Latham, Tyler, Jensen.

In the light of today's broad concern with the relationship of the architect to interior design, it is particularly interesting to examine these contrasting examples of method: the Hudson and Siegel interiors designed by the interior design department of the architect's own office; the Englander interiors by the company's decorator; the Phillips interiors by an outside firm. The results—all tasteful, functional, original—nonetheless recognizably reflect the differences in method.

It is quite clear that the Gruen interiors, diversified through each store and the various areas in both are, present a planned unity of design that joins architecture and interiors in a totally related whole. It is just as clear that the de Grohe and Latham, Tyler, Jensen interiors apply the techniques of interior design, separately from the architecture, to create specific atmospheres that are equally valid design statements.

All accomplish their common purpose—to provide retail establishments with backgrounds that encourage customer traffic and purchasing, facilitate store operation, minimize maintenance costs, "showcase" merchandise. We are impressed with the exceptionally thorough research into available resources for furnishings, resulting in the presence of apt and fresh-looking materials, selectively chosen.



Design of dining rooms in J. L. Hudson Eastland store was based on the Great Lakes Seaway. Sliding panels may be opened to connect main area with fast luncheon area. Walls are vertical teak planking, furniture smoked oak with marine blue upholstery. Featured mural, by Janet Bennett, is constructed in metal, mounted against blue and green glass mosaic wall, day-lighted by overhead plastic skylight, night-lighted by incandescent spots and fluorescent strips.

Photos: Alexandre Georges

p/a interior design data

shopping center stores

client	J. L. Hudson Company
location	Eastland Shopping Center, Detroit, Michigan
architects	Victor Gruen Associates
associate-in-charge	Richard S. Beaudet
interior designers	Ron Fidler, Charles Jones

data

children's department

Designed as a complete children's center, with related adjoining departments arranged according to age groups. Color plan is one of many bright colors in bold stripes and geometric patterns, creating a youthful and gay atmosphere.

Walls: Ben Rose Wallpapers, 1129 W. Sheridan Rd., Chicago 40, Ill.; L. Anton Maix, Inc., 48 E. 53 St., New York 22, N. Y.

Carpet: James Lees & Sons Co., E. Fourth St., Bridgeport, Conn.

Furniture: Janet Rosenblum, Inc., 602 Madison Ave., New York 22, N. Y.; Conant Ball Furniture Co., Gardner, Mass.

Upholstery: "Trilok"/U. S. Rubber Co., 1230 Ave. of Americas, New York 20, N. Y.

Store Fixtures: Ettl Furniture & Manufacturing Co., 1921 N. 12 St., Toledo 2, Ohio.

blouse department

Located next to escalators in order to take advantage of heavy customer traffic. Foliage-impregnated plastic screens, set in brass frames, serve as background against escalator. The curtain-wall is a series of co-ordinated display niches separated by Pandamus cloth panels. Vertical framing along back wall is painted rust-red, low front panel on showcase is deep blue-green.

Walls: "Pandamus Cloth"/Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.

millinery department

Located at a corner on the mall level, with glass walls on both sides, permitting the complete department to function as a large display. Color scheme includes white, pink, deep brown. Furniture is white natural wood, with brass trim.

Drapery: Konwiser Fabrics, Rowen, Inc., 1 E. 53 St., New York 22, N. Y.

Furniture: Brower Furniture Co., Grand Rapids 2, Mich.

Upholstery: Paul Rich Associates, 120 S. Robertson Blvd., Los Angeles 48, Calif.

Carpet: James Lees & Sons Co.

Lighting Fixture: designed by Victor Gruen Associates/ Litecraft Mfg. Corp., 8 E 36 St., New York 16, N. Y.

Store Equipment: American Store Equipment & Construction Co., 1657 Getty St., Muskegon, Mich.

silverware department

Curtain wall separating this department from related china, glass, linens, Bridal Registry, is divided into equal panels, with silver-finished hallmarks mounted in each one. Large chandelier located under concave dropped ceiling is in satin chrome, with inverted shades in bright blue. Light and dark mahogany are combined throughout.

Furniture: Hagen & Strandgaard, Inc., 416 Jackson Sq., San Francisco, Calif.

Upholstery: "Trilok"/U. S. Rubber Co.

Store Fixtures: Weber Showcase & Fixture Co., Inc., 1340 Monroe Ave. N. W., Grand Rapids 2, Mich.

Carpet: James Lees & Sons Co.

shopping center stores

client	B. Siegel Company
location	Eastland Shopping Center, Detroit, Michigan
architects	Victor Guren Associates
associate-in-charge	Richard S. Beaudet
interior designers	Ron Fidler, Charles Jones

data

lingerie department

Located in a rather secluded area behind the feature stairway, the departmnt is screened from general sales area by the two-story high curved glass mosaic wall. A series of floor-to-ceiling walnut dividers sections off the glass-enclosed wallcases.

Store Fixtures: Cadillac Showcase & Manufacturing Co., 2176 Grand River Ave., Detroit 1, Mich.

Carpet: Mohawk Carpet Mills, Inc., Amsterdam, N. Y.

gown salon

Located on second floor, looking out over two-story glass-enclosed entranceway. Walls are a series of floor-to-ceiling panels covered in gold-tone silk paper, and divided by thin walnut strips. Carpet is Alabaster white; sofas and chairs are upholstered in bright red-orange and warm gray-white.

Walls: silk paper/ Kneedler-Fauchere, 451 Jackson Sq., San Francisco, Calif.

Carpet: Firth Carpet Co., 295 Fifth Ave., New York, N. Y.

Fabrics: casement/ Jack Lenor Larsen, 16 E. 55th St., New York 22, N. Y.; drapery/ F. Schumacher & Co., 60 W. 40 St., New York 18, N. Y.

Furniture: Dux, Inc., 390 Ninth St., San Francisco 3, Calif.

Upholstery: Boris Kroll Fabrics, Inc., 220 E. 51 St., New York 22, N. Y.; Thaibok Fabrics, Ltd., 3 E. 52 St., New York 22, N. Y.; Jack Lenor Larsen.

staircase area

Staircase is reinforced concrete set against a curved two-story mosaic wall, in blues and greens. Carpeting is dark blue-green. A small pool, lined with glass mosaic, and containing a miniature fountain, is set beneath the stairway. The two-story lighting fixture, specially designed, has white opal cylinders.

Lighting Fixtures: designed by Victor Gruen Associates; opal glass cylinders; Habitat Associates, 235 E. 58 St., New York 22, N. Y.; Litecraft Mfg. Corp.

Carpet: Mohawk Carpet Mills, Inc.

shoe department

Cagelike island encloses a central seating arrangement, includes a large planting unit and overhead decorative lighting. Recessed displays, with cut-out forms creating a sculptured effect, function as a decorative element. Color scheme is in tones of green, with walnut and cherry woods.

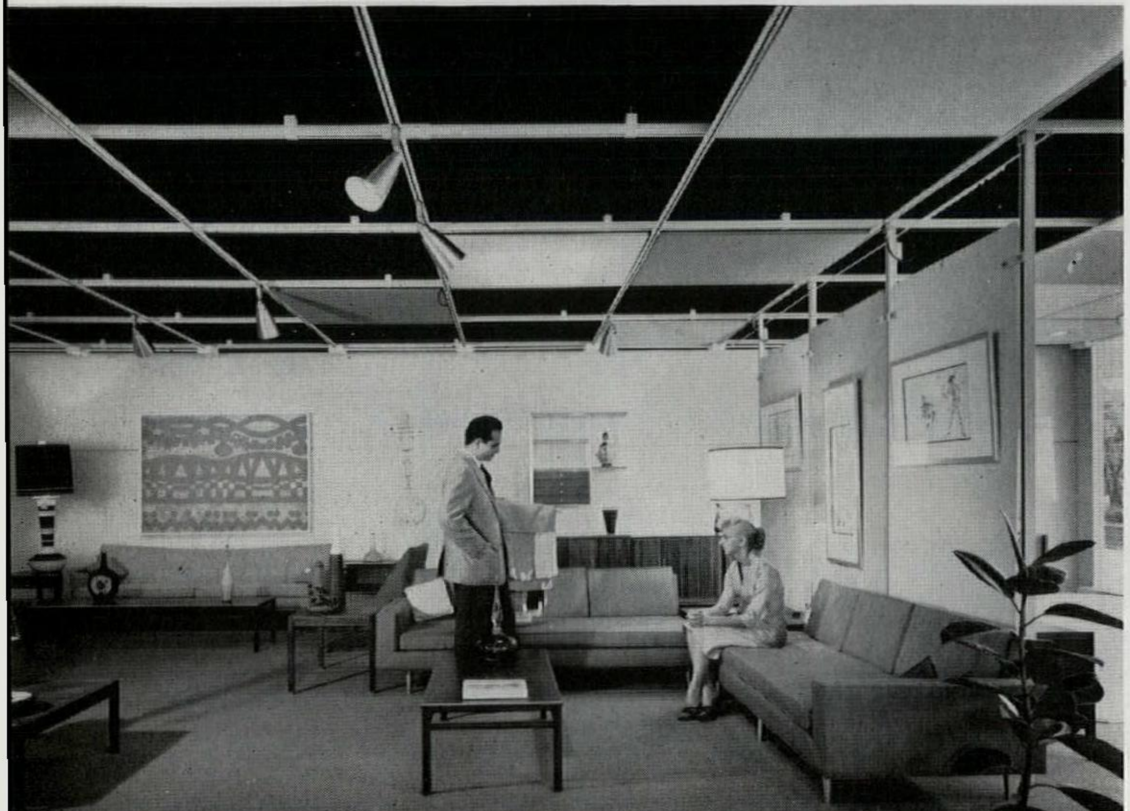
Furniture: Lehigh Furniture Corp., 16 E. 53 St., New York 22, N. Y.

Upholstery: Paul Rich Assoc.

Fabrics: Henry Calvin Fabrics, 412 Jackson St., San Francisco, Calif.

shopping center stores

client	Englander Furniture Shops, Inc.
location	Eastland Shopping Center, Detroit, Michigan
architects	Victor Gruen Associates
co-ordinator	Marvin I. Danto
designer-stylist	Andre de Grohe



data

Theme and Color Plan: Romanesque courtyard setting for contemporary furnishings. All-white background, with sharp accents of red, black, and gold for contrast. Central highlight of room is sculpture of Hebe, goddess of water, with fountain and planting. Marble column flanks architectural mural.

decorating studio

West Wall: gold tortoise-shell Pompeian foil.

East Wall: off-white casement cloth, fine sack weave/ F. Schumacher & Co., 60 W. 49 St., New York, N. Y.

Center Wall and 8' of East Wall: Piranese Heroica mural/ Laverne Inc., 160 E. 57 St., New York 22, N. Y.

Ceiling: The Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill.

Flooring: white vinyl-tile, classic black-and-gold metallic border/ "Amtico"/ American Biltrite Rubber Co., Trenton 2, N. J.

Fountain: constructed per designer's specifications/ Raphael Groppi Studio, 1757 N. Sedgewick, Chicago, Ill.

All Furniture: "Tomorrow's Classics"/ Valley Upholstery Corp., 428 W. 14 St., New York, N. Y.

sales area

Ceiling, Wall Dividers: flexible modules, with colorful panel inserts/ Unistrut Products Co., 933 Washington Blvd., Chicago 7, Ill.

Lighting: unified with ceiling and wall dividers/ "Trol-e-duct"/ BullDog Electric Co., 7610 Jos. Campau, Detroit 11, Mich.

Carpet: "Gulistan"/ A & M Karagheusian, Inc., 295 Fifth Ave., New York 16, N. Y.

data

Theme and Color Plan: An Oriental theme is expressed through the general use of natural materials (hemp, silk, teak, tongue-and-grooved redwood) and such specifics as Shoji screens, wallpaper mural, character of furniture and lighting. The color plan is monochromatic, with beige carpet, black slate floor, off-white upholstery, accented by Persimmon and brass.

walls

Shoji Screens: McGuire Co., 38 Hotaling Pl., San Francisco, Calif.

Silk Paper, Mural: "Persimmon Tree"/ Robert Crowder, Ltd., 110 N. Robertson, Los Angeles, Calif.

Hemp: Pritchard & Roberts, 626 Merchandise Mart, Chicago, Ill.

furniture, fabrics

Women's Chairs: Ficks-Reed, 424 Findlay, Cincinnati, Ohio.

Men's Chairs: Milwaukee Chair Co., 3022 W. Center St., Milwaukee, Wis.

Fabrics: Stroheim & Romann, 35 E. 53 St., New York 22, N. Y.

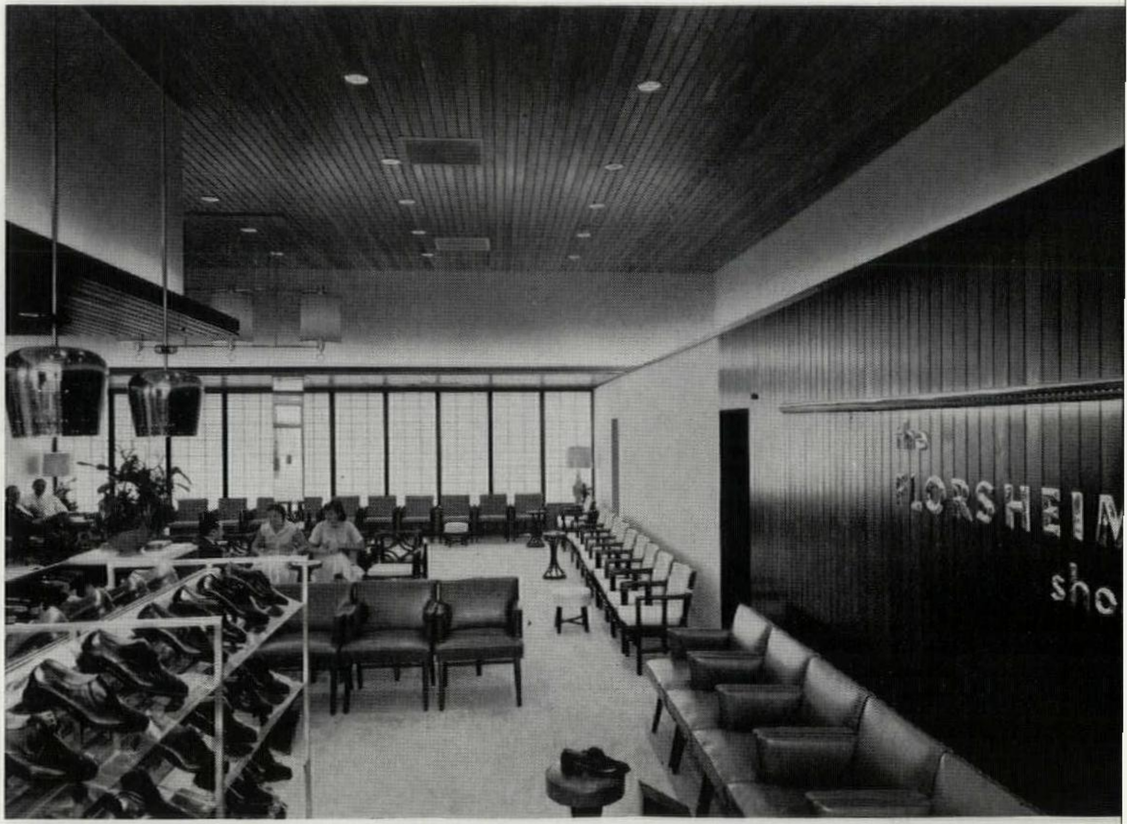
lighting

General: Max Grove, 14 E. Jackson Blvd., Chicago, Ill.

Decorative: New Metal Crafts, 812 N. Wells, Chicago, Ill.

flooring

Carpet: "Greek Key"/ The Slater Co., 300 W. Hubbard, Chicago, Ill.

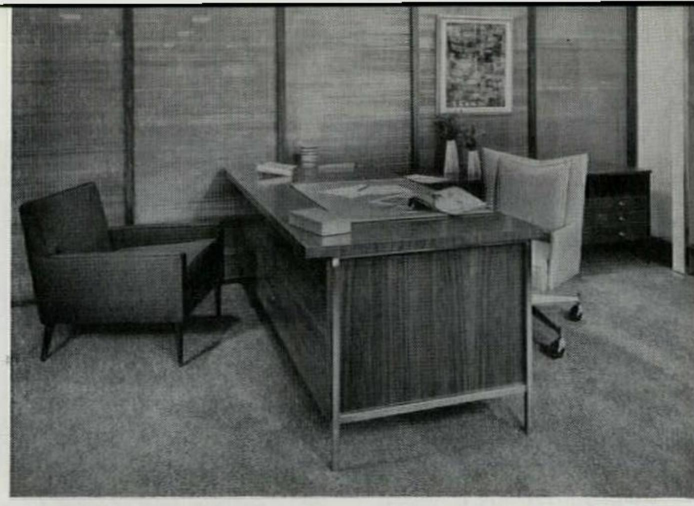


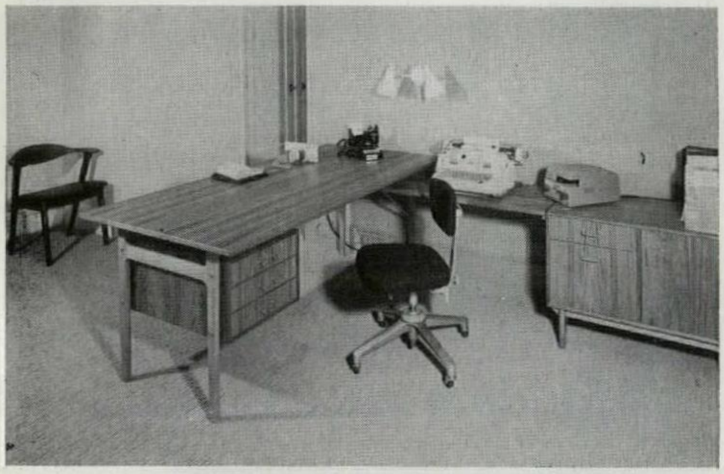
client	Phillips Shoe Company
location	Eastland Shopping Center, Detroit, Michigan
architects	Victor Gruen Associates
store architect	Harry S. King
interior designers	Latham, Tyler, Jensen

p/a interior design products

office furniture

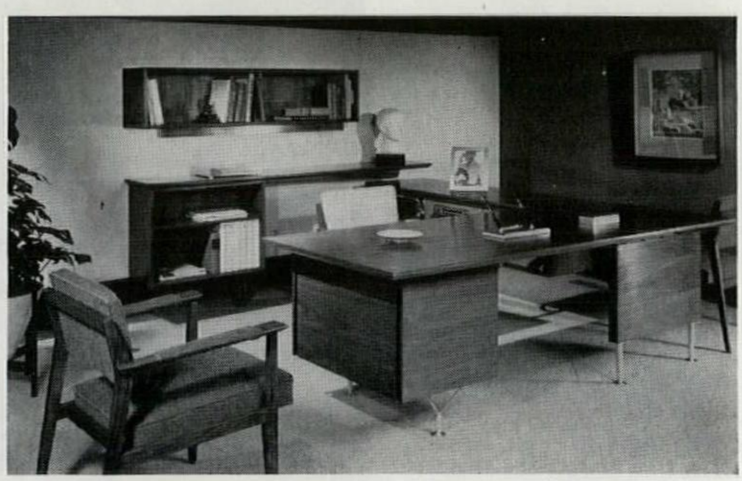
Danish Office Furniture: (below) secretarial-desk combination from Torben Strandgaard's "Executive Office Group"/ flexible collection includes desk tops, pedestals, storage units, chairs, tables, in components for custom assembly/ tops and cabinets are teak, with hnd-oiled finish, frames are smoked oak, hardware is brass/ pieces are finished on four sides, for free-standing use/ **Hagen & Strandgaard, Inc., 416 Jackson Sq., San Francisco, Calif.**



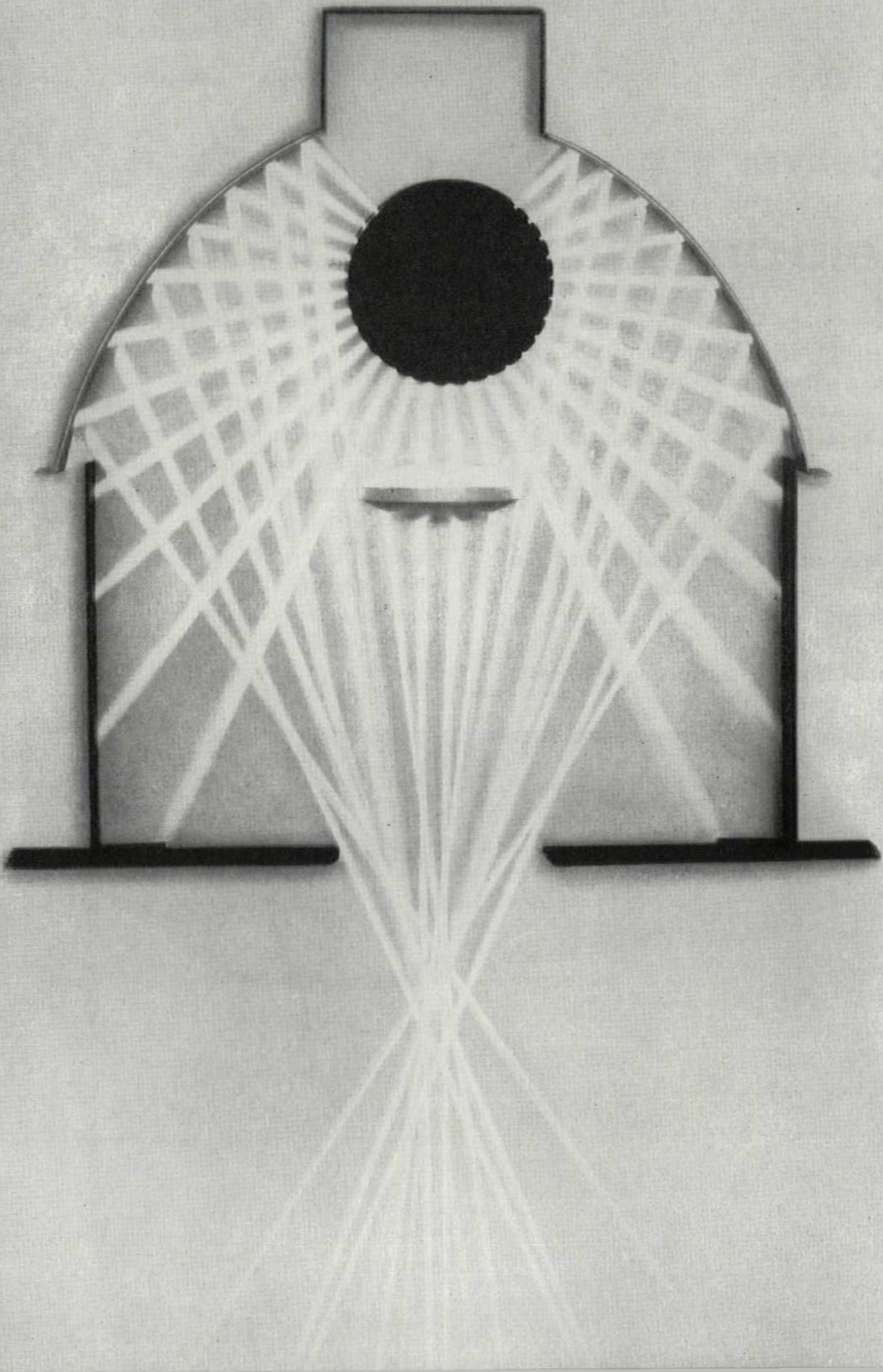


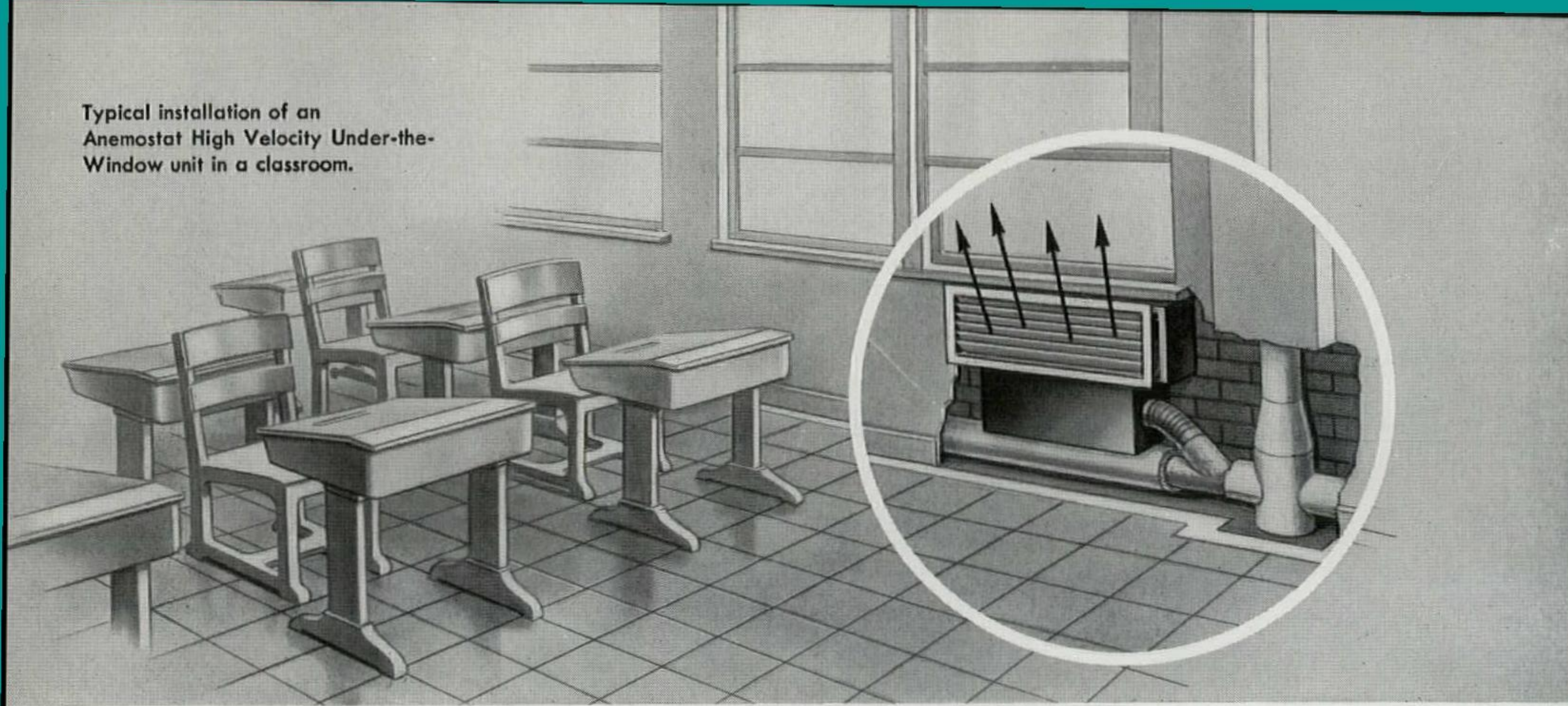
Executive Office: (above) brilliant blue fabrics, accented with muted turquoise, used with warm tones of walnut woods in an otherwise all-white room/ furniture is Paul McCobb's "Area Plan Units," modular components that include desk tops, pedestals, cabinets, and seating pieces/ case pieces are American walnut on satin-chromed steel frames, desk tops are walnut-grain "Parkwood" high-pressure plastic, upholstery fabrics are "Naugahyde" and "Textileather" in high style colors/ **B. G. Mesberg National Sales, Inc., 160 E. 56 St., New York 22, N. Y.**

Executive Desk Center: (below) designed for Executive Furniture Guild, color plan is warm gray and soft green, with Primrose yellow in the predominantly black upholstery, and pewter-finished desk accessories/ desk, of hand-rubbed walnut, embodies the "Mark II Sigmacon," completely mechanized unit for push-button control of doors, draperies, lights, temperature, electronic equipment (detail photo)/ furniture, designed by George W. Reinoehl, is from "Predictor" series/ **Stow & Davis Furniture Co., 8 Front Ave., S.W., Grand Rapids, Mich.**



"Modern Management Group": (left) integrated, interrelated metal components include drawer units, file units, cabinet sections, all of steel, with tops of laminated plastic or wood/ side units may be used either attached or in L-arrangement, free-standing/ finished in six colors, Charcoal gray, Sandstone tan, Tangerine red, Mustard yellow, Turquoise blue, Olive green/ designed by George Nelson/ **Herman Miller Furniture Co., Zeeland, Mich.**





Typical installation of an Anemostat High Velocity Under-the-Window unit in a classroom.

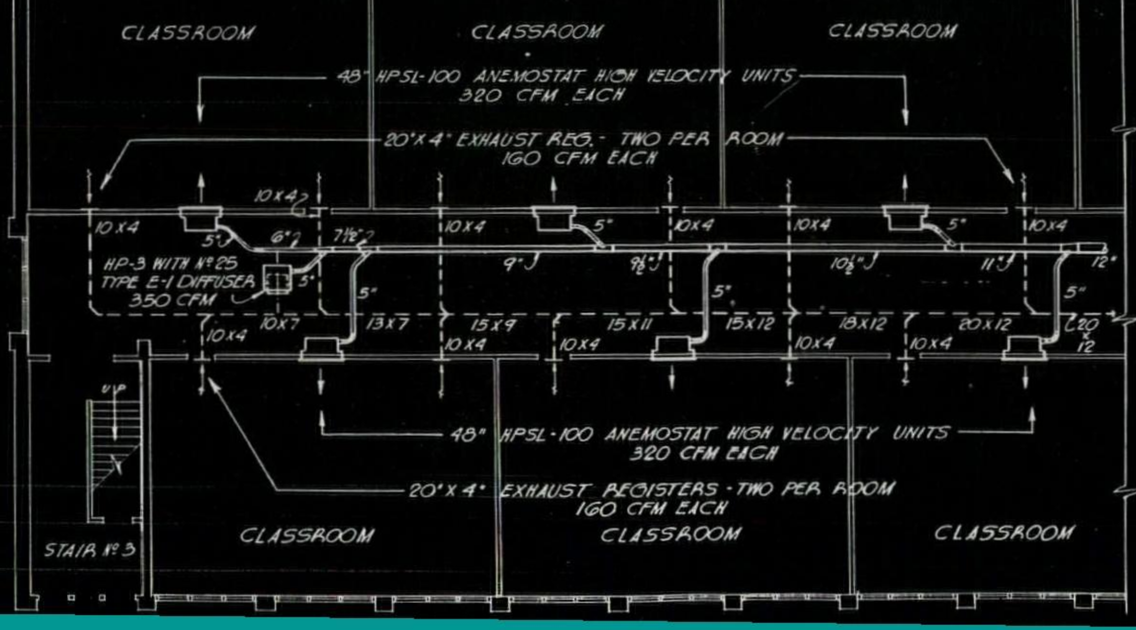
How to deliver high velocity air to schoolrooms

Shown here are two ways of using the Anemostat All-Air High Velocity system of draftless air distribution for heating and ventilating schools. Under-the-Window units (above) are the most practical for colder climates. Corridor distribution (below) is preferable in warmer climates.

Advantages:

- All-Air High Velocity units require smaller than conventional ducts, thus save space and money.
- All-Air HV units can be used for individual or zone control, in single or dual duct installation.
- Since air is supplied from the main equipment room, there is no need to break through the outside of the building for prime air make-up. This eliminates grilles, dampers, possibility of leaks.
- The Anemostat All-Air HV system can be simply installed by the sheet metal trades. No supply or return pipes are required. Units are quiet, need a minimum of maintenance from custodians.

For latest data on All-Air High Velocity units, write on your business letterhead for new Selection Manual 60 to Anemostat Corporation of America, 10 E. 39 Street, New York 16, N. Y.



Diagrammatic layout shows corridor distribution of high velocity air for wing of school.

For complete data on this new tile design write to Owens-Corning Fiberglas Corp., Dept. 63-L, Toledo 1, Ohio, or check the yellow pages for your local approved Fiberglas acoustical contractor.

Office of the Liberty Life Insurance Company, Greenville, South Carolina.
Architects—Engineers: Lockwood Greene Engineers, Inc. Spartanburg, S. C. Carson & Lundin, New York
General Contractor: Daniel Construction Company, Greenville, S. C.

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Liberty Life Insurance Company of Greenville, South Carolina take pride in the beauty of their office building and its functional utility and convenience. On each of its four floors long runs of Hope's Custom Steel Windows, fixed and vertically pivoted sash, are fitted in Hope's Pressed Metal Framing. In the building there are also large installations of direct glazing in these custom-built sub-frames. The flexibility of Hope's products for layout purposes helps the architect greatly in designing the large glass areas in contemporary style buildings, especially as the fixed window requirements of air conditioning are now always a consideration in a modern office.

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Beautiful new St. Paul's Catholic Church, Princeton, N. J.

Recently completed St. Paul's Church, with a seating capacity of 650, is of modern American-Gothic architecture. Exterior is hand cut granite with limestone trim, designed to blend with general surroundings in Princeton.

All heating products were supplied by Dunham-Bush, not only for the church but also for adjacent new rectory and convent. Dunham-Bush hot water specialties, unit heaters, convectors, Fin-Vector and baseboard were used in the modern heating system. Reason for one supplier? Dependable products . . . "one source—one responsibility" supplier!

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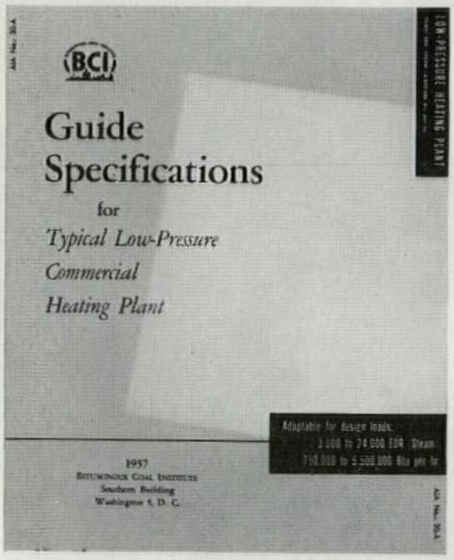

Recently released Guide Specifications for Typical Low-Pressure Commercial Heating Plant *has been published by Bituminous Coal Institute to aid consulting engineers and architects in specifying coal-fired heating plants for such applications as schools, factories, apartment buildings, warehouses.*

Specifications are given for design heating load of 20,000 EDR, to be supplied by two steel firetube boilers of 893 sq ft heating surface fired by 500 lb per hr underfeed stokers. Boiler, stoker, bin size can be adjusted up or down, depending on load necessary. General data stresses low initial cost and clean operation as well as low fuel and maintenance costs.

Items specified, with alternates, include: fuels, boilers, stokers, overfire air systems, coal-handling equipment, coal storage bin, ash-handling equipment, furnace draft system, controls, incinerators, ventilation. Appendix features tables for equipment sizes, stoker setting data. Drawings show typical boiler rooms, overfire air system, boiler controls, and stack.

Copies of Guide Specifications for Typical Low-Pressure Commercial Heating Plant *(AIA 30-A) may be obtained from: Bituminous Coal Institute, Southern Bldg., 15 and H Sts., NW, Washington 5, D. C.*

★ *Editor's Note: Items starred are particularly noteworthy, due to immediate and widespread interest in their contents, to the conciseness and clarity with which information is presented, to announcement of a new, important product, or to some other factor which makes them especially valuable.*

air and temperature control

138. LoLine Cooling Towers, 16-p. file shows water-cooling tower for industrial processes and air conditioning. Structural framework is designed to withstand wind loads of 100 mph, has cast-iron connections. Casing is of corrugated asbestos-cement board; open distribution system gives low pumping head requirements — removable ceramic orifices distribute water evenly. Clear all-heart grade redwood used as filling—drift eliminators give water removal from discharge air. Two series—"BW" has aluminum fan, galvanized fan drive supports, multi v-belt drive, oversized bearings, stainless-steel fan shaft, external grease fittings; "R" series features fan, galvanized fan stack, enclosed fan-cooled motor, speed reducer fan drive, nonlubricated drive shaft. Cross-sectional drawings of each series shown. Engineering data, tower dimensions, general arrangement, supporting-steel arrangements and foundations for concrete basins, specifications outlined. J. F. Pritchard & Co. of California, 4625 Roanoke Pkwy., Kansas City 12, Mo.

139. Five Ways to Cool a Hot Water Heated Home, 8-p. booklet describes several methods of heating and cooling. Systems—combination heating-cooling using fan equipped convector units in each room; split system where radiation unit is hooked to boiler for heating—self-contained units for cooling; baseboard heating system, self-contained cooling unit installed in attic connected by short duct system to ceiling diffusers; another split system has chiller tied in with fan-equipped cooling coil units; system utilizing baseboards for both heating and cooling—are illustrated by sketches. Flexibility of systems is stressed. Institute of Boiler and Radiator Manufacturers, 608 Fifth Ave., New York 20, N. Y.

140. Heat Chaser, 4-p. brochure describing combination water and air cooling unit. Soaker coil provides simultaneous triple heat exchange. No cooling tower required. Available in 2- to 5-ton models. Easily installed in either residential or commercial buildings. Dimensions and specifications. Harvey Hill, Inc., 6552 Clayton Rd., St. Louis 17, Mo.

141. Anemostat Draftless Aspirating Air Diffusers, AIA 30-J. 78-p. manual discussing selection of conventional air diffusers, 100% air-induction diffusers, and all-air high-velocity units. Special section giving definitions of air distribution terms and static pressure factors. Specification and performance data. Photos and charts. Anemostat Corporation of America, 10 E. 39 St., New York 16, N. Y.

construction

256. Mahon Products, 74-p. spiral-bound notebook contains brochures with technical data on electrified structural floor systems, steel decking, insulated metal walls, and prefabricated-wall panels. Provides photos, section property tables, load tables, specifications, perspective installation and welding details, construction details. Catalog of rolling steel doors is illustrated with photos and mechanical details. Includes chart listing of types of structural roof materials, spans, dimensions, costs, and thermal properties. The R. C. Mahon Co., Detroit 34, Mich.

257. Glass-clad Buildings, AIA 17-A, 16-p. booklet outlining completely integrated curtain-wall system of steel and aluminum supporting members coupled with structural-glass panels for vision and spandrel areas. Four-color renderings and photos show esthetic possibilities in design of façades for industrial and school buildings, shopping centers, and multi-story structures. Perspective section drawing, details, structural-glass color charts. Specifications and large detail sheet are inserted in brochure pocket. Pittsburgh Plate Glass Co., 632 Fort Duquesne Blvd., Pittsburgh 22, Pa.

★ **258. Fulget,** 8-p. folder contains information on new process for producing marble floor and wall tiles. Developed in Italy by Fratelli Capoferri, process is in two parts: raw marble is first artificially shaped into spheroids of several uniform sizes; spheres are then hand-set in steel molds, machine vibrated and pressed into grooved and channeled cement units. Tiles can be applied to walls with cement mortar as a veneer. Protruding pieces can be smoothed or polished. Color photos of actual patterns and installations show quality. Directions for installation—stressing that unit be set tight, joining without grouting or filling—and specifications included. National representative: The Fred Dean Co., 916 N. LaCienega Blvd., Los Angeles 46, Calif.

259. Workwall Movable Partitions and Paneling, 14-p. catalog features preassembled, easily installed partitions. Various attachments lock in position in post channels. Photos and data show full installation process. Panels available in Marlite, hardboard, steel in 4 widths for 1′, 2′, 3′, and 4′ modules. Descriptions of hardware, doors, glass gaskets, channels, trims, accessories, and specification data included. Drawings of construction details show possible uses. Workwall Movable Partitions and Paneling, Div. of L. A. Darling Co., Bronson, Mich.

260. T-Chord Longspan Joists, AIA 13G, 32-p. booklet describes structural system for giving clear span to large column-free space. Fabricated from structural split beams and angle web members, welded to form shallow Warren-truss system, joists are rigid, resistant to warping, shrinking, etc. Can be used with various roofing materials. Accessories, components, applications explained; specifications with graphs and tables shown. Design data, moment table, estimate check list given. Brochure includes joist load tables for various sizes, photos of installations. Properties and standard dimensions featured. Haven-Busch Co., 3443 Chicago Dr., S. W., Grandville, Mich.

★ **261. Apparatus for Enginering Tests of Soils, Concrete, Asphalt Materials,** 130-p. catalog illustrates complete line of soil testing equipment. Latest types of equipment are explained in detail, described by photos, including triaxial, pore pressure, direct shear, compaction, consolidation, permeability, etc., apparatus. General information given includes data on scales and balances, proving rings, mixers and crushers, water stills. Portable concrete testing machines —use, operation, accessories—featured, as well as other test apparatus. Bituminous testing equipment discussed, illustrated. Mobile testing laboratory available. Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

doors and windows

323. Naturalite Dome Skylights, Ceiling Domes, 12-p. booklet describes preassembled skylights made of acrylic plastic. Available in two types: clear-colorless said to admit 92 percent visible light, filters ultraviolet rays; white-translucent gives diffused light, reduces heat transmission, filters infrared rays. Flashing frames are of extruded aluminum unless otherwise specified—have built-in condensation gutter and drainage system. Ceiling domes suitable for ceiling with light wells are mounted with full span, piano-type hinges. Installation illustrated in detail. Various kinds available: burglar resistant, automatic fire vent, circular dome skylight and ceiling domes, power-vent skylights; components given—curbs, scuttles, shades, combination units. Drawings, specifications, sizes shown. Plastic Products of Texas, 5115 E. Grand Ave., Dallas, Tex.

324. New Modernaire Wood Windows, AIA 16-L, 6-p. brochure gives installation and frame details for series "D" window —awning, casement, hopper applications. Accessories, four types of operating mechanisms are illustrated. Various combinations of units shown; dimensioned drawings for awning, hopper, fixed casement windows given. Specifications, features such as narrow sightline, shadow box frame, prepitched subsill surfaces listed. Modernaire Corp., 8400 Kinsman Rd., Cleveland 4, Ohio.

electrical equipment, lighting

424. Panelescent Lamp, 4-p. brochure details construction and characteristics of new ceramic-on-metal panel lamp using electroluminescence principle — for low brightness surface lighting. Among applications suggested in photos are: radio-clock face, radio dial, thermometer, luminous house numbers, glowing switch plate, self-illuminating sign. Also illustrates ceiling panel for soft-interior lighting. Sylvania Electric Products Inc., 1100 Main St., Buffalo 9, N. Y.

425. Flexicore Electrified Floors, 36-p. guide to installation of complete electrified-cellular concrete-floor system for office buildings. Describes how use of system facilitates office-building design. Gives sample structural design problem with drawings of typical floor, sections, and structural details; photos show full installation procedure. Also section on design of underfloor electrical distribution system: step-by-step procedure; typical distribution layouts; isometric wiring diagram. Additional data on floor openings, fireproofing, suspended ceilings, floor finishing. Structural and electrical specifications. The Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio.

426. Modular Lighting Systems, AIA 31-F, 12-p. pamphlet discussing features of modular ceiling lighting systems and pendant lighting units. Describes and illustrates systems designed to coordinate acrylic diffusers, suspended acoustical baffles, sprinklers, air diffusers, and movable partitions. Photos show actual installations; drawings explain assemblies. Catalog section shows variety of pendant lamp designs; includes engineering data. The Wakefield Co., Vermilion, Ohio.

427. Wilson Luve-Tile, AIA 31-F-2, 16-p. guide for planning and installation of 12″ square louvered tiles of molded plastic material for ceiling-light diffusion. Drawings explain suspension system which permits hanging from either side. Photos show tiles installed over entire ceiling and in decorative patterns. Discusses key factors in planning. Sample layout; wall sections; analysis of basic elements; pictorial installation and maintenance instructions. J. A. Wilson Lighting & Display, Inc., 260 Delaware Ave., Buffalo 2, N. Y.

428. Sola Fluorescent Ballasts for Plastic Signs, 4-p. folder lists electrical, mechanical specifications for 15 ballasts for outdoor nonweatherproof service. Wiring diagrams for various types of ballasts are featured. Data concerning indoor fluorescent ballasts and constant wattage mercury vapor lamp transformers for indoor-outdoor service also included. Sola Electric Co., 4633 W. 16 St., Chicago 50, Ill.

429. Extended Area Lighting, AIA 31-F-2, 12-p. bulletin describes line called Luma Ceiling. General information given shows characteristic of line—soft, diffused light obtained from reflective surface of corrugated rigid vinyl plastic. Extruded aluminum channels have standard satin anodized finish; are spaced on 3′ centers. Low flammability, uniform air distribution, acoustical properties described. Installation details are stressed, illustrated by detail drawings. Photos of applications, engineering data included as well as coefficients of utilization tables, maintenance instructions, accessories. Pittsburgh Reflector Co., 421 Oliver Bldg., Pittsburgh 22, Pa.

finishers and protectors

539. The Multi-Clean Method, 4-p. brochure is guide to maintenance of terrazzo and oxychloride floors. Method is designed for both old and new floors. Initial treatment of floors is detailed in 10 steps

(Continued on page 144)

PROGRESSIVE ARCHITECTURE, 430 Park Avenue, New York 22, N. Y.

I should like a copy of each piece of Manufacturers' Literature circled. Coupon must be used by 2/1/58.

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139	261	429	897
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257	425	652	970
258	426	748	971
259	427	895	

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p/a manufacturers' literature

(Continued from page 143)

—maintenance operation, restoration of old floors also fully described. Folder lists incorrect materials for maintenance, as well as possible cleaners, wax removers, sealers wax, floor dressing. Data on floor and scrubbing machines, vacuum cleaners also included. Multi-Clean Products, Inc., 2277 Ford Pkwy., St. Paul 1, Minn.

540. Epoxy Paints Have Wider Applications . . . Longer Life . . . With Thiokol Liquid Polymer, 2-p. leaflet describing properties of epoxy paint modified with liquid polymers. Advantages of process include resistance to water, oil, chemicals; adhesion to wood, metals, concrete; impact resistance. Applied with conventional spray equipment; air-drying. Sample coated metal strip is enclosed. Useful in industrial maintenance, marine, and railroad applications. Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

541. Glasfab Torch Tape, 4-p. leaflet describing moisture and corrosion protective tape. Tape made from loom-woven open-mesh glass cloth filled to a thickness of 60 mils with plasticized coal-tar pitch. Type of waterproofing is useful for spandrels, flashings, roof drains. Tape is resistant to abrasion and chemical fumes. Installation described; examples of uses cited. Twinsburg-Miller Corp., P. O. Box 207, Twinsburg, Ohio.

insulation (thermal and acoustical)

652. Baldwin-Hill Perimsul, AIA 37-B-3, 4-p. bulletin describes perimeter insulation which is felted from spun mineral wool fibers; lists properties and uses. Five methods of application are illustrated and statement of testing results are included. Use of insulating material under concrete floor and in crawl space is stressed. Baldwin-Hill Co., 500 Breunig Ave., Trenton 2, N. J.

sanitation, plumbing, water supply

748. Unitron Chair Carriers and Closet Fittings, AIA 29-H-8, 32-p. catalog presents data for complete line of carriers and closet fittings. Features include: reversible closet carrier to fit all types of closet fixtures; vertical adjustment from ¾" to 4⅞" provided by reversible foot; connection allows 4" adjustment between face of fixture carrier and wall line; adjustable-reversible face plate, double fitting, to provide ease of installation. Common vent gives air circulation for fixture and branch. Assembly of components shown in detail. Series of chair carriers illustrated by drawings, application information—for closet bowl, single and double closet fittings (horizontal and vertical). Installation diagrams, suggested layouts, other types of lavatory carriers given. Josam Manufacturing Company, Michigan City, Ind.

specialized equipment

895. Stainless Steel Kitchens, 6-p. pamphlet showing line of stainless steel kitchens for use in schools, hospitals, churches, and other commercial structures. Advantages include: chip-proof, warp-proof, corrosion-resistant carbinet surface. Dimensions and details of complete line of modular base and wall cabinets in numerous sizes. Custom-built features also available. Filter exhaust system available with wall cabinet enclosure. General specifications for base and wall cabinets given. Stainless Food Equipment Co., 272 New St., Newark 3, N. J.

896. Flexalum Blinds, 20-p. pamphlet illustrating design features of aluminum Venetian blinds, draw draperies, and audio-visual blinds. Gives component test data to substantiate that slats resist bending, are non-corrosive, washable, and heat-reflective. Shows various decorative applications of blinds used for single or multiple windows. Specifications, installation details. Hunter Douglas Aluminum Corp., Chrysler Bldg., 405 Lexington Ave., New York, N. Y.

(Continued on page 148)

(Continued from page 144)

897. Parkmaster, 24-p. brochure contains description of automated mechanical parking system. Structural-steel elevator platform and turntable is lifted by precision roller chains, hydraulic jacks. Double-gear pump driven by electric motor; feature of lifting mechanism is cross-chain equalizing system, tied by torque tubes from corner to corner for horizontal stability. Two shuttles on elevator platform receive, store cars—are self-propelling. Cars can be parked two deep by turning platform a half revolution—speed can be varied to meet operating time requirements. Safety tested, system can be installed for above- or below-ground operation. Photos of systems, safety features given; several layouts for possible installation. Parkmaster Systems, Inc., 401 Fernwell Bldg., Spokane, Wash.

Unit-Lab Educational Science Equipment, 16-p. two-color catalog is guide to school laboratory furniture. Units are designed for single- or multiple-unit purposes; variations obtainable by use of different tops, fittings, sinks, storage facilities. Student and instructor tables, work tables, storage units, fume heads, sink units, fixtures and accessories available are pictured. Planning, engineering services also obtainable. Write direct on letterhead: Laboratory Furniture Co., Inc., Old Country Rd., Mineola, L. I., N. Y.

898. Vizusell, 20-p. booklet concerning channel-bracket system for display of merchandise. Structural channel is applied directly to existing wall by use of horizontal furring strips, or can be stud-gunned. Double-faced channel can provide perimeter merchandising, stock room shelving at same time in supported or self-supporting wall sections. Metal and wood gondolas, other systems allow display versatility. Brackets, closed and open binning described. Line illustrated by photos, drawings, construction details. Darling Displays, L. A. Darling Company, Bronson, Mich.

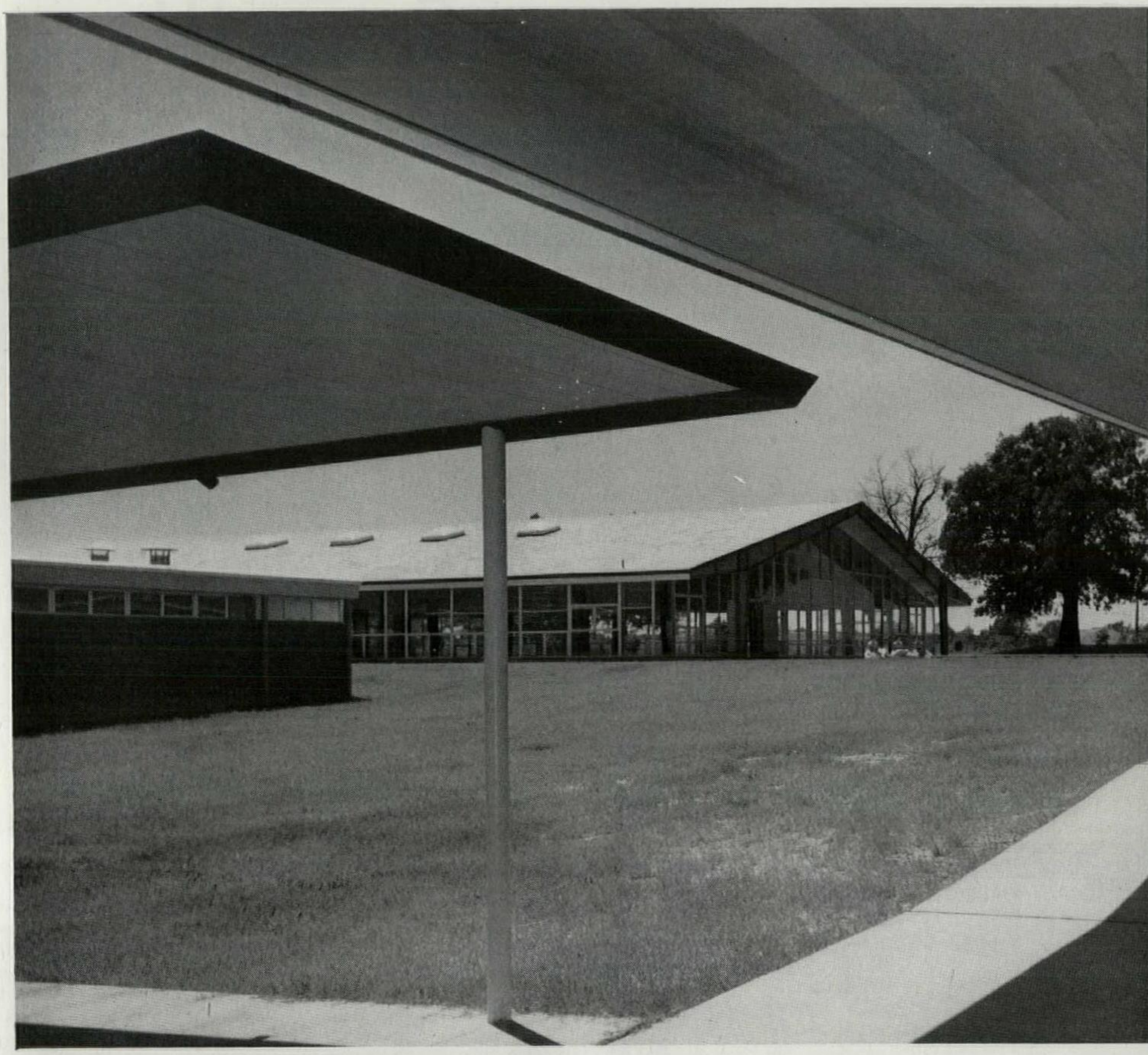
899. Stacor-Matic, 4-p. brochure showing new drafting unit consisting of adjustable, steel, linoleum-covered drafting table and reference area. Space-saving features include drawer and file space, electrical outlets. Drafting table adjustable by foot control. Several models illustrated. Stacor Equipment Co., 768-778 E. New York Ave., Brooklyn 3, N. Y.

surfacing materials

969. Monorock—Monolithic Concrete Floor Surfacing, 4-p. brochure describes surfacing for industrial, commercial, institutional floors. Consisting of surface mixture of aggregate, with controlled water content, material strengthens base concrete. Low water-cement ratio gives smooth, long-wearing finish. Surfacing becomes integral part of slab. Aggregate is graded, tested by rigid standards; emery, aluminum oxide, other abrasives added for nonskid flooring. Application process—including spreading, screeding, surfacing, leveling, troweling, finishing—illustrated by photos. Detailed specifications, application data given. Kalman Floor Company, Inc., 110 E. 42 St., New York 17, N. Y.

970. Crystalline Glazes, Scored Tile, AIA-23a, 8-p. booklet reviewing abrasion-resistant, textured surface tiling for bathroom floors, countertops, and window sills. Two-page color chart of hues available, with photos of numerous installations. Scored tiles are also obtainable with crystalline glazed surface. Sizes and patterns included. American-Olean Tile Co., Lansdale, Pa.

971. Color-Engineered Facing Tile, 30-p. brochure showing scientific approach to color selection. Contains recommendations for choice of color, depending upon type of industry involved. Illustrations and descriptions of various applications—power plants, chemical industry, food service and processing, school, hospitals. Standard color chart included. Illumination, surface finish, technical data sections. The Facing Tile Institute, 1520 18 St., N.W., Washington 6, D. C.



The J. R. Moore Junior High School, Tyler, Texas, is equipped with B&G Boosters where low heads and small motors are adequate and B&G Universal Pumps where high heads and capacities are required. B&G Airtrol Fittings and Compression Tanks are also installed for effective control of air in the system.

ARCHITECTS-ENGINEERS:
Caudill-Rowlett-Scott, Bruce and Russell, Associated, Bryan and Tyler, Texas

MECHANICAL ENGINEER:
J. W. Hall, Jr., Bryan, Texas

MECHANICAL CONTRACTOR:
Leon Southall Plumbing Co., Longview, Texas

A COMPLETE LINE OF EQUIPMENT FOR HEATING AND

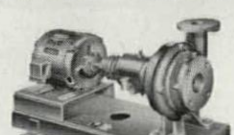
Water Heaters

Monoflo Fittings

Relief and Reducing Valves

Flo-Control Valves

Compression Tanks

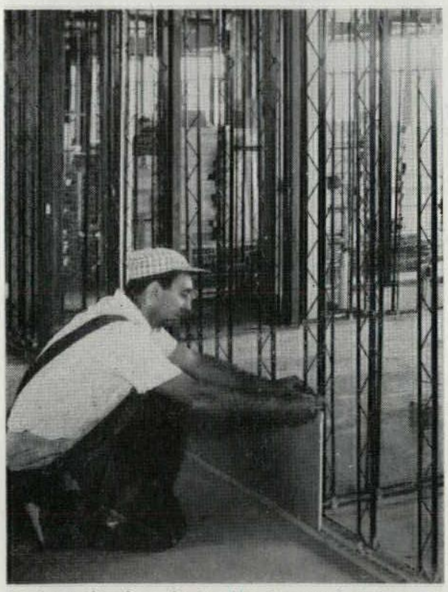


Centrifugal Pumps

Here's where Gold Bond's

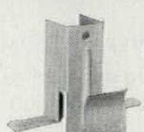
meant economy,

Suburban Community Hospital, Cleveland, Ohio.
Architect: Dalton-Dalton Associates; *General Contractor:* The H. L. Vokes Co.;
Lathing and Plastering Contractor: J. N. Marino Plastering Co.; all of Cleveland.



Holostud's *fast clip* holds the stud and starts the gypsum lath—*in one operation.*

Holostud with Gypsum Lath



Construction savings count — and the money saved by Holostud in Cleveland's new $2,000,000 Suburban Community Hospital was then available for other vital hospital facilities.

Gold Bond's Holostud Wall System for non-load-bearing partitions makes installation faster—the new combination stud shoe and starter clip shown here, for example, saves up to 2½ minutes on every stud. Holostud's open-strut-type construction speeds and simplifies routing of utilities horizontally as well as vertically.

Gypsum lath was used with Holostud here — a system that gives a sound transmission loss rating up to 50 decibels. Gypsolite, the mill-mixed lightweight Perlite plaster, was used as base for Gold Bond Hydrated Finish Lime.

LATH AND

NATIONAL GYPSUM

Reception room on the Executive Floor of the new Procter & Gamble building in Cincinnati, Ohio
Architects & Engineers—Voorhees, Walker, Smith and Smith, New York City

Carpet—for better sound control, lower maintenance costs

Recent studies at a nationally-known acoustics laboratory prove that carpet is a highly effective sound control agent.

Carpet has a sound absorption coefficient equal to many materials used exclusively for sound control and it virtually eliminates floor impact noises.

Combined with the 50% reduction in maintenance costs that carpet achieves in heavy traffic areas, its two-fold importance to your clients becomes apparent.

And, of course, your clients benefit from the increased safety and prestige carpet brings to an office —not to mention the effect of its beauty and comfort on employee morale and efficiency.

Send today for your file copy of "Sound Conditioning With Carpet", the complete study of carpet's ability to control airborne and impact noises. You'll discover that, in addition to the beauty, dignity, safe footing and maintenance economy carpet gives to your clients, it is the only dual-purpose sound control you can specify.

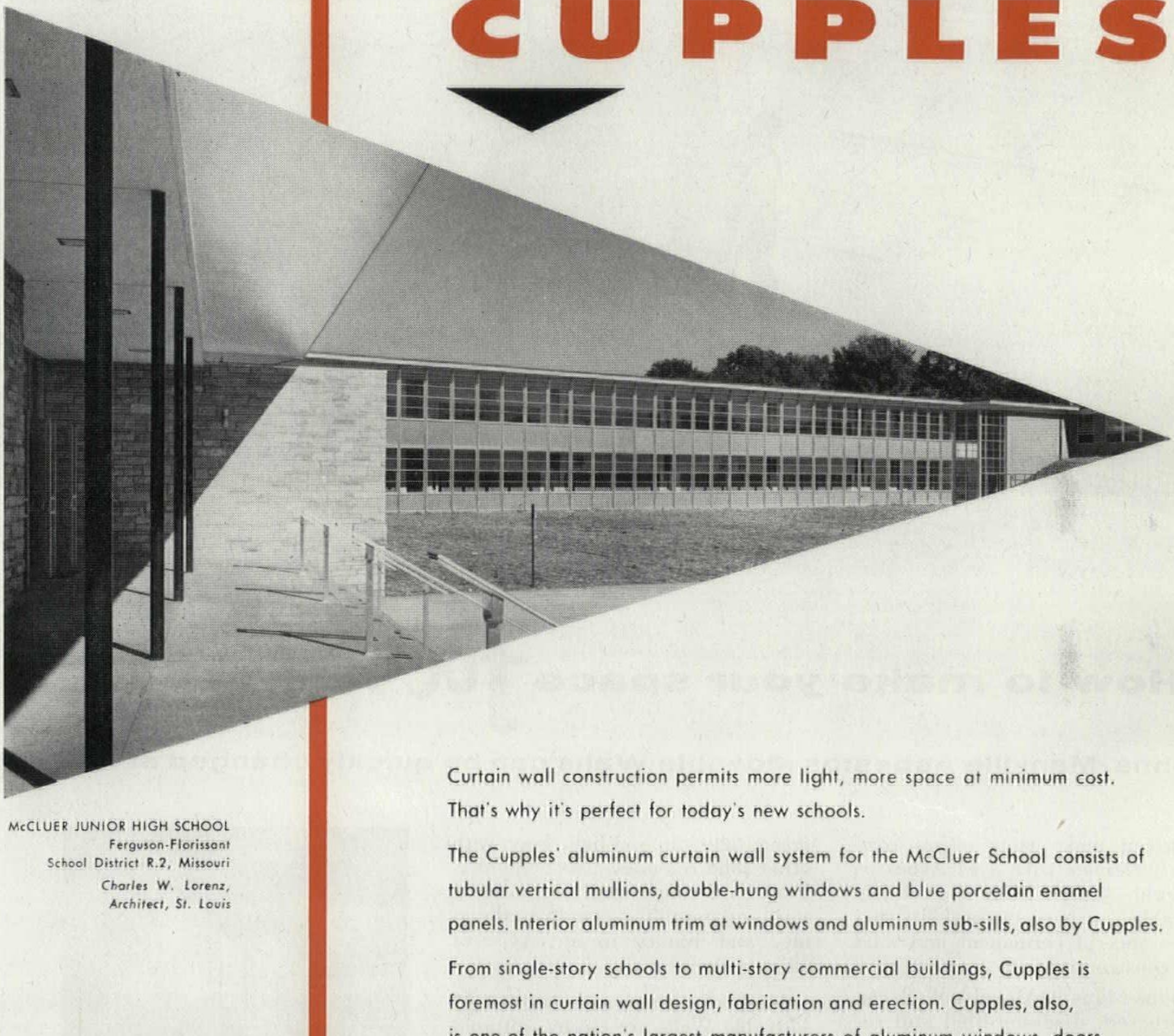
If you don't already have your copy of **"Cutting Costs With Carpet"**, a comparative study of the maintenance costs of carpeted and non-carpeted floors, ask for that, too. Write Dept. A-4, Carpet Institute, Inc., 350 Fifth Avenue, New York 1, N. Y.

Specify carpet designed and made for the American way of life by these American manufacturers: Artloom
Beattie • Bigelow • Cabin Crafts-Needletuft • Downs • Firth • Gulistan • Hardwick & Magee • Hightstown • Holmes
Karastan • Lees • Magee • Masland • Mohawk • Philadelphia Carpet • Roxbury • Sanford • Alexander Smith

CARPET INSTITUTE, INC., 350 Fifth Avenue, New York 1, N. Y.

ANOTHER OF THE MANY MODERN SCHOOLS WITH

ALUMINUM CURTAIN WALLS BY CUPPLES



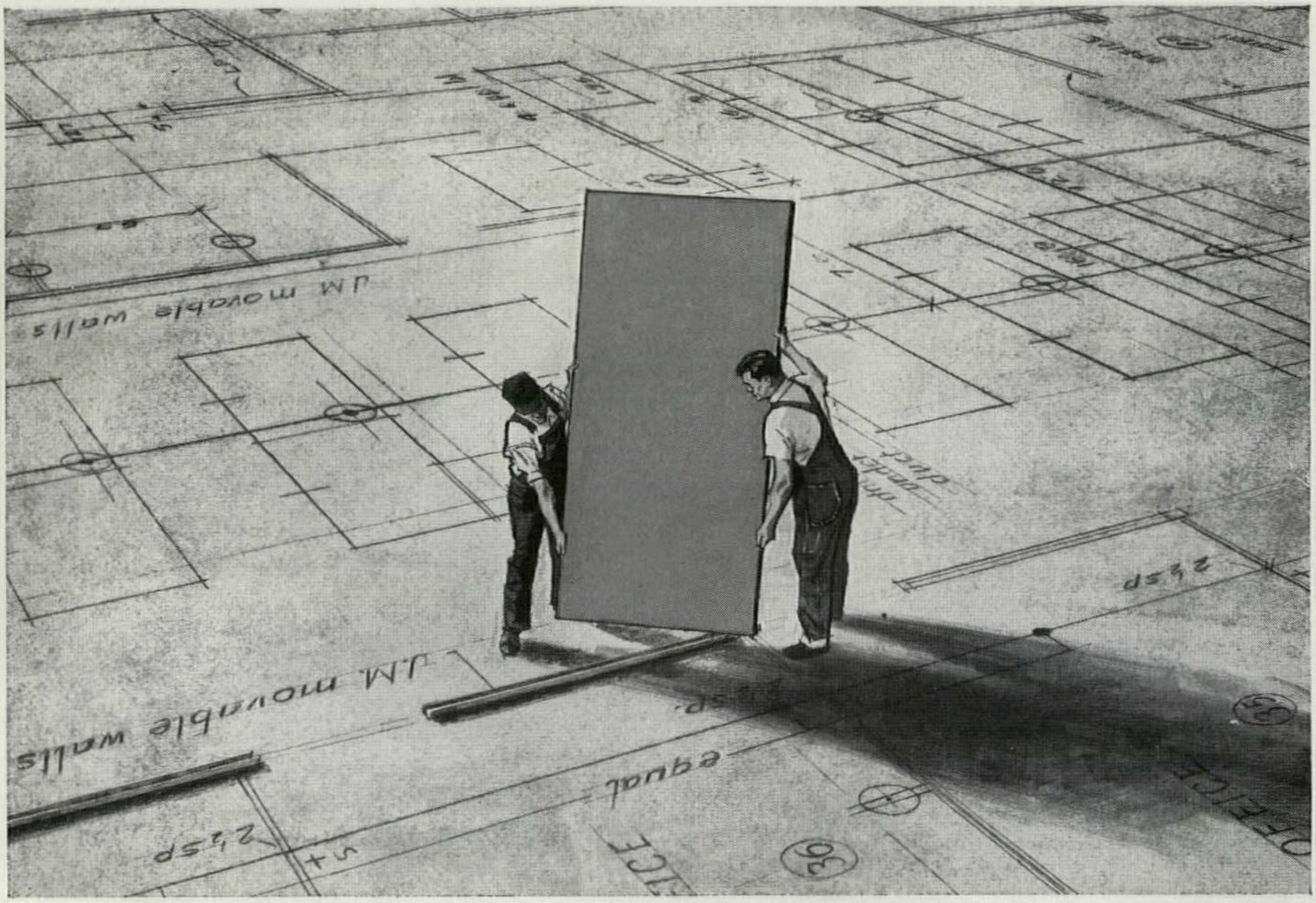
McCLUER JUNIOR HIGH SCHOOL
Ferguson-Florissant
School District R.2, Missouri
Charles W. Lorenz,
Architect, St. Louis

Curtain wall construction permits more light, more space at minimum cost. That's why it's perfect for today's new schools.

The Cupples' aluminum curtain wall system for the McCluer School consists of tubular vertical mullions, double-hung windows and blue porcelain enamel panels. Interior aluminum trim at windows and aluminum sub-sills, also by Cupples.

From single-story schools to multi-story commercial buildings, Cupples is foremost in curtain wall design, fabrication and erection. Cupples, also, is one of the nation's largest manufacturers of aluminum windows, doors, Alumi-Coustic grid systems and special ornamental products.
Our catalogs are filed in Sweet's.

Cupples PRODUCTS CORPORATION
2660 South Hanley Road • St. Louis 17, Missouri



How to make your space *fit* your needs

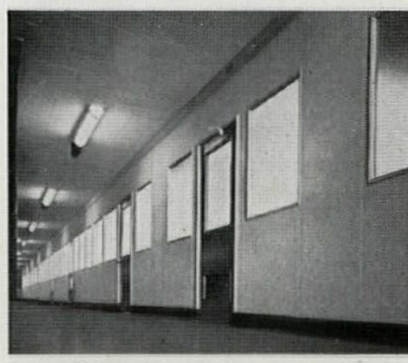
Johns-Manville Asbestos Movable Walls can be quickly changed at will

You can make your offices *completely flexible* with J-M Asbestos Movable Walls. They are readily movable, yet have the stability and appearance of permanent and solid wall construction.

Johns-Manville Movable Walls can be erected, disassembled and relocated time and again—wherever a change in space is required. This time-saving and money-saving flexibility permits quick and economical alterations in size, arrangement or type of layout.

J-M Movable Walls are prefinished in stippled, textured colors of light green, light tan and light gray, with other solid colors available on order. Their hard, tough finish is scratch and stain resistant. These walls lend dignity and beauty to any type of office interior.

Made of asbestos and cement J-M Movable Walls are strong, rotproof and long lasting. Wall changes can often be made in a few days or during a weekend. You save construction dollars. For *free* brochure "Asbestos Movable Walls," write Johns-Manville, Box 158, New York 17, N. Y. In Canada, write 565 Lakeshore Rd. E., Port Credit, Ontario.



Johns-Manville flush or glazed partitions are furnished and erected by J-M's own Construction Department, complete with doors, door hardware, glass and trim.

THE AMERICAN INSTITUTE OF ARCHITECTS
CENTENNIAL CELEBRATION
1857-1957

Johns-Manville congratulates the American Institute of Architects on its 100th Anniversary.

—Consult an architect—use quality materials.

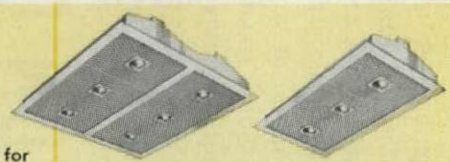
JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

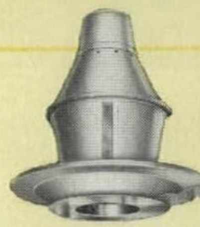
BY ZEUS!

these **Guth brascolite** incandescent fixtures are TOPS!

SQUARE RECESS UNITS
with Holophane and Corning lenses for Intensive, Diffusing, Concave, Convex, Focusing and Asymmetrical distributions.

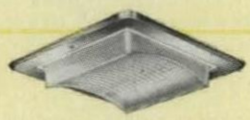


SILVER BOWL DIFFUSING fixtures in 4′ x 4′ and 2′ x 4′ sizes with the amazing GRATELITE Louver Diffuser*.



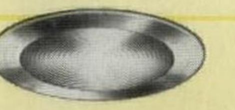
ALZAK PIN-HOLE RECESS LIGHTS
For intense downlighting—100 watt to 1000 watt sizes in General Service and Silver Bowl lamp types.

THE ROTATORS
Both EYEBALL (shown) and CONCEALED rotator. Adjustable recess downlites for PAR and R-lamps.



CORRIDOR PRISMATIC RECESS FIXTURES
Three types for 2½:1 and 1:1 ratios.

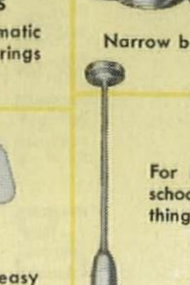
LONG BOY ELLIPSE
Surface luminaire
(also available in recess units). Gives narrow, high intensity beam for indoor or outdoor mounting, or for accent lighting.



ROUND CONCAVE RECESS
Also available with Flat or Prismatic glass, and with metal concentric rings or open types.

BABY RECESS LIGHTS
For directional markers, night lights, other minimum intensity installations. Narrow beam or drop-lens types.

ALZAK HINGED GLASS Drum Units
Hinges on concealed chain for easy relamping and cleaning.



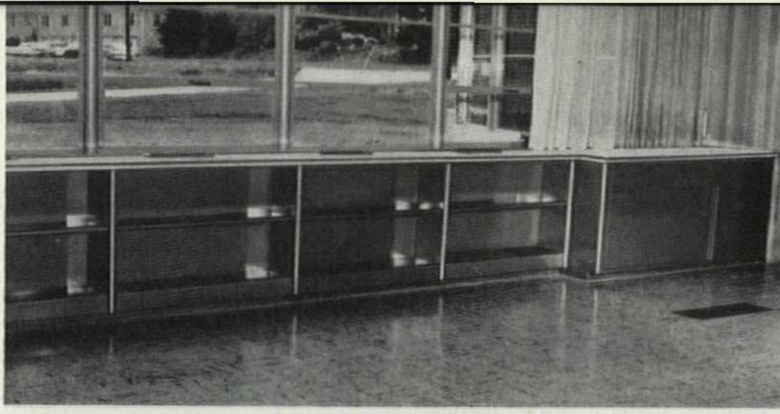
GRATELITE INDIRECT
Pendant Type
For luminous indirect lighting in schools, stores and offices. Something new . . . and beautiful!

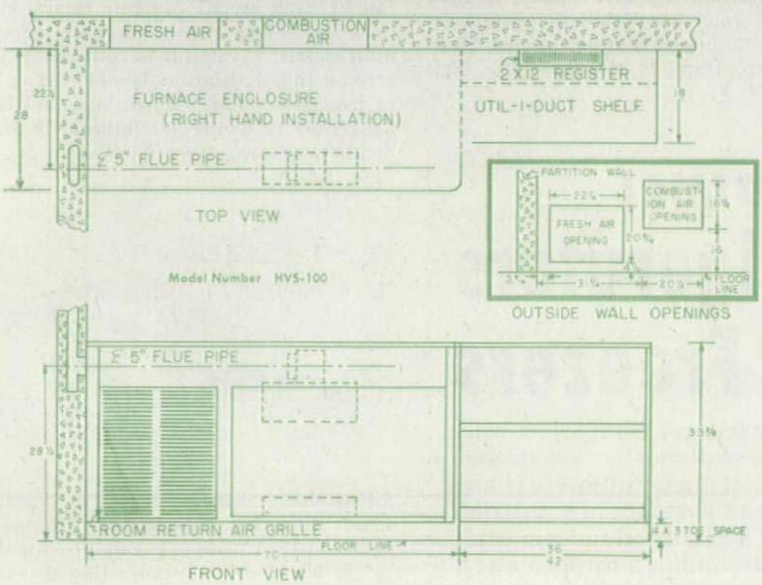
*GRATELITE Louver Diffuser® U. S. Pat. No. 2,745,001. Canadian Patented 1957, No. 538,245.

These and many, many more incandescent fixtures are included in this new Brascolite Catalog by Guth. A complete working tool, it contains all information needed to figure any incandescent lighting job.

Write on your letterhead for your complimentary copy.

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



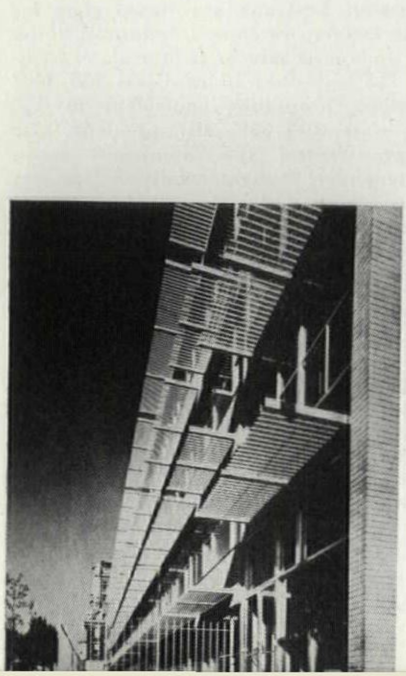


With the dollar volume for school projects remaining high for next year (*see "Business Forecast for 1958,"* NOVEMBER 1957 P/A), architects will continue to search for environmental-control systems that insure superior performance at installation costs in keeping with established budgets.

Such a system (*above*) was successfully used in the Seventh Day Adventist Elementary School at Lincoln, Nebraska. Architect H. O. Potter specified a gas-fired, forced-air heating and ventilating system—installed along the outer walls—to fulfill all requirements of automatic heating, ventilating, and filtering utilizing both outside air and recirculated room air. Forced-air distribution, carried by ducts behind multipurpose bookshelf sections, emerges topside through 2" x 12" registers spaced 42" on centers. Window areas are thus blanketed with controlled, tempered air that stops cold air before it enters the room. Air is diffused upward and outward at correct angles to prevent drafts and assure continuous circulation. The conditioned air automatically compensates for variations in room requirements due to size, occupancy, solar gain, outside changes, and other considerations. Each room has its own system, eliminating need for costly additional space of separate building to house a central heating plant. Any number of classrooms can be added without change of basic system; three furnace sizes are available for installation as left or right hand units.

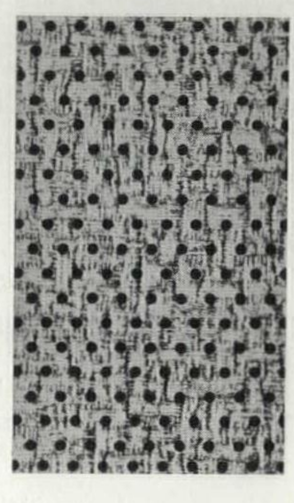
Norman Products Co., 1150 Chesapeake Ave., Columbus 12, Ohio.

Curtain walls of green-tinted glass block (above) *have been erected at New York School of Printing, New York; Architects: Kelly & Gruzen. These walls provide an abundance of glare-free light, are almost maintenance free, and cost-in-place is considerably less than conventional walls (no back-up here). Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.*



Standard aluminum-grating panels were used at Temple University, Philadelphia, by Architects Nolen & Swinburne as sun shades (left). *Hot air circulates freely through open mesh. Panels can also be used as window-cleaning walkways. Irving Subway Grating Co., Inc., Long Island City 1, New York.*

Acoustiflex plastic (below) *is a brand new retaining material for glass-fiber acoustical blankets. Product is odorless, nontoxic, and nonflammable; available in chrome, silver, gold, brass, and copper; variety of perforations possible. Metallic Plastic Corp., 27-10 44th Drive, Long Island City 1, New York.*



(Continued from page 159)

air and temperature control

Electric Glass Heater: newly designed 1500-w radiant-glass heater features built-in deflector on top to keep metal frame cool. Radiant surface is Pyrex glass; heat-resistant gray satin finish with chrome-plated guard completes unit. Measurements of unit: 38-½" x 12-¼" x 3-7/16". Particularly adaptable to limited-space installations. Berko Electric Mfg. Corp., 212-40 Jamaica Ave., Queens Village, N. Y.

Zonvalve: thermostatically controlled valve offers individual room heating control for apartment houses, buildings, stores, institutions. Made in standard sizes, valve is powered by electric motor, uses low-voltage wiring. Burner or heat circulator is automatically turned on when valve is in open position. Package—valve, thermostat, transformer—available to operate on steam and hot-water heating systems. Heat-Timer Corp., Dept. 20, 657 Broadway, New York 12, N. Y.

construction

Concrete Dissolvent: chemically compounded concentrate of organic and inorganic synthetics called Disolvex has been successfully tested as dissolvent for hardened concrete. Working by catalytic action, liquid begins to act immediately on contact; material does not affect aggregates. Liquid must be used as a bath—cleaning time from four hrs to overnight, depending on age of concrete. Dissolvent can be used on all concrete mixes, except those including rubber—has no effect on most metals. Available in concentrate form, recommended dilution is one-part solvent to five-parts water. Caustic material is not dangerous to hands or clothing. Industrial Synthetics Corp., 2000 W. Walnut St., Chicago, Ill.

Adjustable Shim: recently developed metal shim has advantage of being adjustable. Unit (*above*) can provide from ⅜" to 2" of shim by adjusting to various notches—is easy to use. Need for wood shims is eliminated for most applications. Loxit Systems, Inc., 1217 W. Washington Blvd., Chicago 7, Ill.

doors and windows

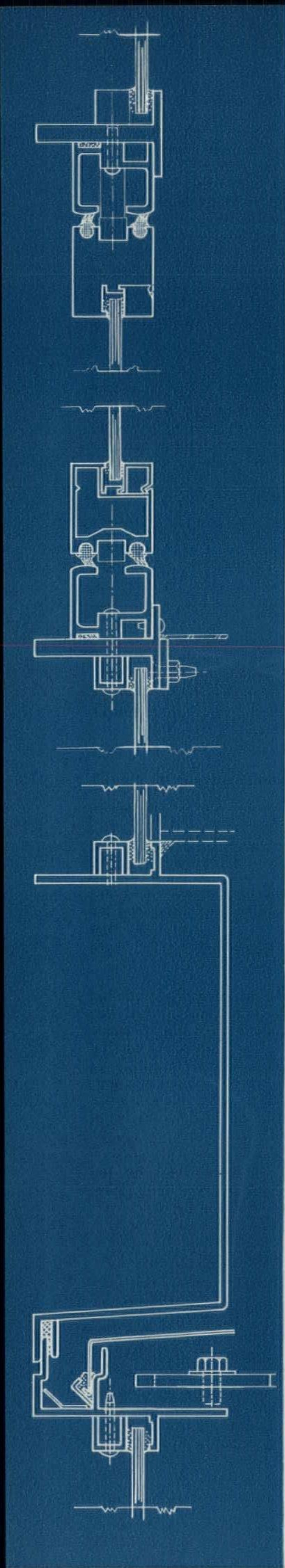
Jalousie Storm Door: new door is both ventilating summer screen door and winter storm door. Open louvers provide summer ventilation; when louvers are closed, storm door results. Made of aluminum, doors will not rot, warp, crack—need not be painted. Solid core Novoply construction gives rigidity. Louvers lock firmly in various positions to give partial air circulation if desired. Unit is adjusatble to fit most openings. Fleet of America, Inc., 1977 Walden Ave., Buffalo 25, N. Y.

Industrial Lo-tran: gray-tinted glass for use in factory, warehouse, industrial building windows is said to reduce glare, transmit 12.5% visible light. Glass has heat absorbing properties equivalent to ¼" plate glass with 58% absorption of solar energy. Neutral tint eliminates see-in ability under daylight conditions; see-out ability perfect under controlled conditions. Color is not distorted. Sizes up to 60" x 38" available. Houze Glass Corp., Point Marion, Pa.

electrical equipment, lighting

"Super-White" Reflector Lamps: color-balanced incandescent reflector lamp for window and interior displays blends with fluorescent lighting. Light has pale blue-white cast instead of usual red-yellow of incandescent bulbs. Unit is achieved

(Continued on page 162)



CURTAIN WALLS
WITH ALUMINUM REVERSIBLE WINDOWS
by GENERAL BRONZE

FOR NEW I.B.M. OFFICE BUILDING, HARTFORD, CONN.

Architects:
Pedersen & Tilney
Contractor:
A. E. Stephens Company

"CURTAIN WALLS by GENERAL BRONZE" is more than just a phrase. Like the hallmark you find on fine silverware, it has become a mark of quality recognized throughout the entire construction industry. More than that, it is a sure indication that the architect, the contractor and the owner recognize that the quality of their completed building can be no better than its component parts. And that's why so many of America's finest new buildings feature "Curtain Walls by General Bronze."

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

GENERAL BRONZE
CORPORATION · GARDEN CITY, N.Y.

PERMATITE DIVISION—Custom-built Windows, Architectural Metal Work and Revolving Doors. **ALWINTITE DIVISION**—Stock-size Aluminum Windows. **BRACH MFG. CO. DIVISION**—Multel. T. V., Radio and Electronic Equipment. **STEEL WELDMENTS, INC. DIVISION**—Custom fabrication in steel and iron.

(Continued from page 160)

through process of ceramic fusing—light-blue filter is sprayed on bulb; then bulb is baked almost to melting point to insure effectiveness of filter. Life expectancy of lamp is 4000 hrs; available in 75, 150, 200 w. Duro-Test Corp., 2321 Hudson Blvd., North Bergen, N. J.

Futurliter: fluorescent fixture features "flexible foot-candle package." Functional luminaire adaptable for 100% downlighting, or combination up and down lighting. Features available: louver diffuser, metal cross baffles, 35° x 25° or 35° x 45° lamp shielding, low brightness lenses, ribbed albalite and skytex glass bottoms. Pendant type or close-ceiling installation. Sizes: 4-8 ft lengths; rapid start or slimline series available. Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.

finishers and protectors

Orostone: protective and decorative coating is plastic cement with appearance of stone. Material is achieved by mixing crushed colored stones with clear acrylic plastic—no pigment is used. Coating is said to be waterproof, flexible, maintenance-free, nonfading; not affected by weather conditions. Applicable to walls, panels, columns, and soffits, finish will adhere to concrete, brick, wood, asbestos board, metal. California Stucco Products of New England, Inc., 169 Waverly St., Cambridge 39, Mass.

Wet Surface Coating: newly developed coating and roof cement gives same protection from leaks as asphalt roof coatings. Special additive gives durable bond for all surfaces—wet or dry. Containing asbestos fiber, coating displaces water from surface on contact. Application by brush or spray. The Warren Refining & Chemical Co., 5151 Denison, Cleveland, Ohio.

insulation (thermal and acoustical)

Duct Insulation: improves efficiency of distribution system by preventing heat transfer between conditioned air in ducts and ambient. Lightweight—7 lb per cu ft—insulation also has attractive finish even on curved surfaces. Speed clips hold semi-rigid insulation to surface of duct. Insulation may be painted if desired. Baldwin-Hill Co., Trenton 2, N. J.

sanitation, plumbing, water supply

Customatic: water softener is encased in appliancelike cabinet, 59" x 19" x 14". Feature of unit electrically operated control valve, balanced hydraulically and insulated with nylon. Automatic back-washing takes place at end of regeneration cycle. Tank insulation reduces sweating. Can be used on hard water up to 10 parts per million iron content. Bruner Corp., 4763 N. 32 St., Milwaukee 9, Wis.

Water Sterilizer: ultra-violet radiation device is contained in new Model "S" sterilizer. Constructed of stainless steel, tank has four 60" ultra-violet tubes, special baffles to guide water through unit. Up to 9600 gal of water can be purified per day. Operation is electrical, automatic—no taste, odor is added; minerals are not lost. Unit may be connected to any water supply system, uses common electrical current. Solenoid-operated safety devices do not allow untreated water to leave unit. Sepco Corp., Cross St., Pottstown, Pa.

specialized equipment

Mastermade Movable Desk: Desk constructed of steel and Northern Hard Maple gives lasting service. Book box is 21" x 18" x 5½" of one-piece steel; base of unit is 16-gage pressed steel; frame: 11-gage tubular steel. Maple seat swivels 45° in either direction. Model is adjustable, available in 3 sizes. Metal finished in baked-on enamel, wood in natural lacquer. E. W. A. Rowles Co., 104 N. Hickory St., Arlington Heights, Ill.

books received

Religious Buildings for Today. F. W. Dodge Corp., 119 W. 40 St., New York, N. Y., 1957. 183 pp., illus.

Modern Masonry. Natural Stone and Clay Products. Publication 466. Building Research Institute of National Academy of Sciences, National Research Council, 2101 Constitution Ave., Washington 25, D. C., 1956. 163 pp., illus. $4.50

Handbuch Moderner Architektur. Safari-Verlag, Berlin, Germany, 1957. Distributed in U.S.A. by George Wittenborn Inc., 1018 Madison Ave., New York, N. Y., 959 pp., illus. $25

Lectures on Architectural Science. Edited by Prof. Henry J. Cowan. Academic Press, Box 4251, G.P.O., Sydney, N.S.W., Australia, 1956. 94 pp., illus. 21 s., additional copies 15 s.

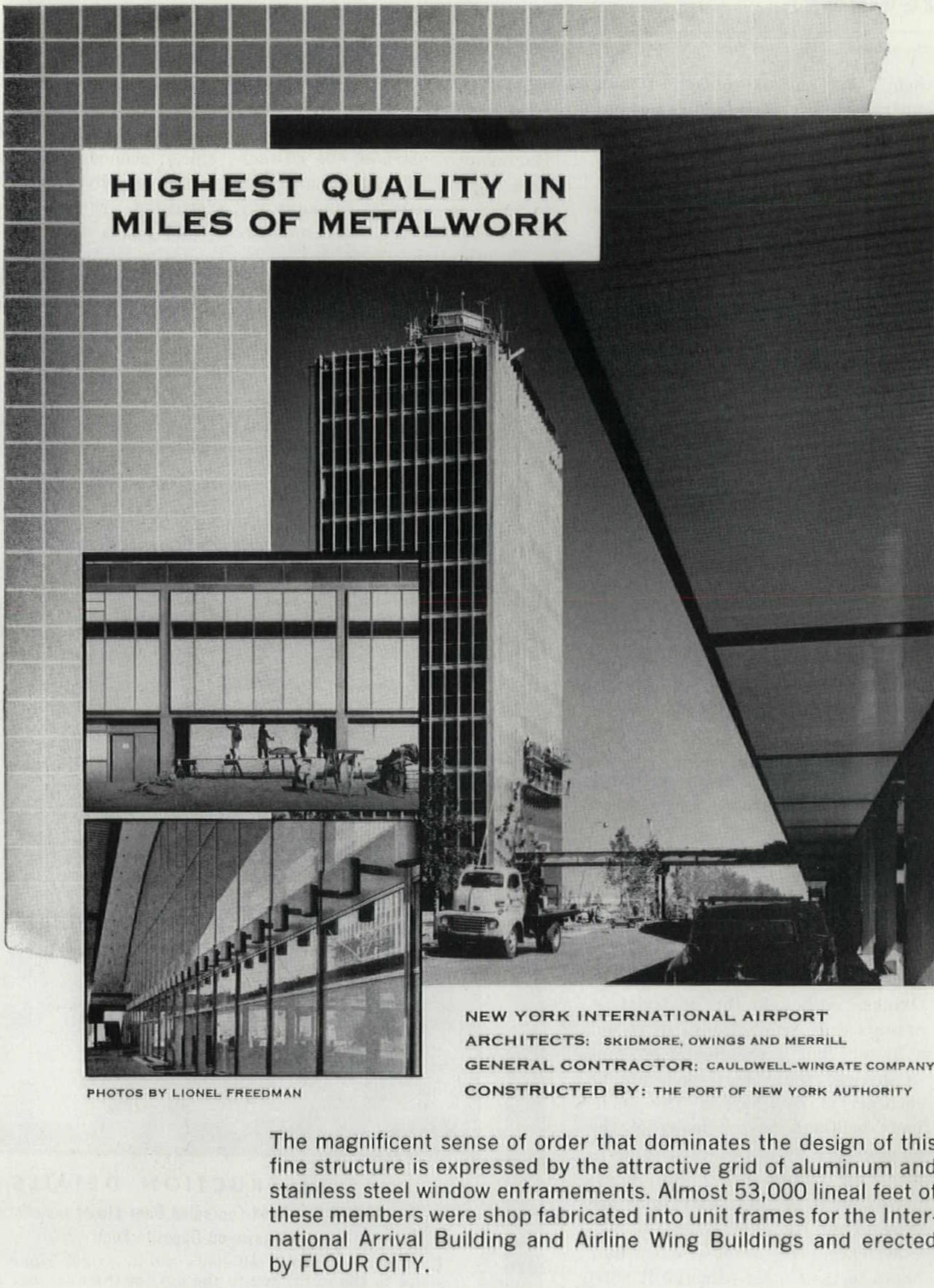
often genuinely brilliant

Architecture as Space. *Bruno Zevi. Horizon Press, 220 W. 42 St., New York 36, N. Y., 1957. 288 pp., illus. $7.50*

The central thesis of Zevi's new book, implicit in the title, is an important one: namely, that in terms of actual sensory experience, architecture can only be apprehended as the manipulation of space. And this experience, Zevi correctly insists, can come only from *moving through* that space. No verbal description or two-dimensional pictorial representation can be other than a poor substitute. This is an obvious point (to architects, at least) but an extremely difficult one to document within the limitations of the printed page. The only medium which could make the point convincingly would be the sound and color movie, since only it could communicate the experience which Zevi is talking about—actual movement through real, three-dimensional architectural space. The distinction is not unimportant: as Zevi points out, this is precisely what so many art critics and art historians fail to recognize and why they persist in analyzing architecture on exactly the same basis accepted for painting and sculpture.

His book is aimed at the layman, whose lack of interest in architecture (as compared to painting, music, drama, etc.) disturbs Zevi, as it disturbs us all. He is convinced that this indifference is not "inevitable and inherent in human nature, or in the nature of building." Hence, he tries to find some new method of approach to that layman, which will be more effective than that ordinarily used by the architect, historian, and critic. Obviously, this is no simple matter. How can one expose this layman to the first-hand experience of great architecture? "It is possible to gather from all over the Western World the paintings of Titian or Brueghel, and so reveal their special qualities in single great exhibitions: it is possible to perform the works of Bach or of Mozart in concerts devoted to

(Continued on page 166)



PHOTOS BY LIONEL FREEDMAN

NEW YORK INTERNATIONAL AIRPORT
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GENERAL CONTRACTOR: CAULDWELL-WINGATE COMPANY
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1893 SIXTY-FIFTH ANNIVERSARY 1958

reviews

(Continued from page 164)

them." But an analogous first-hand experience of architecture comes only from actually visiting it. Lacking that possibility, what is the average layman to do? How can the critic, through the inadequate means of words and pictures, excite the layman's interest; if not enough to travel to great masterpieces, at least enough to analyze the architecture around him?

Zevi thinks that his spatial interpretation is the answer. It is not that architecture is not susceptible to other interpretations. "Every building can be charcterized by a plurality of values . . . anyone is free to write economic, social, technical, or volumetric histories of architecture in the same way that it is possible to write a cosmological, Thomistic, or political analysis of *The Divine Comedy*." But, taken individually, Zevi finds these approaches are too narrow or too specialized to explain the reality of a work of art, especially for the layman. A spatial interpretation of architecture, on the other hand, deals directly with the phenomena of whose impact upon his senses the layman is aware.

The largest, and by far the most interesting section of Zevi's book, is devoted to a demonstration of this technique. His field of investigation covers all the great architectural systems of expression since the Greeks. Although the material is organized chronologically, it is not a history but a systematic attempt to analyze the spatial concepts of each period. Zevi here is often genuinely brilliant, as are many of the photographs he has selected to document his points. As might be expected, most of his illustrations are drawn from Italian or Graeco-Roman experience. He devotes only four pages to the Gothic—though it must be admitted that they are scintillating pages. Gothic architects, he says, "for the first time in the general history of architecture, conceived spaces which were in deliberate antithesis to human scale, which induced in the observer not a sense of peaceful contemplation but a mood of imbalance, of conflicting impulses and emotions, of struggle . . . two directions, the vertical and the longitudinal, coexist in silent but acute antithesis."

Having demonstrated the efficacy of his system of critical analysis, Zevi then proceeds to pinpoint the shortcomings of all other methods of interpretation. Here the going gets much rougher. It is true that, unlike Geoffrey Scott, he specifically does *not* call them "fallacies": they become instead, "partial" truths. He lists eight such interpretations: political, philosophic-religious, scientific, economic-social materialist, technical physio-psychological, and formalist. All eight are disposed of in 25 pages of text! Though these pages prove that Zevi is an extremely intelligent and well-read man,

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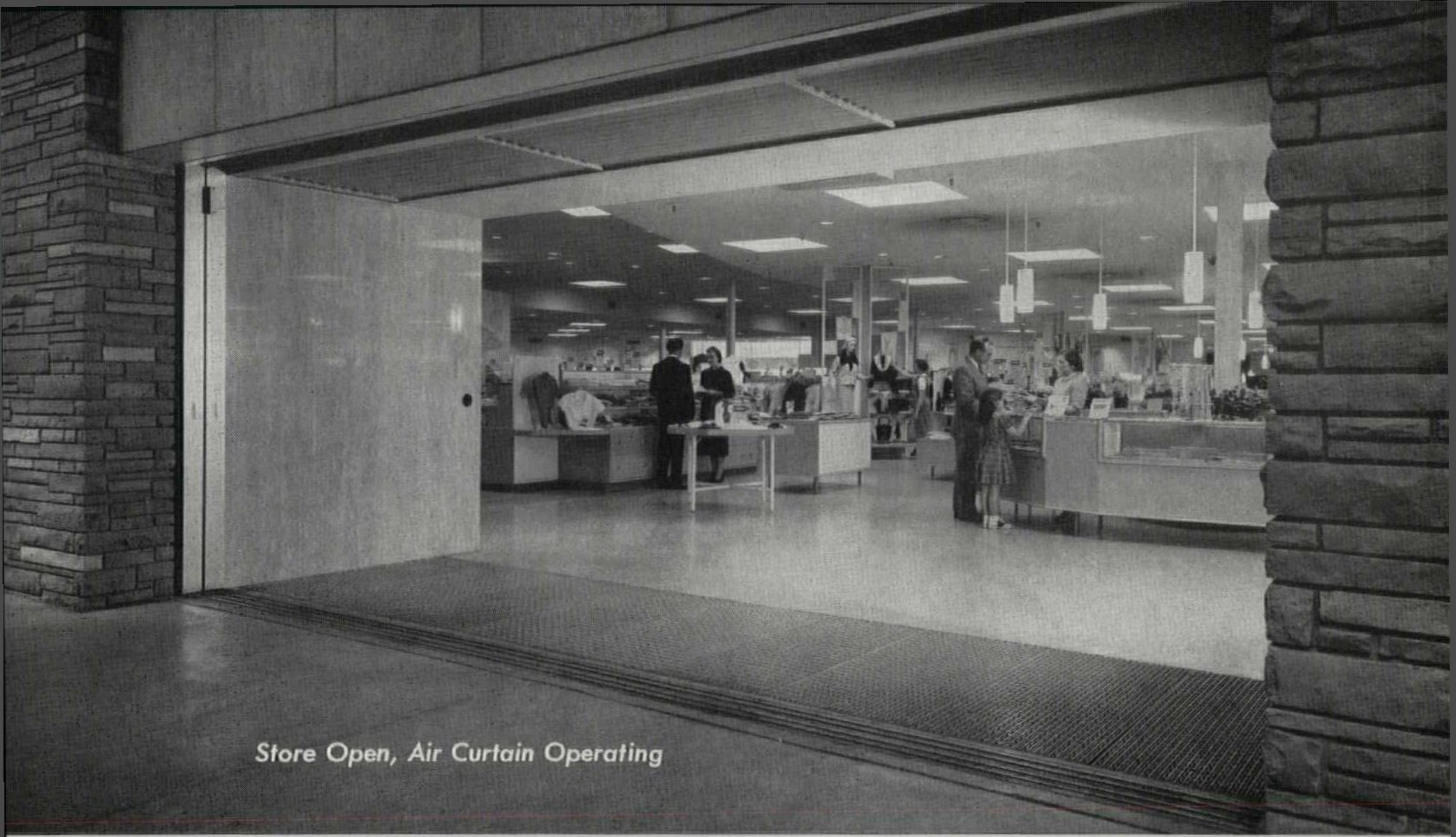

Store Open, Air Curtain Operating

Construction Details on Opposite Page

Store Closed, Doors in Place

(Continued from page 166)

this sort of compression leads less to enlightenment than to caricature. Inadequate or fallacious though they may seem to him, each of these interpretations or points of view represents a perfectly legitimate approach to the criticism of architecture. They cannot be convincingly demolished in an average of three pages each.

Even this treatment, however, might be logically defensible, provided that Zevi's own interpretation emerged as a system which was in fact a synthesis of *all* the truths which characterise a work of art. Unfortunately this is not the case. Zevi's space, as it turns out, is still the esthetic space of the art critic. It has three dimensions, instead of two, so that the spectator walks through it instead of merely looking at it: yet, like the art critic's, Zevi's space is only *visually* perceived. It has no other sensory dimensions. Obviously, this leaves him in much the same position as the critics whom he distrusts. For the sunbeam which enters his cathedrals has not only light but heat as well; it is perceived equally by the eye and the skin. And the enclosed volumes it traverses are not vacuums: they are filled with air. For live men this air has movement and temperature, carries sound, is freighted with odors. And all of these properties of architectural space modify (under extreme conditions, *determine*) men's total esthetic reaction to it. Zevi, certainly, is aware of this: but to admit it is to disestablish the supremacy of his own interpretation and to open the door to some of those other interpretations he has so impatiently dismissed.

Or again: the men who enter his buildings are not like unexposed photographic film, ready to register a set of clear and undistorted impressions. The devout Catholic who enters St. Peter's sees it from a profoundly different perspective than from that of the agnostic. And the invisible chains which tie the dome together will disturb the modern architect but not the lay admirer of Michaelangelo. This, too, Zevi would surely admit; but in so doing, he opens the door to still another set of dismissed interpretations. His criteria, in short, are neither as universal nor as absolute as he claims.

Architecture as Space is thus an interesting but uneven book. It is aimed at the layman, yet much of its material is highly technical (e.g., the section called, "The Representation of Space"). It is polemical in tone yet the polemic itself is not logically constructed: it ends, anticlimactically, with an extensive yet far from definitive bibliography, and a final, bulky section of "Notes." One has, somehow, the uneasy feeling that Zevi is speaking over the heads

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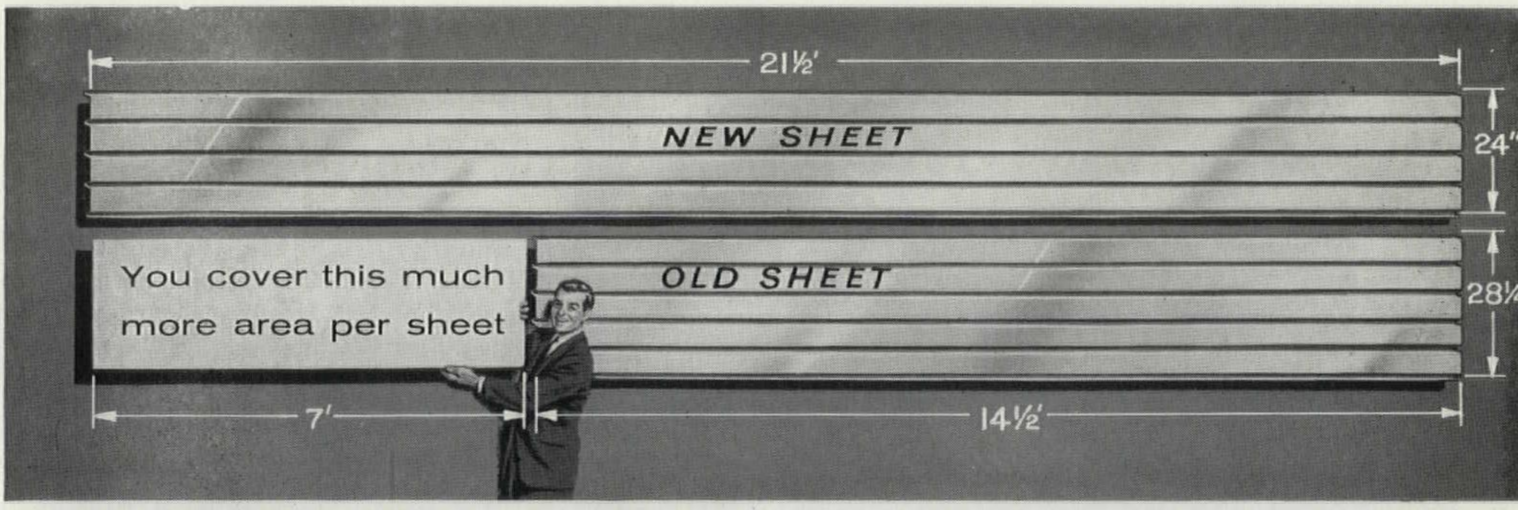

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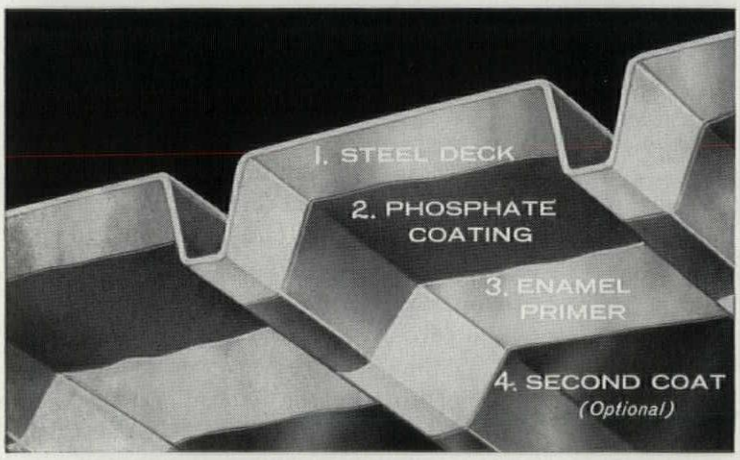

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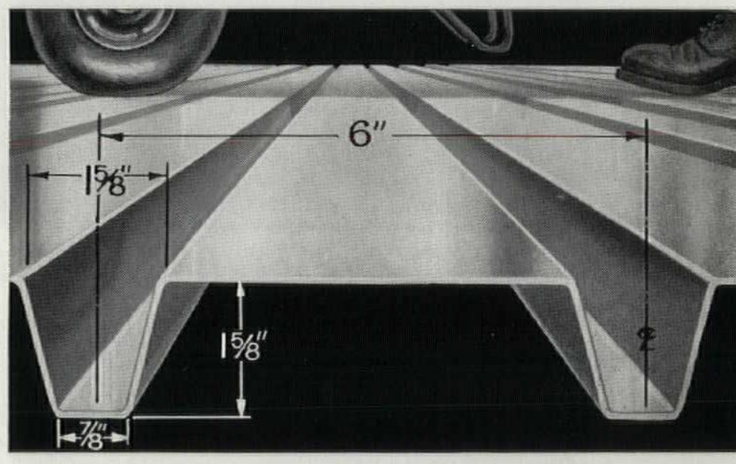

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reviews

(Continued from page 168)

of a lay audience to a whole gallery of historians and critics of quite contrary views. He succeeds in establishing the validity of his own approach without really vanquishing the others. Yet his book has the wit and urbanity, the felicitous phrase and illuminating perception, that one has come to associate with one of Italy's best critics and historians.

JAMES M. FITCH
Associate Professor
School of Architecture
Columbia University

the good old days

The Gingerbread Age. *John Maass. Rinehart & Co., 232 Madison Ave., New York, N. Y., 1957. 212 pp., illus. $7.95*

For those who reminisce about the Good Old Days and find that what is now considered outdated and in bad taste is really quite entertaining, *The Gingerbread Age* will provide a delightful entrée into a dead, but not altogether obliterated world. Victorian life in the U.S.A. between 1840-80 is the subject of Maass' study. Since the best surviving evidences of what went on in that period are architectural, an illustrative description of a succession of architectural styles and "inventive" caricatures here sums up the era.

From "Italian Castellated" and Americanized Egyptian, through American Middle Eastern, Saracenic, Gingerbread Gothic, and Mansardic, to just plain extravagant, America's Victorian architecture had the superb ability to flatter almost any taste (at least at that time). Whether all of this is valid in a discussion of architecture as an art might be a matter of some debate. The author defends outraged Victoriana with a certain skill, if also, it must be said, with a snideness directed at the victorious depreciators of Victoriana. Sometimes, however, even in good faith one doubts the arguments; they seem to protest too loudly, too glibly:

"Tastes and prejudices, fads and

(Continued on page 174)

reviews

(Continued from page 172)

fashions come and go. There is superior and inferior work within each generation but there are of course no 'good' or 'bad' periods of design. It is a truism to state that architecture is an expression of its time. Victorian buildings are perfect symbols of an era which was not given to understatement. They are in complete harmony with heavy meals, strong drink, elaborate clothes, ornate furnishings, flamboyant art, melodramatic plays, loud music, flowery speeches, and thundering sermons of mid-19th Century America.

"Most of our own buildings stand on the shifting quicksand of insecurity. Victorian architecture was founded on the rock of superb confidence." [*sic*]

Almost 200 illustrations, a brilliant record of the period grace this sometimes exasperating, often provocative, and always sparkling volume. The author plainly likes his subject; though one might not share his enthusiasm, his work is a wonderfully light excursion into never-never land.

F.J.S.H.

accurate and usable

The Artist's Handbook of Materials and Techniques. *Revised Edition. Ralph Mayer. Viking Press, 625 Madison Ave., New York 22, N. Y., 1957. 721 pp., $6.75 (illustrated edition); $5.25 (text edition)*

The Artist's Handbook was first published in 1940. Since then it has gone into nine printings and three other languages, and now its appearance in a newly revised and enlarged edition is a most welcome event to anyone interested in the techniques used by artists in producing and preserving works of art.

For the past 16 years, *The Artist's Handbook* has been generally regarded by artists, museum conservators, and painting technicians as the outstanding publication in its field. This revised and expanded edition increases its value for modern usage

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reviews

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and will no doubt increase the already large number of Mayer's following.

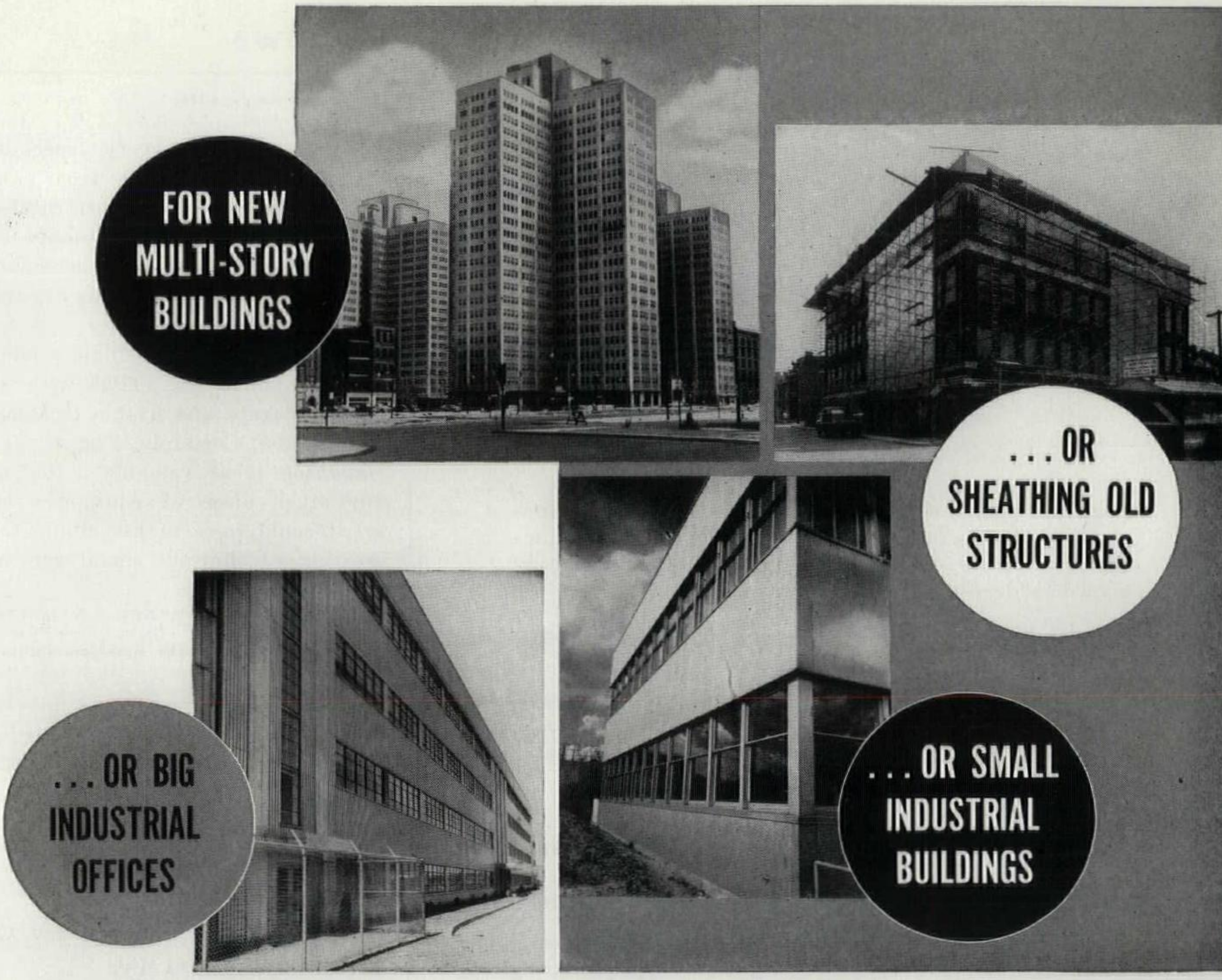
In comparing the revised edition with that of 1940 we find the format somewhat similar. However, the new arrangement and organization present material in a manner that is easier to follow as subject matter; and processes in each chapter are more clearly labeled. There is additional material on the structure of paintings, a set of rules for painting with permanence, new material on oil, tempera, mural, gouache, and pastel painting, and a whole new chapter devoted to painting in encaustic. There is also a new chapter on gums, caseins, glues, and waxes. New and synthetic materials are discussed and uses of such materials as silicon esters, plastic resins, and synthetic paint mediums are given. There is included a practical chapter on the conservation of pictures.

Information on how and where to buy materials such as brushes, canvasses, paints, wood and stone for sculpture, and hundreds of other items make this a practical shopping guide. Almost any technical question that the artist might ask is discussed here and a bibliography, arranged by subject matter, provides easy access to additional information beyond the scope of this one volume. The handbook is well indexed, and line illustrations help explain various processes.

Mayer's position in the art world is distinguished by his many achievements in the fields of painting technology, creative painting, teaching, and writing. In addition to having taught at The Art Students League and Fogg Museum, he created, ten years ago, and has since conducted a course in the materials and techniques of painting at Columbia University.

The author rightly assumes that this encyclopedic volume will be referred to frequently—hence he gives

(Continued on page 178)



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reviews

(Continued from page 176)

practical advice on every aspect of his subjects. In drawing from publications, he has been most careful in choosing dependable authors in the field and avoids the "personal" or "esthetic" approach in his demand for facts.

I know of no other single volume which supplies the artist with so much accurate and usable technical information. Certainly, *The Artist's Handbook* is as valuable a tool as any other piece of equipment an artist could have in his studio for creating a technically sound work of art.

LAWRENCE J. MAJEWSKI
Deputy Field Director
The Byzantine Institute

notices

new addresses

EUGENE D. STERNBERG, Architect & Associates, Mayo-Schlessman Bldg., 1930 Sherman St., Denver 3, Colo.

SUREN PILAFIAN, Architect, 457 W. Fort St., Detroit 26, Mich.

HEYWARD-ROBINSON COMPANY, Consultants, Architects-Engineers, Constructors, The Engineering Bldg., 114 Liberty St., New York 16, N. Y.

CARROLL, GRISDALE & VAN ALEN, Architects, Suite 202, Transportation Center Bldg., 6 Penn Center Plaza, Philadelphia 3, Pa.

THE BRISTOL COMPANY, Pittsburgh, Pennsylvania District Office, 2250 Noblestown Rd., Pittsburgh, Pa.

ROBERT D. GUNN, Architect, 612 Industrial Bldg., Savannah, Ga.

HARRY TERRY & ASSOCIATES, Consulting Engineers, 156 W. State St., Trenton, N. J.

LAURENCE G. FARRANT, Consulting Engineer, 637 Victory Rd., Salt Lake City, Utah.

McCOY & BLAIR, Architects, Buildings Industries Center, 180 South Broadway, White Plains, N. Y.

(Continued on page 182)

New Fireman's Fund Building Utilizes General Electric 480Y/277-Volt System

System-engineered equipment achieves large savings, aids efficient operation of insurance firm home office

PROJECT PLANNERS N. A. Begovich, Fireman's Fund official; Edward B. Page, architect; F. N. Blum, G.E.; Clyde E. Bentley, consulting engineer; J. M. Ets-Hokin, electrical contractor.

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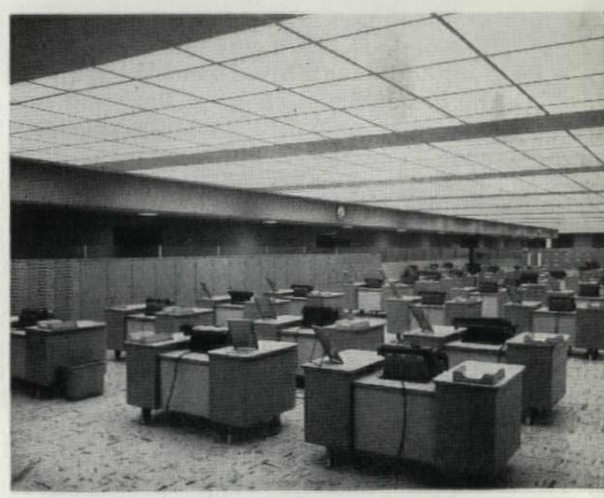

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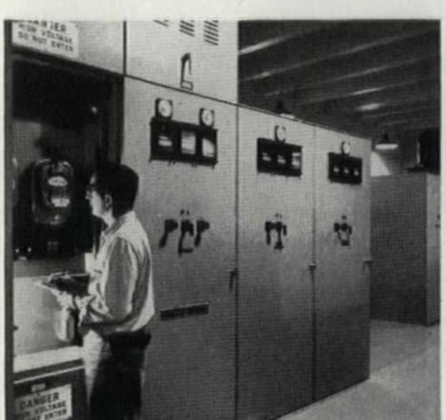

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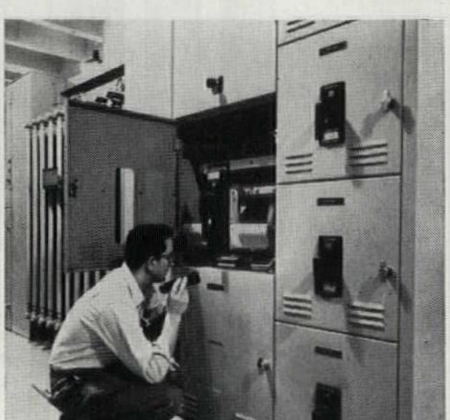

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(Continued from page 178)

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CHARLES C. ZOLLMAN & ASSOCIATES, Consulting Engineers, 3605 Chapel Rd., Newton Square, Pa.

PAUL R. VERPILLOT, Architect, 147 Main St., Ridgefield, Conn.

GEORGE G. PEARLMAN, Architect, 4548 Main St., Snyder, N. Y.

new partners, associates

GEORGE GRIESHABER, KENNETH D. WHEELER, and PAUL E. FALKENSTEIN have been named Associates in the firm of FRANK GRAD & SONS, Architects, Newark, N. J.

EDWARD J. HUSTOLES announces his association with VILICAN-LEMAN & ASSOCIATES, Planning Consultants, Berkley, Mich.

ARTHUR K. HYDE, is a new Associate in the Client-Relations Division of HARLEY, ELLINGTON & DAY, INC., Architects-Engineers, Detroit, Mich.

HERMAN A. HASSINGER and GERALD F. SCHWAM announce their association. Firm will be known as HASSINGER & SCHWAM, Architects, 27 Maplewood Ave., Philadelphia, Pa.

EDWARD L. VERKLER and GORDON L. TINSMAN announce their new partnership. Firm will be known as VERKLER & TINSMAN, Architects, 4609 North Prospect Rd., Peoria Heights, Ill.

HIRONIMUS & TARRANTS, Architects, have formed a new partnership at 502 S. E. Eighth St., Evansville, Ind.

FREDERICK H. RUNDALL has been named Merchandising and Traffic Research Analyst of BURKE, KOHER & NICOLAIS, Los Angeles, Calif.

SEELYE, STEVENSON, VALUE & KNECHT announces the appointment of the following engineers as Associates: WILLIAMS D. BAILEY, Civil Engineering Division; FROHMAN P. DAVIS, IRA M. HOOPER, FREDERICK J.

KIRCHER, PHILIP P. PAGE, WAYMAN C. WING, Structural Engineering Division; WILLIAM T. CLELAND, JACK N. KECK, ALEXANDER MICHELSON, JR., Mechanical & Electrical Engineering Division, New York, N. Y.

SMITH, TARAPATA, MACMAHON, INC., Architects, 894 S. Adams, Birmingham, Mich., announce enlargement of their offices and expansion of organization as follows: ALMON DURKEE, in charge of specifications, building products research, scheduling, and budget control; JAMES R. NEWBOLD, chief draftsman, responsible for general administration of the architectural department including co-ordination of the structural, mechanical, electrical, and kitchen working drawings; WILLIAM V. HEWITT, chief field superintendent, responsible for all aspects of field supervision; GORDON HOYEM, chief mechanical engineer, directly in charge of all mechanical and electrical work.

ROBERT J. SCHAEFER and HENRY W. SCHIRMER, JR. anounce formation of a partnership for practice of architecture. The firm will be known as SCHAEFER & SCHIRMER, Architects, 320 N. Topeka, Wichita 2, Kan.

EGGERS & HIGGINS, Architects, 100 E. 42 St., New York, N. Y., announces that the following staff members have been admitted as associates in their firm: C. GATES BECKWITH, GUSTAVE R. KEENE, and ALLEN C. PARETTE.

KELLY & GRUZEN, Architects-Engineers, 80 Fifth Ave., New York 11, N. Y., announces the appointment of DR. SANFORD BATES as advisor in the planning and design of penal, welfare, and hospital facilities.

SMITH, GARDEN & ERIKSON, Architects-Engineers, 104 S. Michigan Ave., Chicago 3, Ill., announce that the following staff members have been admitted to partnership in their firm: ALEXANDER H. BACCI, GERALD

(Continued on page 186)

p/a jobs and men

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ARCHITECT—administrator, executive, N.C.A.R.B., A.I.A. Licensed many States. Twenty-five years managerial and design experience on major architectural projects and heavy industrial construction. Presently member of large firm, but would like to relocate and purchase interest in progressive firm, or join industry where executive ability is required. Box 579. PROGRESSIVE ARCHITECTURE.

ARCHITECT—36, A.I.A. Broad experience in design, details, specifications, client-contractor relations, for stores, commercial and institutional buildings. Desires position with responsibility in N. Y., N. J. or Conn. area. Free to travel and relocate. Box 591, PROGRESSIVE ARCHITECTURE.

ARCHITECT—37, three children, B. of Arch., registered Pennsylvania by examination. Fifteen years architectural design experience including complete project supervision, executive, illustration, structural, civil engineering, and mapping for Gov't as civilian. Academic understanding of Spanish and familiar with southwest. Prefer to locate in western U. S. Box 578, PROGRESSIVE ARCHITECTURE.

(Continued on page 188)

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(Continued from page 183)

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Richard I. Enzian, new Manager of Wrought Iron Sales; and Harry R. Rowland, elected Vice-President of Wrought Iron Sales of A. M. Byers Company, Pittsburgh headquarters; also Chester W. Leschenko, assigned as Field Service Engineer to the company's Pacific Coast Division, Los Angeles, Calif.

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Joseph H. Williams, appointed Advertising and Sales Promotion Director of Benjamin Electric Mfg. Co., Des Plaines, Ill., manufacturers of industrial and commercial lighting equipment, and audible-signal equipment.

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(Continued from page 184)

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P.S.

design awards plans

Next month's issue—January 1958—will carry results of P/A's annual Design Awards Program. Also next month, in Philadelphia, the Presentation Dinner will be held, and once more a day of Design Awards Seminars will follow. I can't, at this time, break the news and tell who the winners are and therefore what projects will be discussed at the Seminars—success in gaining maximum publicity for the premiated projects depends on a carefully guarded release date in early January. I can tell you, however, that five Awards and 20 Citations were made by this year's Jury, from a staggering number of entries. The five Award projects will probably be the ones to be analyzed critically during the Seminars.

All of this necessary secrecy makes it difficult to invite anyone other than the architects who will be in Philadelphia for that gala occasion, to attend the Seminar discussions. I can simply repeat what I wrote on this page last year at this same time: if any of you want to make the trip to Philadelphia to attend the discussions, under your own steam and on your own responsibility, please let me know, and I will furnish more details. Frankly, we *want* to keep the attendance small. The success of last year's venture at Tulane University in this regard (*see reports on green paper in* MAY, JULY, AUGUST, *and* OCTOBER 1957 P/A) was due in large part, I believe, to the fact that the group was reasonably small (less than 200) and entirely professional, so that discussion could start at a quite high level and be of an intra-professional, enlarged-bull-session nature. The Department of Architecture of School of Fine Arts at The University of Pennsylvania, G. Holmes Perkins, Dean, is the collaborating sponsor this year, and discussions will be held at the University.

So, to repeat myself again from last year's announcement: I ask that any non-Award winning architects who would like to attend write to me personally, and I will either advise you quickly, "Come ahead, there's plenty of room," or I may have to respond, "Sorry, we can't take any more this year." A year ago, a number of visitors did make the trip to New Orleans from various parts of the country. Since then, they have individually told me they felt that sitting in on the Seminars was well worth while.

•

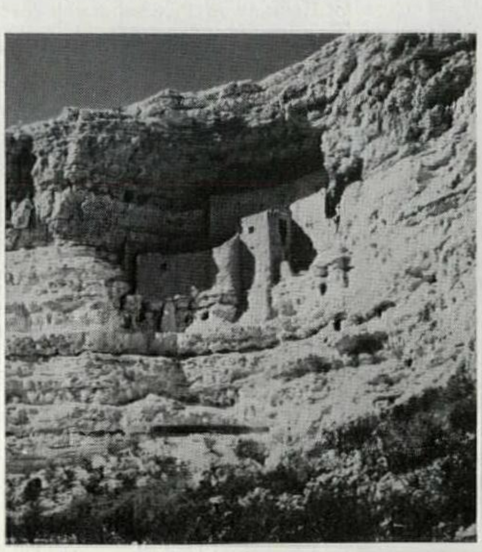
I've made several lengthy trips recently, which I haven't reported in these pages because I think you patient readers must get tired of diary-like columns. I would, however, like to say something of a visit to Arizona, to help judge the International Solar House Competition (*reported last month, pages 62 and 63,* NOVEMBER 1957 P/A). In the first place, I thought the Competition was admirably conducted and most successful in its results. Great credit goes to John Yellott, Executive Director of Association for Applied Solar Energy, sponsor of the Competition, and to Jim Hunter, of Boulder, Colorado, Professional Advisor.

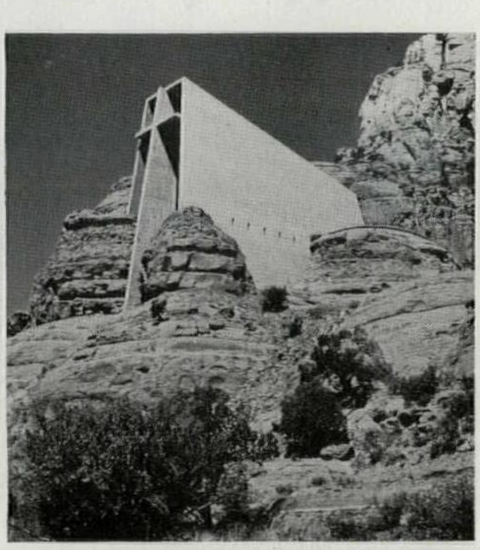
The Jury had one bad moment. After a long and interesting discussion of the comparative merits of the first and second prize winners—basically different in their approach to the solar heat collector system as an architectural factor; almost, in fact, typifying the two divergent points of view we found expressed in the best entries—we made our decision, and the sealed envelopes were opened. It seemed, at first glance, that the two came from the same office—and the program had allowed only one entry from any designer! But then, after a closer look, we realized that the top winner had been submitted by Peter Lee, a student at University of Minnesota working part-time as a designer in the office of Bliss & Campbell (affiliated, for the Competition, with Robert Bliss, senior partner in the firm), and the second prize winner had been submitted by Anna Campbell Bliss (Mrs. Robert Bliss), the "junior" partner.

This, I think, is a unique circumstance, and quite remarkable: two utterly different esthetic and technical approaches, from people working separately in the same office, coming out first and second among so many excellent solutions to a tough problem.

One other comment about that trip. The Association put us up first in Phoenix, to see the house site, and then at the southern rim of the Grand Canyon to do the judging. The trip between the two points—one way by plane, return by car—was for me a sight of a section of our country that I hadn't seen before at close range. On the way we took many pictures, and I found a comparison of Anshen & Allen's Chapel at Sedona (20th Century) and Montezuma's Castle, some thirty miles farther south (13th Century), rather disconcerting. One, in simple, elegant pride *protrudes from* the red-rock forms. The other, modestly but with equal elegance, *adapts itself to* the white limestone hill. At what period in the development of architecture on the North American continent, I wondered, did the natives know best how to wed man-made structures to the natural landscape?

Thomas H. Creighton





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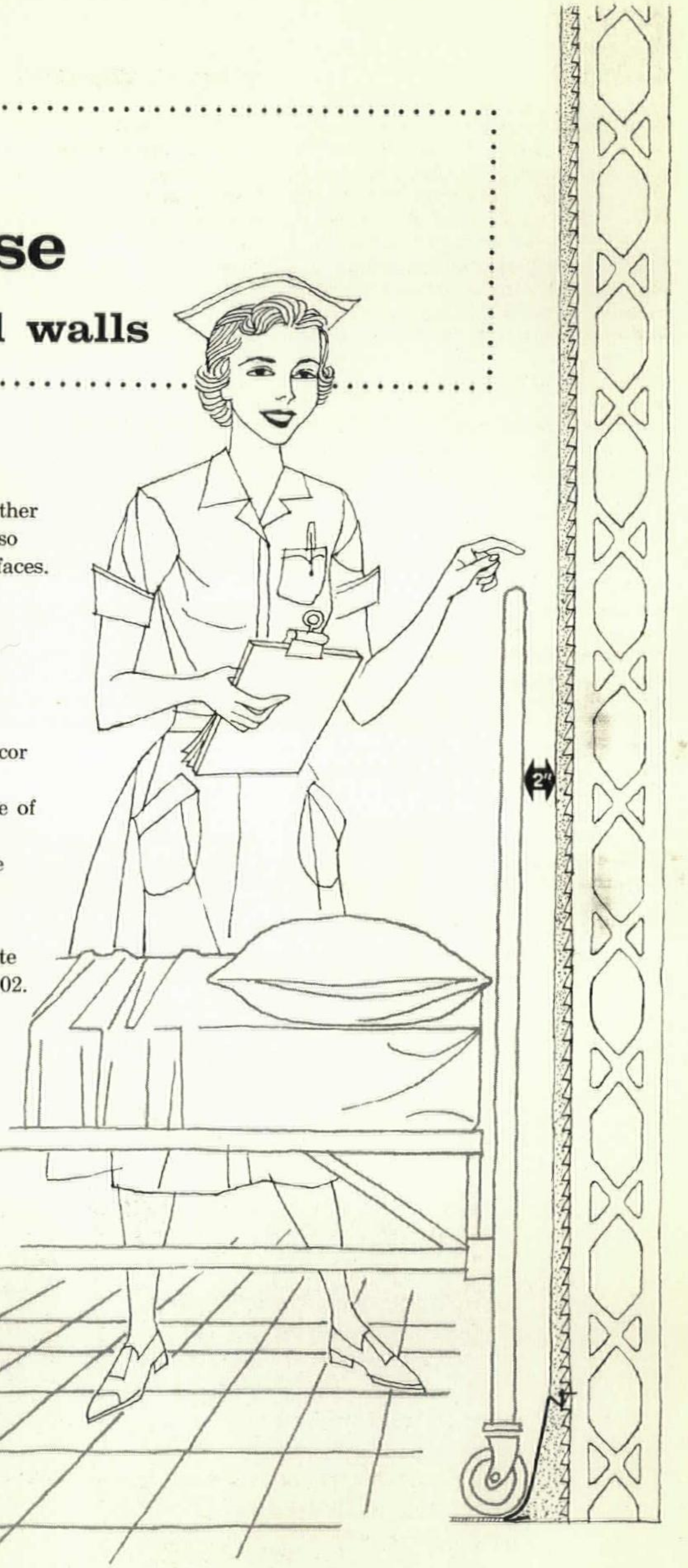

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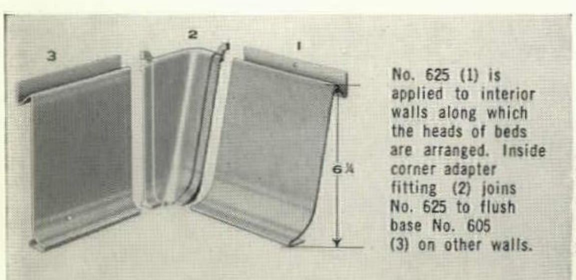

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