

PRIORITIES TO SPUR HOUSE BUILDING

VITAL TO ALL RESIDENTIAL BUILDING is the new priorities plan just announced in Washington. It gives a clear go-ahead signal to privately financed defense housing, and should release a considerable volume of such building. And by doing that it should at least clear up some uncertainties affecting other types of building. The announcement includes instructions for obtaining preference ratings for private projects through local FHA offices, and a Defense Housing Critical List of materials and equipment for which priority aid will be given.

To expedite privately financed defense housing is the purpose of a broad plan recently announced to grant priority assistance to housing projects. The long-promised announcement does much to clear up confusion as to priorities and defense housing. While it offers no direct help to non-defense building, this action on private defense housing should do much to remove the many uncertainties that in some respects have been worse than any actual shortages of materials.

Accompanying the official announcement, by Donald M. Nelson, Director of Priorities, is the Defense Housing Critical List (see Page 118), a comprehensive list of materials and equipment in the procurement of which priorities aid will be given to defense housing projects. Of itself the list is important news, for a great deal of residential construction, defense and non-defense both, has been held up by uncertainties as to what materials would or would not be made available.

Defense areas increasing

There is also a newly enlarged list of designated defense housing areas, now including 275 communities. This list represents an interesting commentary on the extent of the need for residential construction, and on the rapid spread of the defense effort throughout the country.

Under the new procedure, worked out by OPM officials in collaboration with Charles F. Palmer, Defense Housing Co-ordinator, project preference ratings will be granted to "assure priority aid for 200,000 pri-

vately financed homes for defense workers." Other arrangements, continues the statement, have already been made for granting priority assistance to 100,000 publicly financed units.

Full speed ahead

The numbers of units quoted are not to be taken as necessarily indicating a curtailment of the defense housing program, which earlier was announced as contemplating almost twice that number of units for the current fiscal year. The total of 300,000 is more properly regarded as the extent of commitments as to priorities and allocations of materials for an indefinite test period. No time schedule is given. The purpose of the plan is to expedite defense housing, not curtail it. In view of enormous plant expansions, the need for housing for defense workers is urgent, and the priorities plan is intended primarily to get quick action for at least a portion of the need.

While all defense housing ratings will be in the defense or "A" class, the highest ratings for housing will be assigned to defense projects which were already under construction on September 1, 1941, and for remodeling and rehabilitation which create living accommodations for additional defense workers. Next in the preference rating scheme will come new construction for rent, then new construction for sale. Certificates of rating will be extended in the field by the field offices of the Priorities Division, upon the recommendation of the Defense Housing Co-ordinator.

The project rating certificates will

be self-extending, so that the one order is sufficient for all materials, and extends through all supply channels back to the manufacturers. In the words of the official statement, "the Division of Priorities can assign *one* rating which can be used to secure delivery of scarce building materials (which appear on the Defense Housing Critical List) and which will go into any *one* defense housing project." This procedure eliminates the need for many individual applications for different materials.

The Defense Housing Critical List (Page 118) includes all materials and products for which priorities will be given, in this blanket rating, for defense housing. And quantities will be specified in the rating granted.

Consideration may be given, however, to requests for priorities on other items necessary to a specific project, provided they are materials already under priority control. The Critical List is subject to revision as conditions may warrant.

Defense housing defined

To qualify for the priority assistance, construction must be confined to "family units of a value not in excess of \$6,000, if for sale, or for which the monthly shelter rental does not exceed \$50." Exceptions to the limits set will be permitted only "in special circumstances." Also it must be demonstrated that the homes are designed for defense workers, and are at locations convenient to their

employment. Furthermore, that they conform to minimum standards of the Defense Housing Co-ordinator's office, and that they are so designed as to use a minimum of scarce materials.

The forms to be filled out, to obtain a preference rating, are identified as PD-105, the application, and a "documentation sheet," either PD-105a for new construction, or PD-105b for rehabilitation. These are both for privately financed defense housing; for public projects there is another form, P-19a, which is currently being used for priorities ratings. Applications under the new plan should be filed at local FHA offices. Official instructions for obtaining preference ratings follow.

PROCEDURE FOR OBTAINING PREFERENCE RATING FOR PRIVATELY OWNED DEFENSE HOUSING CONSTRUCTION

1. Provision by private enterprise of adequate housing for defense workers is essential to the success of the national defense program.

2. The Office of Production Management has approved the granting of priority ratings to 200,000 housing units, privately financed and qualifying as defense housing.

To expedite the production of needed housing, preference ratings will be graduated, the highest rating will be granted to projects under construction as of September 1, 1941, and to remodeling and rehabilitation. A lower rating will be granted to new construction for rent, and a still lower rating to new construction for sale.

3. To qualify as defense housing, a private project shall be:

(a) located within a reasonable commuting distance from the place or places of defense employment in any of the Defense Housing Critical Areas included in the list of such areas attached hereto; (b) intended primarily, suitable for, and available to workers engaged or to be engaged in one of the defense activities within the area, and shall include the customary equipment and appurtenances necessary to occupancy, and may include stores and other facilities necessary to community life, not otherwise available; (c) offered at a sales price or rental within reach of the defense workers for whose occupancy the housing is intended; provided the estimated market price shall not exceed \$6,000 per family per family unit if for sale, or the estimated shelter rental shall not exceed \$50 per month per family unit, except where extreme circumstances may require that units exceeding these limits be provided.

4. The preference rating granted to a project will apply only to the materials,

products and items of equipment included in the Defense Housing Critical List here-to attached, and in such quantities as the Office of Production Management may permit under the order granted.

5. To obtain a preference rating for a defense housing project, as defined under "3" hereof, the user of the materials, products and items of equipment (the builder) may file with the local office of the Federal Housing Administration, an application for a priority order. Copies of this application form may be obtained from such local office or from local home financing institutions. The form shall be executed in quintuplicate. The applicant shall certify thereon:

(a) that the items of material or equipment to be purchased are necessary to the completion of the construction or remodeling or rehabilitation;

(b) that no practical substitute or alternative source of supply is available;

(c) that quantities are not greater nor

delivery dates earlier than required;

(d) that the rehabilitation shall create or make habitable increased living accommodations.

The Application must also contain a Certificate signed by the owner of the property, containing

(a) a statement showing the estimated present market price of the property (including land and proposed buildings), or the estimated monthly shelter rental (excluding charge for services such as light, heat, etc.) per dwelling unit under present market conditions;

(b) a statement showing the sale price or monthly shelter rental which he proposes to charge; and

(c) a certification that he will give reasonable preference as to occupancy to defense workers.

One set of drawings and specifications showing design and materials must be

submitted with the original Application.

At the end of the Application Form is a form, to be executed by the local office of the Federal Housing Administration.

The statement of the Federal Housing Administrator does not in any way indicate that the property has been or will be approved for insurance under the National Housing Act and is in no way conditioned upon or connected with the filing of any application for such insurance.

A project shall not be considered as qualifying as defense housing unless the Application discloses that the intended work

(a) is defense housing as defined herein, and

(b) complies with such rules and regulations as may be issued from time to time governing priorities and standards for defense housing.

The Application will be reviewed by the Defense Housing Co-ordinator and if approved by him will be submitted to the Priorities Division of the Office of Production Management with a recommendation that the project be assigned a Project Preference Rating. Such rating shall be subject to extension in accordance with safeguards to be defined by the Priorities Division.

The Director of Priorities is making use of the facilities of the FHA as a ready means of immediate assistance. This special service of the FHA is completely divorced from and has no connection with its underwriting activities as a mortgage insurance agency. All applications for preference ratings will be processed without regard to the type of financing used.

The procedure herein set forth shall be subject to such modifications as the Director of Priorities may from time to time deem necessary or appropriate.

DONALD M. NELSON

Director of Priorities,
Office of Production Management.

ANACONDA WIRE & CABLE COMPANY

INTER-OFFICE CORRESPONDENCE

To: Advertising Department
From: Vice-President's Office
Subject: Advertising - 1941
Referring to: National Defense
File Reference: WES

New York, September 1941

In line with our recent conversation will you work up ads explaining to our customers the effect of national defense on our regular business. These ads must emphasize:

1. Our true appreciation of customers who have helped us build our business in the past.
2. Our trust in their appreciation that we must make the defense program our first job; explain all copper is now allocated by OPM and use of rubber is restricted.
3. Our regret that we cannot keep them supplied as we would like because of the defense program.
4. Our sincere effort to maintain customer good will so that we all may benefit when the emergency is over.

*AWS
This says
everything
lets make
it ad #1 EFL*

Remind everyone of this, too. No matter how long the emergency, our research laboratories will carry on in the same way as always. We'll be making product improvements, developing new and better products to the end that when it's all over, our customers and ourselves will reap the benefits of this work.

- S -

41375

Anaconda Wire and Cable

Anaconda Wire & Cable Company, General Offices: 25 Broadway, New York City
Chicago Office: 20 No. Wacker Drive • Subsidiary of Anaconda Copper Mining Company
Sales Offices in Principal Cities





5 sound reasons

why it pays to specify **BETHLEHEM LONGSPAN JOISTS**

1. Economy: Bethlehem Longspan Joists make possible a floor space clear of columns up to 64 feet—with light construction economy.

2. Simplicity: Bethlehem Longspan Joists eliminate the need for pilasters, because they can transfer their loads directly to the walls.

3. Speed of erection: Bethlehem Longspan Joists are completely shop fabricated. They are clearly marked for position, and are quickly and easily placed with the aid of only a light gin pole.

4. Fire resistance: In combination with a concrete floor slab and a plaster ceiling, these joists provide the basis for floor construction with a 2-hour resistance to fire.

5. Adaptable: Can be used with ease and economy for roofs of garages, theatres, gymnasiums, auditoriums, warehouses, and for floors of stores, dormitories and other light-occupancy buildings.

A revised descriptive catalog on Bethlehem Longspan Joists will prove a useful addition to your data files. A letter to Bethlehem Steel Company, Bethlehem, Pa., will bring your copy promptly.

BETHLEHEM STEEL COMPANY

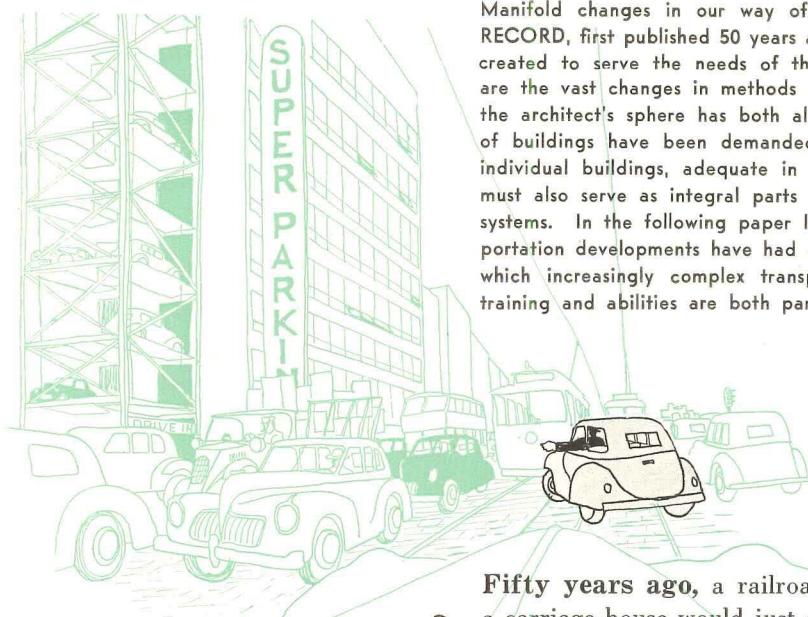


TRANSPORTATION— AN EXPANDING FIELD FOR MODERN BUILDING

FOREWORD

Manifold changes in our way of living have taken place during the life of ARCHITECTURAL RECORD, first published 50 years ago. Its pages are a chronicle of the development of architecture created to serve the needs of this momentous half-century. Not least among the developments are the vast changes in methods of transportation over land, water, and in the air. Concurrently the architect's sphere has both altered and enlarged. Whole new categories of specialized types of buildings have been demanded, and professional specialists have arisen to design them. But individual buildings, adequate in themselves, are not enough. To be counted wholly good, they must also serve as integral parts of intelligently planned community patterning and transportation systems. In the following paper I have tried to indicate not only the dynamic effect which transportation developments have had on building design, but some aspects of the more basic problems which increasingly complex transportation facilities pose. In this wider sphere, the architect's training and abilities are both particularly apt and sorely needed.

THE AUTHOR



"ENTIRELY SUCCESSFUL?"

Fifty years ago, a railroad station, a round house, a livery stable, a barn, and a carriage house would just about have completed the roll call of buildings required to serve the needs of transportation. Since that time, railroad trains have become streamlined, motor traffic has crowded the highway, and airplanes streak the sky. As these developments have taken place, the list of specific buildings needed to serve them has vastly increased—huge union terminals, metropolitan airports, gas stations, bus stations, roadside restaurants, parking garages, drive-in markets and shops, to name but a few. Admirable buildings have appeared in every category. But more often than not, these new buildings have solved a too limited problem.

An efficient service garage, for example, is a useful and welcome structure. But if it brings increased traffic congestion and tends to decrease a town's livability, may it be considered entirely successful? Critics demand that a building do much more than serve its restricted purposes well; in addition it must increase the serviceability of the block, of the neighborhood, and of the entire community.

By

GILMORE D. CLARKE, ASLA

DEAN OF THE COLLEGE
OF ARCHITECTURE,
CORNELL UNIVERSITY

As Dean of one of our great schools of architecture and as Consulting Landscape Architect for the Westchester County Park Commission, whose advanced theories of proper land planning were some of the first in this country to be translated into adequate, restricted, modern parkways, GILMORE CLARKE is uniquely qualified to discuss the impact of transportation and its attendant needs on all phases of planning. The RECORD is proud to have the benefit of Mr. Clarke's thinking as one of the important features of its 50th Anniversary publishing program.

Indeed, the architect today finds his sphere inextricably interwoven with broad phases of community planning and the appropriate use of land. He and his colleagues in the engineering professions will be commissioned to design the necessary new types of buildings to serve a more integrated over-all plan. And as transportation facilities continue to expand and grow more complete, his appreciation and knowledge of the basic problems will make the individual buildings he designs more useful, more efficient, better integrated—in short, better architecture. His stature will increase from the old-time concept of the "useful artist," who functioned in a closeted sphere, to the skilled technician and planner, a vital element in the nation's welfare.

Today the need for a closer interrelationship of fully suitable types of planning is woefully evident. The errors of the piecemeal planning habits of the past have resulted in some of our current major planning problems.

SINS OF THE FATHERS

For instance, in the field of transportation, the highly perfected automobile as yet is unable to serve us as completely, as comfortably, and as effectively as we should like, because of the inadequacy of the design of the country highway, the city street system, and most of the buildings in which we work and live. This, in some measure, is true because the development of the automobile has been carried out upon a lively competitive basis by great corporations, whereas the highway and the municipal street system were developed methodically and unimaginatively by public agencies, without the impelling stimulus of private competition. But it is also partly due to the architect's (and owner's) too frequent concept of a structure as an independent element rather than as an integral part of a much larger whole.

A typical irony of such lack of co-ordination is the fact that it usually takes as long to reach the center of a large city from its airport as it does to fly 100 or more miles. New York and Washington, however, are two conspicuous exceptions. In each of these cities, the principal airport is connected with the city by means of a parkway, thus affording a pleasant, quick means of transporting the air traveler between him home or office and the airway terminal.

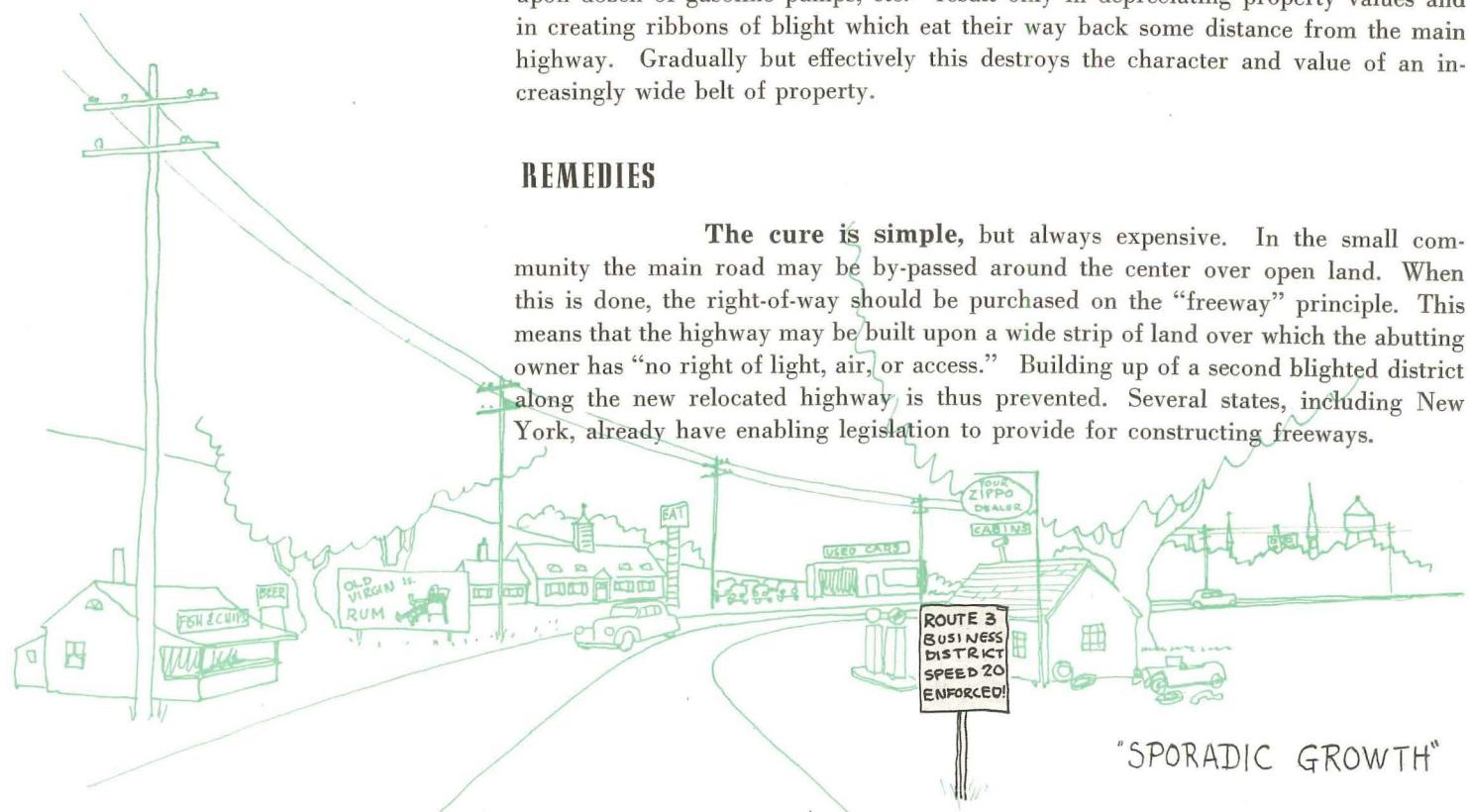
Because of inadequate foresight and lack of correlation on the part of the various planning services—architects included—our automobiles have frequently strangled municipal development, whereas they might actually have liberated us from the congestion we so generously tolerate in cities and in the regions about them.

How much longer are we going to allow the motor car to continue thus indirectly to destroy the character of our cities and villages? As long as we route through traffic over Main Street, we delay the day when our communities may function in a normal, orderly way, when our individual buildings can be designed to key in with the larger scheme of things.

The sporadic growth which normally develops along the main highways that approach and pass through our communities—billboards, sordid looking structures to house eating places, those which serve as backgrounds for dozen upon dozen of gasoline pumps, etc.—result only in depreciating property values and in creating ribbons of blight which eat their way back some distance from the main highway. Gradually but effectively this destroys the character and value of an increasingly wide belt of property.

REMEDIES

The cure is simple, but always expensive. In the small community the main road may be by-passed around the center over open land. When this is done, the right-of-way should be purchased on the "freeway" principle. This means that the highway may be built upon a wide strip of land over which the abutting owner has "no right of light, air, or access." Building up of a second blighted district along the new relocated highway is thus prevented. Several states, including New York, already have enabling legislation to provide for constructing freeways.



"SPORADIC GROWTH"

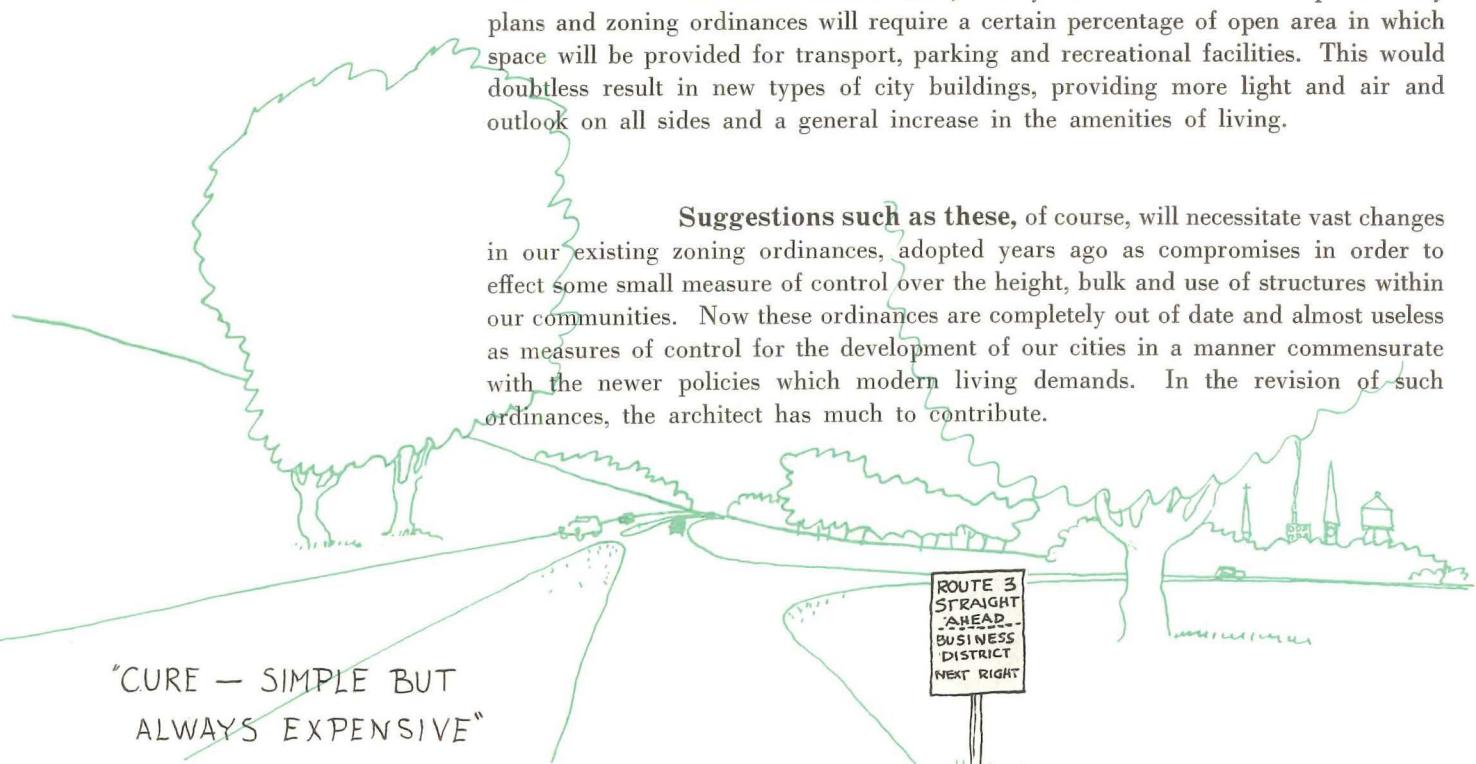
In the large city, the main artery may have to pass through the center. In Baltimore, for example, preliminary studies have recently been completed for a new north and south artery in the form of a freeway to connect Washington on the south with Philadelphia on the north. As proposed, the artery would be located along one border of the business district that is now occupied for the most part by obsolescent residences, and it would be built over or under all intersecting streets, and elevated or depressed above or below the natural grade. In time, this policy of building main motor arteries on the freeway principle will be found to pay dividends based upon the fact that these freeway lands are forever protected against the deteriorating influences which normally destroy economic values and amenities along our highways.

Should these advanced policies with respect to the design of highways become generally adopted, new and sounder types of service buildings for travelers would be sure to follow. In place of the helter skelter of structures that today are strewn like tattered ribbons along our "main stems," an entirely feasible scheme might involve the design of complete service facilities located off the highway and grouped as specialized units at appropriate distances apart. These co-ordinated and planned architectural elements might well include recreational and cultural facilities as well as hotel accommodations and the necessary gas and service stations and restaurants. Complete shopping centers with adequate space for parking cars might also be developed along the borders of freeways, designed in a manner to make them readily accessible via access drives with accompanying grade elimination structures to avoid left-hand turns on the freeway.

RELIEF FOR DOWNTOWN

The auto parking problem is a perplexing one in most cities, and many devices are used to aid in finding a solution. So far, I have never been in a city which has solved the problem. Curb parking eventually will have either to be eliminated or rigidly controlled. Trucks can load and unload inside the factory, the warehouse or the store. Multiple dwellings, offices, loft buildings and factories should be required by law to provide adequate garage space for their needs within each building or in a specially designed structure adjacent thereto. Public garages are needed at frequent intervals for the transient visitor, including the shopper and commuter.

At some future date, it may not be too much to hope that city plans and zoning ordinances will require a certain percentage of open area in which space will be provided for transport, parking and recreational facilities. This would doubtless result in new types of city buildings, providing more light and air and outlook on all sides and a general increase in the amenities of living.

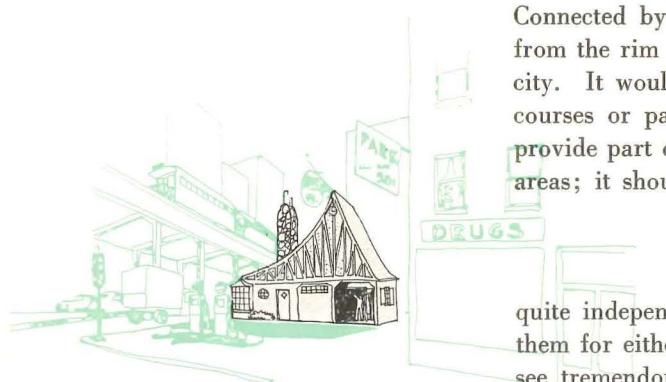


Suggestions such as these, of course, will necessitate vast changes in our existing zoning ordinances, adopted years ago as compromises in order to effect some small measure of control over the height, bulk and use of structures within our communities. Now these ordinances are completely out of date and almost useless as measures of control for the development of our cities in a manner commensurate with the newer policies which modern living demands. In the revision of such ordinances, the architect has much to contribute.

"CURE - SIMPLE BUT
ALWAYS EXPENSIVE"

AIRFIELDS AND GREENBELTS

What of the airport? The young men and women of this and following generations will fly airplanes with the same facility as we drive automobiles, and we must provide space for the development of this means of travel. Existing commercial airports in many of our large cities are already taxed to the limit of their capacity, and privately owned planes will be unable to use them. We shall need more fields—smaller ones, no doubt, at points surrounding the outskirts of our cities. Connected by circumferential belt line parkways, with radiating arteries extending from the rim to the center, these fields could be easily reached from any part of the city. It would be well to keep open land around such airports to be used for golf courses or parks, play fields, or farms. This belt of green around the city would provide part of the open spaces that are so badly needed in our congested municipal areas; it should be zoned to be kept open.



"HOW CAN WE RESCUE
OUR CITIES?"

We have allowed the several forms of transportation to develop quite independently, and almost entirely without planned methods for co-ordinating them for either passengers or freight. In the great Port of New York, one may still see tremendous barges loaded with freight cars being transported over the harbor waters from terminals in New Jersey to those in Long Island, a slow, tedious and costly procedure which has not changed in fashion in more than half a century. The studied interrelation of all forms of transportation and the development of adequate terminals for the transfer of both goods and passengers is still a challenge to those who visualize the possibility of acquiring greater efficiency in and about our great centers of population. We need more efficient freight terminals to speed the movement of goods, involving interchange between different types of transport. The design of such structures calls for the increasing attention of both architects and engineers, for little thought has thus far been given to these important links in our rather loosely co-ordinated systems of transport. The solutions to problems of this character, involving the design of master terminal warehouse and yards in relation to the city street, the highway and freeway systems, to the railroads and to railroad belt lines, to canal and deep water services, and to airports, will necessitate an intensive, collaborative study by the engineer and the architect.



If we are to rescue our cities from the fate that now seems obvious for them, we must devise new means whereby development becomes more secure, changes less rapid, and obsolescence a less frequent factor. Can this be done? Not by haphazard planning and the continuance of the erection of individual structures that have no regard for their neighbors and environment. But I believe it can be done if architects, engineers, and all others concerned with planning are willing to bend every effort to see that comprehensive planning for land use, street systems, railroads, waterways and airports by the competent and experienced takes the place of the laissez-faire attitude of many of the governing bodies of our communities. Great opportunities lie before us, opportunities not only to increase our specific service as designers of better buildings, but also to contribute toward making our communities safer, quieter, more spacious, more comfortable, and more wholesome.

Drawings by William E. Haible

LEADERS OF THE TRANSPORTATION INDUSTRY

... DISCUSS PLANNING FOR TOMORROW'S NEEDS

Significant Comment Written Especially for this issue of ARCHITECTURAL RECORD

AVIATION

★ DEMANDS OF THE PRESENT war emergency have already fastened a new dependence by the civil as well as the military on aviation. This dependency will not decrease. The necessity engendered in the present crisis will become the habit of future peace. Our national economic tempo is certain to require the movement of passengers, mails and an increasing volume of freight over high-speed, high-frequency express airways between principal cities and across the continent; a network of connecting lines from all secondary cities to feed these aerial arteries; and a further system of rural air services to link villages and hamlets. While our national transport will thus be speeded and the facilities multiplied, our international services will be similarly expanded. So also with facilities to serve the greatly expanded industry of private flying.

To indicate but a few of the structural changes that this trend will require, we shall need adaptation, expansion and

improvement of our large air terminals; development of innumerable small but efficient rural airports and construction of specialized utility airports divorced from the busy terminal fields of our transport system. In addition, to serve the increased size and speed of planes which will come into use, new types of fields, terminal buildings and hangars are certain to be needed.

While we cannot accurately envision all of the changes which this enlarged concept of tomorrow's requirements will eventually bring about, we can, through careful study and long-range planning, be prepared for some of them and attempt to avoid the twin pitfalls of costly obsolescence on the one hand, costly inadequacy on the other.

Admittedly the problems involved are complex and difficult; but it is a body of highly competent engineers, architects and designers to whom these problems are addressed.

JUAN T. TRIPPE, PRESIDENT, Pan American Airways System

AUTOMOTIVE INDUSTRY

★ ADVANCE IN THE DESIGN of motor cars has been steady. There is no doubt whatever that the automotive industry can and will produce even more efficient cars in the future—faster, more economical, safer and possibly less expensive. But it is important to note that the optimum development of the automobile or other form of motorized transport is in great measure dependent on advance in the facilities which automobiles must use. Unless problems of highways, traffic congestion and parking facilities are solved first, more cars would mean more congestion and discomfort. Faster cars can be produced, but today's highways are no more than able to handle present-day high-speed automobiles. Cars could be made more comfortable than they are today. But streets, shopping centers, parking

lots and garages, service stations and theaters (to name only a few) all need to be redesigned so that the motoring public can be as comfortable reaching them, disembarking and entering them as they are while traveling along an open road in the country. The opportunities for architects and engineers in helping to solve these basic problems are both obvious and great. It is not too much a stretch of the imagination to suggest that it eventually will mean virtual rebuilding of our cities—revision of city plans and ordinances, redesigning of many types of buildings. In short, the automotive industry is equipped to produce more and better cars. But if we are to realize their full potential, we must have increasing help from planners, engineers and architects.

ALVAN MACAULEY, PRESIDENT, Automobile Manufacturers Association

★ "STREAMLINING" of the railroads means more than mere streamlining of trains. It is an undertaking that invites the knowledge and initiative of architects, as well as structural, mechanical, civil and electrical engineers. Many structures and facilities of the railroad plant must be modernized to keep pace with the new tempo in railroading.

Typical of the development challenging the ingenuity of architects and engineers are the following:

- Stations, ticket offices and railroad structures to reflect the efficiency and smartness of modern trains.
- Main line station facilities for speedy fueling and servicing of trains between terminals.
- Terminal facilities for the rapid inspection and efficient maintenance of both freight and passenger trains, with particular attention to such features as air-conditioning equipment,

★ I DO NOT ANTICIPATE there will be any marked tendency toward changes from proven fundamentals in railroad developments during the period just ahead of us, either in the matter of service, design of equipment or structurally. The railroads are going to be too busy using the instruments at hand and proven practices in the handling of traffic incident to the defense program to venture into experimentation to any considerable extent during this period and the reconstruction period which will follow. Moreover, the limitations on supplies and materials available for advancement in the arts of railroading and the field of experimentation necessary therefor would otherwise be controlling.

ment, diesel-electric power units, fuel oil service and storage, condensate service and storage for the heating boilers of streamline trains, etc.

● Shop and engine terminal facilities for the maintenance and repair of electrical, internal combustion and mechanical equipment.

The faster freight and passenger train schedules of today have been accomplished in two ways: through higher train speeds and by reducing the time for servicing en route. The ramifications of the latter are practically limitless and offer a worthwhile field of careful engineering study.

While most railroad bridges and structures are designed for use only, architectural treatment is being employed more and more and appearance seems certain to influence future construction.

RALPH BUDD, PRESIDENT, Burlington Lines

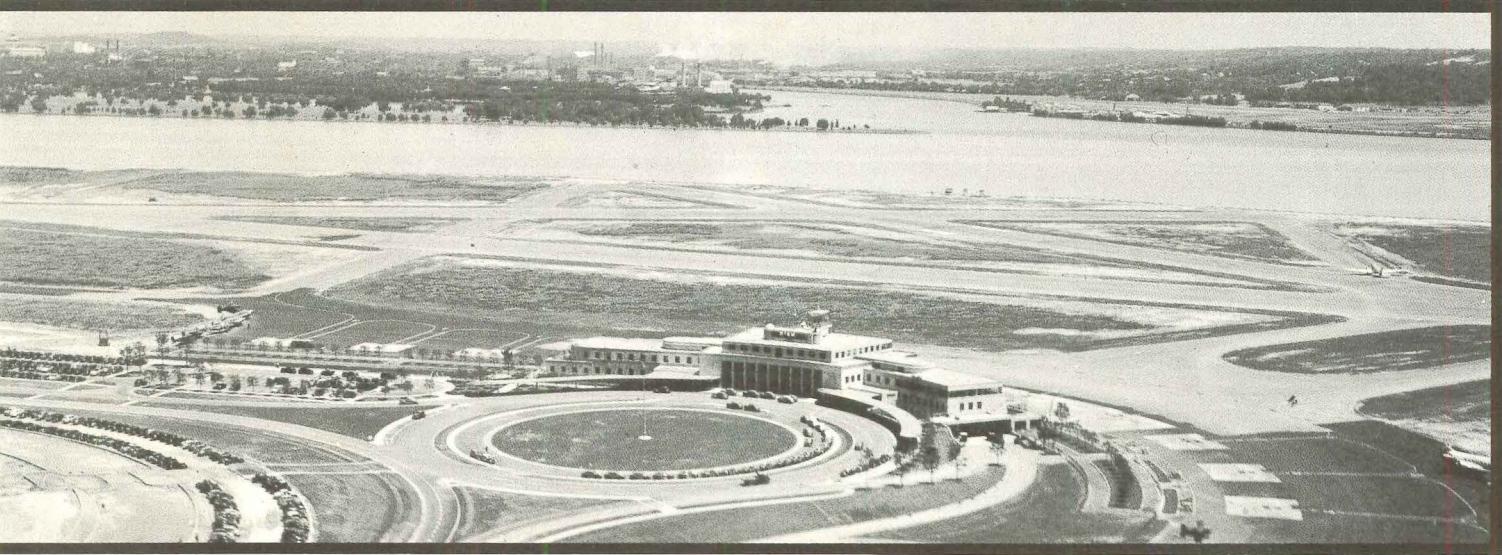
RAILROADS

Before the present emergency is over there will have been brought about, due to the establishment of defense industries in the interior and on the Pacific Coast, a considerable decentralization of industry, some more or less hurriedly established without adequate planning, and the future period of reconstruction and planning will be influenced by the necessities for making the most of what we then have. Out of it all the railroads and other transportation agencies will find it necessary to adjust themselves to meet an entirely new peace-time situation, but it is too early to predict the direction that such adjustments will take.

W. M. JEFFERS, PRESIDENT, Union Pacific Railroad Company



1945



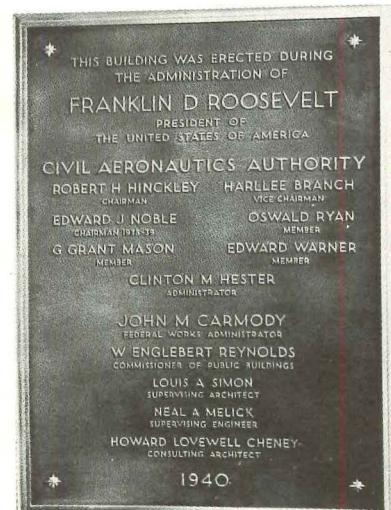
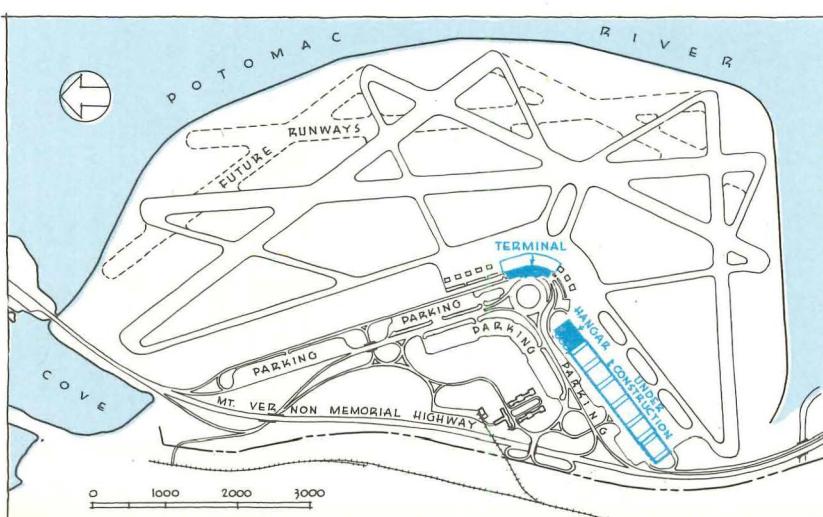
All photos of the Washington Airport by Orville K. Blake

★ WASHINGTON NATIONAL AIRPORT

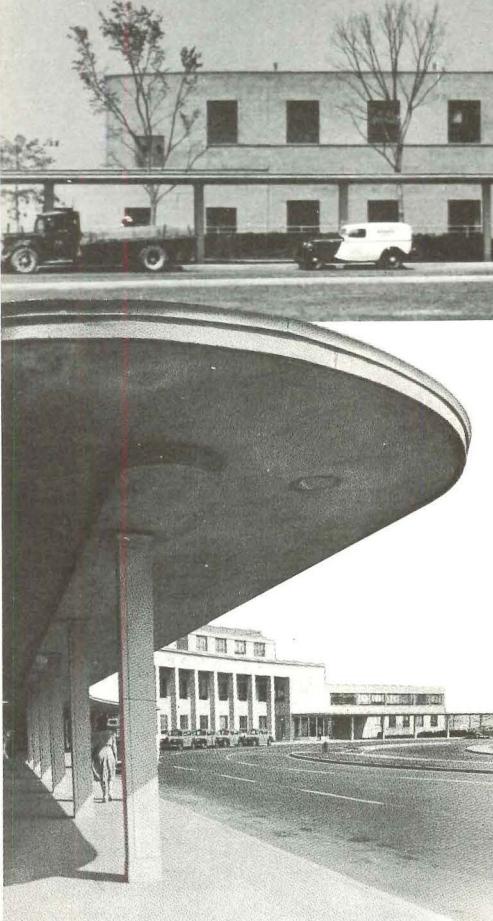
HOWARD LOVEWELL CHENEY, CONSULTING ARCHITECT

ARCHITECTS AND ENGINEERS constantly strive to create perfect structures. When the one perfect building is finally built, ARCHITECTURAL RECORD plans to publish it. Meantime—adhering to a policy begun 50 years ago—the RECORD will continue to report advances that architects and engineers make in the design and construction of buildings wherever they may be found. Usually these advances are made in short steps. But occasionally a structure appears that is not only an important new building in itself but is actually strides ahead of contemporary practice. Such a structure, in the opinion of RECORD editors, is the Terminal Building of the Washington National Airport. Still unsolved (except on paper) is the problem of getting passengers, crews and baggage on and off planes wholly under cover. But a check of only a few of the advanced facilities of the Washington Terminal Building is enough to give the project a five-star rating in anybody's news—a building that sets a new standard for the design of still better airport structures of the future:

- ★ Complete separation of passenger, sightseer and operational services.
- ★ Continuous passage of persons from places they are to places they would be without crossing other areas.
- ★ Handling of baggage, mail, and express channelized for independent, high-speed functioning.
- ★ A building which both serves its specific function well and dramatizes the visual aspects of air transportation—a highly appropriate dual nature for the air gateway to the nation's capital.
- ★ Extraordinary foresight in providing for expansion with a minimum of re-building of field, terminal and other facilities to care for any foreseeable needs.



Perhaps no one person is better qualified to report on the structures erected at the Washington National Airport than HOWARD LOVEWELL CHENEY, PBA's Consulting Architect, who was directly responsible for the planning and design of the buildings. We are greatly indebted to Mr. Cheney for his constant and generous assistance in the preparation of the following analysis.



BACKGROUND

THE WASHINGTON NATIONAL AIRPORT, directly in charge of the Civil Aeronautics Authority, is one of the first projects of its kind in which specialists in land use planning have worked closely not only with architects, landscape architects and engineers but with the aeronautical staffs of both the Civil Aeronautics Authority and the private airlines. As our main concern here is with the buildings developed to serve the port, it is not possible to give due credit to all of the individuals involved in the planning of the site, the field itself or the subordinate transportation facilities. The men whose names appear on the two bronze plaques shown on the preceding page, however, deserve special mention. Their work and that of their boards represents a collaborative endeavor of the first magnitude. Nor can we do more than touch on the thinking behind the selection of the Gravelly Point site, recommended by the Civil Aeronautics Authority after years of investigation by various agencies, and approved by President Roosevelt on September 27, 1938. Adjoining the Mount Vernon Memorial Parkway, but $3\frac{1}{2}$ miles from downtown Washington, the site consists of 729 acres, divided into an approximate 556 acres for the landing field and 173 acres for buildings. An area adjacent to the airport is appropriate for future development of a seaplane base (a mandatory requirement). The site affords ample opportunity for future expansion. In this latter connection, it may be noted that the present terminal building facilities may be extended 500 feet to the south and a quarter of a mile to the north with a minimum of construction alteration. The plot plan on the preceding page indicates the plan for extending field runways to handle future needs.



PLAN HIGHLIGHTS

From airport bus to ticket office to concourse to ground-level field exit is a relatively direct line of travel. And it crosses no other important traffic lane.

Trucking of baggage, mail and express to and from planes is handled by small power or hand trucks through the ground-level truck concourse toward the field side. Notice that baggage and passenger field exits alternate, so that the two facilities do not conflict.

The truck driveway at ground level on the west side of the building handles baggage and express to and from the city. An inside dock serves the airport offices.

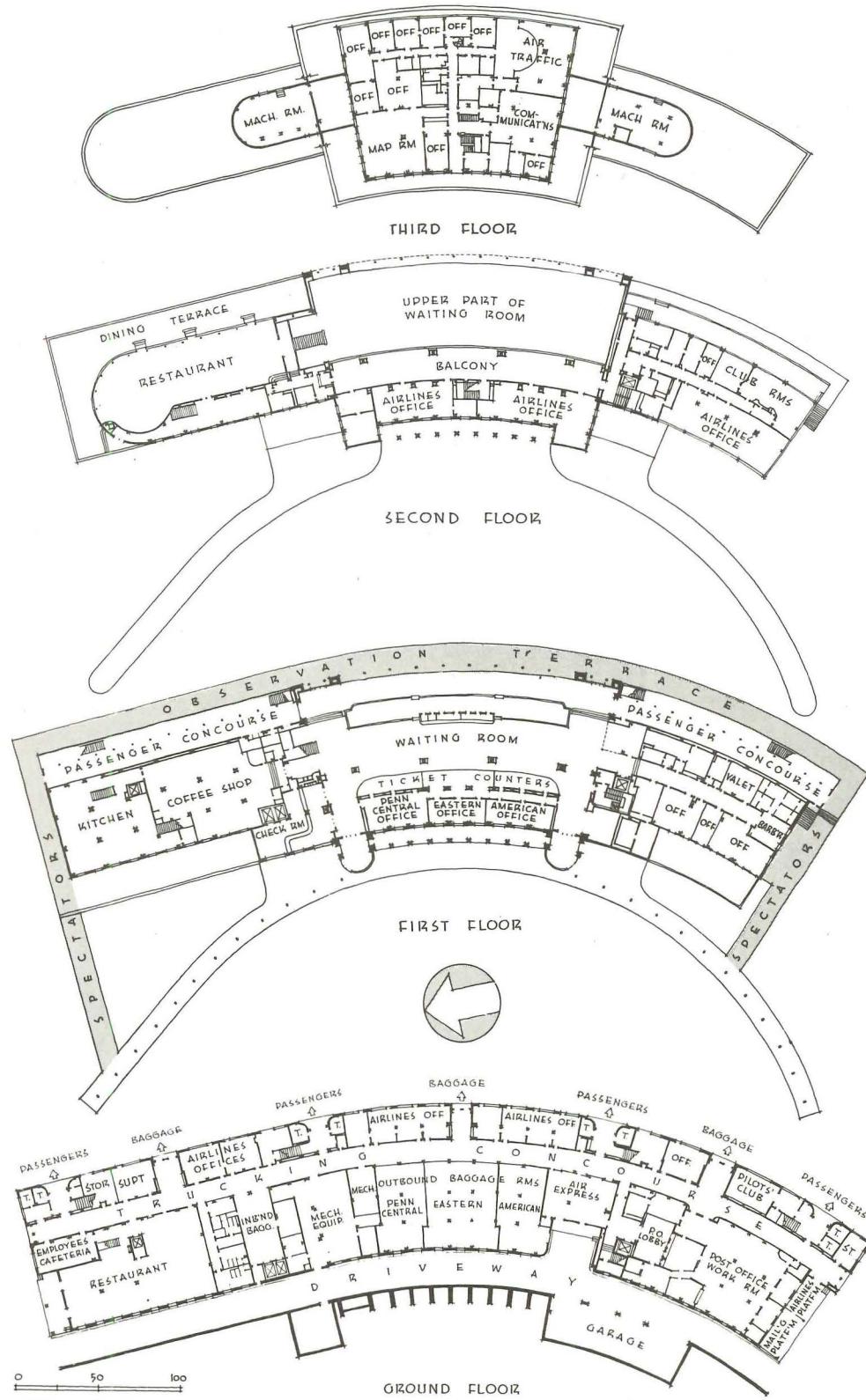
Trucks bringing mail or restaurant supplies have outside loading docks and turn-arounds at either end of building.

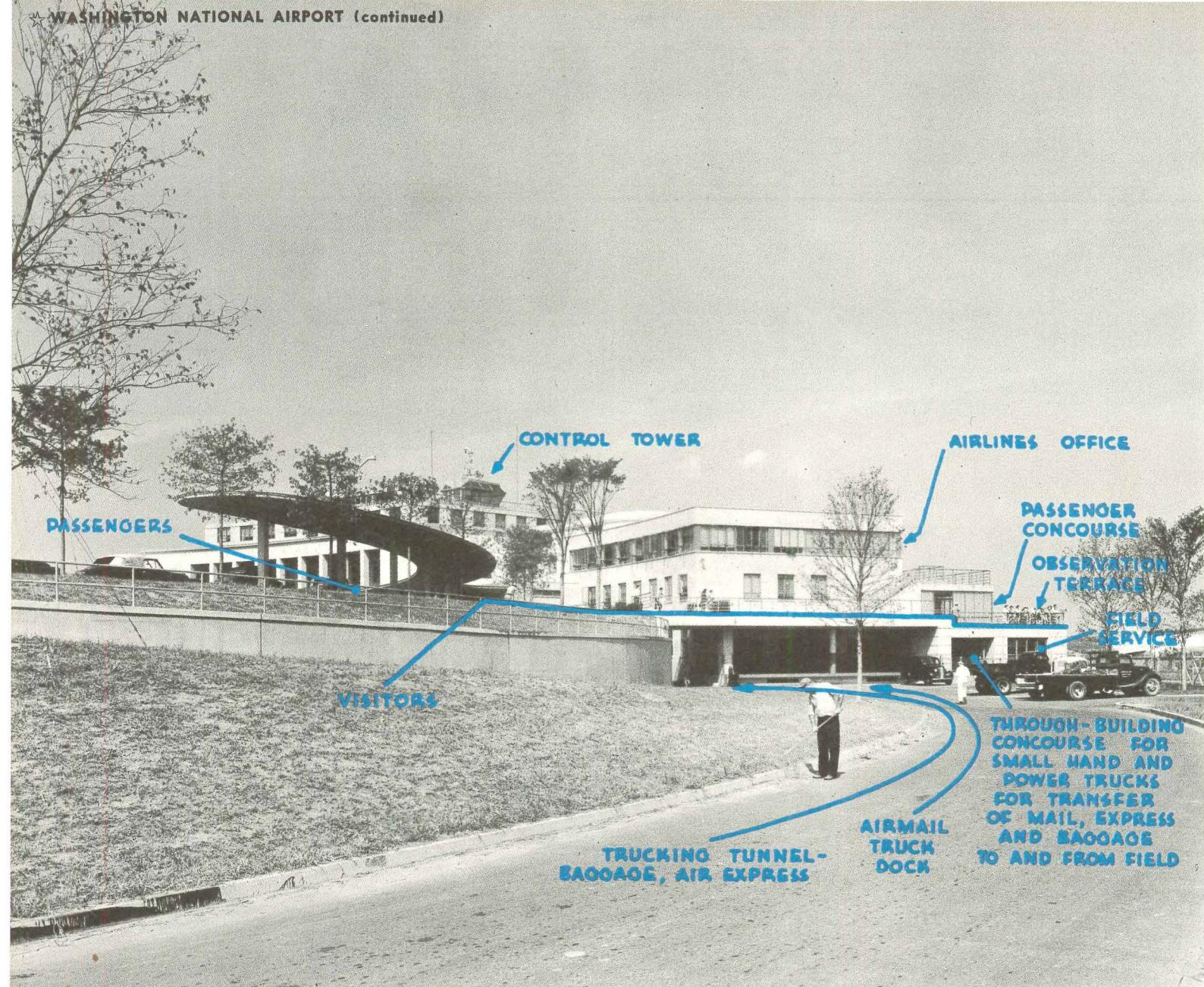
Outbound baggage brought to the terminal by passengers is chuted down to the ground-floor baggage room from the ticket and weighing counter directly above (see photos, page 54).

Inbound baggage from planes is hoisted to elevators which carry it up to wait passengers' arrival at the check room above.

Passenger entrances to the field are each equipped with adjacent toilet rooms and telephone booths.

The visitors' observation deck takes in all the sights without interrupting the main business of the terminal.

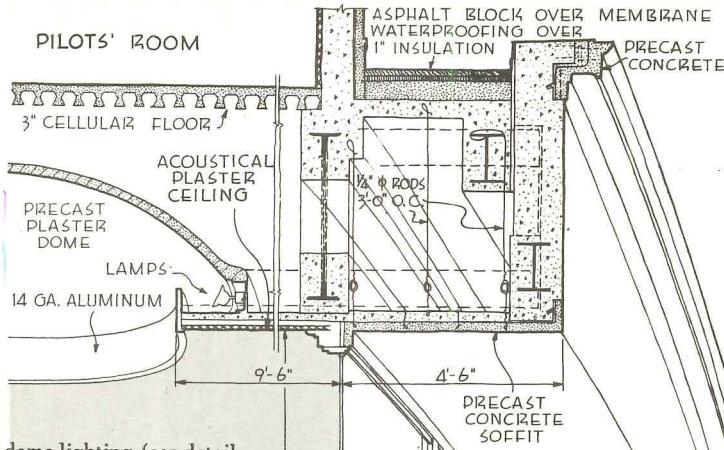




A TWO-LEVEL SYSTEM OF CHANNELIZED CONTROL

THE SEPARATE HANDLING of persons and things—and provision of separate facilities for different categories of persons and different types of things—is perhaps the most complex problem connected with the design of an efficient air terminal building. In addition, all of these factors must be centralized around a relatively limited nucleus. While the solution to these problems at the Washington terminal may not be optimum, it represents such a pronounced advance over current practice that it deserves most careful study. Complete separation of passengers and sightseers is possible. And it is handled wholly outside the building itself—so that conflict is avoided before it can begin. Bridge walks at either end of the terminal building lead out to the observation terrace which surrounds three sides of the building. Indicative of the success of this scheme is the fact that in the first three months' operation, more than 800,000 visitors paid to pass through the terrace turnstiles

without interfering with the passenger circulation. The integrated facilities provided for passengers are described on pages 54 and 55. For all accessory business of the port—movement of baggage, mail and express to and from planes, servicing of restaurants, trucking of baggage, air mail and air express to and from the city—separate channels (through-building driveway and concourse) and cul de sacs (loading docks, turn-around space, temporary parking) are provided for the purpose at a lower level, as shown both on plans and in the photograph above. All this is so organized that not only do none of these operations conflict with one another, but they are entirely isolated from the movement of either passengers or sightseers. So also with the areas set aside for operating the terminal itself—airlines offices and services for the 900 regular employees at the port. These are located so that their smooth routine never intrudes upon other lines of flow.



LIGHT

INDIRECT dome lighting (see detail above) is used in the main waiting room. Flush ceiling units occur in entrance lobbies, public corridors and other public spaces. Fluorescent units are used in continuous flush fixtures over the ticket counter and in the coffee shop. The main restaurant is lighted by both indirect ceiling units and by fluorescent tubing concealed in a cove. The entrance loggia is floodlighted by units concealed in the columns.

SOUND

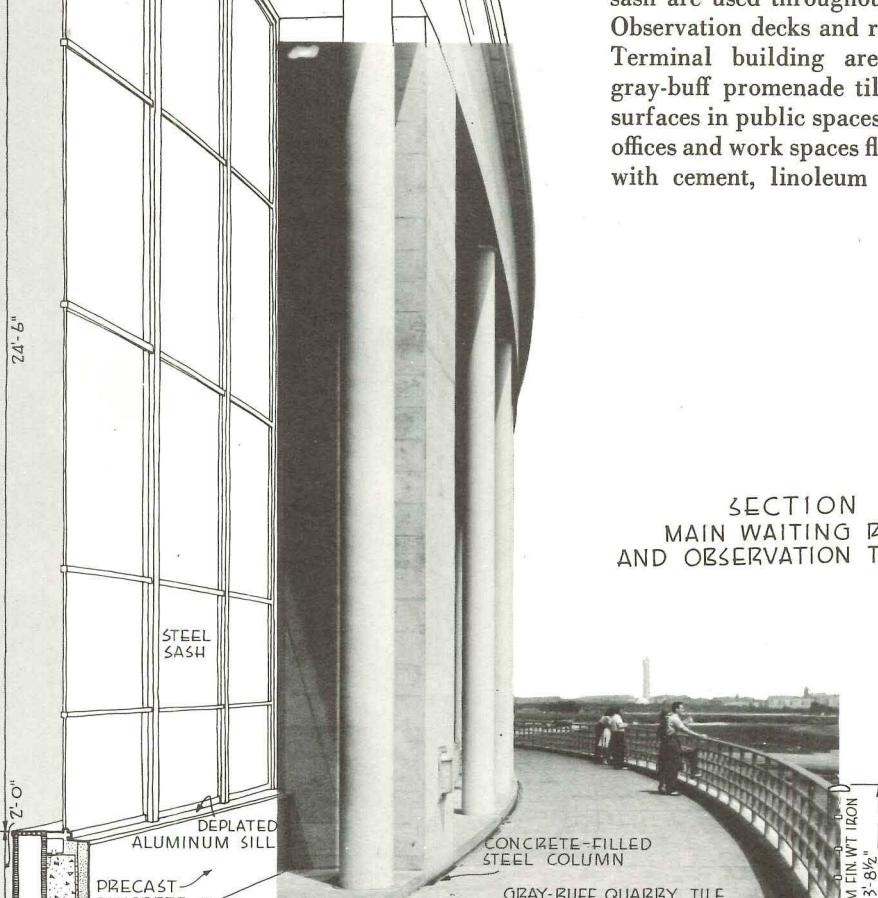
A COMPLETE and extensive public address system reaches every part of the Terminal building. Control of sound is handled by acoustically treated ceilings in waiting room and entrance lobbies; acoustic tile ceilings in passenger concourse, field entrance lobbies, airline offices and other areas and acoustical plaster on the ceilings of the dining and adjacent rooms.

ATMOSPHERE

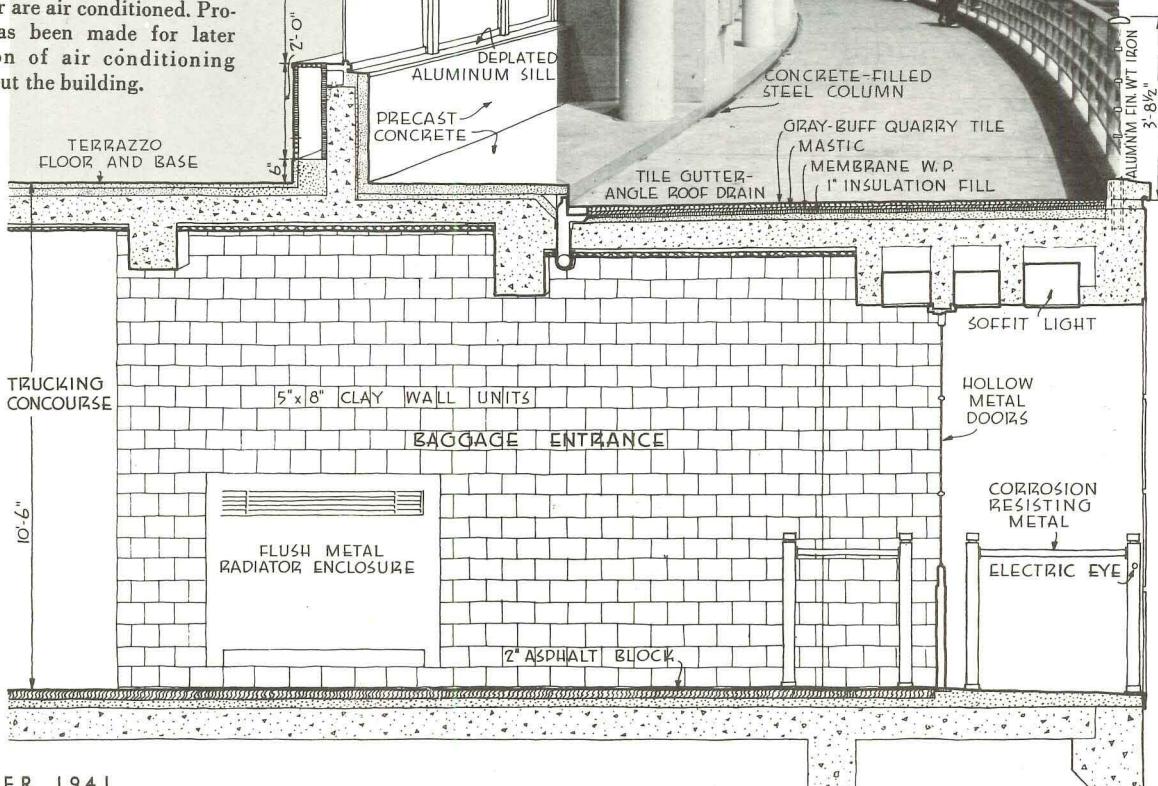
A VACUUM STEAM heating system is used throughout with concealed radiation in all public spaces. Unit heaters are used in the hangars. In the Terminal building, the waiting room, dining rooms, passenger concourses, public spaces and control tower are air conditioned. Provision has been made for later extension of air conditioning throughout the building.

CONSTRUCTION

ALL OF THE BUILDINGS are of fireproof construction employing reinforced concrete and structural steel. Pile foundations are used under the Terminal building and portions of the hangar block; spread footings elsewhere. Exterior finish of the Terminal building and hangars is architectural concrete in which plywood forms of 12-in. width were employed with waste moulds for cornices and ornamental detail. Dividing partitions are of hollow tile, or—for office areas, etc.—of the movable metal type. Projected steel sash are used throughout the buildings. Observation decks and roof decks of the Terminal building are surfaced with gray-buff promenade tile. Interior floor surfaces in public spaces are terrazzo; in offices and work spaces floors are finished with cement, linoleum or asphalt tile.



SECTION
MAIN WAITING ROOM
AND OBSERVATION TERRACE



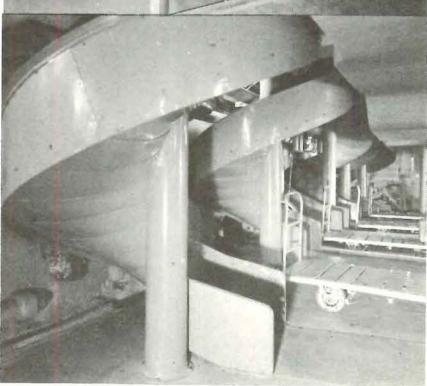
PASSENGER FACILITIES

JUST as the disparate activities of the Terminal Building as a whole have been channelized and separated, so the facilities of individual areas have been organized in the most direct line of travel. Passengers may get from where they are to where they would be—to restaurants, ticket counter or plane concourses—without crossing the main paths of other areas. This activity is all centralized in the main Waiting Room with its 200-ft.-long window commanding an unhindered view of the field and sky activity. A stepped-down area, surrounded by a plate glass balustrade, provides loge seats for the never-ending show. The floor is terrazzo verde antique marble; walls are of pre-cast exposed aggregate concrete in a warm gray-buff tone. The ceiling is acoustically treated.

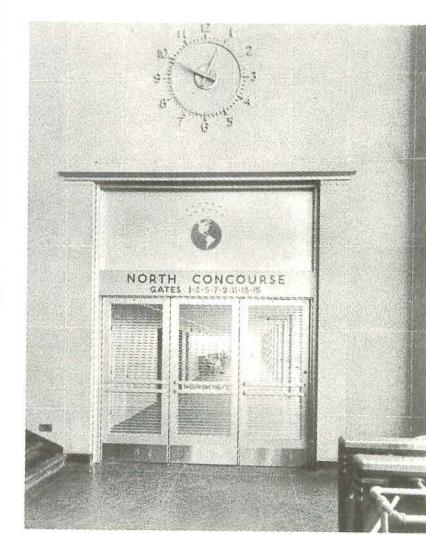


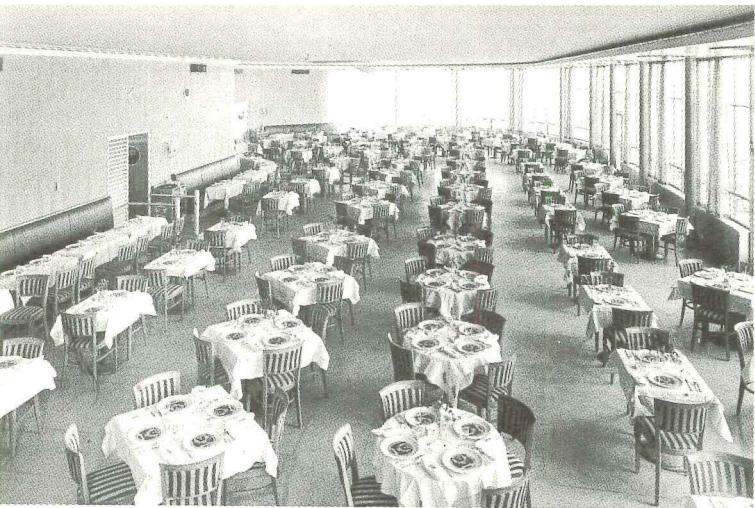
TICKETS AND BAGGAGE

UNLIKE conditions at some other large airports, by far the largest numbers of Washington passengers purchase tickets at the terminal. Hence, the sizable counters that are lined between the two entrance lobbies and convenient to passenger concourses. Here baggage is weighed (the scale indicators are mounted flush with the counter tops); movable platforms then tip the baggage down spiral chutes to waiting trucks for transfer to planes.



MOVABLE PLATFOMS TIP BAGGAGE DOWN SPIRAL CHUTES TO WAITING TRUCKS FOR TRANSFER TO PLANES.





MAIN DINING ROOM

A STAIR with a balustrade of carved panels of non-breakable glass leads up to the mezzanine-level dining room where an unbroken wall of windows provides excellent light and a skyward view. The terrazzo floor is of columbine-blue marble; the walls are of cloth-backed rift-sawn oak veneer. Doors, trim and light-cove cornice are aluminum; the acoustical plaster ceiling is tinted pale blue. An outdoor dining terrace is a few steps lower than the dining room itself, providing an uninterrupted view for all. A quick lunch counter and coffee shop is on the floor directly below, reached by a short flight down from the main Waiting Room.



CONCOURSE

Doors at either end of the room (depending on destination) open onto passenger concourses immediately above exits to the ground-level loading platforms. It is worth noting that this elevated concourse is part of the airport's long-range plan for future needs. With the large transport planes of the future with cabin floors some 10 ft. above the ground, it is anticipated that access to the planes will be provided directly from this upper level. Walls of the concourses are surfaced in peacock blue-green terra cotta units. Doors and trim are aluminum. With the baggage trucking concourse located back of the building line (see ground floor plan), the paths of passengers and baggage never cross.

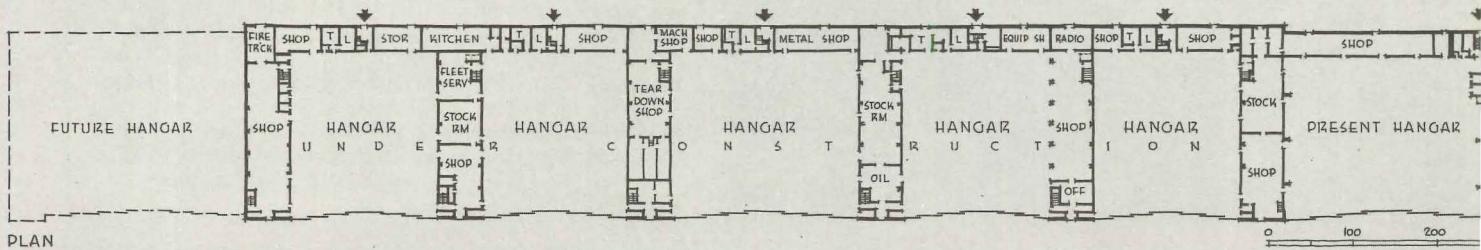
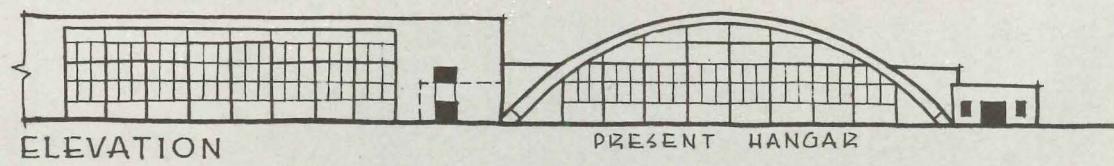




MAIN RESTAURANT and outdoor dining terrace overlook the flying field, the Potomac and the city of Washington

HANGARS

THE HANGAR BLOCK (partially under construction) is located about 500 ft. south of the Terminal Building. The largest hangar (opposite) provides a 223-ft. wide door opening with available clear height of 45 ft.—ample for easy accommodation of the B-19, largest of the Army's latest planes, which has a wingspread of 212 ft. The hangars are fully equipped with shop facilities and are protected by an overhead sprinkler system. Across the north end of the building is an office section for various airlines maintenance and operating departments.

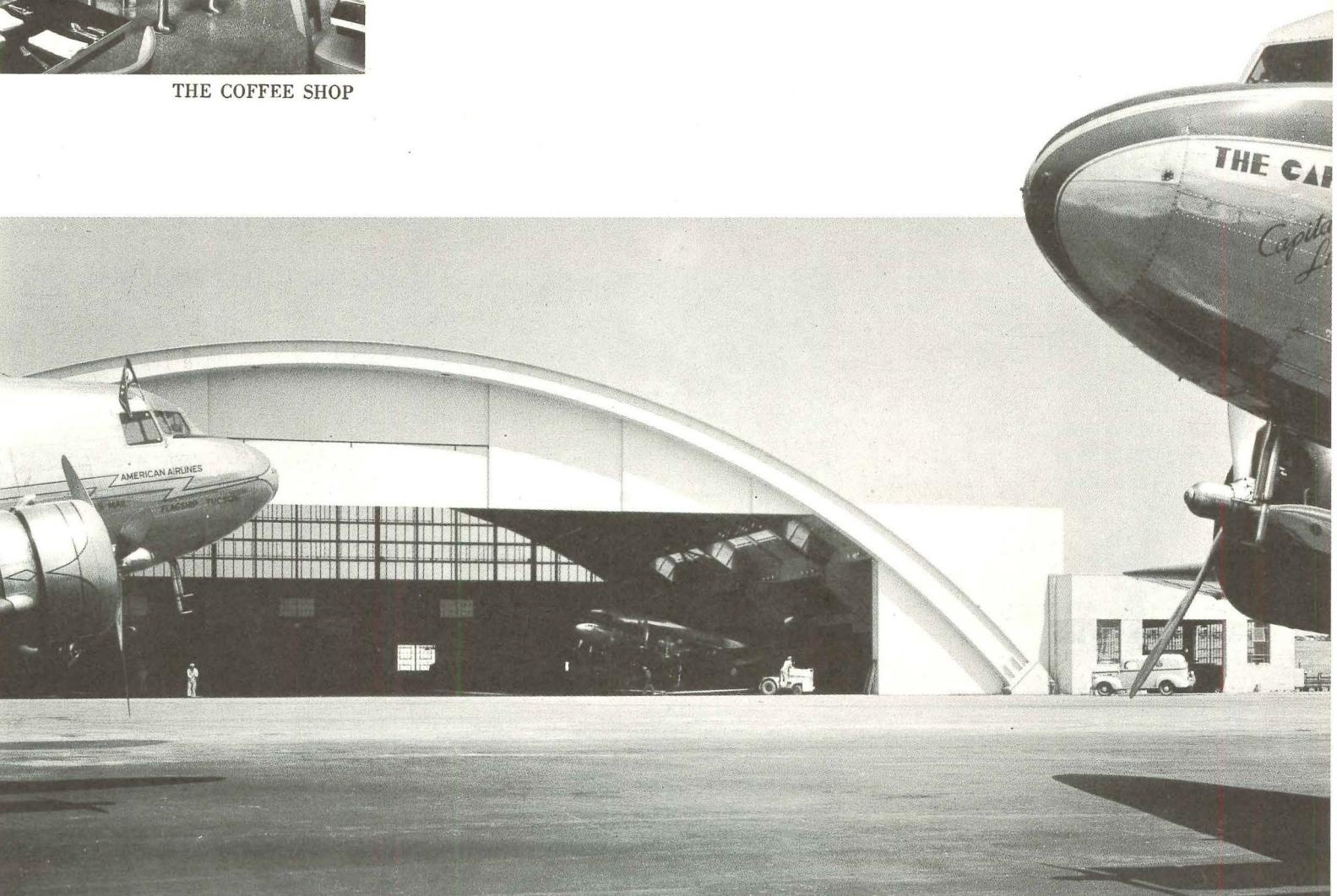


CONTROL TOWER

FLIGHT OBSERVATION, the keynote of the whole terminal, is nowhere more important than in the control tower atop the Terminal Building. From this lofty perch, there is clear visibility of the horizon in all directions, of every plane loading station and the entire length of each runway and the hangar apron. Scientifically designed in collaboration with the Airport Section of the Civil Aeronautics Authority, the shape and size, angle placement of the glass and layout of equipment approach the ultimate in functional integration. The tower is constructed of stainless steel frame with aluminum muntins and trim. The glazing is a bluish-green heat-absorbent glass which eliminates actinic rays and keeps reflections to a minimum. Large windshield wipers clear the glass in inclement weather. The room is air conditioned and fitted with the most advanced radio equipment for airway traffic control.



THE COFFEE SHOP



PENNSYLVANIA RAILROAD

WABASH RAILWAY



1

CITY TICKET OFFICES

PENNSYLVANIA RAILROAD TICKET OFFICE, CHICAGO, ILL. RAYMOND LOEWY, DESIGNER; C. M. BUCK, ASSOCIATED ARCHITECT. One of the older forms of power-driven transportation, the railroad has staged an impressive renaissance in recent years. In place of chains of wooden carriages drawn by asthmatic iron horses, streamlined, custom-fitted high-speed trains now streak the continent. In their wake, up-to-date facilities of every type are gradually replacing the other vestigial remains of an out-moded system. One of the newer services is the downtown city ticket office, designed to serve the traveler more quickly and efficiently and to convey the sense of air-conditioned comfort which contemporary rail travel implies. In the offices shown on these pages, the basic design intent was "to do away with every psychological and physical barrier to planning a trip or simply to buying a ticket to the next town."

A street-front wall of clear glass, set back from the building line, provides customers and passers-by with an inviting stimulus to travel. The company name,

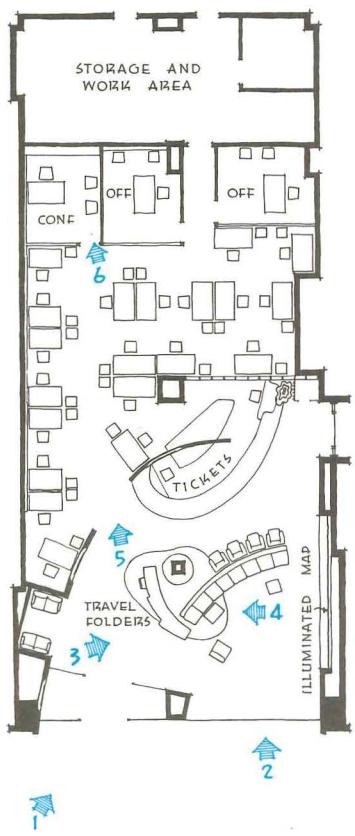
in bronze letters, is mounted on a proscenium of illuminated sheets of opalescent glass. Structural columns are also sheathed in the glass, serving both as light sources and as dramatic back-

grounds for advertising. The floor is of pin-striped gray rubber; trip planning desks are in natural wood with bronze legs. Light and air conditioning elements are contained in a dropped ceiling.

2



Photos by Hedrich-Blessing Studio



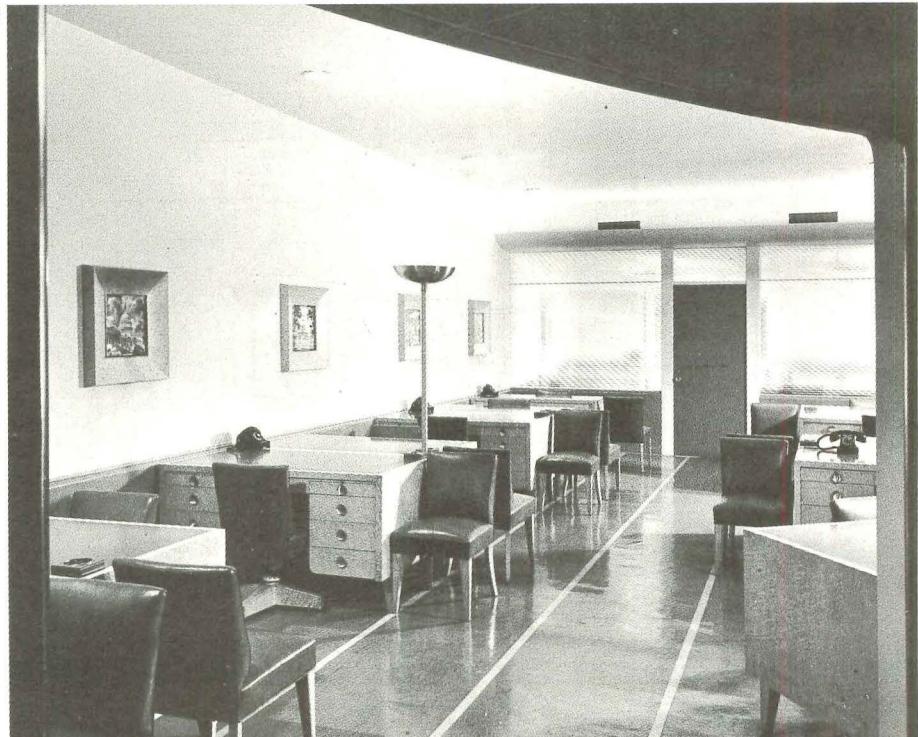
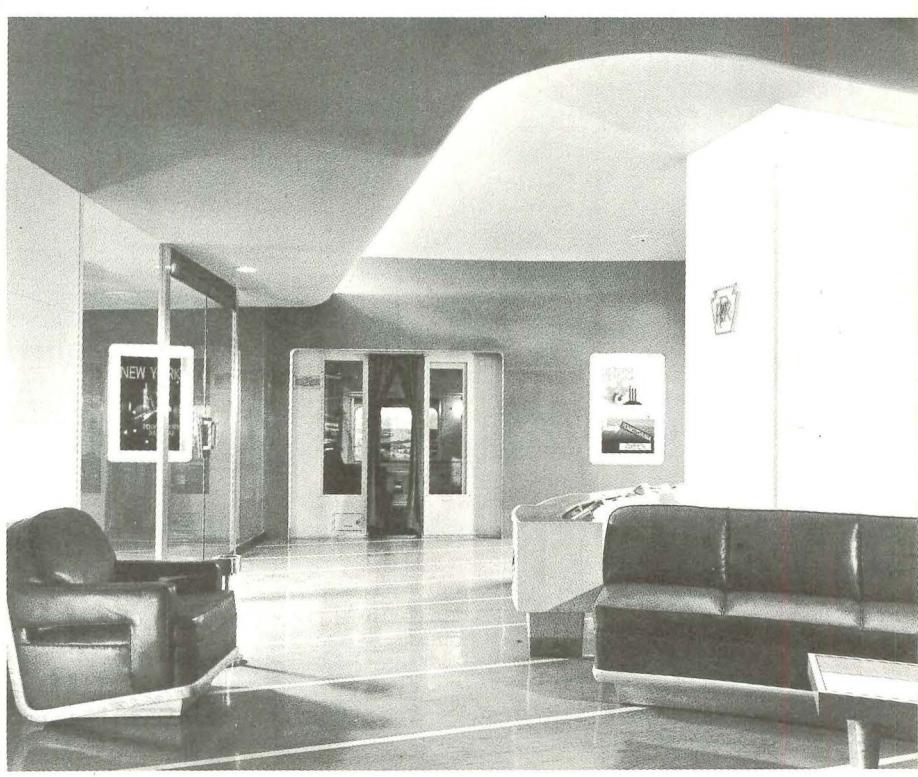
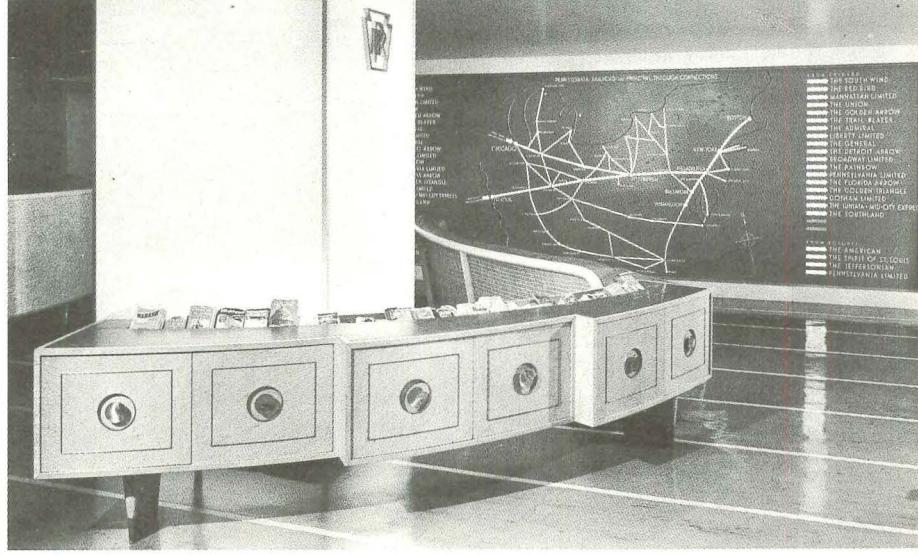
ROUTE MAP

The focal point of attention both from inside the building and from the street is the illuminated map set in a marble-surfaced wall (arrow 3 on map above). The names of crack trains, their itineraries and times of departure are made up of letters, figures and strips of varicolored plastics. A mechanism controls a "continuous performance." As each name lights up, its corresponding route flashes across the continent. The cycle repeats at regular intervals, so that passengers may see where and when connections are made for any given destination. The "audience" is comfortably accommodated in a central lounge grouping

3

4

5



6





DEPARTMENT STORE WAREHOUSE

BUTTONWOOD WAREHOUSE, PHILADELPHIA, PA. SIMON &

SIMON, ARCHITECTS. On city streets where considerable truck loading and unloading occur, traffic "flow" becomes a cynical misnomer, and congestion and lost tempers give impressive evidence of something wrong. A more intelligent concept of land use; an integrated system of highways and city street routings and a broader approach to city planning in general are the eventual solutions. But the Buttonwood Warehouse, designed to serve Lit Brothers department store, is proof that architects can do much to ameliorate conditions even under our present system.

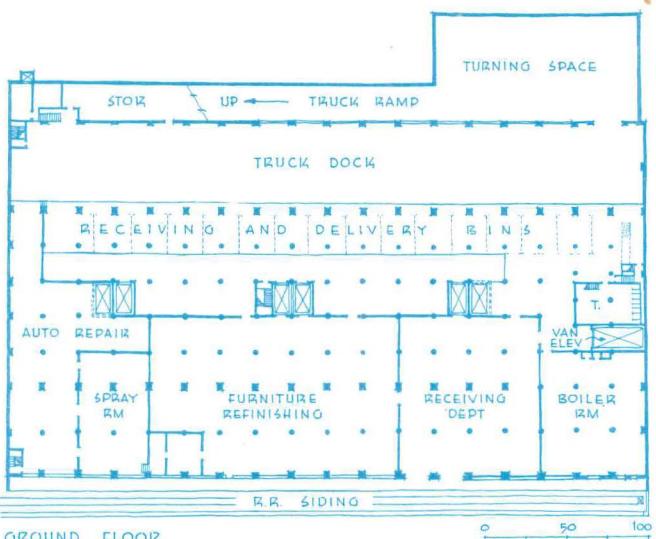
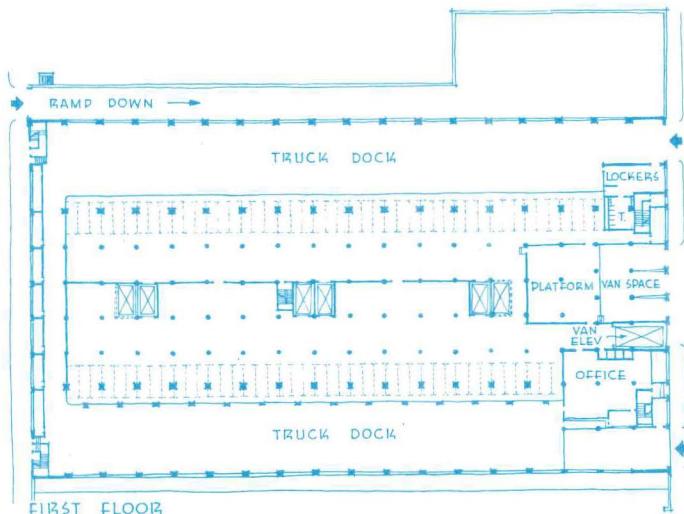
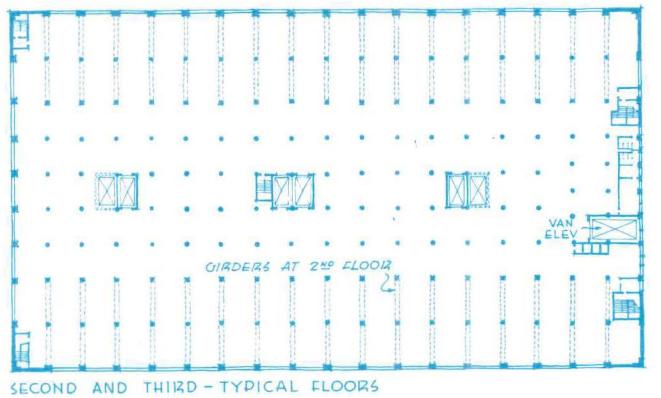
All loading and unloading of trucks is handled within the building envelope. The railroad siding serves the structure at a level below that of regular street traffic. Truck servicing facilities and space for backing, filling and turning are provided off the street. And that is a sizable amount of clogged-traffic relief when it is realized that 120 trucks can be accommodated at one parking. Cost of the building: approximately \$2,000,000.

A few significant notes on the building and its location: SITE. The store is less than a mile distant; the warehouse, while outside the area of densest traffic, is in the geographical center of the population area it serves. The Reading Railroad tracks adjoin the property.

FACILITIES. An elaborate conveyor system (see opposite page), supplemented by freight and van elevators, reduces physical labor to a minimum. Spaces are provided for warehousing according to store departments. Goods may be handled from freight car or truck to warehouse

floor; from warehouse to store; from store to warehouse to local delivery truck, or from warehouse directly to trucks. In addition, an air-cooled fur and rug storage vault is provided (on the fourth floor) and areas are arranged for furniture refinishing, truck repair, cashier's department and employees' and truck drivers' facilities. STRUCTURE. Reinforced concrete skeleton; flat slabs with drop panels and mushroom heads; exterior brickwork in two tones, steel sash, aluminum trim. To carry the load of the columns above the clear truck-operation areas, the full height of the second floor is used for concrete trusses extending from slab to slab—2 ft. 2 in. thick, 14 ft. 6 in. high and just under 58 ft. in length.

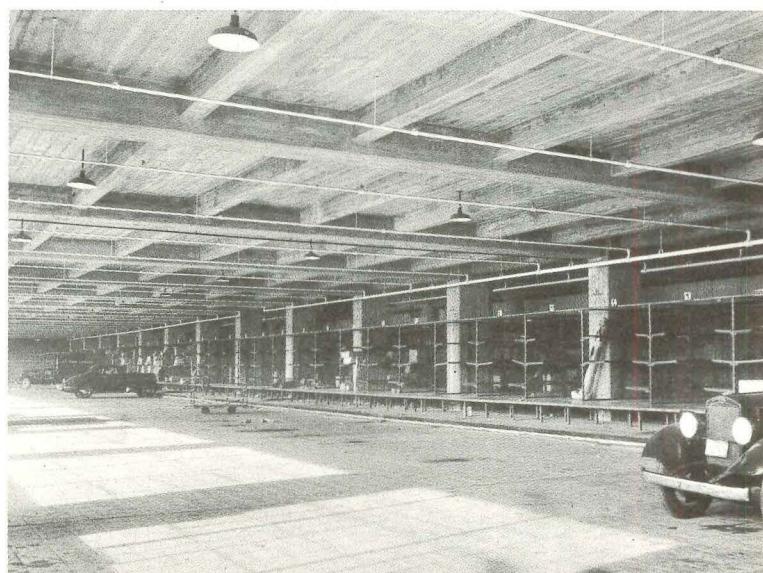
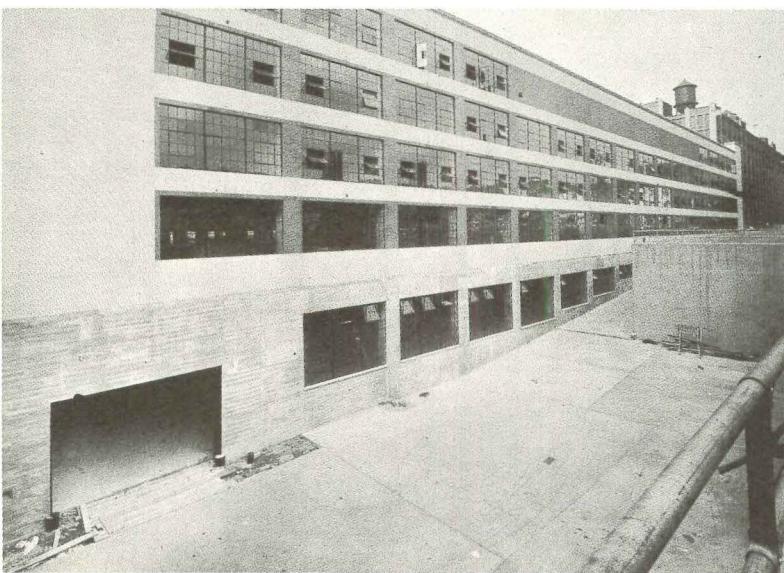




Photos by Bond Brothers



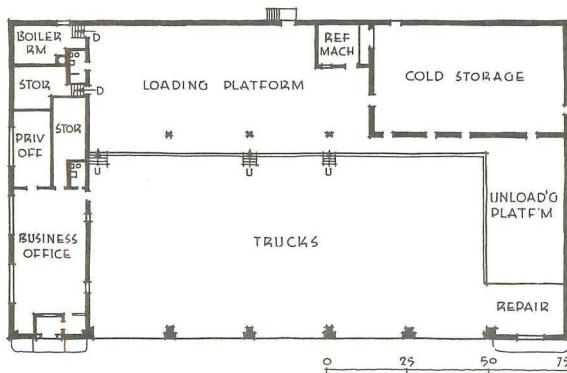
CONVEYOR SYSTEM. Elevators assist in the vertical movement of such items as pianos and large furniture, but the majority of both incoming and outgoing goods move along the conveyor system, consisting of 24 separate lines. A two-way main receiving conveyor is centrally located and extends from ground to fourth floors. Supplementary conveyors across the building bring both carload and truckload freight from receiving platforms to this main mobile artery. A special belt handles rugs, linoleums, etc., for distribution to the delivery truck or to storage on the first floor. At a level slightly below that of the first floor, conveyors converge at a relay depot or markers' pit. Goods sent from the store for local delivery slide to this relay depot. From here five separate conveyors lead to station or transfer points, where additional belts carry goods along the bins at the back of truck platforms. All goods taken from stock throughout the warehouse are similarly sent to the markers' pit for route sorting





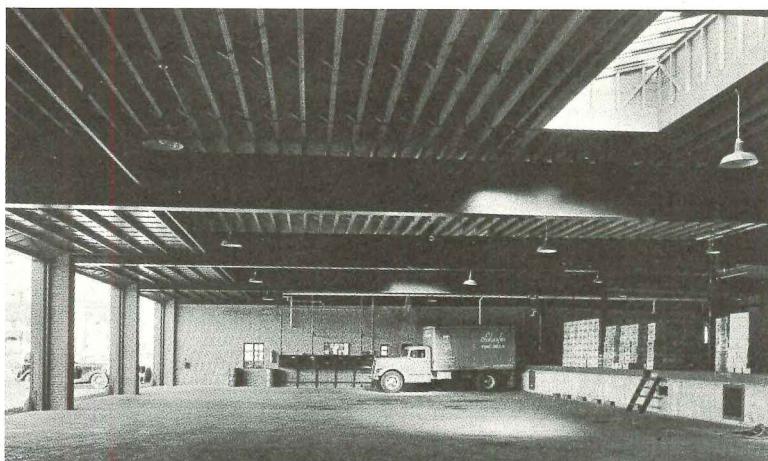
Photos by Gottscho

DISTRIBUTION STATION



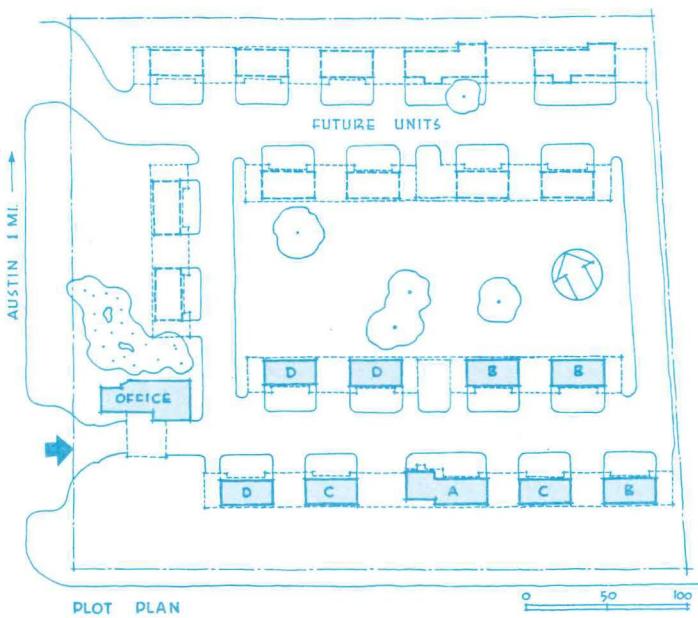
SCHAEFER BREWING CO. DISTRIBUTING STATION, FAIRFIELD, CONN. EGgers AND Higgins, Architects.

Developments in transportation facilities invariably bring a demand for new types of buildings to serve them and open up new opportunities for the building designer. The trucking transfer point or temporary storage building for produce in transit—like the one shown on this page—is a case in point. Located in the center of a wide industrial area, the station includes a business office, cold storage room, trucking platform and repair shop. Daily deliveries of beer in kegs, cans and bottles are kept in the storage room until needed for local delivery. Exterior doors from this room are opened in cold weather, obviating the need for year-round operation of refrigeration machinery. The truck space is large enough to house all trucks at night. Truck platforms are of reinforced concrete; exterior walls are brick. The roof is framed with long-span steel girders and wooden joists.



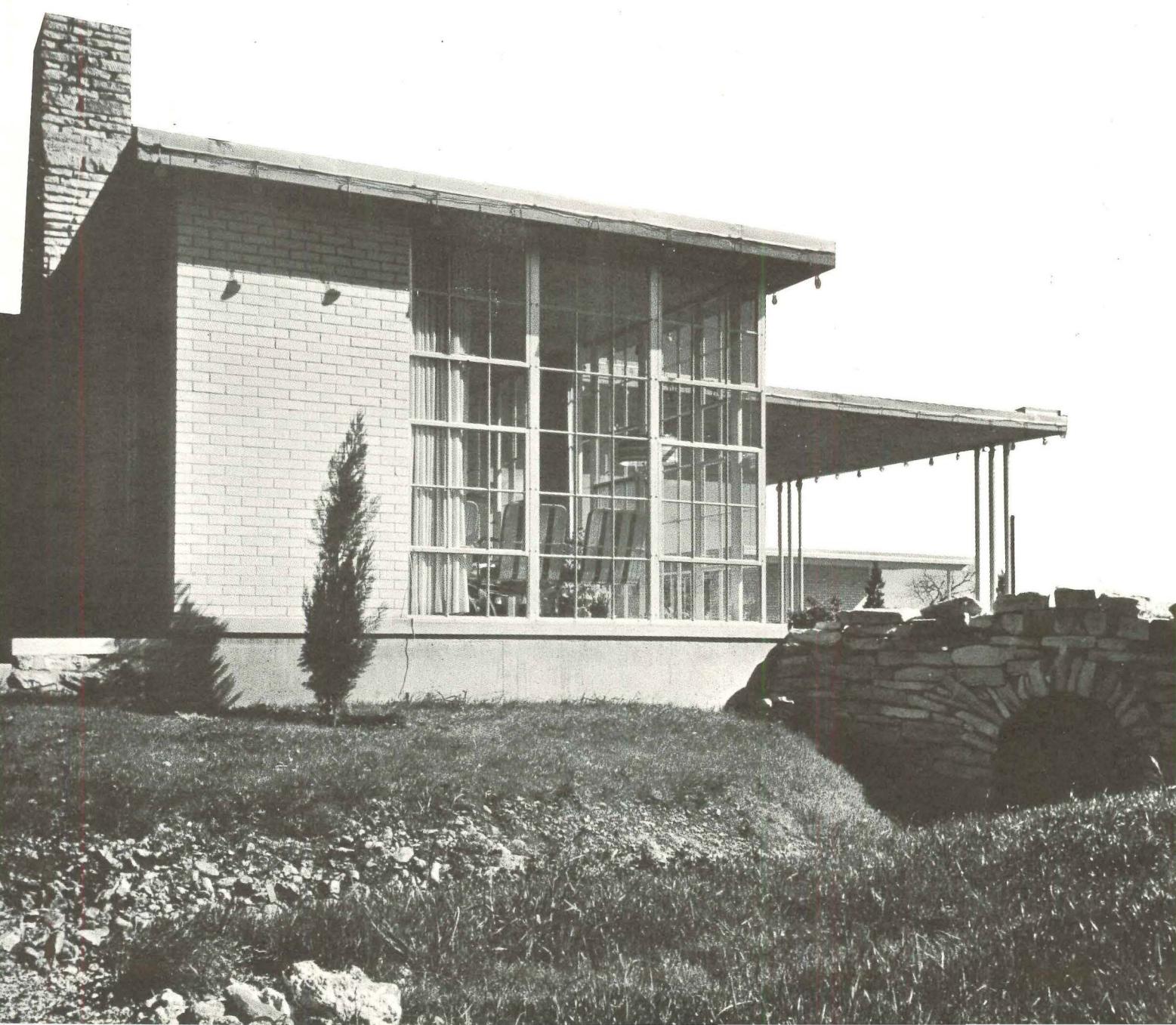
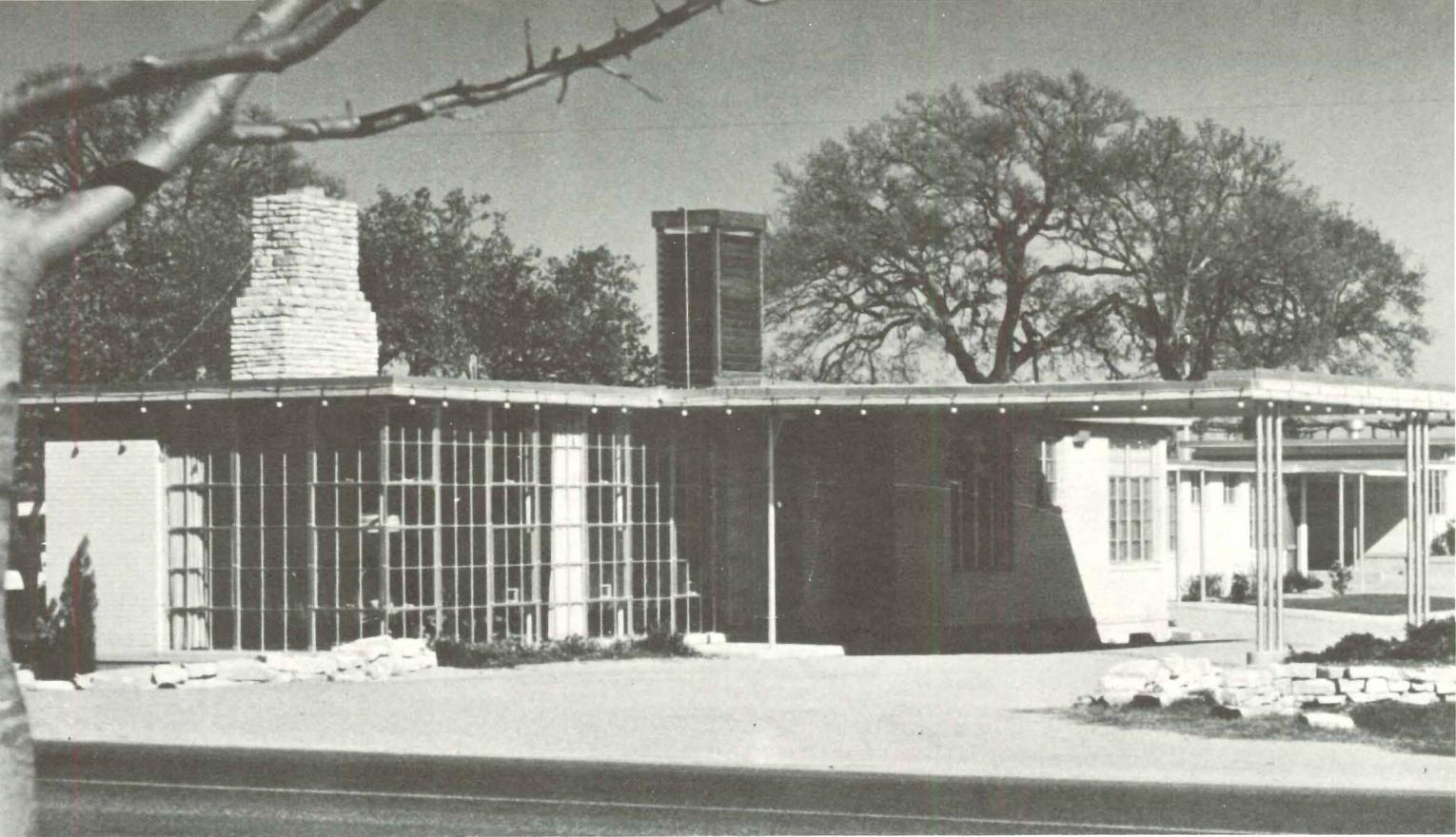


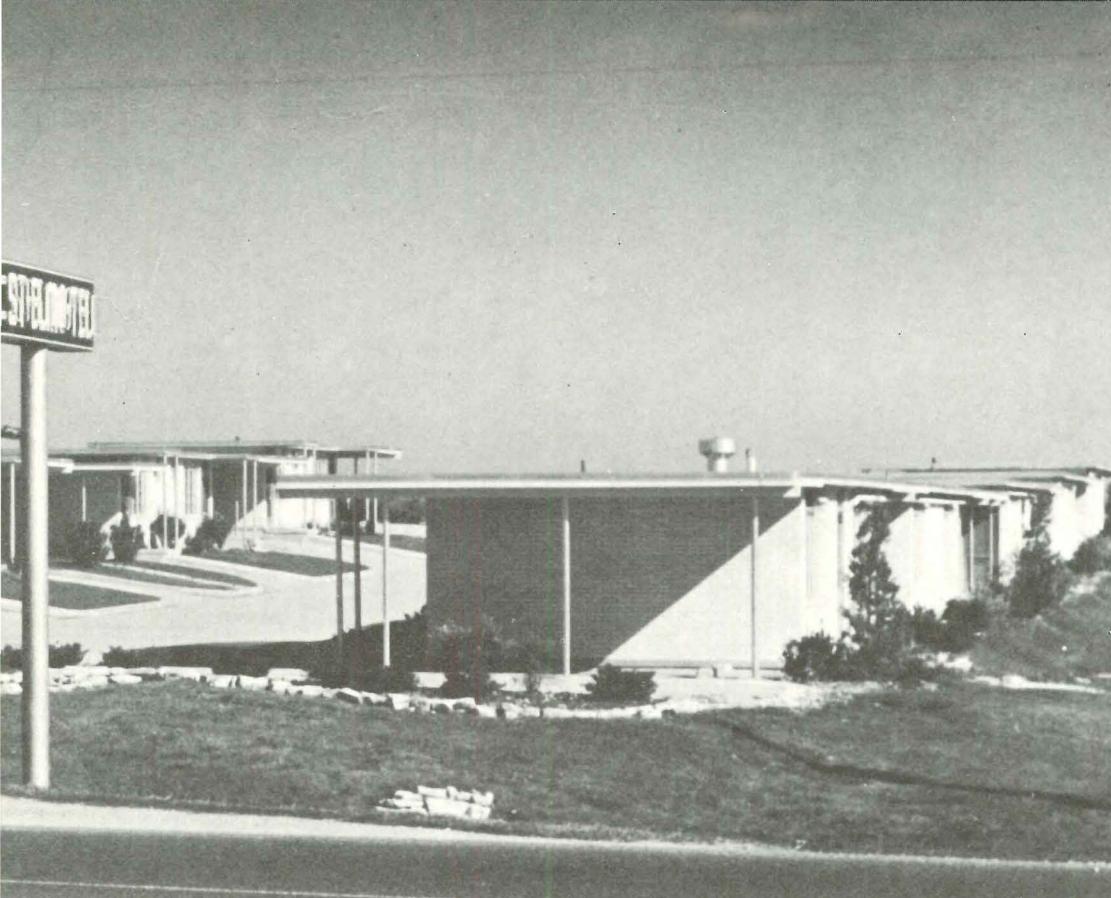
MOTORISTS' ACCOMMODATIONS



ST. ELMO-TEL, NEAR AUSTIN, TEXAS. ARTHUR FEHR.

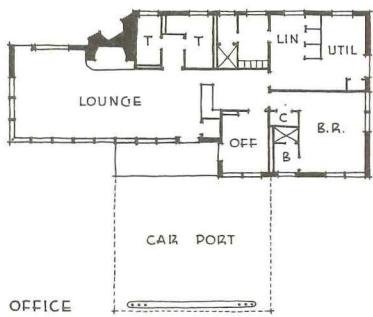
ARCHITECT. "From Hotel to Mo-tel" might well be a chapter title in the story of facilities designed to serve automotive transportation. Not at all to suggest that the latter has replaced the former. But for certain travel-weary groups—for instance, families with much luggage who have driven all day, autoists who shrink from city driving at night or those who simply prefer country sleeping—the "mo-tel" serves an important supplementary need. Coincident with the development of good highways, the new type of roadside hotel appeared in embryo form—seried ranks of tiny imitation "homes," some good, many "picturesque," and others beyond description. As the serious need for this new type of accommodation has grown, and increased comforts and amenities have been demanded, architects at last have been called in to give a co-ordinated over-all approach to the design. One of the most newsworthy is the St. Elmo-Tel. The site anticipates expansion of the project to twice its present facilities.





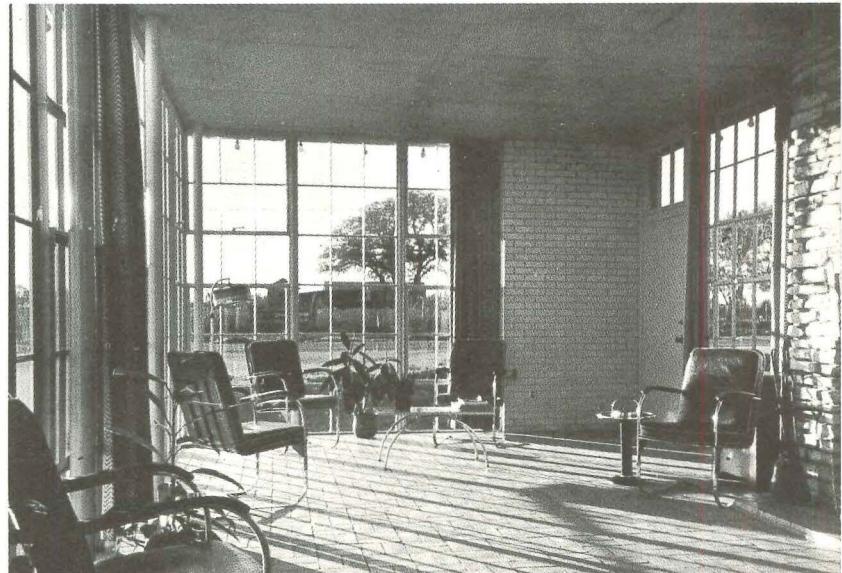
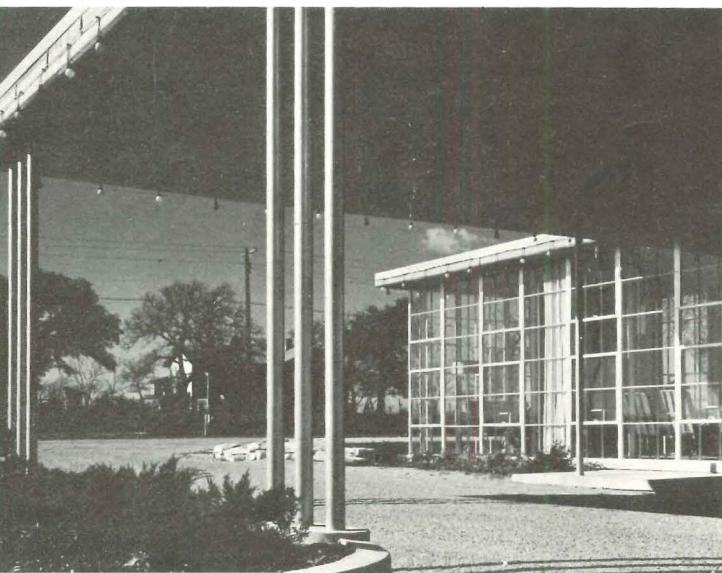
ARTHUR FEHR, Architect
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Photos St. Thomas



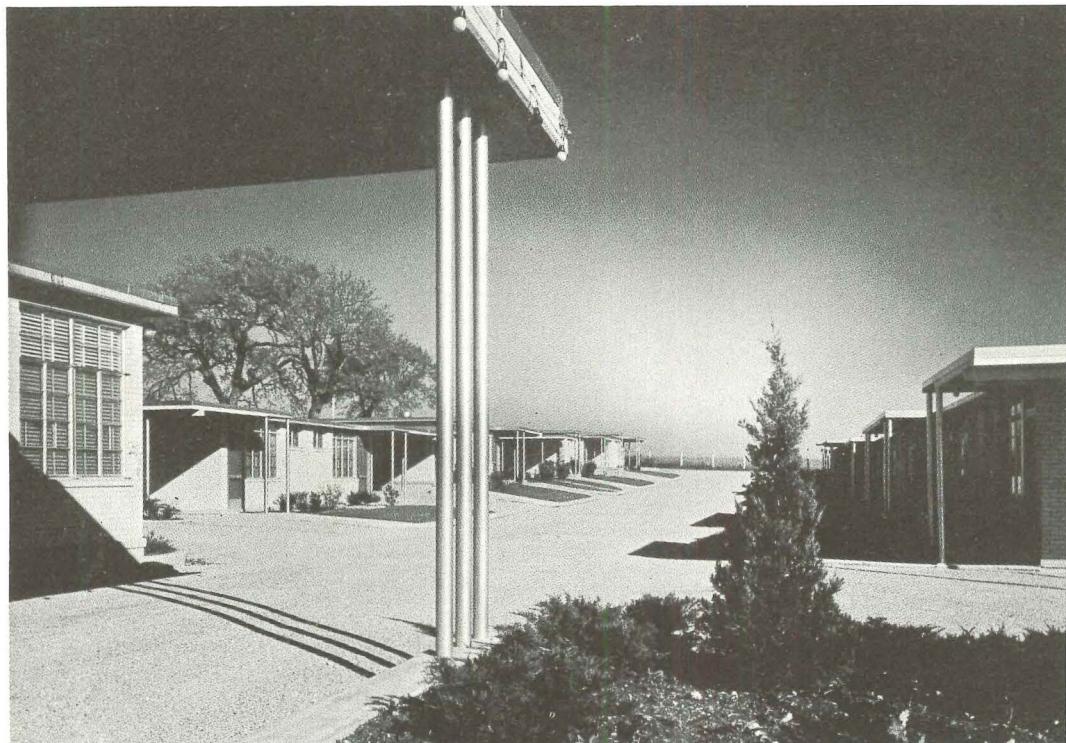
OFFICE AND LOUNGE UNITS

AN AIR-COndITIONED, many-windowed lounge greets arriving guests. Fireproof construction—as in all of the units—consists of concrete floor slab, brick walls and insulated concrete roof slab surfaced with gravel. The sash are of steel. Beyond this building in the area between the present and proposed future units are gardens, croquet courts and a putting green. The carefully selected site of the “mo-tel” is near a highway rotary about one mile south of Austin. Cost of the project was slightly less than \$50,000.



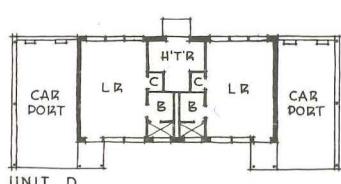
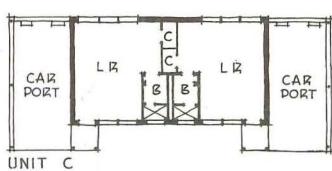
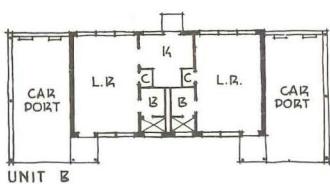
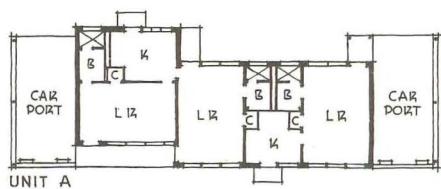


ARTHUR FEHR, Architect
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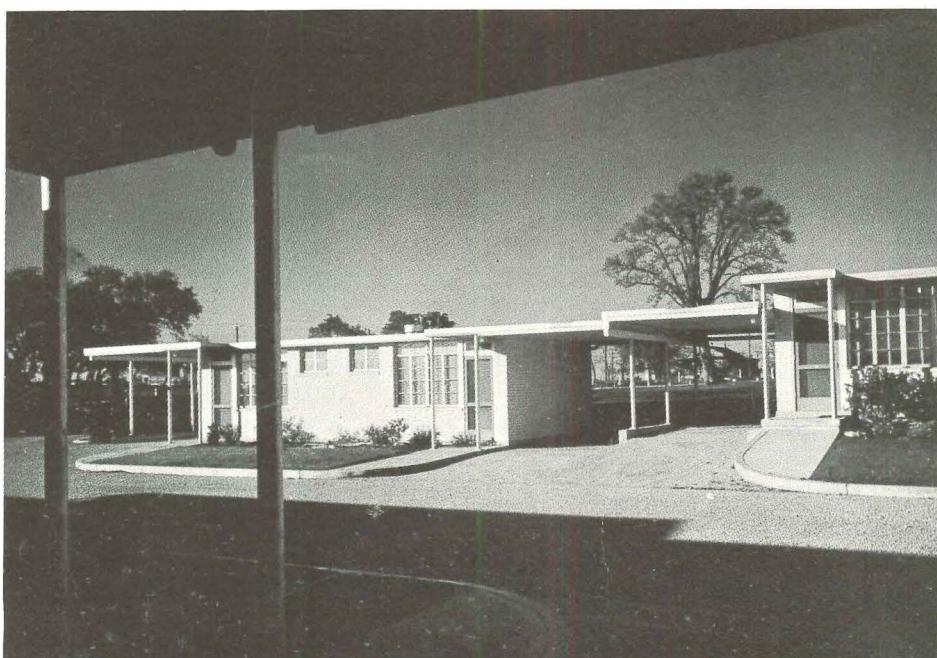


Photos by St. Thomas

ACCOMMODATIONS



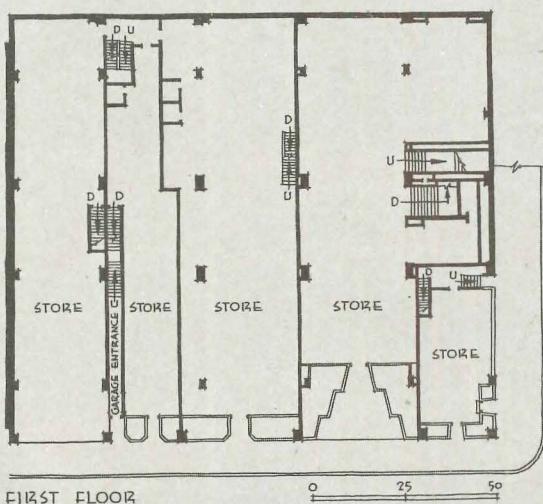
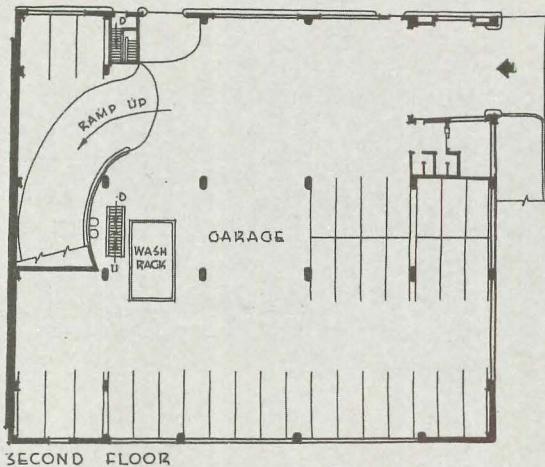
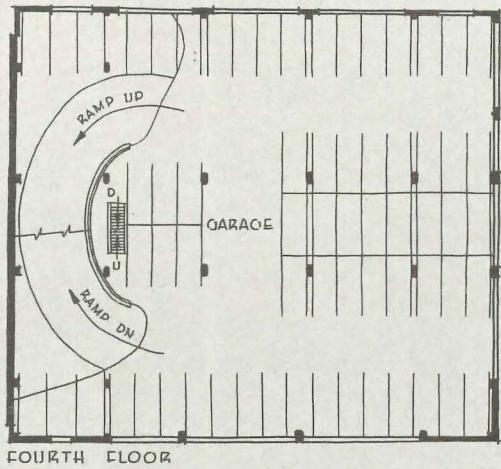
FOUR UNIT TYPES are used along the "mo-tel" lane. Of the 19 rental areas, five are equipped with kitchens. All have telephone connections. Heat is supplied by a circulating hot water system with heater and storage tanks in the two units nearest the office-lounge building. The insulated hot water supply pipe is run overhead under the roof overhang and is used architecturally to join the units visually. Return pipes are run underground.





DOWNTOWN GARAGE

COMMERCE TRUST GARAGE, KANSAS CITY, MO. KEENE AND SIMPSON, ARCHITECTS. This impressive structure is the direct result of the effort of a group of citizens who banded together to do something about their downtown parking problem. President of the Downtown Committee, formed to promote better building construction, modernize old structures, control objectionable signs and provide adequate parking space was James M. Kemper, President of the Commerce Trust Company. To set an example, the bank purchased the property immediately adjoining, tore down dilapidated buildings and erected this garage. Advantage was taken of the sloping site to provide several shops on Main Street at the lower level. Projecting signs are prohibited; all leases call for signs and awnings to be erected in the spaces provided for the purpose. Spanning the alley between the garage and bank at the third floor level is a bridge connecting with the main banking floor. Persons having business at the bank may drive up to this floor and park for 15 minutes without charge. The bridge also directly serves the office building lobby. Garage space is provided for 250 cars. Construction is of reinforced concrete with roof frame of light structural steel. Steel commercial projected sash, placed 6 ft. from the floor of each garage level, are equipped with insulation-type glass. Story height floor to floor is 10 ft. 6 in., which requires only a nine percent grade for the 20-foot ramp. Total cost of the project, including land, building and equipment, came to \$478,000. The building cost was 24.8 cents per cu. ft.



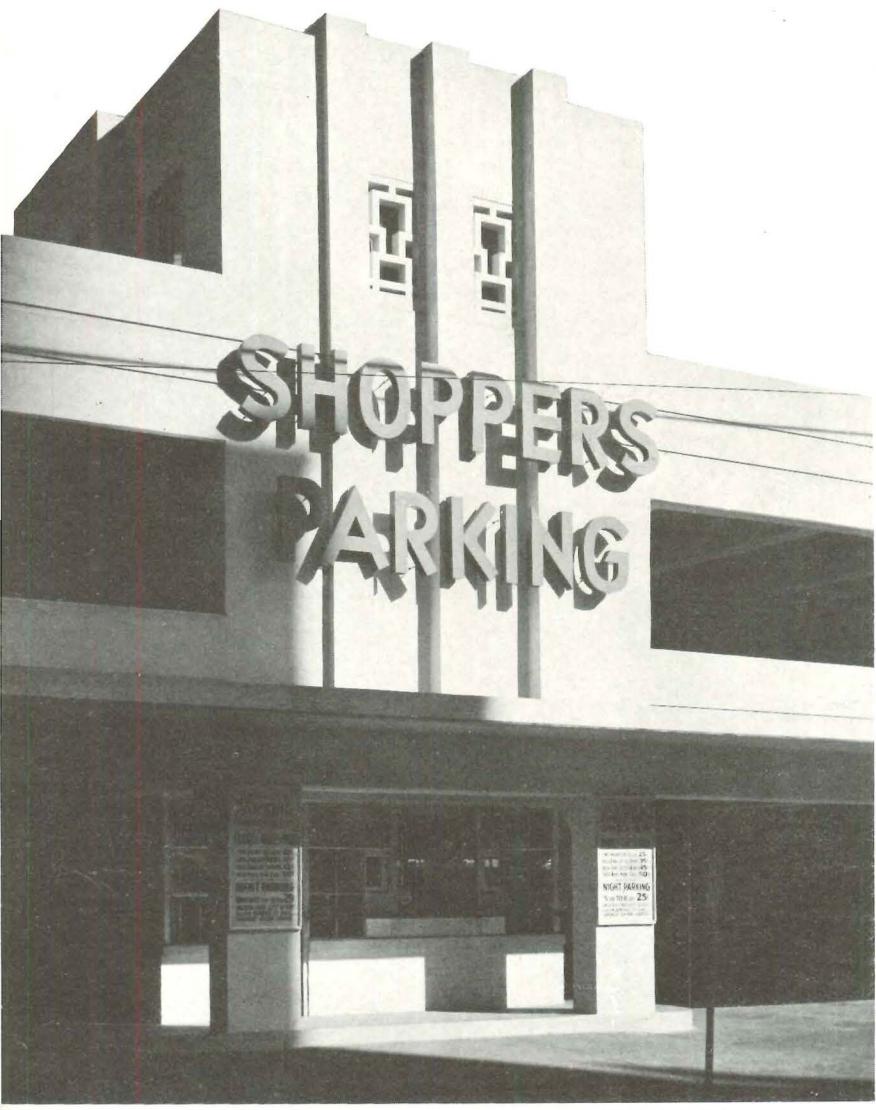
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PARKING DECK

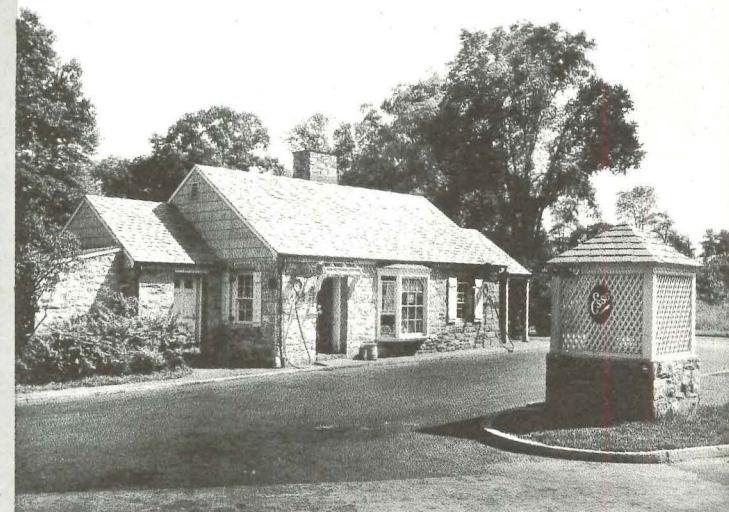
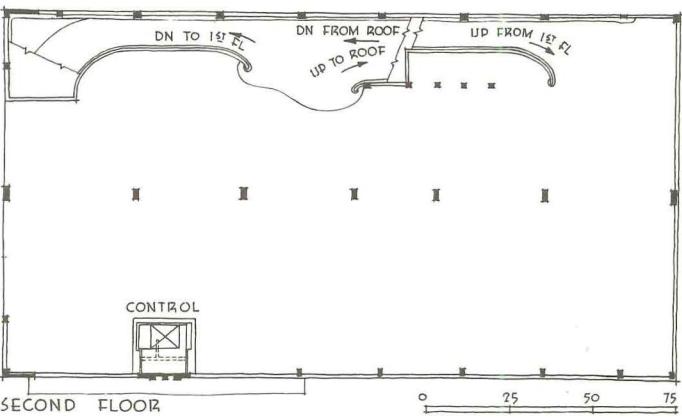
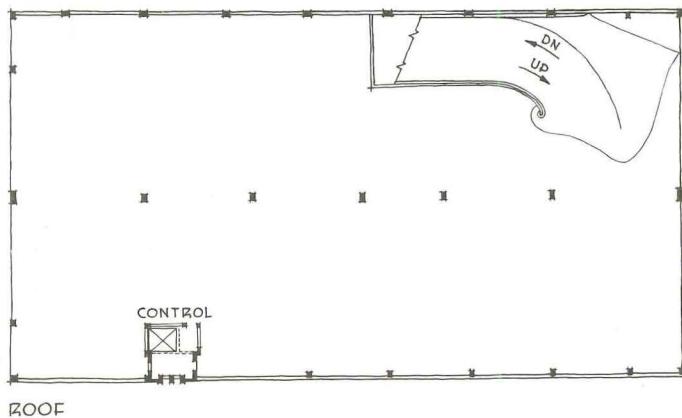
SHOPPERS' PARKING DECK, DETROIT, MICH.

SMITH, HINCHMAN & GRYLLS, INC., ARCHI-
TECTS. One of the most economical types of parking structures that has been devised to relieve downtown traffic congestion is the open-air deck. In the Detroit project, built on a 110-by-200-ft. plot, the ground level and two floors above grade provide normal space for 270 cars. Maximum capacity, using aisle space, is 300. In actual operation, the average turnover is two and a half times daily. Handling an average of 800 cars a day calls for a staff of six attendants and a cashier. The structure is entirely of reinforced concrete, employing long span shallow depth beams and girders and a minimum of columns, thus increasing the ease of operation and making the parking of cars more flexible. The four-inch floor slabs were increased in thickness at the sides of some of the girders to form a more satisfactory T, and at several places the floor was warped to provide adequate headroom over ramps.



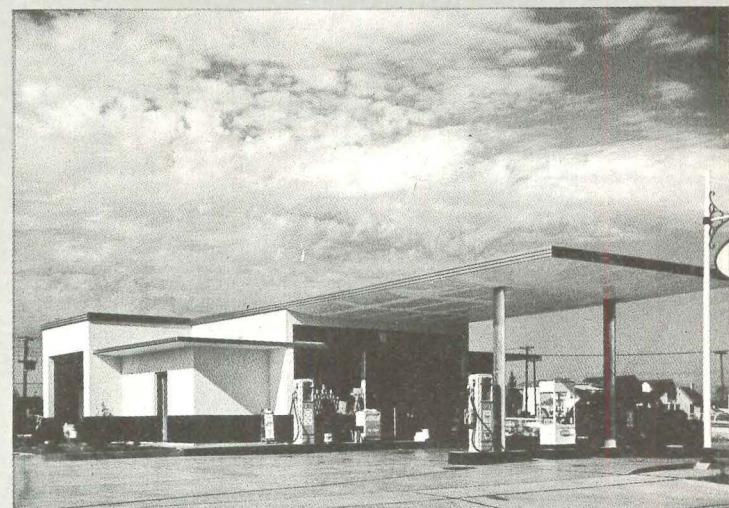
MODERN GASOLINE STATIONS . . .

Harold Haliday Costain



range from tidy, somewhat sentimental little structures whose design expressions are determined by their proximity to highly restricted residential districts or landscaped parkways . . .

Photos by St. Thomas



. . . to rationalized service buildings planned both to function as efficiently as possible and to dramatize the station facilities and service process rather than conceal them



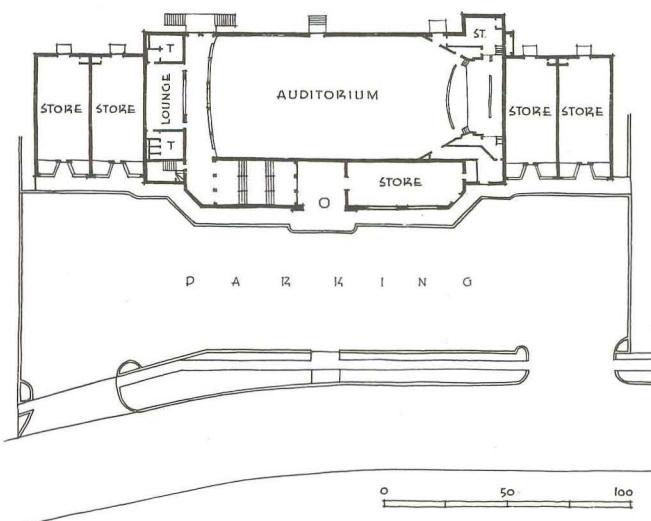
Photos by St. Thomas



DRIVE-IN NEIGHBORHOOD GROUP

THEATER AND STORE BUILDING FOR JEFFERSON AMUSEMENT CO., BEAUMONT, TEXAS. STONE & PITTS, ARCHITECTS.

One effective step toward "thinning out" a city, relieving downtown congestion and increasing the amenities of urban living is establishment of decentralized neighborhood shopping centers. Located at a point between city and suburb, the Beaumont group serves a wide residential area. Approximately 80 per cent of those using the facilities arrive by automobile or suburban bus line. Wise planning included generous off-the-street parking space, thus obviating the formation of a new nucleus of traffic congestion. Heavy rainfall conditions dictated the basic scheme of a single unit with continuous protective marquee. Structurally the building consists of concrete spread footings and grade beams, exterior walls of stucco-surfaced hollow tile; steel stud interior partitions and a built-up roof over wood frame. Building cost, including ventilation system, light fixtures and architect's fee, but excluding furniture and equipment, was 23 cents a cu. ft.



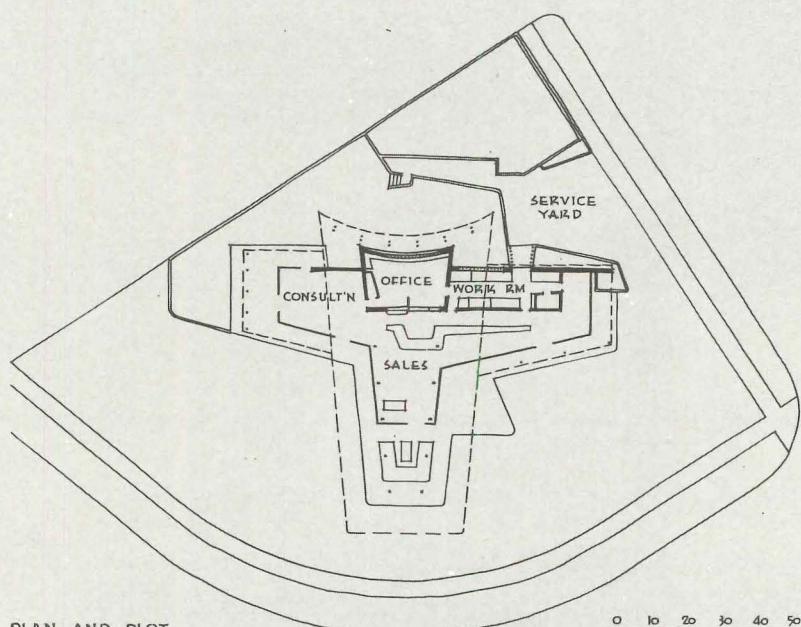


Mott Studios

DRIVE-IN FLOWER SHOP

McELDOWNEYS, LOS ANGELES, CALIF.
JOSEPH L. FEIL, DESIGNER; S. P. BARNES,

ENGINEER. Something of an anachronism arose in the planning of this extraordinary shop for the sale of flowers. While the drive-in concept was considered basic, a large amount of parking space was not necessary. This is due to the fact that sales (unlike those of a grocery store or restaurant) are on a quick pickup basis. A controlling design factor was the need for visibility of stock. Hence all walls except that at the rear are of glass, and the roof over the glazed area is supported on inconspicuous tubular steel columns. The T-form of the building enhances the display for passing motorists. The structure has a light steel frame welded or bolted to base plates which rest on foundation piers. The latter are tied together with reinforced concrete tie beams. To support the roof, a light steel cantilever frame with wood joists was used. Welded gussets join roof and columns. Extensive air conditioning maintains ideal atmospheric conditions for the perishable merchandise.



PLAN AND PLOT

SUPER MARKETS

THE OFFICE OF STILES CLEMENTS, ARCHITECT



Photos by Floyd Ray, Fred R. Dapprich, and Mott Studios by Merge

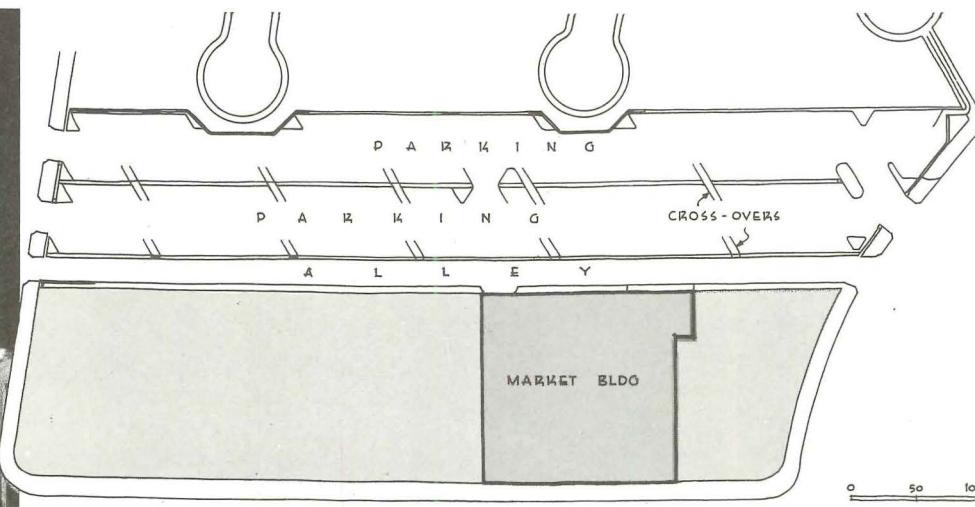
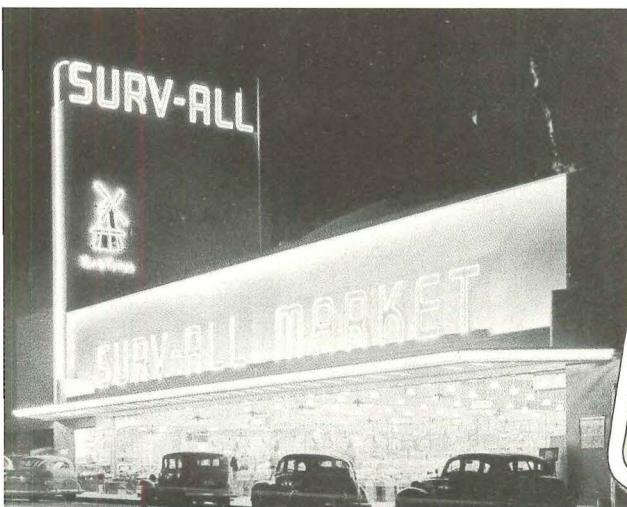
SIMPLE FORMS and generous wall spaces provide background for signs by day and tube lighting by night — bold masses easily understood at the speed of present-day traffic

EDITORIAL NOTE: The following discussion was prepared especially for our Transportation issue by Architect BEN H. O'CONNOR of THE OFFICE OF STILES CLEMENTS



THE SUPER MARKET, a departmentalized food store offering for sale practically every item of food from cornstarch to caviar, is one of the outstanding results of urban decentralization in the Los Angeles region, and the motor car is one of the principal contributing factors. To understand the effects of transportation on the design of certain types of buildings in this metropolitan area, one must first realize the effects transportation has had on the community itself. In probably no other city has urban decentralization occurred so spontaneously. Three principal factors have contributed to this condition: automobile transportation, climate and rapid increase in population. Of the three, transportation is probably the most potent. Given only a mild climate and a meteoric rise in population, we would still find a relatively limited occupied area had we not had the automobile for easy accessibility of distant residential developments. Furthermore, in this coastal plain, the normal process of development of new residential areas

TYPICAL PLOT PLANS — one with the parking area in the most prominent position, calling motorists' attention to the



has frequently been reversed; the sub-divider has been able to locate new real estate offerings without regard to commercial and industrial developments. Commerce and trade follow each new residential growth to serve the primary needs at least — food, clothing, amusement, etc.

Before the full impact of the city's phenomenal growth had been felt, the so-called "Drive-In" market was replacing the traditional neighborhood grocery. Usually consisting of a shallow building extending across the rear of a wide lot, the Drive-In afforded room for the customer to take his car off the street and provided somewhat easier parking facilities.

There were, however, serious disadvantages. The available amount of parking, for instance, hardly exceeded that of curb parking furnished by city streets, while lack of space within the buildings prevented handling sufficient volume of merchandise. As such drawbacks became apparent, far-sighted merchandisers saw the need of meeting competition with more efficient operation. The answer seemed to rest in volume, and so the size of the building began to increase to provide the facilities required. Here again transportation comes in, because it is obvious that the larger market must draw on a large territory for support and practically all such markets exist on a cash-and-carry basis.

The type of building developed for the Super Market is simplicity itself. The need for flexibility in interior display case arrangements has resulted in the use of light wood trusses spanning upwards of one hundred feet, thus creating a hollow shell, the outer walls of which are usually of reinforced concrete or reinforced brick. The principal front may be entirely open, protected only by collapsible gates, or it may be enclosed with traditional but generous display windows; or, as in some of the more recent markets, it may be equipped with complete display windows and bulkheads which are raised behind the front spandrel in summer and lowered in winter. In area the buildings average between 20,000 and 25,000 square feet. Parking areas four to five times as large as the building area are required.

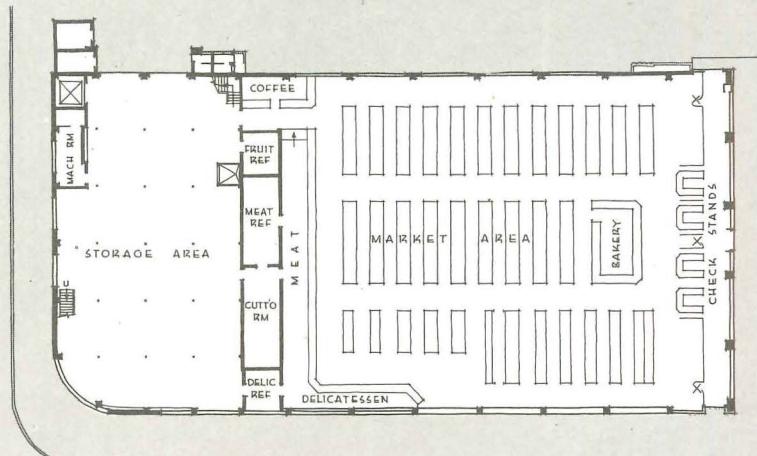
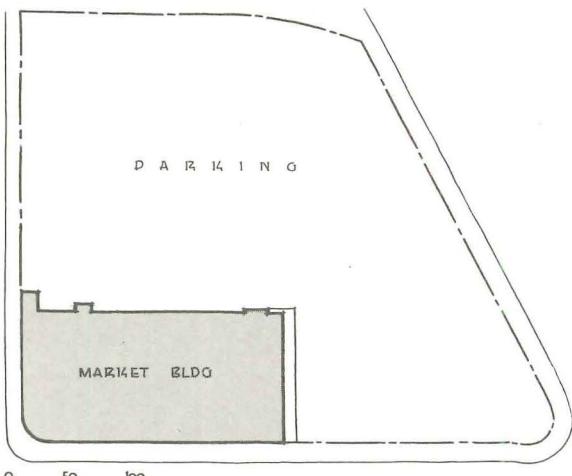
The actual arrangement of the interior varies with the operating company. In order to maintain a volume business, ample storage areas must be provided for all departments — transportation again. Large, fast trucks make possible daily deliveries. Both belt and trolley type conveyors are used to move supplies. Loading docks must be ample and accessible and so located that refuse may be conveniently disposed of and still remain out of sight. A complete bakery may be included for preparation and baking of bread on the premises. Assembly rooms for demonstrations, lectures and other types of meetings are sometimes provided on a mezzanine or balcony floor.

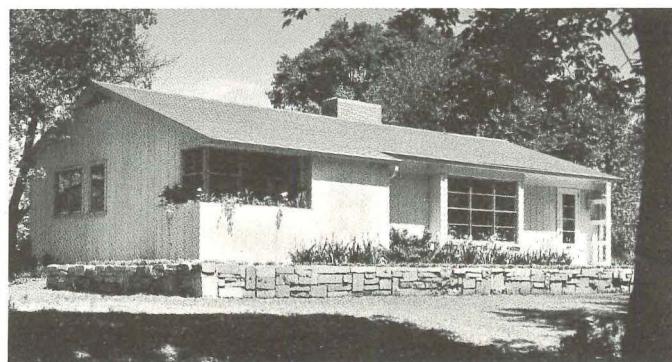
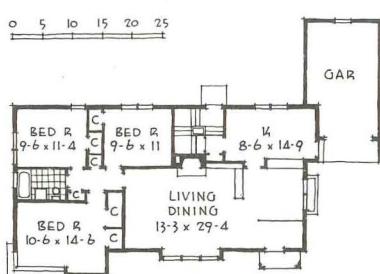
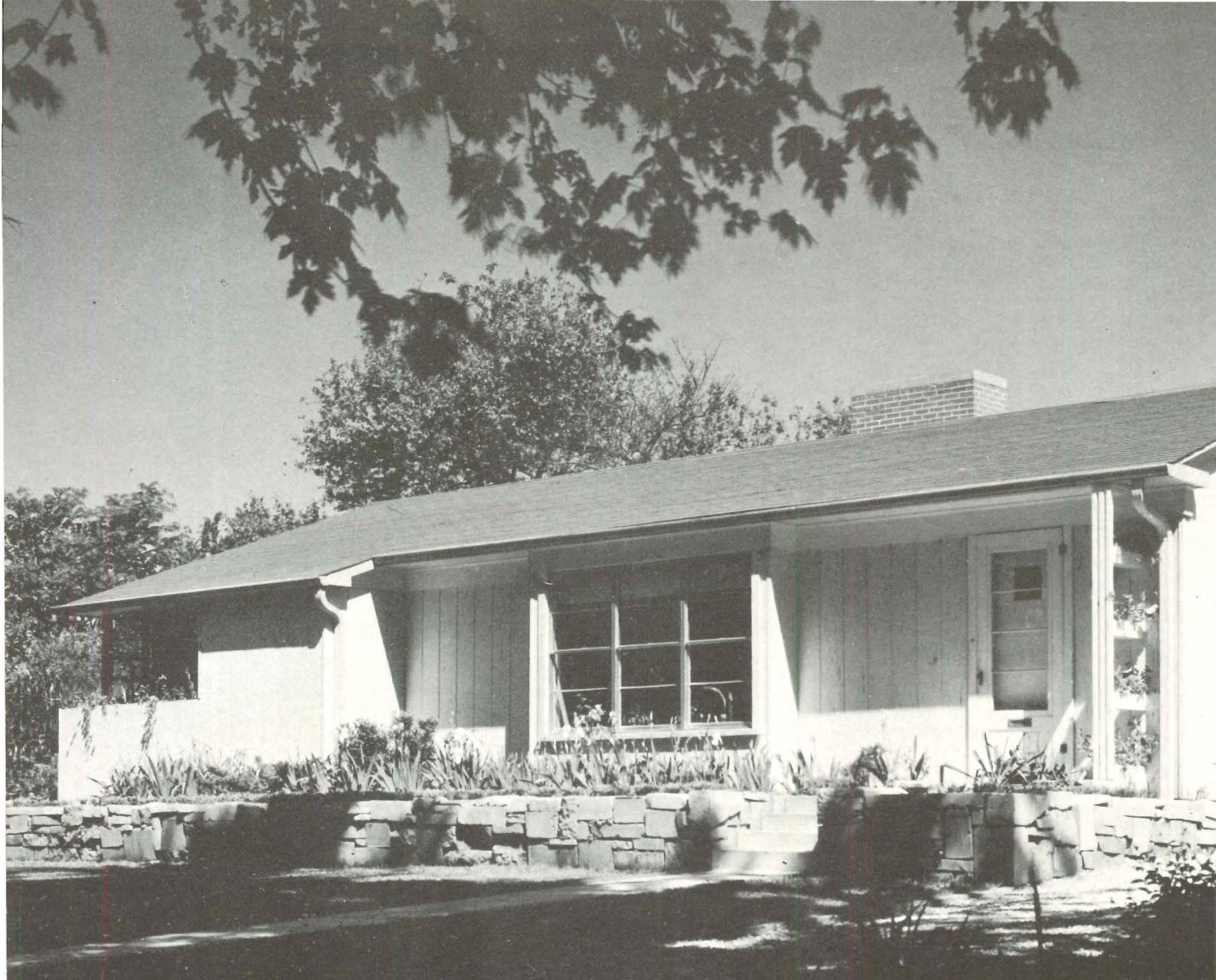
All in all, the design of the Super Market represents an advance in architectural thinking in at least one respect. In filling the needs of a merchandising process, the building which houses that process must be as efficient as the process itself; else both fail. The buildings which house the so-called Super Market have been developed for that purpose. Their form, their construction, their arrangement have all been designed to make their architecture an integral part of the process they serve.



COMPLETE LACK OF COLUMNS permits an infinite variety in display arrangement

ample facilities; the other, with parking in back of the building, flanked by adjoining businesses

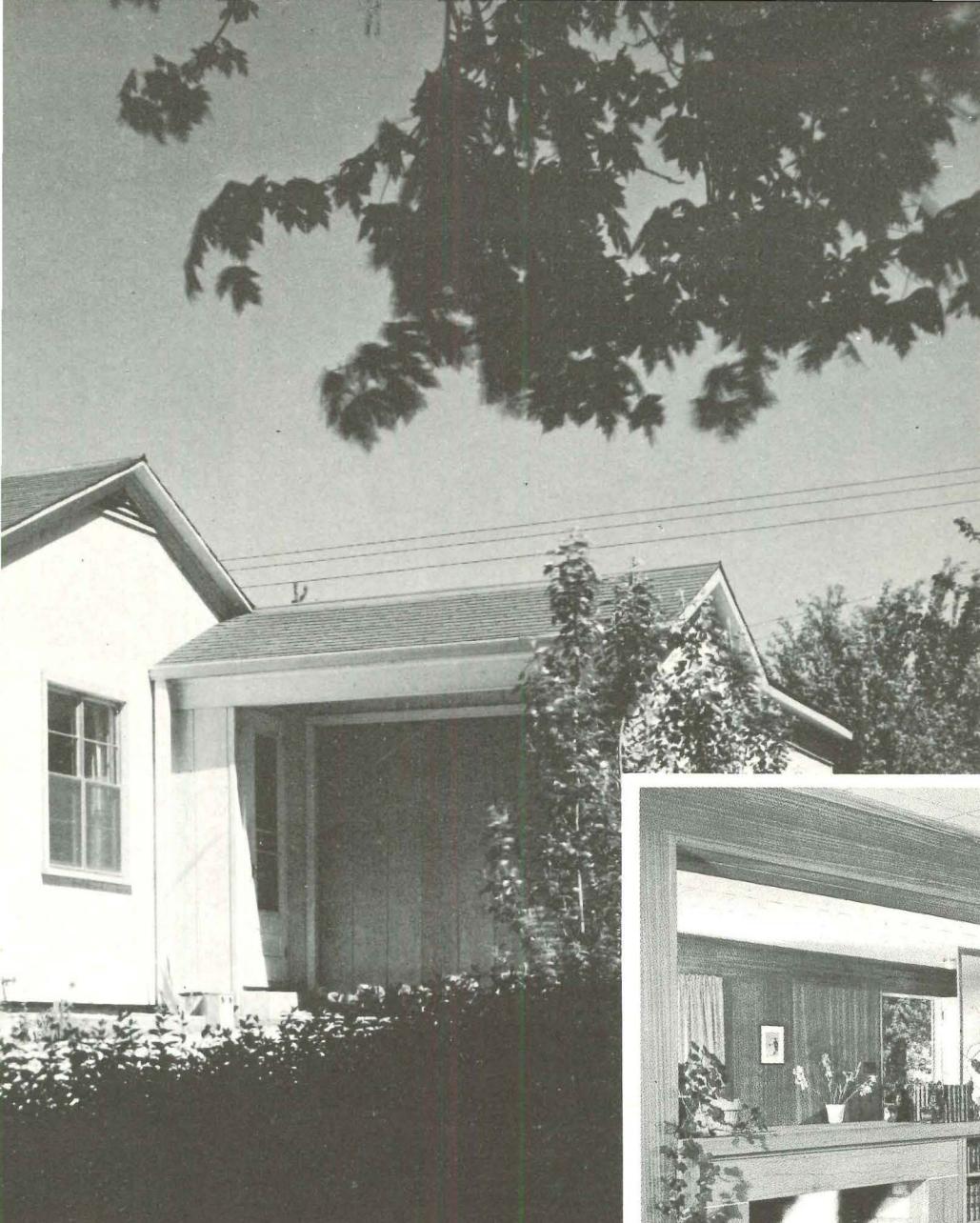




Photos by Hedrich-Blessing Studio

HOUSE IN ILLINOIS

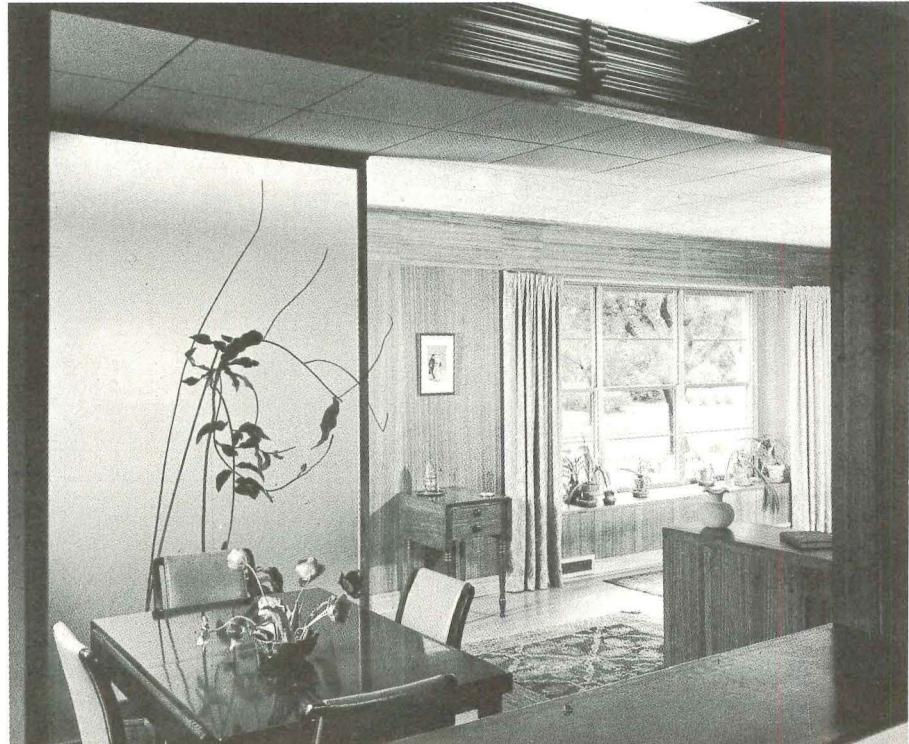
ARCHITECT'S OWN HOME, CHAMPAIGN, ILL. GRANVILLE S. KEITH, ARCHITECT. A compact, one-story, three-bedroom house with garage attached. As there are no servants, the kitchen is designed as an attractive part of the general living area. The planning of the garage is of particular interest to those in towns where building laws forbid direct entrance from garage to house. By recessing the garage door, space is gained for a kitchen entrance, and the projecting roof serves as a shelter in rainy weather. Exterior walls are white-stained pecky cypress vertical boarding; sash are aluminum, double hung, and the roof is covered with asbestos shingles.

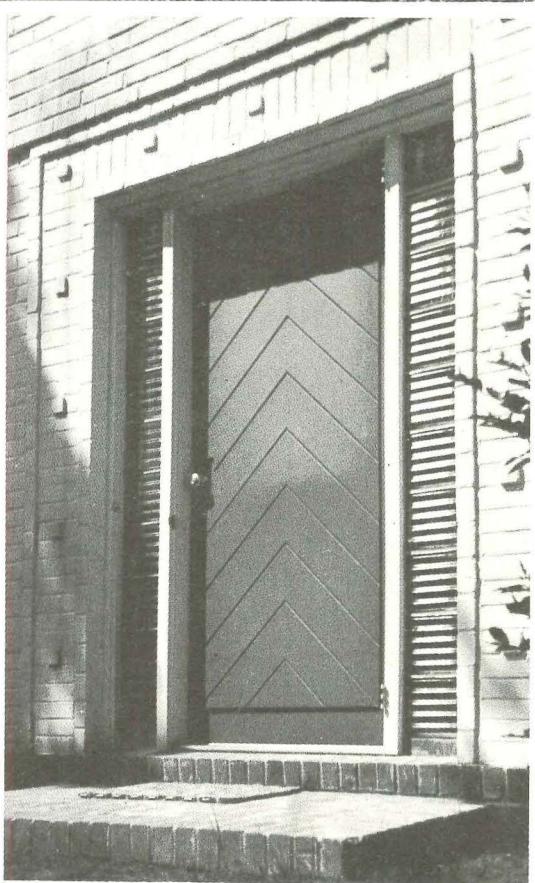
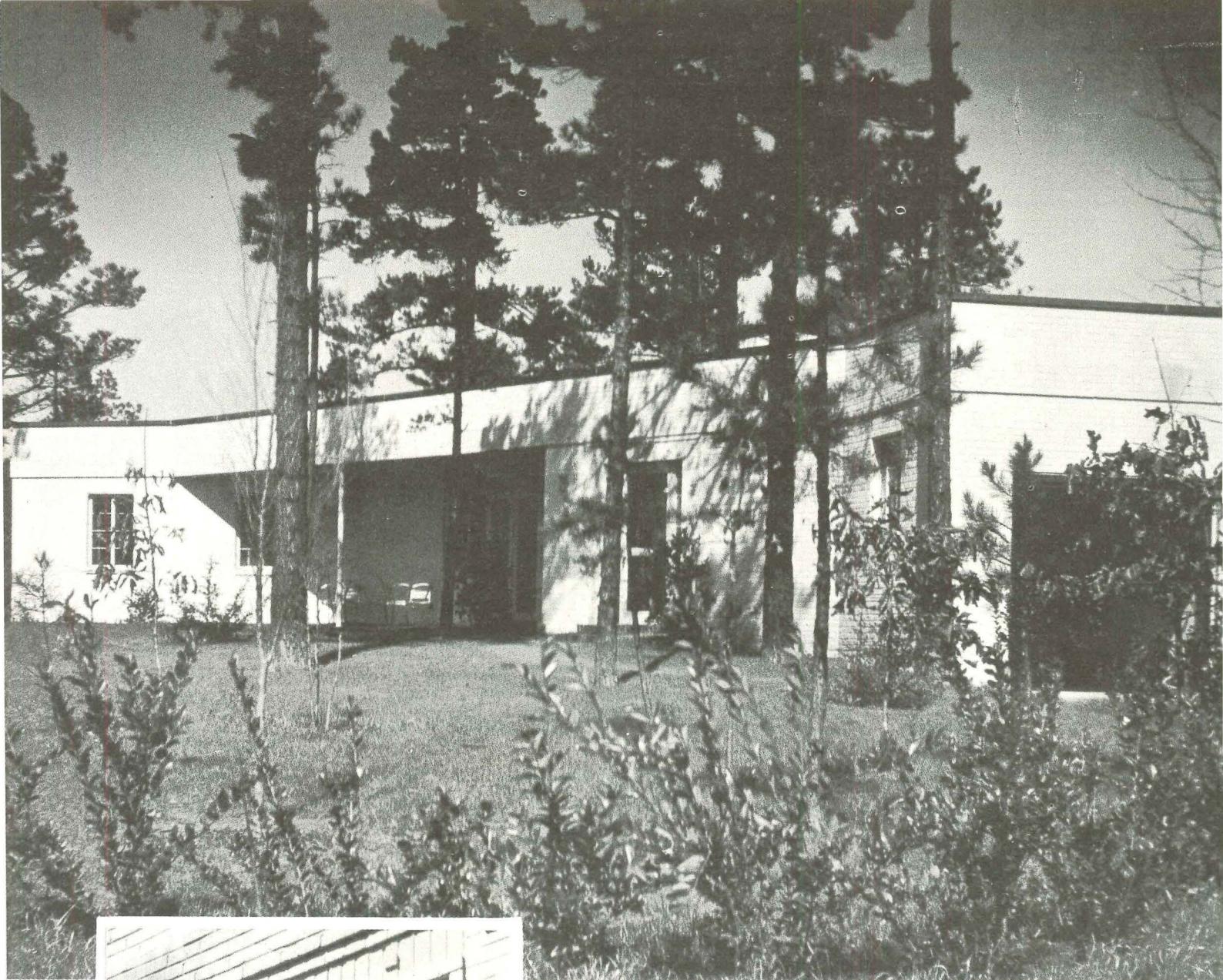


TRANSPORTATION NOTE: The day is happily almost past when the garage is treated as if it were a disease and placed out of sight at the back of the lot. Too frequently still, however, it is handled in design as an unwanted appendage. In each of the houses shown in this section, the garage has been given considerate attention, and the result in each case is increased livability. This closer integration of house and garage is but healthy respect for the fact — which is hardly news — that we live in a motor age.



Looking across the kitchen serving bar to the dining area. Note both the glass panel that shields the front door and the blind that lowers to close off the kitchen entirely. Kitchen walls are gray linoleum; table and counter tops are eggplant brown. The floor is jaspe, with a purple-brown border and inset of tangerine





Photos by St. Thomas

HOUSE IN NORTH CAROLINA

A PROFESSOR'S HOME, DURHAM, N. C. WILLIAM POTTER,

ARCHITECT. Planned around the big living room, the house spreads out to obtain cross ventilation in each of the rooms. The dining area is treated as an alcove of the main living room. In the bedroom wing is the study, desirably isolated from the main living area by a book-lined hallway. A small basement contains heater and storage rooms. More often than not the owner comes to the house by car; hence the prominent location of the garage and incorporation of a front hall entrance directly from it. Walls of the house are of whitewashed brick veneer over wood frame. Sash are steel casements.



3

1. General view showing garage and service wing at right

2. A pair of glass-block panels flank the front door

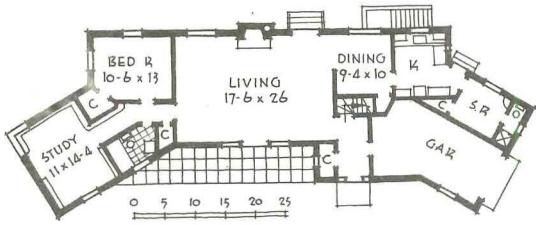
3. A brick terrace opens off the living room on the south

4. Plaster walls are painted a warm coppery tone; trim is white

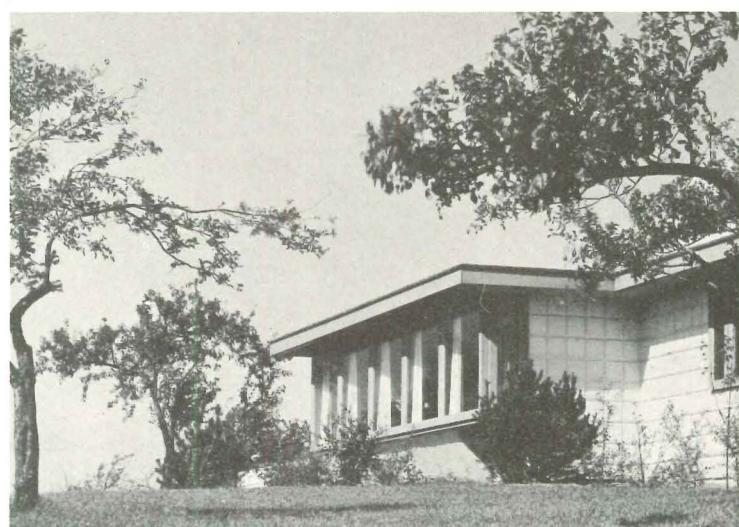
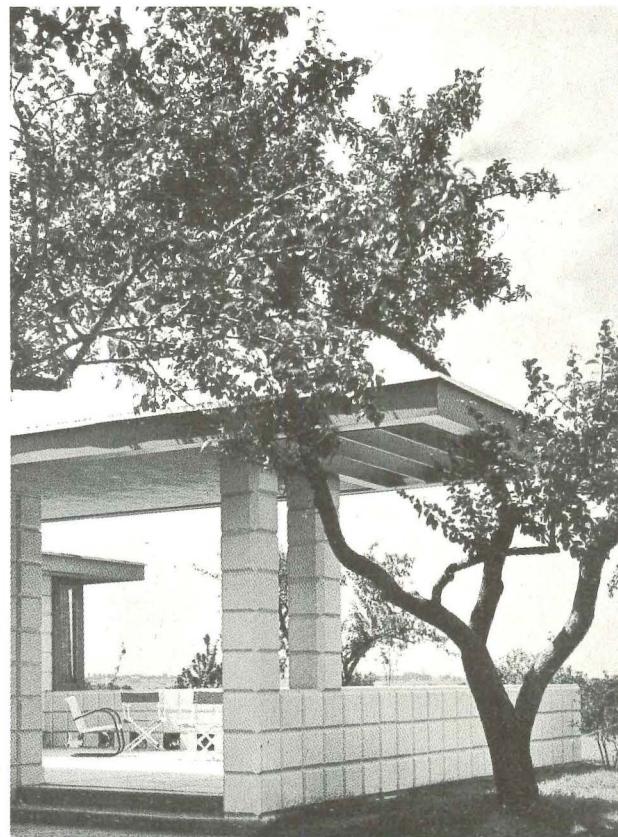
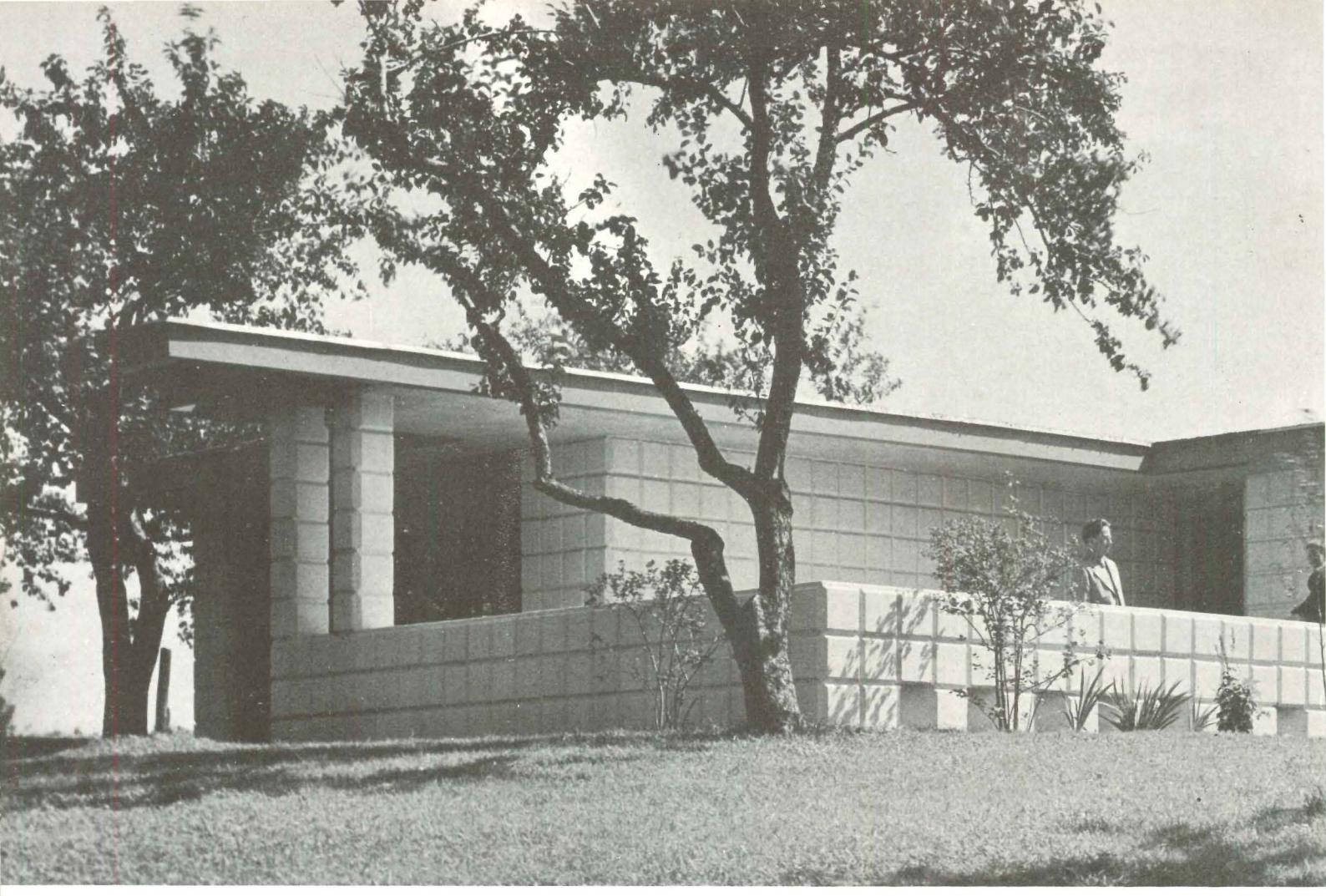
5. The glass doors lead to the terrace; beyond is the hall to the study



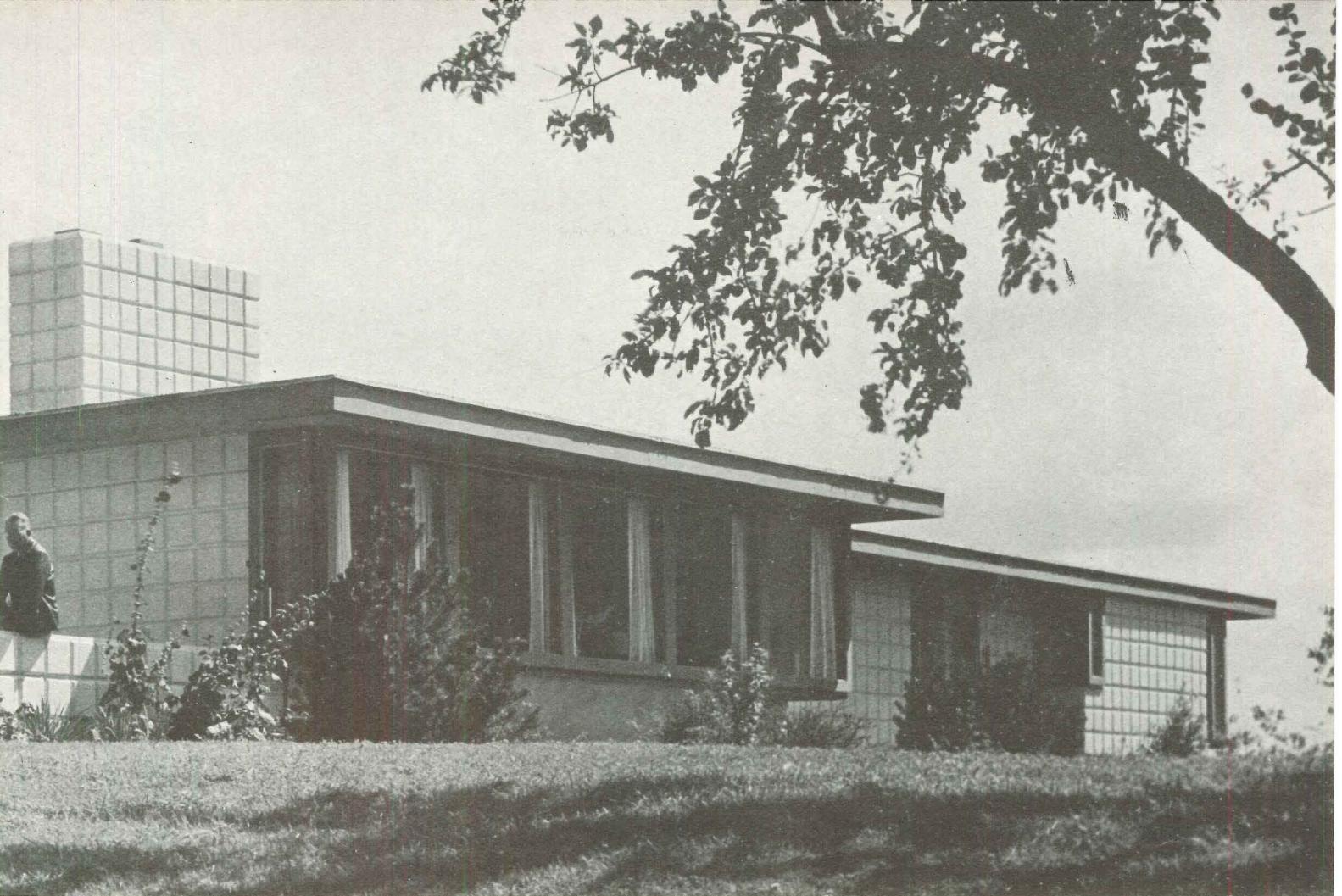
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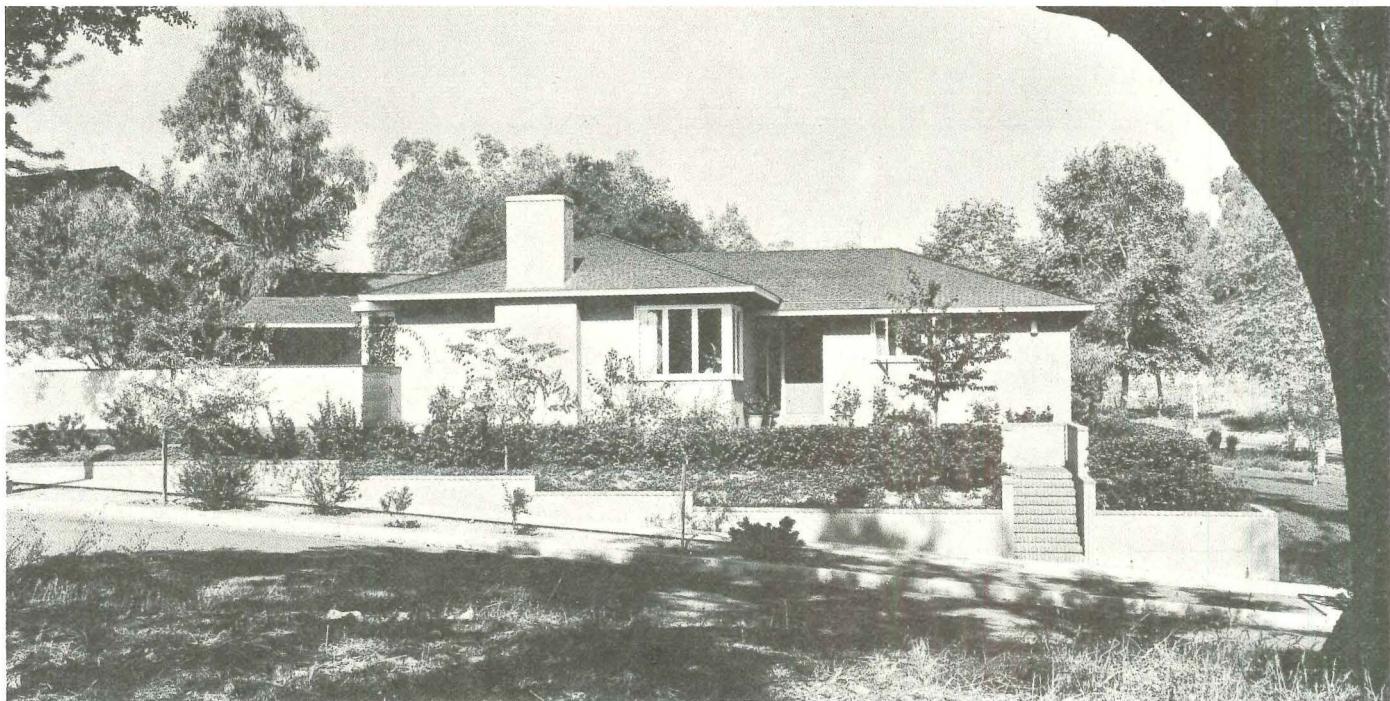
Photos by Elmer L. Astleford



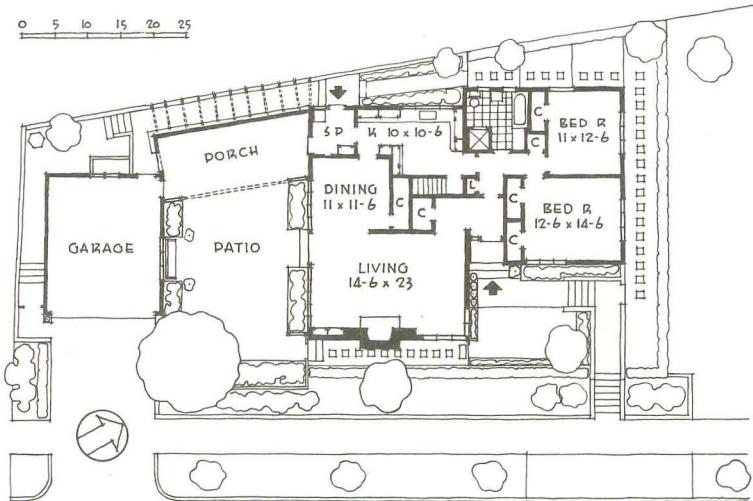
HOUSE IN MICHIGAN

HOUSE AT PETOSKEY, MICH. ALDEN B. DOW, ARCHITECT. A flat-roof house in northern Michigan, a region which, as the architect comments, "is extremely cold in winter and has snow four and five feet deep . . . This snow, furthermore, ruled out excessive walks and drives." The garage and front door, therefore, are closely related, and the garage is frequently used as the main entrance. Its placement, incidentally, forms a desirable shielding wall at one side of the front terrace. Walls of the house are waterproofed unit cinder block; exterior wood trim is painted turquoise. Interior partition walls are finished in natural plaster; the carpet in the living-dining area is bright red.



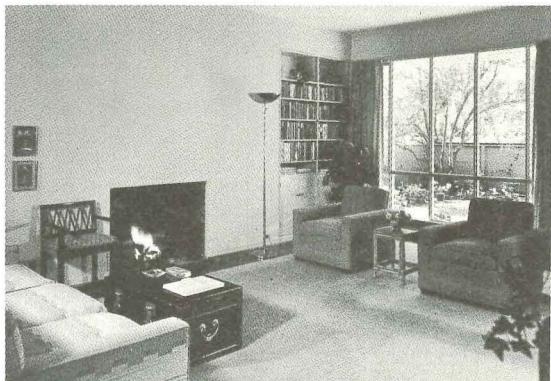


HOUSE IN CALIFORNIA



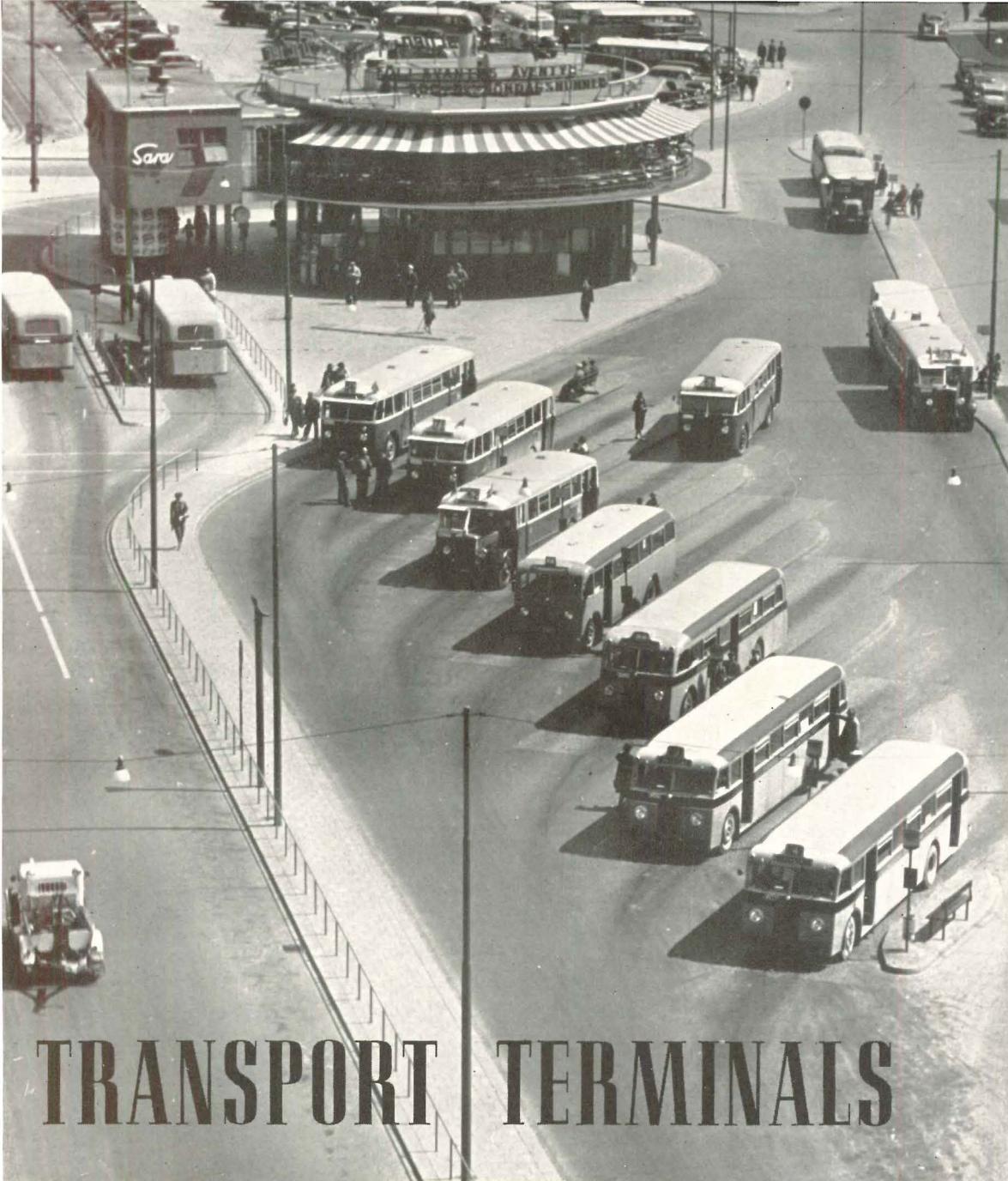
ARCHITECT'S OWN HOME AT PASADENA, CALIF. WALTER L. REICHARDT,

ARCHITECT. In this house, privacy and provision for outdoor living were primary requisites. High bedroom windows and the corner living room windows shield the view of passers-by. Placement of the garage gave form to an outdoor living room. A fence on the street side, a covered access porch at the rear and the glazed wall of the main house itself complete the four walls of this "room." The compact planning of the minimum hall space deserves more than passing study.



LIVING and DINING areas are combined and look out through tall windows on the enclosed patio

STOCKHOLM BUS STATION, with restaurant, ticket office, lounges, police station. HOLGER BLOM, Architect



F. Svantesson

MOTOR TRANSPORT TERMINALS

BUSSES, TRUCKS AND ARCHITECTURE

By JOHN S. WORLEY, Professor of Transportation Engineering, University of Michigan

TERMINALS for mass transport are not in themselves a new phenomenon, but our inventions, our teachings, religions, politics, ideologies, fanaticisms impose new requirements upon the problem of designing them. Apply invention of the gasoline motor to transportation of passengers en masse. One result is highway congestion. Another is, in essence, a revival of the eighteenth-century post-house—but with a difference. Today the multitude of passengers complicates the problem, and for the inn-yard we substitute loading docks; for the stable, a garage; and the very ease with which the poorest among us can get from place to place conspires to compress feverish activity into smaller and smaller confines. South of the Ohio River, custom at present demands separate facilities for different races. The only palliative the politician can find for traffic congestion is an edict ruling busses off the streets.

Similarly, truck transport is not in itself new. The trucks which use our highways are doing what Pizarro's gold trains did, but they do it for everybody.

However, terminals for receiving and transshipping trucked merchandise have been slow in developing. Without exact parallel in history, relegated to secondary

There is much to be said about the effect of the internal combustion engine upon our culture, and, more narrowly, our architecture. Specifically, how has mass transport of people and goods affected us?

A
BUILDING TYPES
STUDY

importance in the minds of the pseudo-cultured—perhaps because freight demands less flash and more efficiency in handling than do human beings—the motor freight terminal has only recently become architecturally important.

Neither bus nor motor freight travel has been publicly discussed as have the effects of the private automobile. Poor as our provisions for the private car have been, they are far in advance of public provisions for motor transport. Since the automobile came on the scene, we have seen garden cities rise, housers learn to exclude traffic from living areas, and home owners attach garages to houses.

But for motor truck transport what do we do? We not only turn our backs on it when we can; we route it in any way expedient to ourselves; or we allow it to mingle with private traffic to become a source of mutual exasperation. And so we place in the laps of the terminal designer, the operator, the city planner and the politician another set of howling problem-children.

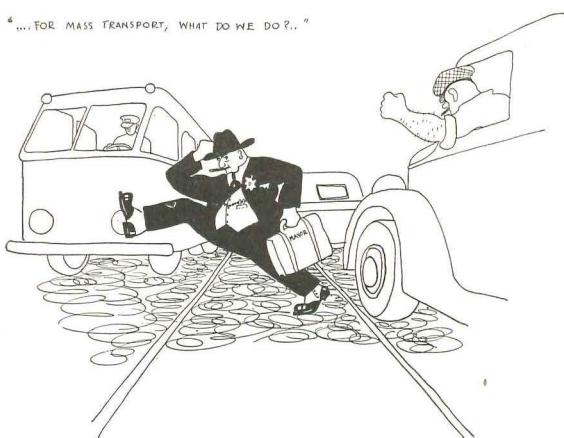
Remedies for the larger evils of motor transport traffic are outside the scope of this study, yet the conditions which cause them are part of every terminal designer's problem. When bus travel first became important, the bus had no terminal; the sidewalk was its depot. There early became apparent a need for more formal accommodations, and drug stores, pool rooms, or other convenient places made arrangements to serve as "official" loading stations. Through several intermediate steps, our present depots and terminals—buildings specifically designed for the purpose—have evolved.

These are provided with ticket offices, information bureaus, news stands, restaurants, rest rooms, emergency hospitals, company offices and other facilities. In some instances large hotel accommodations are integral parts of depots or terminals, an outstanding example being the Pickwick Hotel, which is a part of the bus terminal at Kansas City, Missouri. Bus depots are numerous, and range in cost from \$50,000 for a town of 30,000 population to \$5,000,000 or \$6,000,000 for a city of 500,000. The range of types may be gathered from the only recent book on the subject.* In addition to depots, the motor bus requires garages, repair shops and other structures.

Motor truck and trailer transportation followed a course similar to that of bus companies. For early operations they had no terminals. The necessity for recognized places where small lots of freight could be received and delivered led them to lease or purchase whatever room, warehouse, or building might be available. Their entrance into the commercial hauling field came in the last days of the interurban railway, and in many instances they were subsidiaries of interurban companies. Hence they often used interurban terminals. As their operations have become more extensive, interchange of freight at common points has become desirable, and new motor truck terminals have been constructed. However, as a rule it can be said that their terminals are remodeled structures originally erected for some other purpose. Without doubt the future will see considerable building of new ones. The motor truck, like the motor bus, requires extensive garages and repair shops.

* *Modern Bus Terminals and Post Houses*, University Lithoprinters, Ypsilanti, Mich. Manferd Burleigh, President, Central Greyhound Lines, and Charles M. Adams, co-authors.

Bus Terminal, New Orleans, La. DIBROLL, BOETTNER & KESSELS, Archts.



IN ARCHITECTURAL DESIGN there are always two dominant considerations: utility and aesthetics. Of the two, in transport terminals, at least, utility controls. However, the "institutional" character of a chain of bus or truck terminals can be capitalized upon; appearance and reappearance of a well-designed terminal motif along a company's route cannot help but impress that company on the public mind.

And in so doing, a bus station or a truck depot—and through them, the architects who design them—can contribute immeasurably to the advancement of our civilization. For the inventions so characteristic of our times are not accurate measures of our progress. Rather, the ability to make inventions submit to our needs, to control traffic, not let it control us, is a true index. And to achieve even a reasonable degree of advancement we must, in daily life, become so familiar with technical progress in all its manifestations that we no longer fear it. Only then can we plan intelligently.



BUS TERMINAL DESIGN AND CONSTRUCTION

By HARRY S. PACK, Industrial Designer and Consultant on Bus Terminal Design

ANALYSIS of about 70 terminals the author has surveyed, consulted on, or designed, indicates that: 1, few fixed relationships exist between elements; 2, fixed percentages of areas cannot be allotted for specific functions; 3, each project must be designed for its own situation. Economic and operational design factors include type, size and geographic location of the city; location of the site in the city; and type of operation—main line, feeder line, rest stop, meal stop, or "pickup" point.

CITY'S EFFECT ON DESIGN

In larger cities bus traffic alone may bring in sufficient revenue to maintain the terminal. Hence concessions (except restaurants) become less important, design can be more "free." In small cities (2,000 to 20,000) the revenue problem becomes critical; bus ticket sales alone cannot support a terminal. And when—a current happening—local legislators do not permit drug stores, restaurants or hotels to act as bus "stations" or pickup points, the operator is forced to consider the small terminal seriously. The architect is called upon to design a small terminal that can produce considerably more revenue than can ticket sales alone.

Determination of size of terminals is the most difficult phase of design. Most terminals built several years ago are too small today. This results from more rapid expansion of inter-city traffic during the 1930's than was anticipated. Growth during the next decade may not be the same. During the last five or six years business has increased 10 to 15 per cent per year. Under normal conditions expansion might well continue at the same rate, but no one yet knows how the national defense program will affect bus travel. There is already a shortage of new rolling stock. Add to these considerations the facts that a terminal must provide facilities adequate for a 10- to 20-year period, that unnecessary fixed charges must be avoided, and that individual routes have traced instantaneous passenger increases of 10 to 13 per cent directly to erection of terminal facilities, and a situation arises which calls for careful judgment in determining the size of terminal for *each* location.

Site. The writer feels that a site convenient to, but not on, a main street has definite advantages. First costs and taxes can be reduced. There should be no decrease in business; locations "just around the corner"

should make little difference to city patrons. Value of some concessions, particularly restaurants, conceivably could be enhanced by the opportunity to invite a better class of patronage to roomier quarters. Reduction of traffic congestion would speed schedules and improve relations between autoists and bus operators.

Building plan and appearance. In smaller cities working areas should be kept to a minimum in order to make available a maximum of space for concessions. Work areas should be planned for expansion, by removing minor walls or by additions. In several very small cities, gas stations have been successfully combined with terminals. The need for attracting patrons to concessions by good appearance cannot be too highly stressed.

The building as a whole must be adequate for peak loads at rush hours, weekends and holidays. These loads can be determined by checking existing and potential schedules with the operator.

TERMINAL DESIGN

Plot plans are of several types, most common being the *island* and the *parallel* or *through* type. Islands

usually accommodate more busses, but in actual use both are of almost equal importance. Islands are suitable for almost square plots (corner or center of block); narrow plots, particularly inside lots, usually call for parallel arrangement.

Building appearance depends on many factors: cost, locality, designer's preference, and, most important, desire to conform to an "institutional" style peculiar to the operator. The terminal, an important building, should enhance its neighborhood—unfortunately some do not, often because the designer goes to extremes to achieve modernism.

Structure. Generally speaking, buildings are "fireproof"; reinforced concrete is used at least for passenger concourse, sidewalks, ramps and driveways. Materials for remainder of structure usually depend on local availability, labor costs, etc. Materials for exterior finish include stone, structural glass, glass block, terra cotta, concrete, stucco, stainless metals, porcelain enamel, and glazed, painted or natural brick.

Interior structure and finish must be practical and easy to maintain. Floors in medium and large-sized buildings are generally terrazzo; smaller buildings have cement-surfaced slab floors. Occasionally the latter are covered with asphalt tile, linoleum or rubber. Partitions are usually plaster over hollow tile, except that in some small terminals wood studs and plaster are used.

Wainscots vary from plain painted plaster to cement plaster, glazed or unglazed tile, linoleum, painted burlap, and a number of other materials. Ceilings usually are of plain plaster finish but occasionally are "sound-proofed"—a practice which has much to recommend it.

Lighting is often provided by inexpensive fluorescent fixtures applied to or hung from the ceiling. Some fairly recent buildings have flush lighting. In many buildings areas of glass block in exterior walls permit increased daylighting and night display effects.

Heating systems of a number of types are used: automatically controlled steam heat, automatic forced air (in conjunction with air conditioning system in some instances), direct radiation, gas unit heaters and suspended gas blower heaters. Later, larger terminals are air conditioned.

AREAS REQUIRED*

Waiting rooms are usually from 20 to 35 per cent of total building area—the smaller the terminal, the higher the percentage. In Southern terminals, separate accommodations are needed for negroes.

Rest rooms have to be adequate for peak passenger loads. No formulae have been established. Practice is to provide as many fixtures as space permits. All water closets but one each for men and women are

*Specific data are given in Time-Saver Standards, page 97 et seq.

ordinarily pay units. Some states require ladies' lounge.

Dining facilities average from 15 to 25 per cent of building area. Larger buildings need more dining space. Sandwich bar is minimum provision; booths are preferred by customers, tables more flexible to lay out. Kitchen and kitchen storage space are needed.

Ticket office has to be accessible to all waiting room space. In medium to large-sized terminals, a small manager's office, in which agents can "check out," is needed.

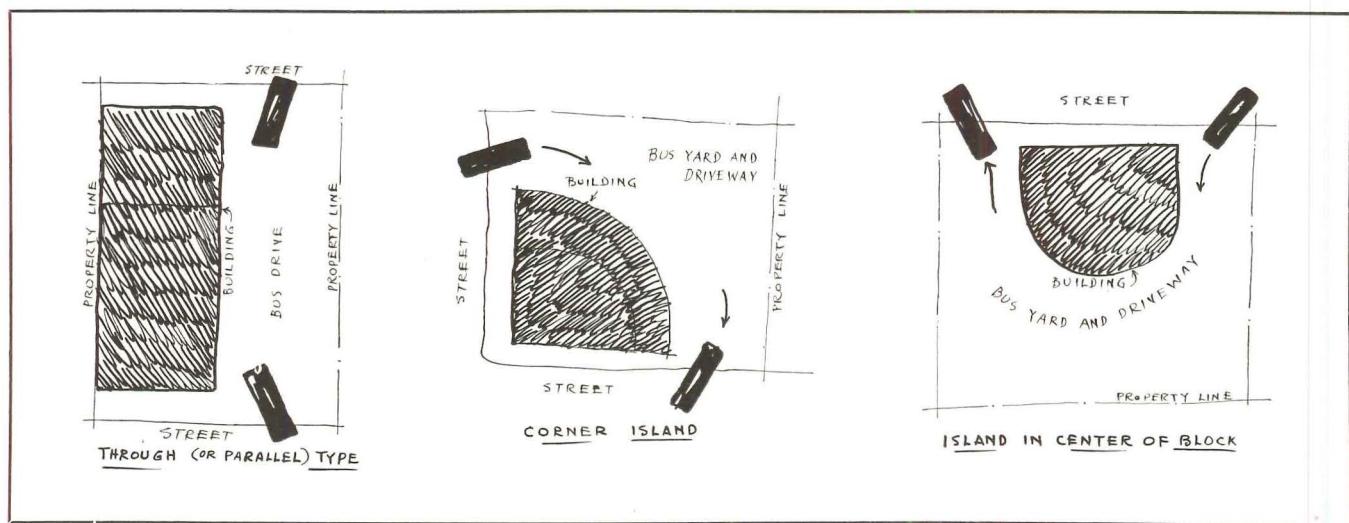
Baggage room is adequate in only a few existing terminals. Size is indicated in Time-Saver Standards. Additional storage space in basement is desirable.

Dispatcher's office is required except in smallest depots, consists of small booth located so dispatcher can see all bus loading stations.

Administrative offices are needed in large terminals for proper operation of terminal; and for divisional or company offices. Facilities include executive, auditing, secretarial and general offices.

Concessions may cause success or failure of a terminal. Depending on locality, the following may be included (those mentioned first are most common): Restaurant, fountain, travel bureau, news stand, telegraph office, shoe shine, barber shop, shower booths, beauty shop, retail shops, drug store, etc.

Bus drives, loading platforms, ramps, etc., are discussed in Time-Saver Standards.



TYPES OF PLOT LAYOUTS:

"Parallel" plot plan is not to be confused with "parallel" loading dock (see page 99). Sawtooth loading is used with all plot layouts; parallel loading is so used also, but to less extent



LARGE TERMINAL WITH PAYING CONCESSIONS

GREYHOUND TERMINAL, WASHINGTON, D. C. WISCHMEYER, ARRASMITH & ELSWICK, ARCHITECTS. This terminal, an island type completed in 1939, cost \$290,000. The entire structure, including bus drives, is reinforced concrete; building is faced with limestone and terra cotta on the street front, with glazed brick on rear walls. Ceilings are acoustic plaster; interior walls, colored plaster with sheet plastic wainscots; floors, terrazzo. Heating is at present forced air supplemented by direct radiation. An air conditioning system has been provided for future use.

Noteworthy in the plan of this large terminal (see over page) is the number of concessions, ranging from news stands, restaurant and barber shop to four retail shops and a drug store. Drivers' quarters, public toilets, storage space and mechanical equipment are in the basement, terminal facilities and concessions on the first floor, offices for several bus systems on the second.

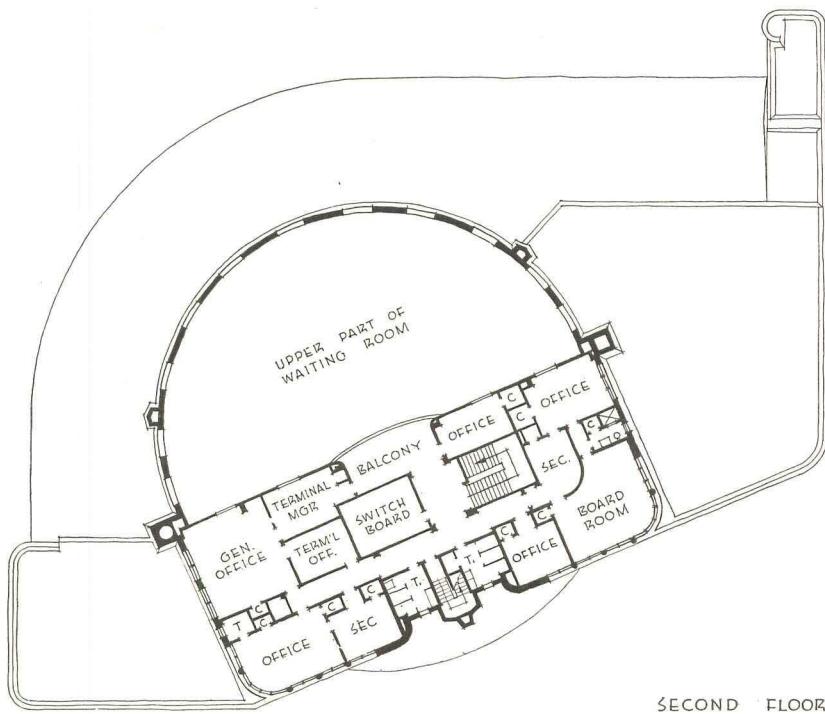


In photo of loading dock, below, note combination of lally columns and cantilever which supports the canopy. Canopy roof is a reinforced concrete slab, approximately 4 in. thick, 27 ft. wide, 200 ft. long. Columns are some 15 ft. from the building, leaving a cantilever of about 12 ft.





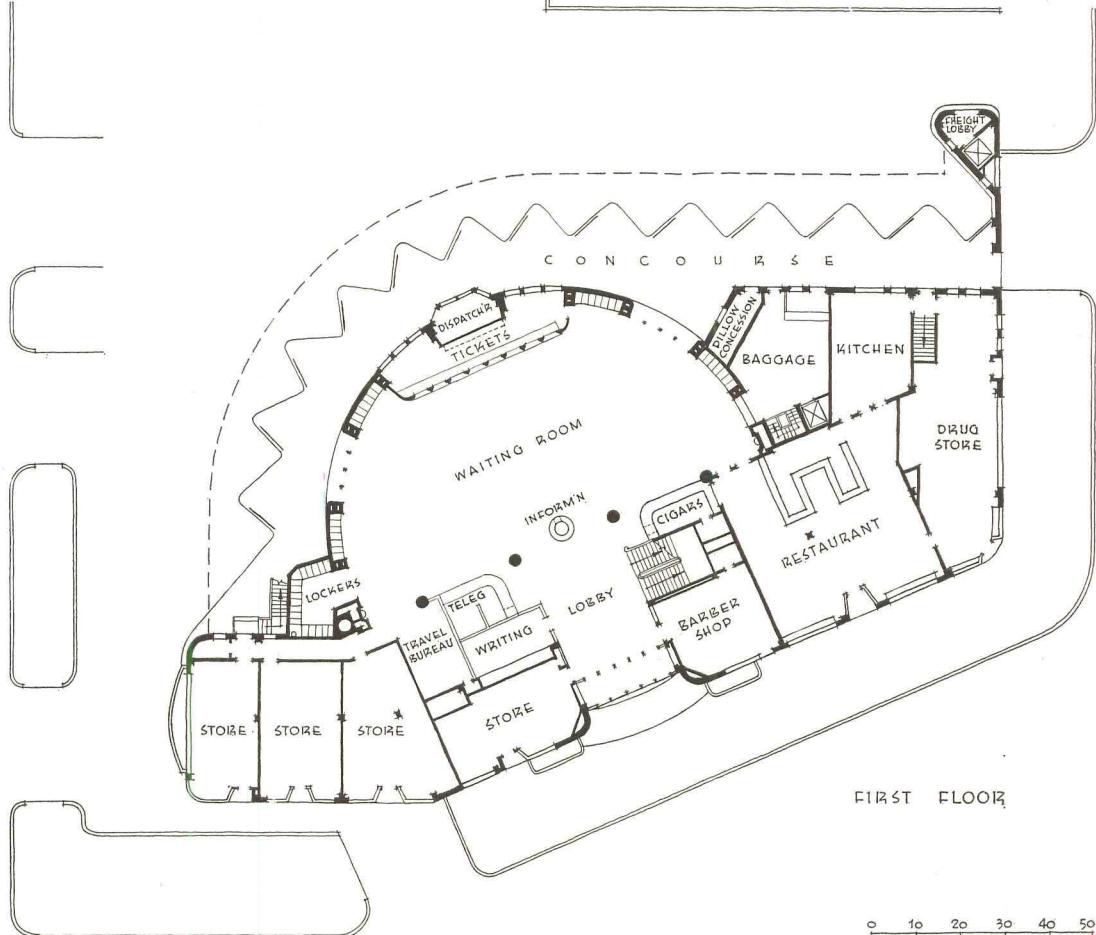
Leet Brothers



SECOND FLOOR

APPROXIMATE AREAS

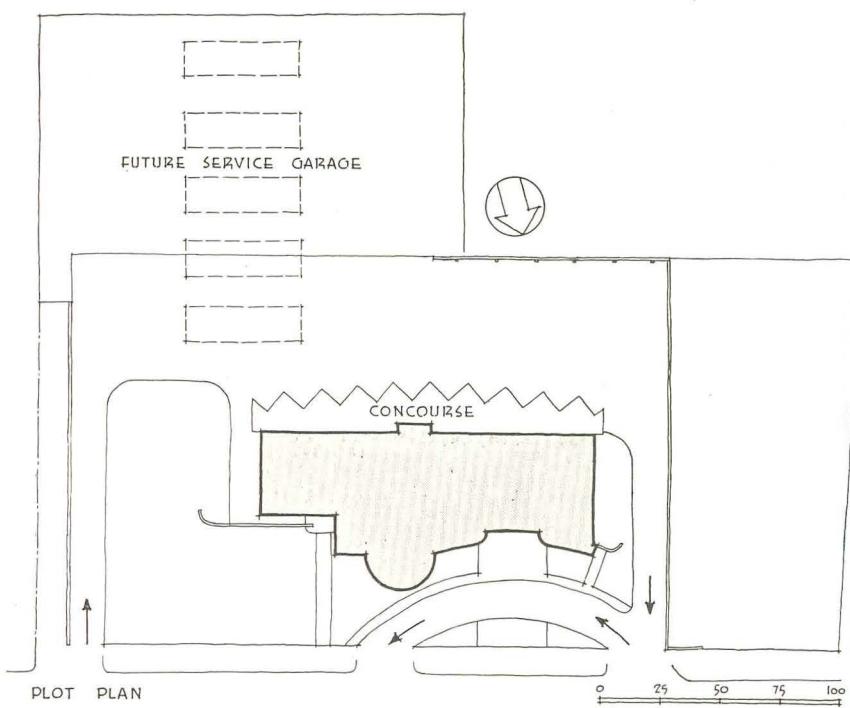
Waiting room,	3,300 sq. ft. (180 seats)
Ticket office,	550 sq. ft.
Baggage room,	600 sq. ft. (additional lockers, also space below)
Restaurant,	2,200 sq. ft. (34 seats)
Kitchen,	400 sq. ft. (storage below)
Travel bureau,	270 sq. ft.
News stand,	140 sq. ft.
Barber shop,	240 sq. ft.
Drug store,	1,000 sq. ft.
Shops (total)	2,080 sq. ft.





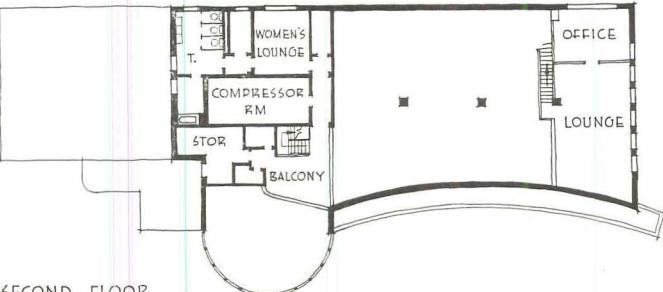
Photos by M. L. Pruitt

SOUTHERN TERMINAL PROVIDES

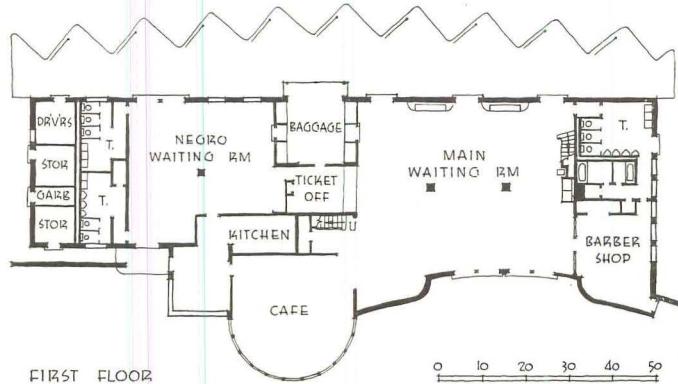


TRI-STATE TRAILWAYS TERMINAL, JACKSON, MISS. R. W. NAEF, ARCHITECT and ENGINEER. Completed late in 1940, this terminal cost approximately \$125,000, and contains typical areas required in a moderately large Southern terminal. Note in plan the location of a service block—baggage room, ticket office and café—between the two waiting rooms. Also, in the front of the plot, space for travelers' cars is provided—an amenity not always considered, yet one which must contribute greatly to passengers' comfort and convenience. Concessions are limited to a barber shop, café, and a news stand next to the café.

Part of the terminal was built over



CONCOURSE, LOADING DOCKS



MAIN WAITING ROOM



NEGRO WAITING ROOM



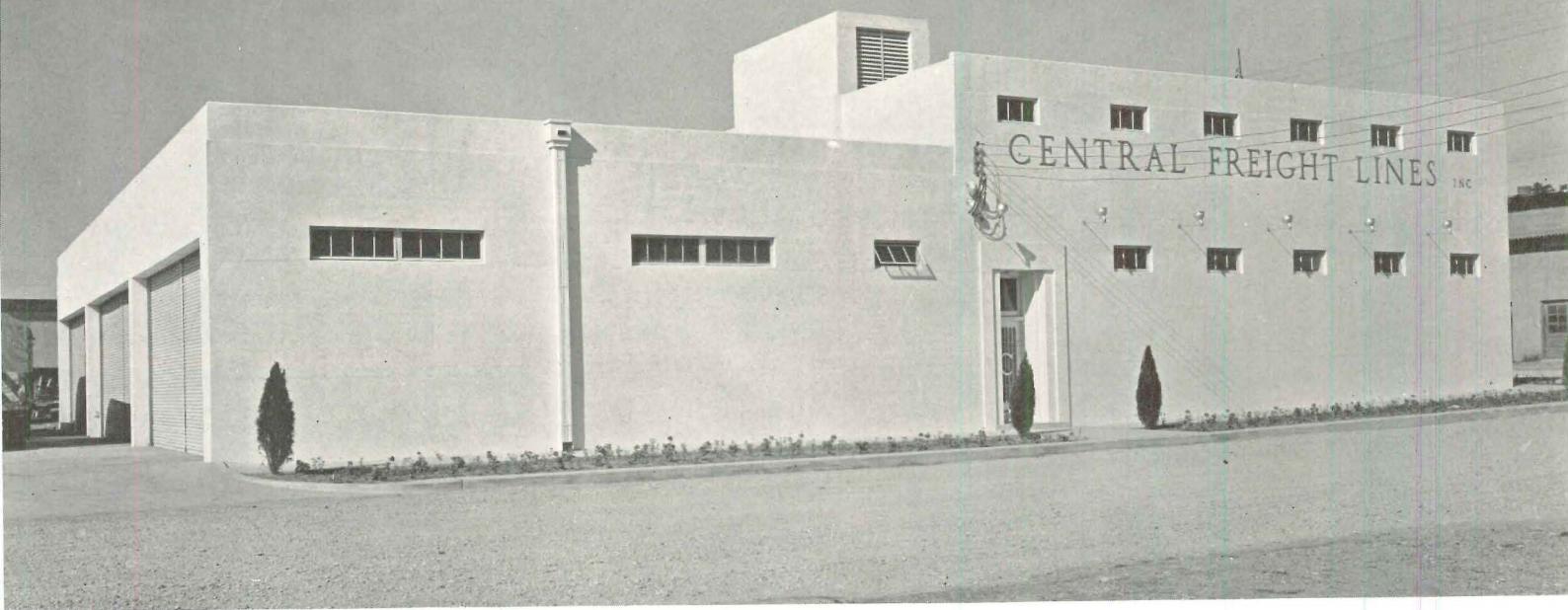
CAFÉ



PARKING SPACE

a deep gully. Only a portion of this was filled; the greater part is supported on reinforced concrete beams and columns, with planting spaces built into the concrete slab. Construction of the building is of brick and steel generally, with cast stone, concrete, and stucco trim. Restaurant bay is built of decorative structural pipe columns to which steel sash are secured directly. The building is air conditioned.

The concourse is slightly radial, which eases the bus driver's job. Such small refinements as the combination of the pipe rail bumpers at loading docks with the lally columns which support the canopy, are also noteworthy.



Gildersleeve

TRUCK TERMINALS BENEFIT FROM LOGICAL PLANNING

By FRANK G. LOPEZ JR., Associate Editor of ARCHITECTURAL RECORD, as reported by W. W. CALLAN, President, Central Freight Lines, Inc., Waco, Texas; and by ROBERT P. WOLTZ, JR., AIA

ESSENTIALLY, a motor freight terminal is a depot for transshipping freight. It may be a central station where great quantities of goods are transferred from railroads to truck lines, or from long distance to local systems; or it may be a small way station where freight from the main line is picked up by local distributors. Sometimes these functions are combined. Depending on its type, facilities for drivers, for transacting business, for storing and repairing trucks, may be needed in varying amounts.

SITE

Location should provide the truck operator with an address on a well-known street, in or on the outskirts of a wholesale or manufacturing district, reasonably near the center of the city served. An exception to this requirement is the small local station, where the main highway may run through the edge of town. In all cases, convenience to main commercial traffic arteries is paramount. The terminal should have at least two means of entrance and egress in order to eliminate delays. Within the terminal's facilities should be included a rail-

road siding. The terminal grounds should be entirely surrounded by a high fence, topped with barbed wire. Area for future expansion should always be considered when obtaining the initial site.

AREAS REQUIRED

Loading docks. If a building is a terminus of a line, where both road trucks and pick-up and delivery trucks are accommodated, loading docks are desirable on both sides of the building for rapid freight handling. If the building is an intermediate point, where road trucks, though not regularly stationed, pause en route to pick up and deliver local freight, only one set of loading docks is needed. A safe rule for large terminals is to allow one loading door for each 15,000 lbs. of freight handled daily. Allow 12 linear ft. per truck space. For freight docks with loading doors on both sides a width of 50 ft. is usually adequate. Another method of determining space is to allow 250 to 300 sq. ft. per truck load.

Warehousing. A storage warehouse is not essential; however, temporary stor-

age space is needed because not all shipments can be delivered immediately, and it is advisable to remove such freight from the busy transfer platform between loading docks. Warehouse docks can be small, to accommodate one truckload at a time. A 10-ft. ceiling is satisfactory for handling and stacking goods.

Garages. while not essential for all types of depots, are required at terminals. Shops, equipment and storage space for spare parts are usually needed for repairs, chiefly mechanical, even though complete overhauling is done elsewhere. These should be included within the same fence as the terminal building, but are often separate buildings.

Drivers' accommodations are needed whenever drivers remain during rest periods, day or night. Dormitory, toilet, shower and locker rooms are needed. Recreation room is required when drivers, off duty, are likely to have to remain at the terminal, and must be provided with other facilities than busy working areas. It is desirable to segregate all these accommodations from office work and



Gildersleeve

Garage and Office Building (opposite) and Freight Depot, Central Freight Lines, Inc., Waco, Texas. HARRY SPICER, BROOKS PEARSON, Architects. Parking area separates the buildings. Fire wall between garage and offices reduces insurance rates. Drivers' quarters and café are behind large windows above



40- by 60-ft. depot, Taylor, Texas. SPICER & WOLTZ, Architects



30- by 60-ft depot, Cleburne, Texas. ROBERT P. WOLTZ, JR., Architect

(Continued on page 92)



Smith

TRUCK TERMINAL PLANNING (continued)

PLANNING AND CONSTRUCTION

Most important are loading doors and dispatcher's office. The manager's office is best located so as to control closely all portions and operations of the terminal. Dispatcher's office should not be accessible to the public; public space should lie between street and business offices, and should be segregated from trucking activity. Drivers' quarters can be on a second floor, over the business offices.

Construction materials used vary according to local availability and cost. It should be remembered that usage will be hard, and that the average minimum life of a terminal building is 10 to 20 years. If the dock is not placed on solid fill, floor supports have to be adequate to carry heavy loads. Floors should withstand traffic and abrasion, and be easily cleaned. Warehouse and dock column spacings should be as great as is economically possible; 20-ft. bays in both directions are in common use. In warehouses, a row of columns may be spaced 10 ft. from a wall. These dimensions simplify aisle layouts and stacking of freight, and suit most occupants, who work in hundreds of square feet. If the warehouse is to be bonded, fireproof construction is required.

EQUIPMENT

Motor freight employees have necessarily irregular hours. Their work is found more efficient if winter heating is supplemented by at least a summer cooling system. Also, much of the repetitious office work requires accuracy, and good lighting is needed. Walls and ceiling painted in highly reflective tints are desirable, and fluorescent lighting has been found to reduce current consumption and provide increased usable light. Plumbing fixtures and piping are selected for durability, in numbers according to public building standards, codes, and space available. Where winters are extreme, plumbing systems have to be insulated because freight docks stay open regardless of weather.

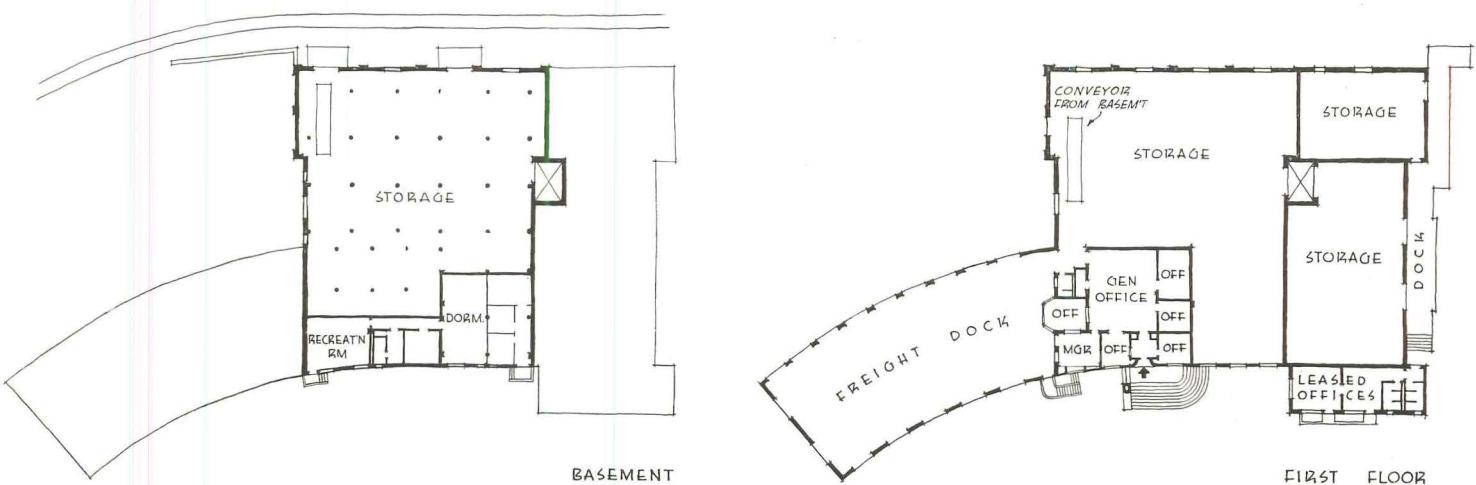
From the dispatcher's office communication is needed with the freight platform, via loudspeaker. It should also be possible to call from the platform to the office, subject, however, to the dispatcher's control. The dispatcher has also to be able to call drivers in their quarters, and to call the garage for equipment.

Automatic scales used on the freight platform are preferably countersunk level with the floor. Belt conveyors have proved desirable particularly when freight is handled on different levels.

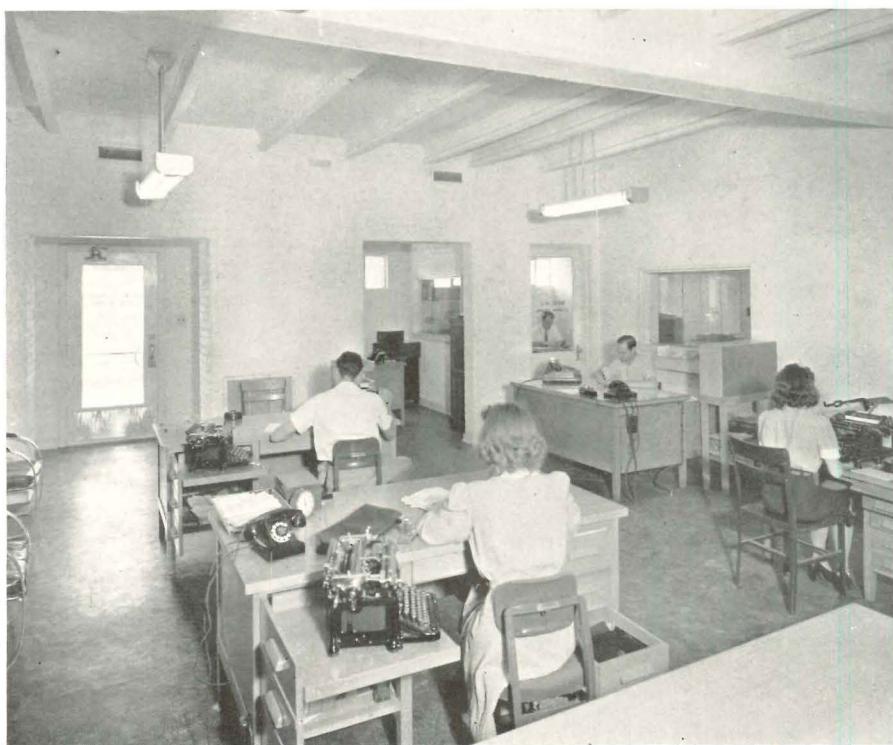


Smith

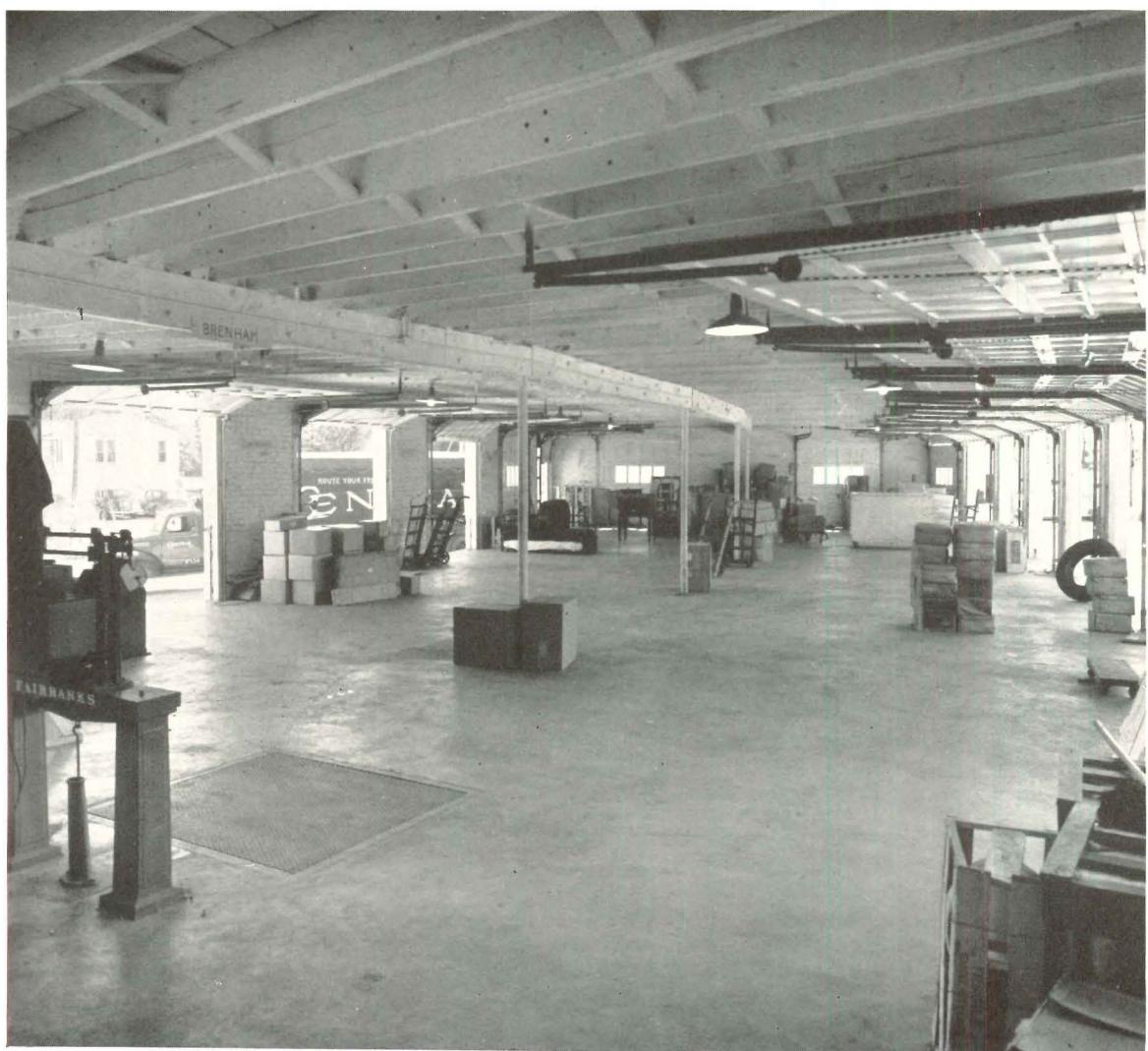
TERMINAL AND WAREHOUSE ON TWO LEVELS



CENTRAL FREIGHT LINES, INC. AND CENTRAL FORWARDING, INC., FORT WORTH, TEXAS. ROBERT P. WOLTZ, JR., ARCHITECT. By remodeling an ice house and demolishing another structure, it was possible to achieve a plan with trucking facilities at one level, railroad at another. Use of conveyors and an elevator for handling freight from car to warehouse or trucks has helped in securing business. The tall portion is a warehouse.



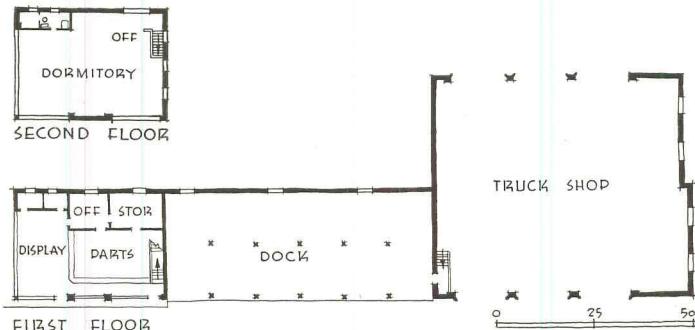
General office, shown above, is easily supervised from manager's office in corner. Adjoining is an alcove-office for clients' salesmen, etc. Loading dock, below, has 50-ft.-wide concrete floor in which scale platform is countersunk





Murwin Mosler

"ONE-STOP" SERVICE FOR TRUCKS



Thomas Korn
GARAGE UNIT

TRUCK TERMINAL, JOPLIN, MISSOURI. ROBERT J. BRAECKEL, ARCHITECT. Designed to provide service for numerous individual truck owners as well as fleets, this structure houses many activities: sales of new trucks, parts, accessories, tires; pick-up and delivery of local shipments; dispatching and communication via telephone, telegraph, teletype; and truck repairs and servicing ranging from gas and oil to use of a wrecker and parking space.

An important part of the problem was provision of flexible, accessible facilities without interfering with local traffic. From several points of view the site is well chosen: it is just within the main business district of Joplin; is accessible from three streets, of which one is U. S. Highway 66 and another leads by viaduct to by-pass truck routes; and a number of shacks had to be demolished to make room for the building.

New truck displays are now parked outside the office block. In the short time since the building was completed, its use has been so intensive that expansion to the west is now considered. Construction is brick and steel generally, and floors are concrete, except for loading dock. Complete "fireproof" construction was considered unnecessary since attendants are on duty 24 hours a day.

BECAUSE INDIVIDUAL truck owners are important in the business volume, and drivers are responsible, free access is afforded them to all parts of the three units: office and sales, dock, and garage. The management supervises dispatching, loading and unloading, and collections. An intercommunicating loudspeaker system is installed.

First floor of office unit has glazed tile walls, plastered ceiling, tile floor over concrete. Heat is supplied by gas-fired suspended units. Drivers' quarters and offices on second floor have wood floors, plaster walls. The structures cost approximately \$60,000.



OFFICES, SALES, and DRIVERS' QUARTERS



OFFICE: glazed walls facilitate supervision of yard



DOCK, permanently open, faces away from storms



GARAGE: door openings are 15 by 14 feet



BUNK ROOM in drivers' quarters

Photos by Thomas Korn and Marvin Mosler

BUS TERMINAL DESIGN

ARCHITECTURAL RECORD
TIME-SAVER
STANDARDS
OCTOBER, 1941

Information on this sheet was prepared by Ronald Allwork from data furnished principally by W. S. Arrasmith of Wischmeyer, Arrasmith and Elswick, Architects. Harry S. Pack, Industrial Designer; Greyhound Bus Lines; and *Bus Transportation* also furnished data. See also T-S. S. "Bus Terminals—Loading Docks and Concourse."

Plot layout. Plan and arrangement are governed by placement of bus lanes and loading platform. A square lot (most desirable) permits efficient and economical concourse layout, provides for loading busses on two or three sides of waiting room, makes approach to all busses approximately the same. An alternate scheme provides loading on two opposite sides only. Both plans are known as "islands." Narrow, deep lots necessitate stretching elements into a "parallel" plan, in which busses are loaded from one side of the building only. Increased distance between elements makes this type less efficient.

Bus facilities. Except where bus traffic parallels both sides of a building that extends through from street to street, one bus entrance and one exit are normally sufficient. Their width depends on width of street and bus turning radius; 14 ft. is minimum, 16 to 18 ft. preferred. Bus movement should be clockwise, since passenger loading door is on right side of bus.

PASSENGER REQUIREMENTS

Street entrances should be 2 to 6 doors wide. Entrances should be centrally located; from them the elements of the terminal radiate.

Waiting room should be directly accessible from street. Access to concourse should be through multiple doorways or "gates," so located as to distribute passenger traffic uniformly, without congestion even during peak load periods. Seating may be based on approximately 1/3 passenger capacity of loading docks, assuming 35 to 37 persons per bus. Space allowances range from 15 to 35 sq. ft. per person; 20 to 24 sq. ft. is considered satisfactory. Total area averages 20 to 35 per cent of total building area; the smaller the building the larger the percentage. Eight-place settees, with or without separation arms, are commonly used. Drinking fountains, trash baskets and ash receptacles are also needed.

Baggage room should be accessible from both waiting room and concourse. Outside freight has to be delivered without interfering with concourse traffic. Baggage is usually checked over counter from waiting room and trucked to buses, and vice versa. Area of baggage room should be 10 per cent of total building area or contain 50 sq. ft. for each bus loading dock—whichever is the higher. Large storage space (usually in basement) is desirable for holdover and unclaimed baggage. Standard metal racks, one or two units deep and four to five shelves high, are suitable for baggage storage.

Check lockers are desirable in addition to the above facilities and are generally paying concessions. Number of lockers is based on potential earning capacity.

Toilets must be convenient to waiting room. Cement or terrazzo floors and bases are preferred. Wainscot should be 4½ to 5 ft. high. Number of fixtures depends on size of terminal, but as many as economically possible should be provided. Women's lounge should be large enough for a couch, vanity or dressing table, and several chairs. Men's lounge is not desirable.

Ticket office should be prominent in waiting room. In small stations proximity to concourse is desirable but is not essential in large terminals. 50 sq. ft. should be provided per selling position. One position may be provided for each 25 or 30 waiting room seats; but number of positions is usually based on personnel normally required and on anticipated extras for peak periods. It is not necessary that ticket office be connected to other offices. Counters should be 42 in. high; cages or windows are not desirable.

ADMINISTRATION AND CONCESSIONS

Dispatcher's office controls bus movement and should be on concourse at a point from which all loading docks can be supervised. It need not be related in plan to waiting room or ticket office, but is usually connected by telephone and telautograph to ticket office, manager's office and bus garage. Public address system is used to announce arrivals and departures of busses.

Offices for terminal manager, passenger agent and switchboard are usually sufficient. These need not contain more

than 100 to 200 sq. ft. each. In larger terminals, offices for regional manager, clerical force, meeting rooms, etc., may be required.

Drivers' quarters are usually limited to lounge and toilet facilities (with shower) in basement or on second floor, and require private entrance accessible from concourse. Space is needed for reading table, lounging chairs, shelves for tool kits. Sleeping quarters are usually provided at local bus garage, not in terminals.

Restaurant is usually necessary for all terminals, has floor area ranging from 15 to 25 per cent of building area; usually, the larger the terminal, the larger the percentage. Larger restaurants have counter and tables. Patrons prefer booths, tables are more flexible, so both are used. Counters generally receive bulk of business. Soda fountains should be included. In larger terminals, soda fountains may be installed in waiting rooms. Kitchen area is from 15 to 35 per cent of restaurant area, depending partly on storage facilities; these are often in basement.

News stand should be adjacent to waiting room and restaurant.

Telephone and telegraph booth is mandatory. In larger terminals a telephone operator is sometimes desirable.

Barber shop and stores are often included. Space economically available, anticipated demand, size of terminal, etc., have to be considered in allocating space for this type of concession. In small terminals some means of increasing revenue is essential; concessions may be the answer. Drug stores are sometimes included. Beauty parlors are seldom included at present.

Travel bureau is important, particularly in large terminals. It should be on or near street, adjacent to waiting room. A show window may be provided on street front.

SERVICES AND CONSTRUCTION

Air conditioning is widely used, especially in large terminals. In northern localities this is often supplemented by steam or hot water radiation.

Lighting in public spaces is often fluorescent, either direct or indirect, with

BUS TERMINAL DESIGN

a three-stage control to permit adjustment of light level to variable passenger traffic.

Intercommunicating system includes telephones and telautograph connecting dispatcher, ticket office, manager's office and bus garage. Cut-in on public address system is usually provided so switchboard operator can page individuals.

Construction should be "fireproof," and

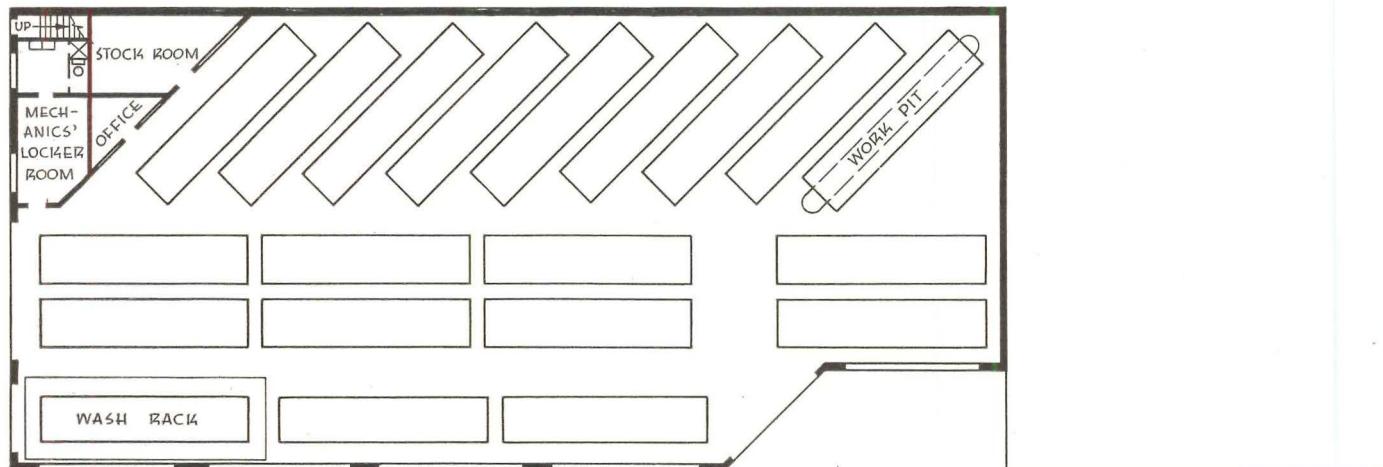
is ordinarily steel frame or reinforced concrete, depending on building design, availability of material, costs, etc. Partitions are usually tile or gypsum block, and should be planned for economical changes if required for expansion.

Interior finish, where subjected to public use, must be rugged and easy to maintain. Terrazzo or tile floors are usually employed; smaller buildings often use cement. Wainscoting in main areas should be able to take abuse. Ceilings in restaurants, waiting room

and telephone office should be acoustically treated.

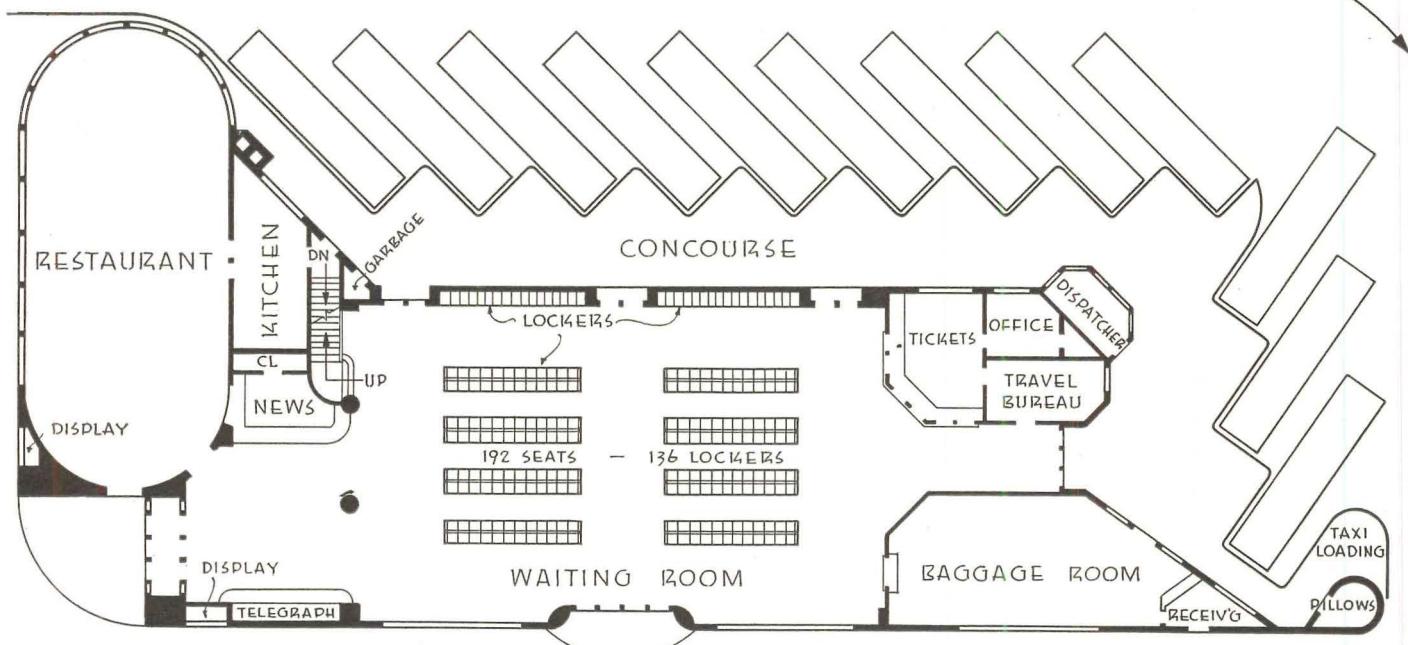
Exterior finish is often cut stone. Glass block is extensively used. Brick, terra cotta, stucco, and concrete are also used; and glazed brick is commonly employed for concourse wall and rear of building.

Concourse, bus lanes and yards are constructed of 7 or 8 in. thick concrete slabs, of 2,500 lb. concrete, reinforced top and bottom with No. 40 mesh. A surface hardener should be employed.



SCALE $\frac{1}{32}$ " = 1'-0"

TO DRIVEWAY



PLAN, typical bus station, fairly large size, Wischmeyer, Arrasmith & Elswick, Architects. Note bus garage in rear

BUS TERMINAL DESIGN—Loading Docks and Concourse

This sheet is intended to supplement T.S.S. "Bus Terminal Design," October 1941. Data were prepared by Ronald Allwork from information furnished by W. S. Arrasmith and Harry S. Pack.

LOADING DOCKS

Parallel loading requires an excessive amount of space per bus. Usually busses in rear cannot move out until first bus exits. In a large terminal several lanes would be required, and overhead or underground passage would be necessary to several island loading platforms. Otherwise passengers would cross bus lanes, an extremely dangerous practice which creates a liability on the bus company.

Right-angle, or head-on, loading is acceptable, but disadvantages include the outswinging bus door which forms a barrier around which passengers must go, and difficulty of maneuvering each bus into its berth. This type of loading is useful when the bus yard is deep, but concourse is limited in extent.

Straight sawtooth loading is efficient, and is employed where lot is comparatively narrow and deep. Passenger has direct approach to loading door, baggage truck can operate between parked busses for loading into side baggage doors.

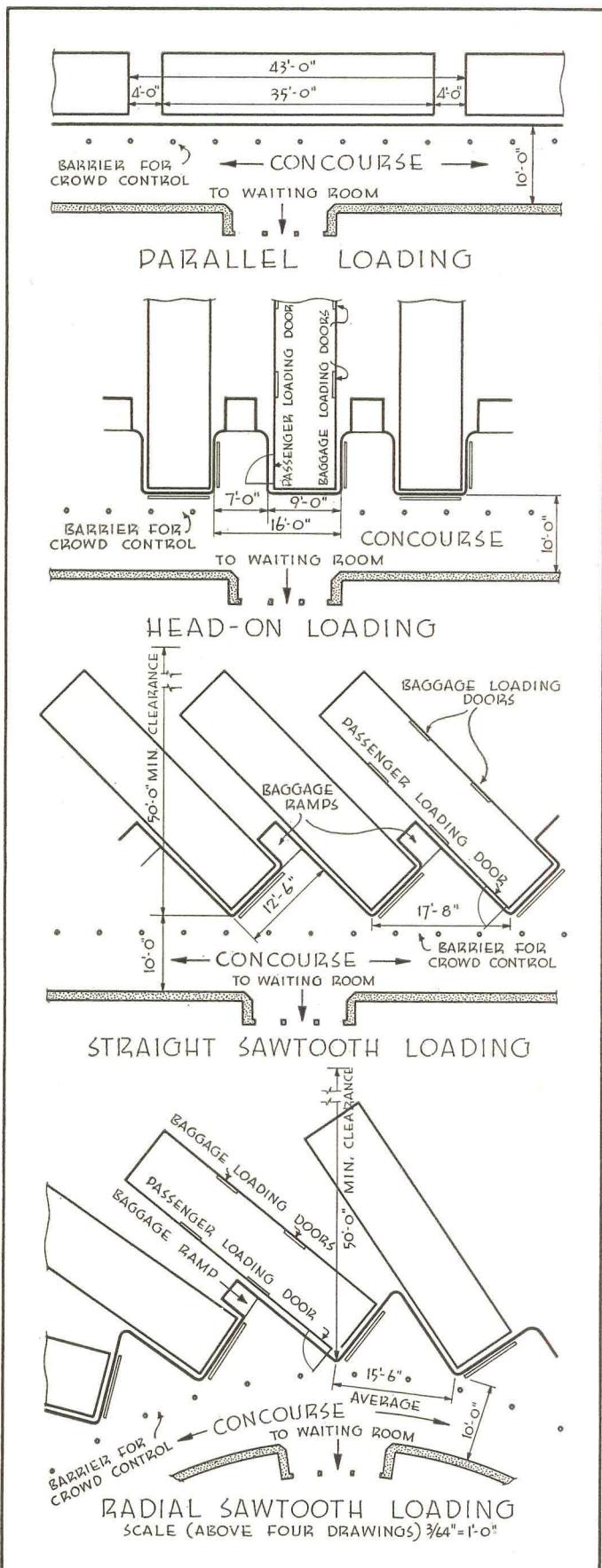
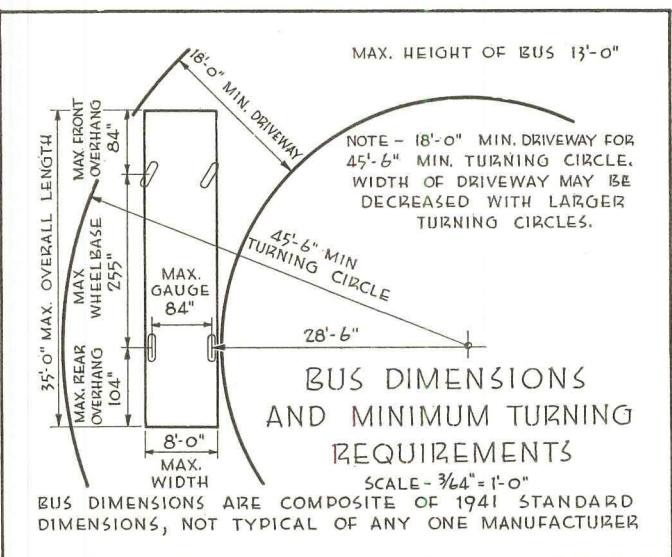
Radial sawtooth loading is most efficient. Busses may swing into position along a natural driving arc. A minimum of concourse frontage, per bus, is required. In this system each bus space is narrow at front and wide at rear, making maneuvering easy and conserving space.

Number of loading docks is based on average peak loading conditions, size of lot, and size of structure. Abnormal peak conditions such as occur on holidays can be taken care of by "doubles"; that is, by parking additional busses in the lot and immediately running them into loading docks as scheduled busses depart. Limited dock space is not a serious drawback if ample parking space can be provided for "double" busses.

Passenger concourse is protected from weather by overhead canopy which cantilevers over passenger doors of busses in loading docks. This protects passenger getting on and off busses as well as front baggage doors on sides of each bus. Holiday crowds can be controlled by using airplane cord barriers as indicated in diagrams.

BUS YARD

Area depends on type of loading used and number of busses to be parked. Parallel loading requires approximately 12 ft. (width) per driveway; right-angle loading requires approximately 40 ft. from rear of bus to property line; sawtooth loading (straight or radial) requires about 50 ft. from front right wheel of bus to property line (assuming busses parked at 45°, berths 12 ft. 6 in. wide).



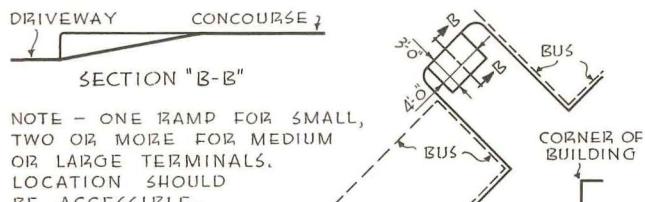
BUS TERMINALS—Loading Docks and Concourse

OCTOBER 1941

Data from Harry S. Pack, Jr.



BUS PARKING ANGLES



BAGGAGE TRUCK RAMP



BUS RAMP ANGLES

