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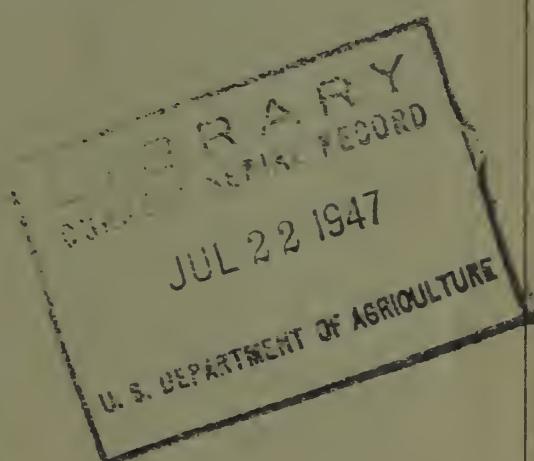
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FARM CREDIT ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C.

FARMERS' PRODUCE MARKETS
IN THE UNITED STATES
PART II
PLANS AND FACILITIES

By

W. M. HURST



COOPERATIVE RESEARCH AND SERVICE DIVISION

UNITED STATES DEPARTMENT OF AGRICULTURE
FARM CREDIT ADMINISTRATION
WASHINGTON 25, D. C.

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FOREWORD

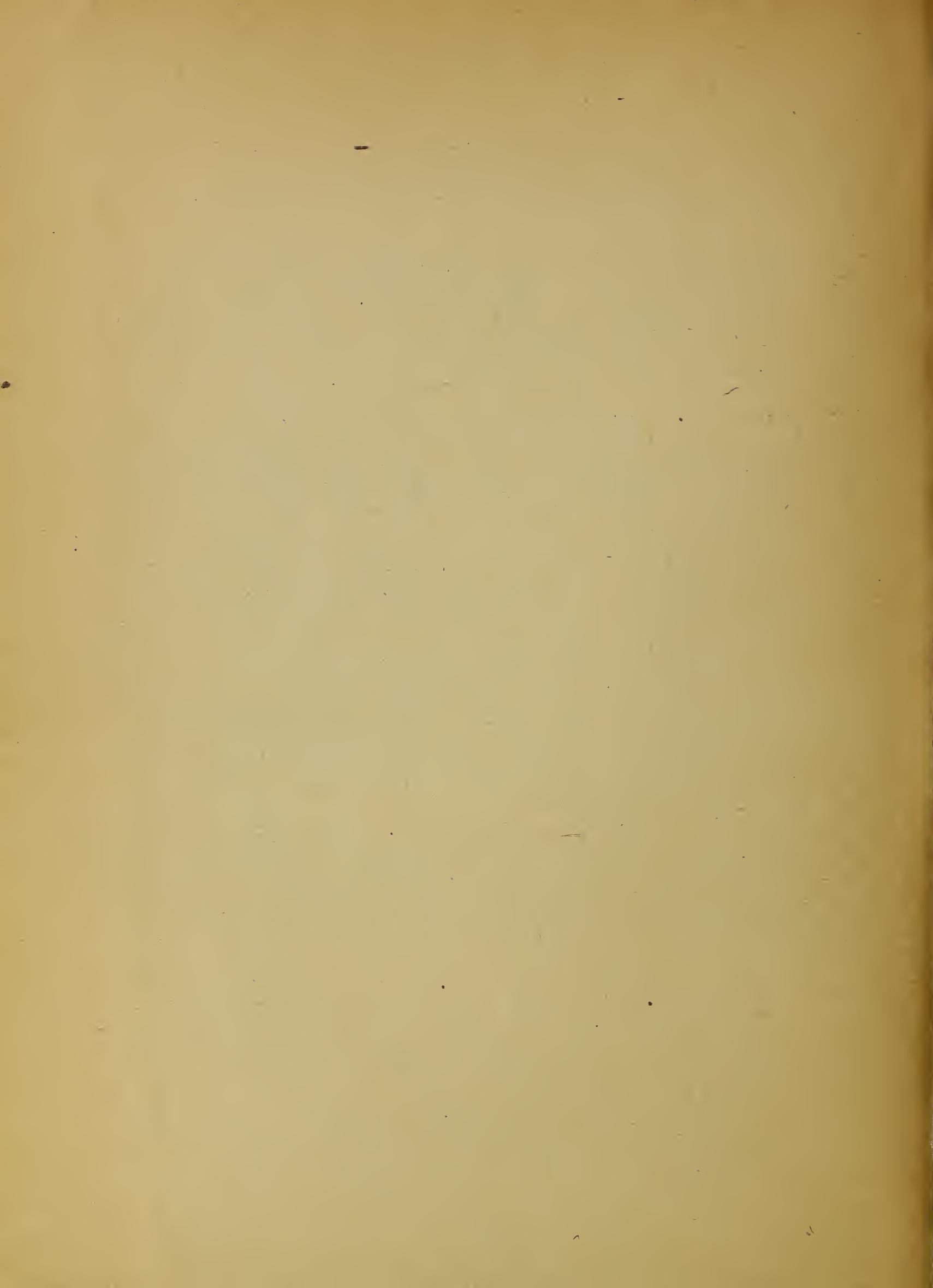
People have always maintained close ties with their market places. For centuries, crude production and simple distribution impelled direct trading between producers and consumers. Perhaps this helps to explain the enduring ambition of these two groups to span the gap between them.

This report deals with plans and facilities of these markets where farmers and farm women sell their products, in many instances directly to the consumer. There were in 1946 approximately 750 of these outlets for farm produce throughout the country. Countless consumer connections are made at these markets and maintained for long periods. In the smaller towns and cities many of these business affiliations lead to lasting friendships.

These primary outlets for farm products make the difference between success and failure for many operators of small farm units. Not infrequently individual producers, or their wives, finish paying for their farm homes from proceeds of sales made at these markets. Many also raise the necessary funds for educating their children by this means.

This report is one of several in a series resulting from a study of farmers' produce markets. The Cooperative Research and Service Division has had frequent requests from home demonstration agents, county agents, groups of farmers, and cooperatives for plans and specifications for market facilities of the several types included in this study. Naturally, the greater demand has been for the primary type, such as retail and simple wholesale structures. The descriptions and sketches of plans appearing in this report will provide the means of answering the majority of such inquiries in the future. They should also prove helpful to the banks for cooperatives in financing cooperative associations in this field. It is believed that the information will be of special benefit to schools and students of marketing facilities and practices.

In the conduct of this study, the Division has worked closely with other agencies of the United States Department of Agriculture, State Colleges, State Departments of Agriculture, and other public agencies. A particularly close working relationship has been maintained with the Marketing and Facilities Branch, Production and Marketing Administration, of the Department.



SUMMARY

1. Thirty-seven farmers' markets were visited in 17 States and the District of Columbia to study plans, structures, and equipment in order to provide information helpful to farmers' cooperatives who may be planning to build new markets or improve their old ones.
2. Those studied included six general types of Farmers Markets: Women's, City Retail, City Wholesale, Wholesale Redistribution, Wholesale Regional, and Wholesale Shipping Point Markets.
3. Farm Women's and Farmers' Retail Markets may have either a city or suburban site, although the town site is likely to be more expensive and to present parking problems. Wholesale markets locate in the business or semi-industrial sections because of zoning restrictions and railroad shipping facilities. Traffic problems, land values, and the terrain itself must also be considered before choosing a location.
4. Farm Women's and Farmers' City Retail Markets operate in store buildings or in structures especially designed as markets. Buildings are generally of two types - long, narrow structures with counters next to the walls and an aisle down the center or square or rectangular buildings with counters arranged in parallel rows. Store buildings usually have only a front and rear entrance which means that both buyer and seller must carry the produce some distance. Buildings designed especially for a market usually provide a number of entrances. Sufficient counter space for display and handling the produce should be provided. Aisles should be wide enough for customers to move freely between the sellers' stands.
5. Farmers' sheds are of four types, illustrated in the report by drawings which differ mainly in arrangement of stalls. In Type A, farmers back their trucks in, buyers walk through and drive by to pick up loads. In Type B, farmers back in, buyers walk or drive through. In Type C, farmers drive in, buyers walk or drive by. And in Type D, farmers drive under the shed, beside the curb, buyers walk or drive by to pick up loads. Advantages of each type depend somewhat upon how the market operates. The Type B shed provides better protection to sellers and buyers but needs more area than A and C. Transferring packages from seller to buyer is more convenient in C and D. If open 24 hours a day, or if there are no regular hours, A and B are preferable as farmers may drive in and out without bothering others.
6. Wholesale stores are of three general types according to the layout of their display aisles. The type with a display aisle on each side and a dock for receiving rail or truck shipments on the other is most common for carlot wholesalers. The second type has a common display aisle between two rows of adjacent stores and the third, the stores are back to back with a partition between and a dock for receiving, shipping, and display at the front on opposite sides. The last two types can be used when space for buildings is limited. The third type is satisfactory for retail stores at wholesale markets.

7. Market adjuncts - business catering to the trade at markets and operated as concessions - include processing plants, cold storage plants, grading and packing sheds, restaurants, supply stores, and offices. Community canneries have also worked out satisfactorily as market adjuncts in some parts of the country. Types of buildings needed for these adjuncts vary with the business itself.

8. While planning the buildings for a market, designers also need to consider their proper arrangement on the site to give the most efficient flow of produce and traffic possible. This report gives some suggestions for possible arrangements. Farmers' sheds through the center with carlot wholesalers on one side and jobbers, commission merchants or shippers on the other are favored by some market officials. However, designers too often must arrange buildings to fit the plot of land.

9. Railroad sidings play an important role in efficient movement of produce at the larger markets. Double tracks with the tops of the rails at the paved level adjacent to and parallel with wholesale stores are favored by many dealers and market masters. A surfaced area for trucks on the opposite side of the tracks from the stores is recommended. When not convenient to bring in sidings, team tracks nearby can be used, laying tracks in pairs with a surface area between for trucks to load from the cars.

10. Docks and platforms should be at a height that will eliminate as much handling as possible. Dimensions of freight cars differ but local railway officials can provide these figures and specifications as to clearance and dock height. The proper dock height for railroad cars and large trucks is approximately the same. Most wholesalers prefer sheltered platforms adjacent to and parallel with their stores for receiving or shipping.

11. The increase in dimensions of trucks for hauling farm produce has resulted in traffic congestion at some old markets. The wide spacing of buildings to accommodate trucks has increased the area necessary for a market. The maximum legal dimensions of motor vehicles vary from State to State - the width and height are the same for the majority of States, but there is considerable variation in length.

12. Judging from truck size recommendations, an area at least 9 feet wide and 35 feet long should be provided for each farmer to park for displaying his produce, and the roof of the sheds should clear at least 13 feet.

13. Detailed plans of a number of markets are reproduced and discussed in the section on Markets Studied. These point out some good and bad features of the various plans illustrated. Market No. 5 illustrates the long narrow type of structure for a retail market which may be either an open shed or enclosed and No. 12 the square or rectangular type structure; markets Nos. 17 and 21 are good examples of city wholesale markets; and Nos. 7 and 16 illustrate shipping point centers.

FARMERS' PRODUCE MARKETS IN THE UNITED STATES

PART II. PLANS AND FACILITIES

By

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In Cooperation With
Farm Credit Administration

This report covers one phase of a study of farmers' markets begun by the Farm Credit Administration in 1945. From information obtained during the general survey and from inquiries received by the United States Department of Agriculture, it was evident that there was also need for a study of the layout and physical facilities of farmers' markets in different parts of the country.

Each site, of course, presents specific problems which must be dealt with on the job by architects and engineers. However, a number of questions of a general engineering nature basic in the design of a market arise during the initial planning stage. In order to assist farmers' cooperatives in planning their markets, the Farm Credit Administration, in cooperation with the Bureau of Plant Industry, Soils and Agricultural Engineering, made a study of the layout, buildings, and equipment of typical farmers' markets in different parts of the country in 1946. The study includes 37 markets in 17 States and the District of Columbia. Of this number, plot plans and typical sections of certain types of buildings are shown for 24 markets.

In the study, an attempt was made to include several types of markets as well as those in different geographic areas. Those selected were visited and the layout or plot plan obtained together with typical floor plans and vertical sections of such buildings as farmers' sheds, wholesalers' stores, and administration buildings. In some cases working drawings were supplied. In many instances only sketches could be located and at some markets no drawings at all could be found. In these cases it was necessary to make estimates and take measurements at the site. Moreover, the dimensions of buildings and their location on a site are not always in exact accordance with the drawings. For these reasons, the dimensions given on a number of the plans are approximate. However, for reviewing some of the good and bad features, in plans of existing markets the report should help those who want to plan a new market for efficient operations or change an old one.

NOTE: The study on which this report is based was conducted under the general supervision of M. C. Gay, in charge, Fruit and Vegetable Section, Cooperative Research and Service Division, Farm Credit Administration. The drawings were prepared by Charles E. Taylor, Assistant Mechanical Engineer, and Walter G. Cadmus, Jr., Architect, Bureau of Plant Industry, Soils and Agricultural Engineering.

The Bureau of Agricultural Economics and the Production and Marketing Administration of the United States Department of Agriculture have made surveys in cooperation with States and municipalities for locating and laying out markets. Reports of some studies with recommendations have been published. While these reports frequently deal with large city wholesale markets, they contain information which would be of great value to farmers' cooperatives in locating and building a market.

TYPES OF MARKETS

Farmers' markets differ as widely in appearance and in operation as grocery stores or any other business. They take on complexion or atmosphere depending in part upon the locality, produce handled, size, facilities, management, and type. There are roughly six different types referred to in this report as Farm Women's Markets, Farmers' City Retail, Farmers' City Wholesale, Farmers' Wholesale Redistribution, Farmers' Wholesale Regional, and Farmers' Wholesale Shipping Point Markets.

Farm Women's and enclosed Farmers' Retail Markets are stores where the greater part of the produce handled is grown locally and sold by the producers. The kind of produce handled at a Farm Women's Market depends largely upon the section of the country where the market is located and on local ordinances and State laws regulating the sale of food. Fruits, vegetables, dairy products, and poultry and eggs are perhaps the most common items handled. Cooked foods, handicraft, flowers, and nursery stock are also common.

Farmers' Retail Markets are larger as a rule than the Farm Women's Markets. However, some are merely parking space at the curb on a street or space in a vacant lot. Others are elaborate with all modern facilities and conveniences. One large farmers' retail market studied had a loud speaker system, local and long distance telephones, parking space for farmers and customers, toilets, drinking fountains, and heat in the buildings.

Some Farmers' Retail Markets restrict selling to producers and others permit dealers to sell. A producer at some markets is classed as one who grows at least 50 percent of the produce he sells. Farmers frequently object to selling in competition with dealers on the same market because the dealer may have an advantage in experience and can handle a wider variety of produce. If the market is open twelve months during the year the dealer will be at his stand each day while the farmer may be there only during the summer. There is some advantage in having dealers on the market as they attract customers and help keep the market active throughout the year. Some Farmers' City Retail markets sell at wholesale during early morning hours for the benefit of local grocery stores and hucksters.

Farmers' City Wholesale, Farmers' Wholesale Redistribution, and Farmers' Wholesale Regional Markets are similar in appearance and operations. They are generally known as public markets, city markets, or produce terminals. A redistribution market may have more facilities for rail and motor shipping than the others and may be located between heavy production and consumption areas. The regular city wholesale market is a

food terminal in that the bulk of the produce received is consumed locally. A regional market, as the term implies, serves towns and cities in a particular area or region.

Farmers' Wholesale Shipping Point Markets represent a distinct type. They are found in winter vegetable production regions and in concentrated production areas. The name is descriptive in that at such markets farmers bring their produce for shipping to distant points or to a particular city. The buyers are, for the most part, brokers, jobbers, or representatives of large produce firms. Such markets need sheds for transferring loads from farmers' vehicles to buyers' trucks or to railroad cars and also offices for the buyers. Normally, the produce is graded and packed in wholesale units before delivery to the market.

Some wholesale markets have stalls or stores for retail dealers; some have stalls for retail transaction by farmers; or farmers may sell at retail on certain days. At others, business is restricted to wholesale.

CHOOSING SITES*

Anyone who could locate and lay out a market with a guarantee of its success would be much in demand. Some markets, with the best of facilities and located only after a careful study of the many factors involved, have failed. In other instances, markets which "just happened" have succeeded. However, such examples should not minimize the importance of planning in selecting the site and in laying out the market.

The location and operation of a market, especially a Farmers City Wholesale Market, is of concern to many officials in the city involved. Some cities have a department, board or committee to study enterprises and their locations for their effect on the development, growth, and appearance of the city. The police and fire departments might need to study the possible effect of market traffic on the movement of fire fighting equipment, ambulances, and police cars in possible emergencies. The width and condition of streets in the proposed market area, availability of power and light, water supply, connections, for sewage and drainage are subjects which must be investigated in connection with a site. The public health department is, of course, interested in any activity where food is handled.

Farm Women's Markets often locate in store buildings in town or in rented or gratis quarters in public buildings. Others may be found in the country as roadside stands. Some groups have constructed their own buildings or acquired valuable property over the years. Both Farm Women's and Farmers' Retail Markets may locate in or near the shopping district of a town or in any outlying district where parking space is available. Sites in either of the two areas have advantages and disadvantages. A town site is likely to be more expensive as to land and buildings than one in the suburbs and to present parking problems for both the sellers and buyers. Some customers may be attracted more easily in the business part of town than elsewhere. Others who buy in relatively large quantities need an automobile to haul the produce home and parking space is more important to them than distance to market.

City Wholesale Markets are located in the business or semi-industrial sections of cities because of zoning restrictions and railroad shipping facilities. An effort is usually made to pick a site so farmers can get to and from the market without confronting city traffic and at a point convenient for buyers.

Land values also influence choice of the site as an area of 50 acres or more may be needed for a large city wholesale market. A tract this size may be difficult to find regardless of whether it is in a good or bad location for a market. For these reasons designers too often find themselves confronted with the problem of getting as many buildings as possible on a very irregularly shaped piece of land in such a manner as to leave the widest possible streets and drives. They may find also that the site has been a city dump at one time or in a fill. Such conditions present problems in laying foundations for buildings and in providing roadbeds. Hilly or rolling sites also make it difficult to obtain uniform dock heights for the several buildings.

The site for a Farmers' Shipping Point Market should be chosen so producers can reach the market easily. Shipping facilities should be plentiful and close by. Since these markets are merely concentration points for shipping to distant points they may be located in the country or near small towns.

OWNERSHIP VARIES

Farm Women's Markets are owned or operated by the sellers as individuals, clubs, or cooperatives. Home demonstration agents have been active in several States in organizing farm women's markets and these are often referred to as home demonstration club markets. Such markets have given many benefits to rural communities. Farm women are reported to have paid for farms and others have sent their children to college on returns from the sale of home grown farm produce.

Farmers' Retail Markets are owned by individuals, producer stock companies, cooperatives, and municipalities. The several types of Farmers' Wholesale Markets may be owned or operated by individuals, producer stock companies, cooperatives, municipalities, railroads, States, or State agencies.

At several points farmers joined in a group as a stock company or a cooperative have acquired the farmers' portion of a city wholesale market from a railroad or other agency. With this procedure the farmers obtained more complete facilities than would have been possible for them to set up by themselves.

Producers and private individuals have worked together in some cities to locate the farmers' market in the wholesale produce section. With such a plan the farmers needed only to acquire necessary land for sheds and construct them. The success of a Farmers' City Wholesale Market depends in no small measure upon cooperation between producers and wholesalers. While wholesale produce and grocery firms located on a market generally

buy relatively little produce from the farmers at the market they all attract the same trade.

Many cities, either from desire or necessity, have constructed farmers' markets. From the standpoint of construction and operation, a municipal market has several advantages. The city has its own engineers who can design the buildings, lay them out, and supervise construction. The city also can acquire land to better advantage in some instances than private individuals or groups. Such services as power and lights, sewage disposal, maintenance, paving, traffic control, and policing can be handled quite readily by city officials. They may, however, have more difficulty in reconciling conflicting interests of competitive groups operating on a market than would be encountered by private or group owners. City markets often have a committee or board representing all interests such as producers, retailers, wholesalers, truckers, and railroads, or a group with no direct interest in the market, to pass on matters of policy.

Several States, through special legislation have acquired the authority and funds to construct and operate Farmers' Wholesale Markets. Some of the largest and most successful wholesale markets in the country are owned and operated by a State or a State agency. The advantages and disadvantages of State ownership are similar to those of municipal ownership.

While individuals, municipalities, railroads, States, or State agencies may provide a farmers' market, farmers often like to own their own market. Producer ownership has its advantages and disadvantages. The matter of acquiring land, constructing buildings, and operating a market presents complex problems, especially in a city. However, the larger the city the less influence the producers generally have in the affairs of the market unless they own or operate at least the farmers' portion.

LIMITED PERSONNEL NEEDED

Farm Women's Markets sometimes have a manager who is paid a percentage of the sales. In such instances, the manager makes change for the sellers and buyers and performs other such duties as may be prescribed. There are often no paid employees except possibly a janitor or a bookkeeper who collects fees and performs clerical work.

Farmers' markets, both retail and wholesale, require relatively few employees considering the volume of business done. Each seller and buyer of course provides his own labor for loading, unloading, and transferring produce.

No employees or facilities other than those provided by the farmer may be needed on open curb and open parking lot markets. Most Farmers' City Retail Markets have a market master, at least one clerical worker, perhaps a collector of fees, and a janitor. The majority of the City Wholesale Markets visited have a market master, an assistant market master, a secretary, one or more fee collectors, one or more traffic directors, a janitor, and one or more clean-up men. The exact number depends in part

upon the size and type of the market, the layout, and the hours. Markets open 24 hours per day naturally require more employees than if open for business only 8 hours per day.

BUILDINGS AND EQUIPMENT

Type of structure and equipment varies with the type of market being run. Main points to be considered in plans for all markets, however, include: Convenient arrangement of buildings and facilities for both buyers and sellers so goods won't have to be carried long distances; plenty of walk-through or drive-through space; good display space; protection from weather for buyers, sellers, and produce; and traffic control. For more specific details, each type market is considered separately in the following pages.

Farm Women's Markets

Farm Women's Markets, as pointed out, may be found in most any kind of a building. A structure designed as a store, usually a long, narrow building, has proven satisfactory in some localities. One disadvantage of a store with only front and rear entrance is that produce must be carried some distance by sellers even if a parking space can be found near either the front or rear entrance. With a building designed especially for a market, a number of entrances are provided and the sellers park for unloading near their respective stalls.

Each seller in a Farm Women's Market has a counter or space on a counter for displaying and selling produce. Counters of the same size and design give a better appearance. Sellers handling dressed poultry, cakes, or pies may have regular glass cases. The counter space for each seller varies from market to market, but usually ranges from 6 to 8 feet. Some sellers have more than one space. The counters are about 36 inches wide and 30 to 36 inches high. A space of 24 to 48 inches is provided back of each counter for the seller to move around in, or for storage or display in addition to the counter. Some markets in long narrow buildings have a slanting display shelf next to the wall back of each row of counters. Others have shelves back of the counter in the form of a cupboard. The width of aisles for customers between counters varies from perhaps 6 to 12 feet at different markets.

Counters for Farm Women's Markets often are made of rough lumber with covering such as oil cloth tacked on. These rough counters are hard to keep clean. In designing and building new counters, waterproof plywood or a plastic covering might well be used for better appearance and better sanitation.

Scales of the type commonly used in grocery stores that are legal in trade are expensive. For this reason, and because all sellers do not have constant need for scales, there may be only one such scale for a farm women's market. One scale of the type used in weighing milk is often provided for each of two sellers. None of the farm women's markets visited had refrigerators although they could be used to advantage in many markets.

Farmers' Retail Markets

The general plan of an enclosed Farmers' City Retail Market differs little from that of Farm Women's Markets. Buildings designed for the purpose are usually one of two general types. One is a long, narrow building with counters next to opposite walls and an aisle down the center. It may be open or enclosed. The other type is a large square or rectangular structure. In the latter type the counters are lined up in parallel rows facing in opposite directions, or arranged to form squares facing each of four directions.

Difficulties in finding a suitable building or in designing one increase with the size of the market. Sellers should have equal access to their stalls and the building or buildings should be of such shape and size that customers find it equally convenient to visit any or all stands. It is difficult to lay out a market in such a manner that customers are just as likely to enter at one place as another or that the customers pass all stands while in the market. Variations in rental fees for stands in some markets reflect desirable and undesirable locations.

Farmers' Retail Markets open throughout the year need heat in most parts of the country during the winter. Some have wood or coal burning stoves at different points in the building; others have a central heating plant and radiators. Some of the new markets have unit heaters suspended overhead for heating and circulating the air.

Public telephone booths, drinking fountains, and public toilets are found at most Farmer's City Retail Markets. Space is often rented to an individual for a restaurant or lunch counter unless there is one nearby.

The number and extent of business enterprises on a farmers' retail market other than those selling farm produce depends somewhat upon its size, its location in town, and whether dealers have space on the market. Dealers sometimes put in a meat market or other allied lines.

Some Farmers' City Retail Markets have loud speaker systems which save much time for the manager and clerical workers. The need for such a system increases with the size of the market and with the number and scope of business activities other than the sale of home grown produce.

Farmers' Wholesale Markets

Farmers' City Wholesale, Farmers' Wholesale Redistribution, and Farmers' Wholesale Regional Markets have three types of structures which are characteristic of the business. They are the administration buildings, farmers' sheds, and the wholesalers' stores. Farmers' sheds and wholesale stores are standardized to a greater extent than administration buildings.

Administration Buildings

Administration buildings vary from those just large enough for an office to a structure which may cost \$100,000 or more. The large administration

buildings are designed to house not only the market officials but other agencies and individuals such as a weighmaster, county agent, State and Federal marketing officials, and offices for buyers. Restaurants, barber shops, retail stores and other business activities catering to the public at markets may have space in this building. At one market studied, the administration building housed a locker plant, a radio broadcasting studio for market news reports, and a bank. Public telephones, toilets, and a telegraph office are commonly located in administration buildings.

The size, shape, and materials of construction for administration buildings vary widely. They may be frame, concrete, brick, or concrete block of one story, or two story with or without basement. Offices are customarily on the second floor of two story structures. Some market masters prefer to have the market office on the first floor for convenience or a small office on the first floor for use by fee collectors and traffic directors as they come in and out frequently.

Some of the newer Farmers' Wholesale Markets have buildings for truckers. These may be stores with front and back platforms or they may be long, narrow, open sheds used primarily in transferring loads.

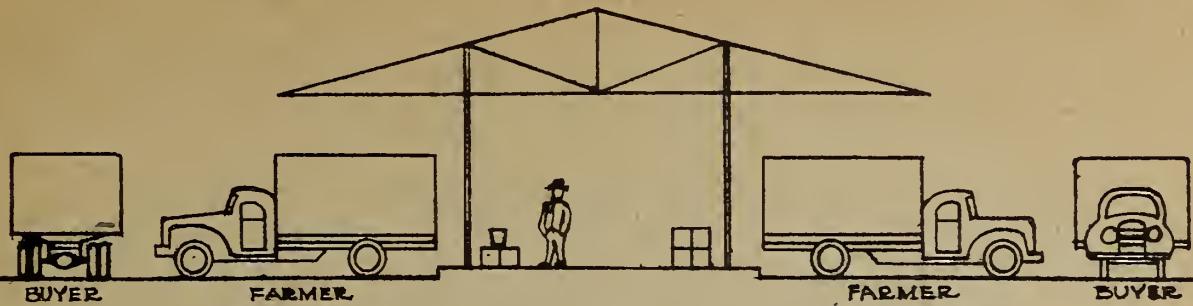
The variety in sizes of containers for fruits and vegetables, mixed loads, and the nature of the produce complicates the use of large scale warehouse handling machinery at farmers' wholesale markets. Hand trucks and gravity roller conveyors are common. Ice companies sometimes have portable crushers at shipping point and redistribution markets for icing trucks and cars of produce. Wholesalers who sort, grade, and package produce have regular packing house equipment in their stores. Tomatoes, for example, are often placed in consumer-size containers by wholesalers on the market. Overhead trolley rails are sometimes used for handling bananas.

Farmers' Sheds

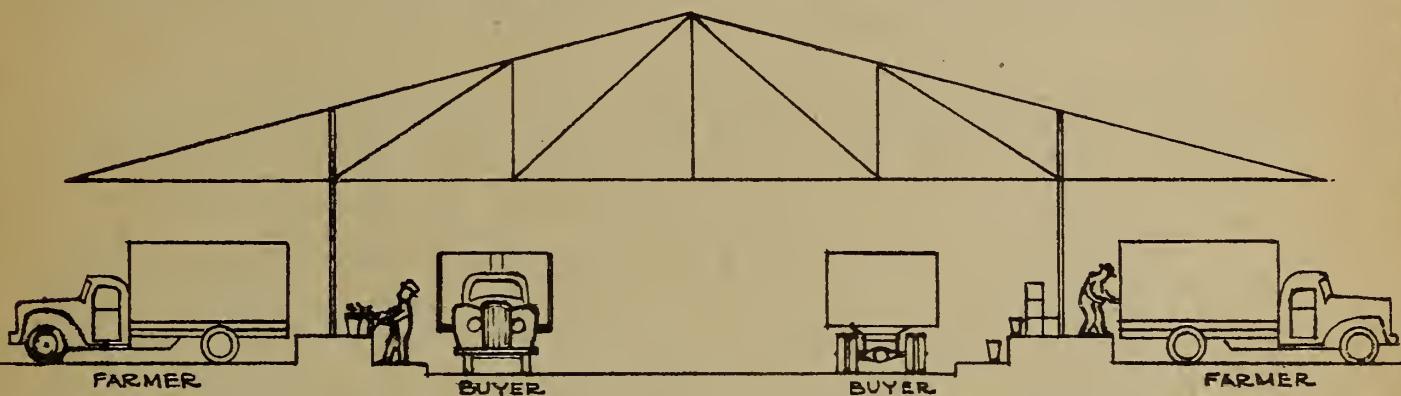
Farmers' sheds at wholesale markets are generally open and may be of steel or frame construction. They are similar in appearance at different markets but differ as to size and means of displaying produce. Most of them are wired for lights, and some for power. As most wholesale markets open for business before daylight, yard lights are needed also. Some have water faucets for connecting a garden hose to sprinkle leafy vegetables and wash sidewalks, streets, and display platforms.

Type A Shed - Several basic types of farmers' sheds are shown in figure 1. In Type A loads of produce are backed in on each side of the shed. A display aisle and walk for buyers is provided through the center. The floor may be level or have a raised portion as illustrated at or slightly above sidewalk level. Samples of the produce for sale are displayed in containers on the floor.

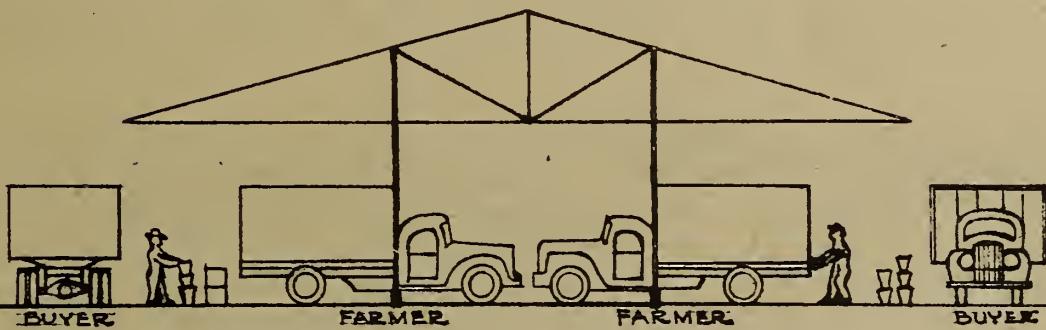
This center aisle type serves well at markets where space under sheds is rented by the day, week, or season as a grower may park and stay as long as he cares without interfering with other sellers or with buyers. When buyers have their stores nearby, and when the entire load is purchased by



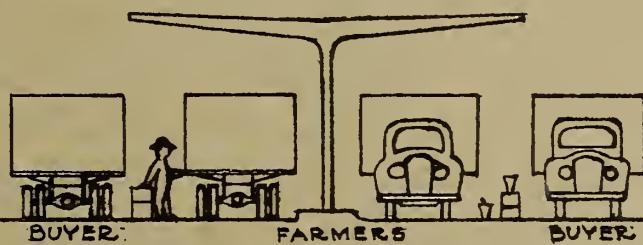
A. BACK UNDER, WALK THROUGH AND DRIVE BY



B. BACK UNDER, WALK AND DRIVE THROUGH.



C. DRIVE IN, WALK AND DRIVE BY



D. DRIVE UNDER, ALONGSIDE, WALK AND DRIVE BY

FIG. 1 TYPES OF FARMERS' SHEDS

SCALE IN FT. 0 5 10 20

one individual, the farmer may deliver his produce directly to the store. However, when merchants buy only a few packages from each of several farmers the packages are carried to the buyers' trucks outside the shed, often through narrow spaces between parked trucks.

The Type A shed is perhaps one of the least expensive of the several shown. A sheltered walk with display on both sides and shelter for at least a part of the farmer's load may be obtained with a shed 40 to 50 feet wide. The design is simple as two rows of posts can be used. These posts can be set back from the curb for protection against trucks backing against them.

The roof may be as shown, flat or curved. It usually extends 10 to 14 feet beyond the curb on each side for sheltering at least a portion of the farmer's load from sun and rain. The raised portion of the floor, or that part designated for display and a walk, varies from 18 to 30 feet in width at the several markets visited. The exact width should depend somewhat upon the nature and variety of produce handled. In a section where farmers have only a few items to display on each load, a display area possibly 4 feet deep across the width of the stall adjacent to a 10-foot aisle may be sufficient. If numerous items are offered by each farmer or if retailing is done on certain days or after regular wholesale market hours, the display area and buyers' aisle should be wider. Figure 2 shows farmers selling at retail at open curbs on a large wholesale



Figure 2. - Farmers selling at open curbs on a Farmers' City Wholesale Market. The curbs are 24 feet apart with a 12-foot aisle for buyers.

market. The distance from curb to curb is 24 feet. A strip approximately 6 feet wide is used at each curb for displays leaving a 12-foot walk down the center.

The Type A shed uses less area on the market than some types in providing room for farmers to get in and out, and for buyers to inspect the produce and to load packages into their vehicles. The old markets often do not have more than 70 feet between curbs under adjacent sheds. Some of the new ones allow 100 feet because of the increase in length of trucks used for hauling farm produce. While vehicles used for hauling farm produce are generally 20 feet or less in length, a majority of the States allow 35 feet as a maximum for single unit trucks. If vehicles 35 feet long are to be accommodated, 110 feet would be needed if two 10-foot lanes are provided for loading and two of the same width for driving out.

In order to compare the different types of sheds on the basis of area required for farmers to get in and out and display their produce and for buyers to haul it away, some assumptions will need be made. In this connection 35 feet is allowed for the length and 10 feet for the width of stalls, 10 feet for driveways, and 24 feet for the raised portion under Type A sheds. On this basis an area of 670 square feet is required for each farmer to do business in a Type A shed.

Type B Shed - Sheds of Type B provide shelter for the farmer while selling and for the buyer while loading. However, in order to get both under shelter a wider shed is needed than for Type A. With two pick-up and two drive-out traffic lanes under the shed and sidewalks, the display platforms need to be at least 48 feet apart. If two 6-foot display platforms are provided and the roof extends 20 feet beyond the curb or raised platform, such sheds must be 100 feet wide. If the sheds of Type B are spaced so that curbs of adjacent sheds are 110 feet apart each farmer's stall will utilize 850 square feet.

The large area is needed for Type B because of traffic both under the sheds and between them. With one-way traffic between sheds and under them the area could probably be reduced to 800 square feet. It should be remembered, however, that both sellers and buyers are sheltered with the Type B shed.

Opinions differ as to the desired width of the display platform under Type B shed. At one market visited, these raised platforms are 10 feet wide. At another, they are 6 feet, 6 inches wide. The exact width should depend somewhat upon the operation of the market and the variety of produce on each load. Markets where space is rented by the load sometimes provide rather narrow display docks to prevent sellers from piling the entire load on the dock for someone else to sell while they return to the farm for another load. If commercial truckers use the shed, the size of the load and the variety of items may justify a platform 10 feet or even 12 feet wide.

Type C Shed - The Type C shed is more economical as to space required than Type B, but the seller is not protected as well and the buyer is out in the open. If 35 feet is allowed for the farmers' trucks, 12 feet for display and the buyers' walk, 10 feet each for pick-up and drive-out lanes, and a 32 foot parking strip between sheds, 830 square feet is needed per stall. At the market visited which had this type, the sheds were long and the parking lane was needed. The parking area with pick-up and drive-through lanes is shown in figure 3. With shorter sheds and parking space elsewhere the 32 foot parking strip between sheds could be eliminated. In this event sheds could be constructed on 13 $\frac{1}{4}$ -foot centers. This would utilize 670 square feet for each seller, which is the same as for Type A. In comparing this shed with other types the parking should be eliminated, as no parking other than for farmers under sheds and for merchants in picking up loads is considered in discussing the others. However, under operating conditions it might be more desirable to have parking between sheds rather than elsewhere as one may park near any farmers' stand on the market.

Perhaps the major fault of the Type C shed is that the buyer is unprotected and the farmers' display receives little protection from rain and sun since it is so close to the edge of the building. In order to protect both buyers and sellers the shed would need to be 110 feet wide. Even then, the farmers' display would have little protection from blowing rains. The market visited with the Type C shed is located in a city where good climate is an important asset.



Figure 3. - Parking area between sheds of Type C where farmers drive in and buyers walk and drive by.

The major advantage of the Type C shed is the convenience in transferring packages from sellers to buyers. But occasionally a buyer truck interferes with the loading of produce from farmers stalls to other buyers.

Type D Shed - The only market visited with Type D sheds allows 25 feet at the curb for the farmers' vehicles and the sheds were constructed on 55 foot centers. Therefore 687.5 square feet are allowed in connection with each stall. However, market officials feel that at least 30 feet should be allowed at the curb and the space between sheds should be increased. With no increase in spacing, but with 30 foot stalls alongside the curb, the area needed would be 825 square feet. To allow for a 35-foot vehicle and room to get in and out next to the curb at least 40 feet would be necessary. In order to make this type comparable with others the area for each seller would be 1,100 square feet. Widening the space between buildings would make the area still larger.

Comparisons of Sheds - Judging from these comparisons, the Type B shed provides better protection to the sellers and buyers than any of the other types but more area is needed than for Types A and C. Transferring packages from seller to buyer is convenient in Types C and D. The relative advantages and disadvantages of the several types depends somewhat upon how the market is operated. If it is open 24 hours each day, or if there are no regular hours, Types A and B are preferable. Farmers may drive in and out, especially with Type B, anytime without bothering others. If the market is operated each day on a designated hour with all sellers in place, any of the several types may be satisfactory.

Wholesale Stores

Wholesale stores on farmers' markets differ from regular stores in that, as a rule, they have covered docks or platforms both front and back. The floor level is such that the platforms are a convenient height for receiving and shipping. The front platform is used for display and for a buyers' aisle.

Markets with dealers who buy in carlot quantities may have a railroad siding to the dealers' building or a team track nearby. Small wholesalers, jobbers, or commission merchants usually have the same kind of stores as the carlot wholesalers but they may be smaller and have no railroad siding.

The several types and sizes of stores may have basements and mezzanine offices but these are most common in the carlot wholesalers' buildings. When refrigerated rooms are installed, they are placed in the basement, if the building has a basement, or on the main floor. Wholesalers' stores customarily are constructed of brick, concrete, or concrete blocks. Except in cold climates, they are not heated. When heat is necessary there is only enough provided to prevent the produce from freezing.

Wholesale stores at farmers' markets differ greatly as to size but there are only a few types. Three major types are illustrated in figure 4 as vertical sections of long rows of stores.

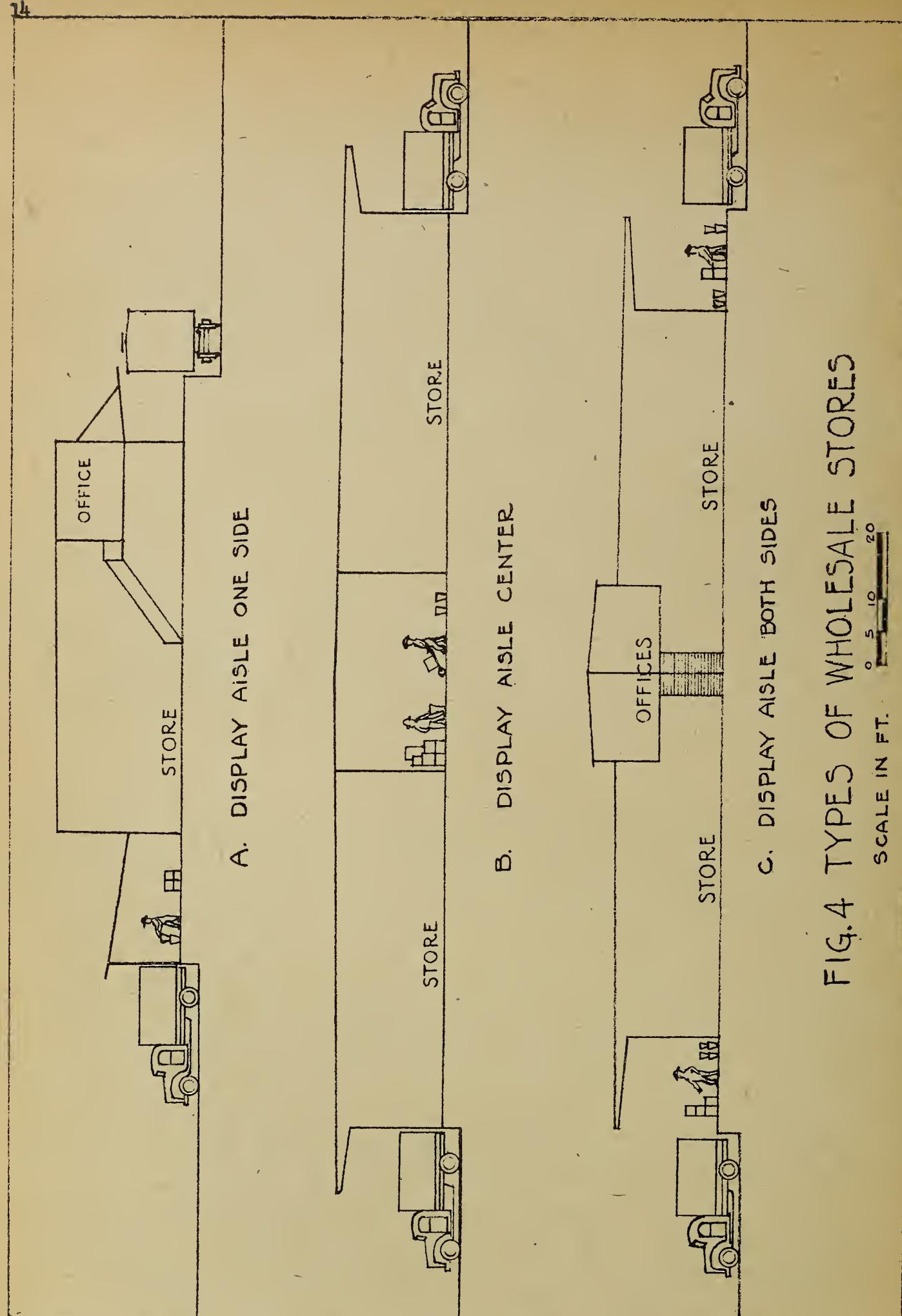


FIG. 4 TYPES OF WHOLESALE STORES

Type A with railroad siding on one side and truck service to a display aisle on the other is the most common for carlot wholesalers. At large markets, the bays or individual stores in these buildings are 20 to 24 feet wide and about 70 feet deep. The display and sales aisle is often 20 feet wide and the railroad dock 10 feet, making a total width of 100 feet. Merchants who need more area than provided by one 20 by 70 foot bay rent two or more and partitions are erected accordingly.

The floor area needed by a merchant depends upon the number of car loads of produce he must house at one time. According to a recent study ^{1/} approximately 300 square feet of floor area should be provided for each car, exclusive of docks and aisles.

The ceiling over the first floor of wholesale stores is often high enough for a mezzanine office. While a high ceiling gives the appearance of waste space it is helpful in keeping the building cool in hot weather. Except under crowded conditions, packages of produce are seldom stacked more than about 5 feet high. Walls of wholesale stores often are designed for a second story even though an extra floor is not contemplated immediately.

Stores of the several types may or may not have a basement. Merchants differ on the desirability of a basement. Some feel that difficulties in getting produce up and down offset the advantages. Those who handle bananas quite generally favor a basement room for ripening. Temperatures in a basement are more constant than on other floors and temperature and humidity control rooms take up considerable space. Dealers who also have cold storage rooms, may use the entire basement floor for banana ripening and for cold storage rooms for fruits and vegetables. However, produce is moved in and out of cold storage rooms frequently and some merchants prefer to have them on the main floor.

When used for jobbers, commission merchants, and small wholesalers, the depth of the Type A store is usually reduced to 40 or 50 feet. Since they seldom receive carlot shipments, the railroad siding is not needed and this dock is used by truckers in making deliveries. In many cases, however, the display aisle dock serves for receiving, shipping, and sales. A one floor structure is usually sufficient for these small stores.

The roof of Type A stores is usually flat, or relatively so. A pitched roof with longitudinal monitor is sometimes used for light and to provide headroom for a mezzanine office. However, artificial light is needed in addition to that obtained through windows.

Stores of Type B or C might be considered for either small or large wholesalers. No railroad siding is provided adjacent to stores but a nearby team track might serve. Stores of this type might be used to advantage

^{1/} Loyd, C. F., Engineers Plan New Wholesale Produce Market for New York. Civil Engineering, 16(9) p. 392-394, Sept. 1946.

on markets with limited area for buildings. Type C should also prove satisfactory for retail stores at a wholesale market. Some escape other than through the front door should be provided in case of fire.

Railroad Sidings

Double tracks with the tops of the rails at the paved level adjacent to and parallel with wholesale stores are favored by many dealers and market masters. A surfaced area for trucks on the opposite side of the tracks from the stores is recommended. With this arrangement two cars side by side on parallel tracks can be unloaded at a particular store by working through the car next to the platform. Trucks can be loaded from the cars in the same manner. With rails at the paved level trucks can load from cars on either track and from the stores. Deliveries to buyers are made whenever practicable directly from cars as this procedure saves at least one handling operation.

At some markets it is convenient to lay tracks at an angle to the stores. Platforms 10 to 12 feet wide are built out at receiving floor level long enough for two or three cars on each side as shown in figure 5. Trackage is therefore available for at least one car for each merchant at all times.



Figure 5. - Railroad sidings at a Farmers' City Wholesale Market are at an angle to wholesale stores in order to provide trackage for at least one car per dealer.

However, the produce must be trucked much further than if the track is adjacent and parallel with the store. In addition, the extended docks are exposed to the weather unless enclosed. A roof and sidewalks for such docks are expensive as each dock is at least 100 feet long. The exact length depends, of course, upon the number of cars to be accommodated.

At some markets it is not convenient to bring in sidings. In such cases team tracks, unsheltered tracks where produce is loaded directly into trucks, are used. With this plan tracks usually are laid in pairs with a surface area between pairs for the trucks or wagons to load. In handling produce from team tracks dealers try to deliver to buyers as much as possible direct to save handling. Selling from cars also is common under these conditions.

Docks and Platforms

The wide range in sizes and shapes of packages of fruits and vegetables handled at a Farmers' Wholesale Market and mixed loads complicates the use of mechanical handling machinery. Since the nature of the product and the business are such as to necessitate much handling, it is important to have docks and platforms at a height that eliminates as much lifting as possible.

The dimensions of freight cars ^{2/} differ but the distance from the rail to the floor level in the car is usually between approximately 3'-7" and 3'-10". This distance may be as much as 4'-9" for refrigerator cars. Docks for rail shipments often are constructed with floor level 3'-3" above the top of the rails to permit refrigerator car doors to clear the floor when opened. Questions in reference to docks and platforms for rail shipments should be taken up with local railway officials.

Box cars range in overall length from approximately 42'-3" to 52'-3" and refrigerator cars from about 41'-8" to 52'-6".

The height of the floor of truck beds varies widely, depending in part upon the size and design of the truck, load, tire size, and tire inflation. Measurements of the distance from the ground to the floor level of 6 trucks picked at random at a market showed a variation from 32 to 50 inches. Many pick-up and delivery types are below this range and large trucks above it. The minimum loaded height of the truck bed floor of two popular makes of trucks of the 1-1/2 ton size is approximately 40 inches. Judging from these dimensions the proper dock height for the larger trucks is approximately the same as for railroad cars. Market officials questioned on dock height for trucks recommended heights ranging from 18 to 48 inches.

The slope of the site may make it difficult to get the front dock the same height as the one on the railroad side. For the same reason

^{2/} Marks, L. S., Mechanical Engineers' Hand book. 4th Edition, 2,274 pp. Illustrated. New York and London, 1941. See p. 492.

variations may occur in dock height from one end of the building to the other. In some sections of the country wholesale stores without railroad sidings have floors at sidewalk level as illustrated in figure 6.



Figure 6. - Floor at sidewalk level of a type of wholesale store that has display space on both sides.

Steps to elevated display platforms at wholesale buildings are usually placed at the ends. On long rows of stores additional flights may be needed along the side. Some markets have steps to the display aisle floor extending the full length of the building. Such steps are convenient and act somewhat as a bumper for trucks backing up to the platforms.

Platform floors and docks extending out from wholesale stores may be of wood or concrete. Those front and back of most stores are of concrete and are sheltered. Maintenance problems arise regardless of the material used as the platform floors and those in the stores are subject to hard usage. Repairs and resurfacing disrupt business operations. A cement-finish surface with hard aggregate laid over concrete slabs is often recommended.

BUILDING ARRANGEMENT

The wide spacing of buildings to accommodate farmers' trucks and even wider spacing for semi-trailers at wholesale stores spreads a farmers'

wholesale city market over a large plot of land. For this reason care should be exercised in arranging buildings and drives to hold the area to the minimum for efficient operations. Otherwise, the large investment in land coupled with expensive buildings and acres of paving may impose a high overhead expense to be passed on as high rent for stores and stalls.

Architects frequently construct scale models of proposed buildings and study their arrangement on a scale drawing of the site. Blocks of wood cut to scale, or even pieces of cardboard, are helpful in working out the best possible arrangement of the buildings on a map of the site in planning a new market or in altering an old one.

Buyers at Farmers' City Wholesale Markets are produce dealers, grocery men, hucksters, hotels, restaurants, institutions, and business enterprises which sell to or feed a sufficient number of people to warrant purchases in wholesale quantities. Individuals representing these agencies visit the market and buy from both farmers and dealers. For this reason it is desirable to have the farmers' sheds and wholesalers' stores so arranged that customers who come to the market and dealers located at the market can use both conveniently.

Farmers' sheds are sometimes placed between carlot wholesale stores and those of jobbers or commission merchants. Such an arrangement is not possible in all cases because of the shape and size of the site or some physical barrier. Figure 7 shows a market where the farmers' portion is on one side of a thoroughfare and the wholesale stores on the other.



Figure 7. - A large Farmers' City Wholesale Market with farmers' and dealers' portions separated by a thoroughfare. Farmers' sheds and open curb stalls in foreground.

Business is often more active at one spot under a shed than at other places. One of several sheds may also appear to be more popular than others. The reason is not always apparent and may be difficult to explain. Dealers, farmers, and market officials do not always agree why. Some say the reason farmers at certain stands do more business than others is because of high quality products; some claim lower price as the reason, and others think it is the appearance and disposition of the seller. Certainly some people are good salesmen and others are not. However, a farmer will need some special attraction for customers if his location is inconvenient for buyers. For these reasons every effort should be made in laying out a market to get sheds and stores conveniently arranged for both buyers and sellers.

MARKET ADJUNCTS

As a general rule, farmers' markets of the types studied restrict their operations to handling fresh fruits and vegetables. In other words, the market is merely a place where buyers and sellers meet with facilities for the seller to display his produce and transfer it to the dealer or consumer. There are, however, a number of businesses and services which increase the usefulness of a market. Among these are processing plants, cold storage plants, grading and packing sheds, restaurants, market supply stores, and offices.

In the line of processing, community canneries have worked well on a number of markets. Regular commercial canning plants have located near farmers' markets in other instances. One market visited had a poultry processing plant on the grounds, but it was rented to a private operator.

In the cold storage and freezing line, one market visited had made land available to a commercial firm to construct a processing and freezing plant for fruit and berries. Another had provided quarters for a locker plant. At several markets cold storage warehouses and freezing plants had located nearby. Except for refrigerated rooms in wholesale or retail stores none of the markets visited had freezing or cold storage facilities. Trends in connection with processing at or near markets doubtless will depend in large measure upon technological developments affecting the speed at which produce can be delivered to the consumer and improvements in preserving quality while in transit and storage.

In some localities it is customary to grade and pack produce in wholesale packages before it is delivered to a market. In other sections very little attention is paid to grades and standards. In the latter case wholesalers often sort, grade, and pack some produce after it has been purchased from the farmers. Farmers at a number of markets are interested in obtaining grading and packing service in a building either on the market or nearby.

There are differences of opinion among producers as to the value of grading. Some feel that total returns would be no greater from graded than from ungraded produce. Their contention is that, if graded, a certain percentage of a given commodity would have little or no sales value,

thereby offsetting returns from the higher grades. On the other hand, experienced buyers know pretty well what they can get for a load and many persons feel there is a tendency for the buyers to offer a price more in line with the lowest grade on a load than on the average. Also, with grades, there may be an incentive to market a high quality product. Grades and wholesale package units are important if the produce is to be shipped long distances.

A restaurant on the market or nearby is needed for employees and persons doing business on the market. Some market masters, especially of large markets, feel that there should be two restaurants. Clerical help and officials like a place where lunch may be had in comfort and leisure during a designated lunch period. Truckers and farmers hauling produce to the market are often in a hurry and prefer a lunch counter. For these reasons there appears justification for a lunch counter and a restaurant on or near large farmers' wholesale and retail markets.

Producers and merchants both need boxes, crates, hampers, baskets, flats, lugs, and other such supplies. Factories for manufacturing these items have located near the market at some points. At other markets commercial firms maintain establishments where second-hand containers are repaired or new ones assembled and sold.

Offices for agencies associated with market activities are needed at most large wholesale markets. Shipping point markets are particularly in need of a large number of offices for representatives of grocery firms, buyers, market news reporters, and railway officials. A second story over wholesalers' buildings or an administration building designed for extra offices are satisfactory arrangements in most cases.

Only a few of the markets visited had rooms or a dormitory for farmers or truckers to sleep. The question as to whether a market should provide such accommodations depends largely upon the type and location of the market and whether rooms are available nearby. Market masters questioned were generally opposed to having such quarters on the market grounds.

While toilets are not a market adjunct they perhaps should receive some comment in this connection. Hitch hikers often visit a market to catch rides across country with truckers. Slum dwellers and others visit city markets in search of fruits and vegetables to eat which have been thrown away. Such persons use public facilities and their habits are not always conducive to sanitation. Moreover, cases of vandalism are reported occasionally. For these reasons some city markets have attendants on duty at all times in toilet rooms. Others have installed or considered the installation of prison type fixtures.

VEHICLES AND TRAFFIC

Paving for market streets and grounds may be concrete or a bituminous material, depending in part upon the availability of road building materials in the locality and the site. If settling is likely to occur a flexible paving material is often used. The paving at some markets

visited had cracked, buckled, or was otherwise uneven. There was evidence in a number of cases of either inadequate drainage or obstructed drains. Questions in reference to drainage, grading, and paving should be taken up with State highway officials.

Persons who direct traffic at farmers' markets often feel that drivers stay in the proper traffic lanes only when directed or when physical barriers are provided to keep them in place. Proper location of the entrance or entrances and exits to and from a market may help keep the number of traffic directors needed to a minimum. One-way traffic between certain buildings also may be helpful under certain conditions. Some market masters feel that too much room as well as too little can cause traffic snarls.

Several of the farmers' wholesale markets visited have increased the size of farmers' stalls several times. As the use of horsedrawn vehicles for hauling farm produce decreased and motor trucks increased it was necessary to increase both the width and length of stalls. During the period of change, motor trucks also increased in size. The use of semi-trailers and truck-trailer combinations, principally for custom and commercial hauling, have further complicated traffic problems.

The legal limits as to maximum dimensions of motor trucks varies from State to State, as shown in table 1. It should be borne in mind that several States have rules and regulations other than those dealing with dimensions. Specific questions dealing with motor vehicles for hauling farm produce should be taken up with State highway officials in the locality involved. Moreover, not all vehicles crowd the limits shown. Since the cost of hauling with a given vehicle depends somewhat on the load, the trend is naturally towards the maximum limits, especially for bulky produce.

Of the several important motor vehicle dimensions of concern to markets, there is little variation in the legal maximum width in the several States. As shown in table 1, an 8-foot overall width is the maximum in nearly all States.

The maximum height of a vehicle, with or without a load, is 12.5 feet in the great majority of States. However, there are four reported to have no restrictions as to height, six with a maximum of over 12.5 feet, and three under this limit.

The maximum legal length of vehicles varies more in the several States than width and height. There is also a difference in legal length of semi-trailers and in truck and trailer combinations. The truck and trailer combination is not permitted in a few States and in others there are no restrictions as to the length of either of these two types.

Truck manufacturers, commercial haulers, and State and Federal officials have spent much time and effort in trying to get uniform maximum legal dimensions for motor vehicles in all States. While this objective has

Table 1. - Legal maximum width, height and length of motor vehicles by States, 1946 1/

States	Width in feet	Height in feet	Length in feet		
			Single unit	Semi- trailer	Truck and trailer
1. Alabama	8.0	12.5	35.0	45	Not permitted
2. Arizona	2/ 8.5	13.5	35.0	65	65
3. Arkansas	8.0	12.5	35.0	45	45
4. California	3/ 8.0	13.5	35.0	60	60
5. Colorado	8.0	12.5	35.0	60	60
6. Connecticut	4/ 8.5	12.5	40.0	40	Not permitted
7. Delaware	8.0	12.5	35.0	60	60
8. Dist. Columbia	5/ 8.0	12.5	35.0	50	50
9. Florida	8.0	12.5	35.0	20/ 45	20/ 45
10. Georgia	8.0	13.5	35.0	45	45
11. Idaho	8.0	14.0	35.0	45	65
12. Illinois	8.0	12.5	42.0	45	45
13. Indiana	8.0	12/ 12.0	36.0	21/ 40	21/ 40
14. Iowa	8.0	12.5	35.0	45	Not permitted
15. Kansas	6/ 8.0	12.5	35.0	45	45
16. Kentucky	8.0	12/ 11.5	14/ 26.5	21/ 33	Not permitted
17. Louisiana	8.0	12.5	14/ 33.0	45	45
18. Maine	8.0	12.5	15/ 40.0	21/ 40	21/ 40
19. Maryland	8.0	None	55.0	55	55
20. Massachusetts	6/ 8.0	None	14/ 33.0	21/ 40	None
21. Michigan	6/ 8.0	12.5	35.0	50	50
22. Minnesota	7/ 8.0	12.5	40.0	45	45
23. Mississippi	6/ 8.0	12.5	40.0	40	55
24. Missouri	8/ 8.0	13/ 12.5	16/ 35.0	22/ 45	22/ 45
25. Montana	8.0	13.5	35.0	60	60
26. Nebraska	9/ 8.0	12.5	35.0	42	45
27. Nevada	10/ 8.0	None	None	None	None
28. New Hampshire	6/ 8.0	None	35.0	45	45
29. New Jersey	9/ 8.0	12.5	35.0	45	50
30. New Mexico	8.0	12.5	35.0	60	60
31. New York	5/ 8.0	13.0	35.0	50	50
32. North Carolina	8.0	12.5	35.0	48	48
33. North Dakota	8.0	12.5	35.0	45	45
34. Ohio	11/ 8.0	12.5	17/ 35.0	45	60
35. Oklahoma	8.0	12.5	45.0	45	45

Table 1. - Legal maximum width, height and length of motor vehicles by States, 1946 1/ (continued)

States	Width in feet	Height in feet	Length in feet		
			Single unit	Semi- trailer	Truck and trailer
36. Oregon	7/ 8.0	12/ 11.0	35.0	50	23/ 50
37. Pennsylvania	8.0	12.5	33.0	45	50
38. Rhode Island	8.5	12.5	None	45	45
39. South Carolina	8.0	12.5	40.0	50	50
40. South Dakota	8.0	13.0	18/ 35.0	45	45
41. Tennessee	8.0	12.5	35.0	45	45
42. Texas	8.0	12.5	35.0	45	45
43. Utah	8.0	14.5	45.0	60	60
44. Vermont	8.0	12/ 12.0	50.0	50	50
45. Virginia	8.0	12.5	19/ 33.0	45	45
46. Washington	6/ 8.0	12.5	35.0	60	60
47. West Virginia	8.0	12.5	35.0	45	45
48. Wisconsin	6/ 8.0	12.5	35.0	45	45
49. Wyoming	11/ 8.0	12.5	40.0	50	60

1/ State Restrictions on Motor Vehicles Sizes and Weights, Highway Users Series No. II, 1946 Edition, 127 pp., National Highway Users Conference, National Press Building, Washington, D. C.

2/ 8' body width.

3/ 8'-4" permitted at wheels when pneumatic tires are substituted for others.

4/ 8' public service vehicles.

5/ 8'-10" permitted at wheels when pneumatic tires are substituted for others.

6/ 8'-6" permitted at wheels when pneumatic tires are substituted for others.

7/ 9' permitted urban buses.

8/ 9' permitted in cities of 75,000 population.

9/ No restrictions when pneumatic tires are substituted for others.

10/ Speed of vehicles over 8' restricted to 8 miles per hour.

11/ 8'-8" urban buses.

12/ 12'-6" special limit during the war.

13/ 15' permitted in cities of 75,000 population.

14/ 35' special limit during the war.

15/ 45' special limit during the war.

16/ 30' permitted in cities of 75,000 population.

17/ 48' urban buses.

18/ Buses under jurisdiction railroad commission.

19/ 35' urban buses.

20/ 50' limit for-hire.

21/ 45' special limit during the war.

22/ 85' permitted in cities of 75,000.

23/ 60' special limit during the war.

not been fully realized, a guide has been established by the American Association of Highway Officials. 3/

A maximum width of 8 feet is recommended for motor vehicles but the association suggests that State Highway Department and the Public Road Administration consider the desirability of 8.5 feet in planning the reconstruction of Federal Aid and State highways.

The recommendation for maximum height is 12.5 feet for all types of vehicles. A 35 foot maximum length is recommended for trucks; 50 feet for semi-trailers and 60 feet for a truck and trailer combination.

Judging from the legal limit as to width, height, and length of motor vehicles in the several States, and the recommendation of the American Association of State Highway Officials, the space allowed for farmers to park for displaying their produce should be at least 9 feet and perhaps 10 feet wide. It also appears that shed roofs must clear at least 12.5 feet in most States and as much as 14 feet in others. Even if the legal limit is 12.5 feet a height of 13 feet and perhaps 14 feet should be allowed, especially in regions where snow on the ground is likely to decrease clearance. At several markets visited considerable damage is done each year to the roofs of low sheds by trucks. An accident at one place is reported to have cost the market \$125 for roof repair.

The maximum legal length of 35 feet recommended for trucks includes two-axle buses. Farm trucks used for hauling produce to a market seldom approach this limit. Even long wheel base trucks rated at 1.5 ton capacity popular in many areas for hauling farm produce have an overall length less than 25 feet. A study 4/ recently made at a large city market shows that a majority of trucks observed were two-axle vehicles averaging about 21 feet in length. The report of the American Association of State Highway Officials, previously mentioned, shows that about 45 percent of single unit trucks encountered at pit scales in 37 States were under 20 feet and 50 percent between 20 and 25.9 feet in length.

There is, however, a tendency for trucks used by farmers to increase in length. At one market visited where stalls 24 feet in length were provided for a farmer's truck and his display, market officials felt that the stalls should be at least 26 feet long. Another market with parallel parking at curbs had a space of 25 feet for each vehicle but recommended 30 feet. For right angle parking and a 35 foot space for each farmer, curbs under adjacent sheds would need to be 100 feet apart for two 10-foot pick up lanes and one 10-foot drive through. While only a few trucks would need this much space at the present time those of maximum length would cause congestion unless the buildings are spaced accordingly.

3/ Policy Concerning Maximum Dimensions, Weights and Speed of Motor Vehicles to be Operated Over the Highways of the United States, American Association of State Highway Officials, Washington, D. C., 33 pp., adopted April 1, 1946.

4/ Isaak, Elmer B. New Wholesale Produce Market to Dissolve Truck Congestion. Civil Engineering 16(12): 524-26, December 1946.

Trucks are used almost entirely for hauling local produce to a market and for much of the long distance hauling. Practically all hauling from a market to local stores and nearby towns as well as to distant points is done by motor vehicles. This brings many trucks to a market in addition to those used by the farmer. A traffic survey ^{5/} made recently in connection with locating and designing a large city market shows that an average of almost 3 long distance trucks were required for the equivalent of a carload of produce, 4.64 trucks for each carload unloaded at team tracks, and 5.2 trucks to carry away the equivalent of each carload of produce from wholesalers' stores.

MARKETS STUDIED

Some illustrations of markets and facilities are shown for the several types as a basis for discussing good and bad features. It is hoped that the drawings in the appendix will serve to show what some of the markets are like over the country and that interested persons may pick up ideas helpful in planning or operating markets. As previously stated, the dimensions given on some of the sketches are approximations only.

Farm Women's Markets

Several Farm Women's Markets are illustrated in drawings for markets 3, 4, 11 and 19 and in figures 8 through 12 of the appendix. Market No. 3, figure 8, is located in a basement room of a public building in a city of about 47,000 population. It is open for business Saturday mornings and has approximately 50 sellers.

The room was not designed for use as a market but available accommodations such as parking space, running water, and toilets are well adapted to this use. The tables and chairs may be moved easily and the room used as a banquet hall or for some public gathering. One disadvantage is that the produce must be taken downstairs from vehicles outside. Also, since the women do not own the structure, they have no definite assurance as to length of tenure.

Market No. 4, figure 9, was under construction when visited. When completed it will probably be one of the largest women's markets in the country. The arrangement of offices and tables are suggestive only. As indicated on the drawings, the structure is to be used as a county agricultural building as well as for a farm women's market. The portion for offices is two stories while the market is one story in height. The structure is brick.

The market portion, designed for 100 sellers, replaces an old market in temporary quarters having 60 sellers. The old market had a volume of business ranging from \$39,606 to \$59,831 per year during the period 1941 to 1945, inclusive. It is open one day per week.

^{5/} See footnote 1/ on page 15.

The new market is located at the edge of town in a city of 60,000. The plot of land on which the building is located appeared ample for convenient parking for both sellers and buyers. The design is such as to provide good light and it should be easy to keep clean. The customers' aisles are of ample width. The management hopes that the number of sellers will be increased to 100 and that business will justify keeping open at least two days per week.

Market No. 11, figure 10, is a farm women's cooperative located on a highway near a city of 295,000 population. It has somewhat the appearance of a roadside stand and is open two days per week, Wednesday and Saturday. Sales were reported at approximately \$350 per week. There were 15 regular sellers at the time the market was visited. The building is frame construction. It is owned by the association but located on leased land. The market illustrated is one of two almost identical farm women's cooperative markets located near the same city.

Market No. 19, figures 11 and 12, a farm women's cooperative, is housed in a regular store building in a town of 11,000. More cooked or prepared foods are sold than customary at farm women's markets. Coffee and cocoa are prepared in the building. With these beverages and food which may be purchased from the women, one may have lunch. Tables are available for eating.

Food and produce to be sold from the counters are protected from customers by glass, as shown in figure 12. The counter for each seller is 3.5 feet long, somewhat shorter than customary. However, the glass ledge over the counter similar to the ones used around a steam table in a cafeteria and a ledge near the floor protruding into the buyers' aisle provide additional display area. There are cupboard-like shelves against the wall back of each seller. One scale is provided for each of two sellers.

Farmers' City Retail Markets

Market No. 5, figures 13 and 14, is the retail portion of a municipal retail and wholesale market. It illustrates the open shed type farmers' retail market and is located in the business section of a city of about 62,000 population. Both dealers and farmers have stands and the market is open all year. A wide variety of produce is handled as the market is located between a winter vegetable production area and several large cities. Dealers also handle out of season produce.

This market is convenient for shoppers but it is a concentration point for traffic in the business part of town. Driveways on opposite sides of the sheds which extend down the middle of a wide city street are approximately 40 feet wide. This width is sufficient for automobiles to park and to pass, but trucks delivering produce to the sheds occasionally block traffic.

The sheds are steel and have tile roofs. The counters, tables with a ledge in front, are heavy sheet metal and mounted on angle iron legs.

The tables are bolted to the posts supporting the shed. Some sellers use slanting display tops on the counters for increasing the display area. Each sellers' counter is 8 feet long and sellers may have more than one stand. Many of the sellers have canvas curtains which may be let down behind them from overhead for shade and for protection against wind, rain, and sun.

One advantage at this market is that buyers, especially those who drive to the market, are as likely to enter at one place as another. There also appears to be an incentive for customers to walk up and down the aisle as many of the stands have attractive displays.

Market No. 12, figures 15 and 16, a farmers' cooperative city retail market, is located in a town of approximately 88,000 population. It is some distance from the downtown shopping district and has ample parking space. The building was designed as a Farmers' City Retail Market and is representative of the square or rectangular type with counters in parallel rows. The light is good and entrances are provided around the building for their sellers to get their produce from trucks and automobiles to the stands.

Farmers' city retail market No. 13, figures 17-20, is municipally owned and is located in a city of about 79,000 population. The side elevation in figure 19 illustrates an example of the enclosed hall type. The designers were confronted with a number of problems because of terrain. The site slopes rather abruptly from the street paralleling the administration building.

As shown in figure 17, the plan provides parking for about 90 customers in addition to parking on streets. Each seller has a parking space next to his stall. One door is provided for two sellers and they park at right angles to the building under a roof extending outward from the sides of the buildings. Windows above the roof provide light for the interior. The structures are brick and builders' tile.

The counters in the market are pipe construction and have a neat appearance. They are substantial with a minimum of cracks to fill up with dirt and particles of the produce handled. The produce sold is principally fruits, vegetables, poultry, and eggs. The market is open for business all year. Wholesale transactions are made during a short period each morning on opening for the benefit of hucksters and grocery stores.

The main entrance to the market is from the street which runs parallel with the administration building. Customers naturally park in the first available space. Except during a busy period, space is usually available near the front of the market and there is a tendency for the customers to enter the first wing. For this reason stands in the first wing are preferred by farmers and dealers.

Market No. 15, figures 21-23, is one of three similar municipally-owned farmers' retail markets located in a city of approximately 165,000.

The market illustrated is located in a residential section of the city and the site would make an ideal neighborhood shopping center with stores on each side of the farmers' stands.

The pipe construction for counters, as shown in figure 23, has certain advantages but provisions for the use of tarpaulins by each farmer for protecting his produce and the buyers' aisle from sun and rain have not worked so well. The tarpaulins are varied sizes and not all farmers provide them. The pipe framework over the buyers' aisle is flat on top. Water from rains tends to sag the tarpaulins and the water thus collected may all spill at one time on a customer. A ridge pole down the center and tarpaulins tailored to fit would be more satisfactory. Such a design might be worth considering for farmers' sheds at a market open only during the summer months. There is some question, however, as to the relative cost for shelter between canvas and some permanent structure. The initial cost of tarpaulins together with the labor costs for putting them on and taking them down each season might be as much or more than for a shed of conventional design.

Farmers' City Wholesale Markets

Market No. 2, figures 24-26, is located in a city of 58,000. It is State owned and operated. A large part of the produce handled is consumed locally. The volume of business done annually by farmers and dealers is estimated at about \$2,000,000. However, not all of the produce handled is grown locally.

The plot plan figure 24 as shown is diagrammatic and the dimensions are approximate. The market covers approximately one city block. The wholesalers' buildings are old stores adapted for market use with floors at sidewalk level. The one which houses the cannery was used as an arsenal during the civil war. The farmers' shed, figure 25, is of conventional design.

The equipment in the community cannery at market No. 2, figure 26, is conveniently arranged. Fruits and vegetables are prepared by their owners and put in cans. Subsequent operations are performed by regular employees of the cannery.

The wholesale market illustrated as No. 9, figures 27-29, a farmers' cooperative, is located in a city of about 172,000 people. One of the two similar sheds is used by wholesalers and the other by producers. The wholesale shed is enclosed and partitioned to suit tenants. A drive-way through the center is used for trucking produce to and from the dealers.

The shed used by the farmers, figure 29, is open with the floor at ground level. Loads of produce are backed under the shed between posts which are spaced 10 feet apart on centers. Buyers use a center drive-way through the shed for picking up loads.

The area around market No. 9 is used effectively by sellers and buyers for getting in and out and for parking. Few commercial haulers with large trucks were observed but space is needed for them. The business is reported to have outgrown present facilities and plans are being made to expand.

Market No. 10, figures 30 and 31, was under construction when visited. One farmers' shed was completed and in use and a second one was under construction. Complete or tentative plans for the other structures illustrated had been prepared for use as the market develops.

This market is located in a city of 295,000 and has possibilities of developing into not only a large farmers' city wholesale market but a redistribution center. The market was laid out after a careful study of other markets over the country and represents an excellent example of planning.

Farmers back into the shed at right angles to raised display platforms. Sidewalks are provided on the inside of the display platforms on which buyers may walk the full length of the shed. Traffic through the shed between the sidewalks for buyers is one way with parking at an angle to the curb on both sides. This driveway, 45 feet wide, is sufficient for passing one way between the two lines of parked vehicles of the size and type generally used by produce stores in that city.

Merchants who buy a full load from a farmer may direct him to their stores at other points in the city for unloading. Those who buy only a few packages from each of several growers, the customary procedure, transfer the produce from the display platform or farmers' trucks to their own vehicles at the market.

The sheds at market No. 10 appear large and widely spaced but both the farmers and buyers are sheltered. The distance between curbs under adjacent sheds is shown as 100 feet which is somewhat greater than at most markets visited. This spacing is not excessive, however, in view of long trucks which may use the market.

The wholesale buildings are planned to face each other and are shown 130 feet apart. The wide spacing is intended to take care of semi-trailers and truck trailer combinations. This spacing is sufficient for 60-foot vehicles to park at right angles in front of each building and allow one-way traffic between.

The carlot wholesalers' building is shown with double railroad tracks at paved level. With this arrangement cars may be unloaded directly into stores or trucks.

Market No. 14, figures 32-34, is municipally owned and located in a city of 79,000. It was open for business about 1896. A 7-1/2 foot space was provided at the time for each wagon to park at right angles to open curbs and under sheds. Many changes and additions have been made since that time.

The market is one of the few visited which had a fence around it. Only one street borders the market. The fence is of the factory type and there is a common entrance and exit. Any one entering or leaving the market must pass in plain view of the office.

The administration building, as indicated in figure 33, houses the market office, a restaurant, and public toilets. The city scale also is operated from the market office.

The market illustrated in market No. 17, figures 35-39, is located in a semi-industrial area of a city of 400,000. It represents a good example of arrangement of buildings for effective use of a relatively small area. Sheds and stalls are conveniently arranged for customers to buy from both farmers and dealers but the sheds are too close together for long trucks.

The site of market No. 17 is rolling and many problems as to dock height for buildings confronted the designers. The floor level of the display aisle of the carlot wholesale building averages perhaps not more than 12 inches above the street level while the railroad dock on the opposite side is about 4 feet above the ground. It was necessary to change the floor level between a number of adjacent stores as both rows run up and down hill.

Market No. 17 is one of the few city wholesale markets visited which has retail produce stores. The first floor of the administration building, figure 36, is used almost exclusively for retailing. Farmers also sell at retail on Saturday.

The retail stores face a sidewalk around the administration building but have entrances from a hall down the center of the building. While most of the sales appear to be made from the front, customers can and do enter from the hall. These stores are small for two entrances and much needed wall space is taken up by the hall entrance. Some persons familiar with the operation of retail produce stores on wholesale markets feel that the stores should be wider, not so deep, and have only a front entrance.

The carlot wholesale building at market No. 17, figure 38, has a basement and mezzanine offices. Several wholesalers, especially those having more than one bay, have small offices on the main floor near the entrance from the display aisle in addition to the mezzanine office.

Some of the commission merchants' stores at market No. 17 have two stories and a basement, and others have only one floor. The one floor design shown in figure 39 appeared ample.

The shed and administration building at market No. 20, figures 40-42, were designed as a part of a municipal wholesale market for a city of 490,000 people. Unfortunately stores for wholesalers have not been constructed. The market has an additional handicap in that wholesale produce firms have their stores and warehouses in another part of town.

The buildings at the market are exceptionally well constructed and are arranged for efficient operations except that the sheds are rather close together. The administration building, figure 41, is larger than it need be under existing conditions. There is also more than ample shed room.

The sheds, figure 42, are steel and have a center aisle for display and for buyers to walk. The raised floor under the sheds is 24 feet wide and farmers park at right angles to the curbs. Traffic lanes are provided between sheds for buyers to pick up loads and pass.

Market No. 24, figures 43 and 44, is one of several municipal produce terminals in a city of 7,455,000. The sheds, figure 44, are shown because they represent a distinct type. These flat top sheds of the railroad station type are used at markets but the arrangement for stalls at market No. 24 is somewhat unique.

As illustrated by the drawings, the farmers park under the shed along a curb to a narrow platform. The platform is used for empty containers and supplies which the farmer may wish to lay aside temporarily. The display is made at the side of the truck away from the shed. The sheds are far enough apart so a farmer may park and make his display and buyers load alongside with a lane between for passing, wide enough for one truck.

The space marked off for sellers to park is 25 feet along the curb. Market officials feel that this space should be 30 feet and that the sheds should be spaced further apart. A distance of 45 feet is provided between curbs under adjacent sheds. At a new market under construction in the same city, the distance between curbs under adjacent sheds of this type is 58 feet.

Information obtained at market No. 24 indicates that occasional traffic snarls between sheds are caused largely by vehicles deliberately crossing traffic lanes to pick up packages on the opposite side. One drive-out lane with traffic in opposite directions causes delays at times. The 58-foot spacing would be sufficient for two pick-up and two drive-out lanes in addition to the farmers' parking and display area.

Farmers' Wholesale Redistribution Markets

Market Nos. 1, 6, 18 and 21 are city wholesale markets which ship either by truck or rail a large percentage of the produce received to nearby towns or to distant points. However, probably only one or two in the group illustrated ship more than 50 percent of the produce received outside the city where they are located.

Market No. 1, figures 45-51, is reported to have been designed as a regular city wholesale market to serve farmers in the area and a city of 300,000. While it continues to perform this function, in addition, it attracted commercial haulers and wholesalers who supply buyers in other cities. For these reasons it has expanded beyond the capacity for which it was designed. The business is estimated at about \$20,000,000 per year.

for both farmers and dealers. The market is open 24 hours per day throughout the year and its volume ranks among the highest in the country.

Practically all the buildings are too close together especially for the large number of semi-trailers and truck trailer combinations using the market. This is especially true of the wholesale stores. An expansion program is contemplated for alterations and additions to eliminate congestion and to provide additional facilities.

The sheds, figure 47, are 100 feet wide and of steel construction. They are of the drive-through type with elevated display platforms. The roof clearance is ample but the sheds are rather close together, especially for long trucks.

Market No. 6, figure 52, is privately owned and located in a city of 173,000. The plot plan shown is diagrammatic and the dimensions given are approximate.

The buildings are largely of frame construction but the market has many desirable features. The space between the administration building and the center shed is well adapted for parking. The parking and shipping sheds serve well as the market is near a winter vegetable production area. It is also one of the few visited with sleeping accommodations for truckers.

The wholesale redistribution market No. 18, figures 53 and 54, is owned and operated by a city with a population of about 37,000. It is reported that it was designed originally as a Farmers' City Wholesale Market but has developed into a redistribution center used largely by truckers and dealers. It is well located geographically for this type of business and handles a large volume of produce.

The floor of the market building is divided into areas approximately 10 by 20 feet which are rented to dealers. They may have one or more of these areas subject to rules and regulations prescribed by the market. Produce purchased from a farmer or trucker by a dealer is unloaded on his plot or directly into another carrier's vehicle for delivery at some distant point. Produce is handled almost entirely by trucks. The market has no railroad siding but there is a freight yard nearby.

Market No. 21, figures 55-58, serves a city of 322,000. It is a redistribution center, but more than 50 percent of the produce handled is consumed locally. The market was constructed by a railroad. The farmers' portion, a strip of land extending through the center of the site on which the sheds are located, has been purchased by a producer stock company. The farmers operate their portion and the railroad the remainder.

The buildings are similar to those on other wholesale markets visited but the arrangement of farmers' stalls under the sheds for display is different. The arrangement is shown diagrammatically in figure 57.

The farmers drive under the sheds from the sides and park front bumper to bumper down the center line with the rear of the trucks just back of the eaves. The center shed is wide enough to accommodate two lines of trucks and the outside sheds one line each.

An area 10 feet wide and 24 feet long is marked off for each seller under the sheds for parking and display. The sellers' display borders a walk for buyers extending the full length of the shed. The display and the walk are under shelter but close to the eaves.

Two unsheltered one-way drives parallel each walk. The one adjacent to the walk is used for loading produce purchased from farmers and the other for driving out with a load. Driveways are provided on both sides of the wide shed and on one side of the narrow ones. The sheds are spaced far enough apart to provide a parking lane between the driveways. This arrangement is excellent for transferring produce from seller to buyer but it provides less protection for the display against rain and sun than some other markets.

The area for farmers' stalls and display is shorter at market No. 21 than customary, and the walk for buyers is narrow compared with some. Market officials feel that the length of the spaces provided for farmers to park and display produce should be increased from 24 to at least 26 feet. Some markets provide 24 feet for parking and the equivalent of 12 feet for display and walk for each seller.

Accommodations for receiving and shipping by rail are good at market No. 21. Electric power is available for motor driven ice crushers for icing cars of produce and a building is provided for truckers. The carlot wholesale stores have basements and some are two stories with offices upstairs. The distance between the wholesale stores and the farmers' sheds is reported insufficient in view of the long trucks used by some commercial haulers. A box factory is located nearby and several wholesale grocery firms have warehouses near the market.

Farmers' Wholesale Regional Markets

The general plan and facilities for Farmers' Wholesale Regional Markets differ little from those of Farmers' City Wholesale Markets. The name implies that the market is intended to serve a particular region. Two regional markets are illustrated in drawings for markets Nos. 22 and 23.

Market No. 22, figures 59-61, is located in a city of 576,000 and was constructed by a railroad, but the farmers' portion is rented and operated by a farmers' cooperative. The location of the buildings and some dimensions are approximations. The sheds, figure 61, are the center aisle type for display and for buyers to walk through. The roof is curved and supported by rolled channel irons mounted on steel posts. The design is simple and the cost of erecting such sheds should be low. Overhead doors are installed on the windward side and the ends are enclosed for protection against cold winds, rain, and snow.

Market No. 23, figures 62-67, has many features not generally found at wholesale markets. One farmers' shed, figure 64, is enclosed for winter use, and another handles the sale of live poultry. There is also a poultry dressing plant, figure 66. The wholesalers' buildings, figure 65, have the saw tooth type of docks for unloading cars. The administration building, figure 63, is also more elaborate than usual. These structures are illustrated in the drawings. The market is owned and operated by a State agency.

Farmers' Wholesale Shipping Point Markets

Market No. 7, figures 68-75, is in a winter fruit and vegetable production area and is characterized by widely spaced buildings and market adjuncts including a plant for freezing fruits and berries and vegetables, figure 74, and a livestock auction, figure 75. The location of the buildings on the plot plan and many dimensions are approximations.

The majority of the buildings are frame. The packing and sharp freeze plants are owned and operated by private firms and the livestock auction facilities are leased. The partitions across the proposed wholesalers' building shown on the plot plan are fire walls. A frame building somewhat similar to the one proposed was destroyed by fire.

The floor plan of the farmers' shed, figure 69, illustrates the position of platforms for the auctioneer and the buyers during the berry season. When the berry season is over, which precedes the season for other commodities, the auctioneers' platforms are removed but the buyers continue to operate at or near the same spot. Farmers approaching the shed are directed into traffic lanes. As they move forward in these lanes under the shed buyers inspect their produce and make offers. When an offer is accepted the farmer is usually directed to deliver the load to the merchant's place of business on the market or elsewhere in town for shipping or processing, as the case may be. The market is located at the edge of a town of 7,500 population.

The shed on market No. 8, figures 76-79, is one of the largest structures of its kind in the country. It is open, and is approximately 100 feet wide and 1,000 feet long. It is of wood and the roof truss spans the buildings. The floor is elevated 4 feet for receiving and shipping farm produce. The market is located near a town of 4,400 in a winter vegetable production area. It is State owned and operated.

Three railroads serve the market and two of them have team tracks nearby. The other road has freight yards about one mile from the market. A majority of the produce is shipped by rail.

Large growers and brokers rent space on the floor of the shed and solicit business. The market merely provides a place for these transactions, sheltered space for produce awaiting shipment, and offices for railroad officials, commercial firms, and buyers. The buyers on the market make arrangements for hauling their produce from the shed to railroad cars and for shipping.

Market No. 16, figures 80-83, is between two adjacent towns with a total population of 25,600 and about 100 miles from a city of 3,397,000. Most of the produce is shipped by truck.

When a farmer approaches the market he is directed into a traffic lane. As he moves forward down this unsheltered lane buyers inspect his produce. When an offer is accepted he is directed to the buyers' shed space and his produce is unloaded on the floor of the shed or into another vehicle across the shed. The sheds merely provide a sheltered area for transferring loads. They are frame construction.

Floor space in the sheds parallel with the sellers' aisles is rented by the season to buyers. Space under others is rented by the day to out of town buyers who come to the market from distant points for one or more loads of produce.

Most of the fruits and vegetables sold on the market are grown locally. However, occasionally a trucker from some distant point brings in a load. The retail market is operated largely by dealers and hucksters.

Traffic lanes for selling are 8 feet wide and those for driving out are 10 feet wide. Long wheelbase trucks often have difficulty in getting into drive-out lanes from the selling lanes. Market officials feel that these drive-out lanes should be at least 12 feet wide.

Traffic guides, concrete walls about 12 inches high, on opposite sides of the selling area are 40 feet from sheds. The distance is sufficient for farmers' trucks to park at right angles to the shed and for one way traffic to pass, but insufficient for use by an occasional commercial hauler with a semi-trailer. Also, the wholesalers' sheds which are 14 feet wide should be perhaps 20 feet or more in width for present operating conditions. Consideration is being given to changes and alterations to eliminate some of these difficulties.

Sales made by growers at market No. 16 have ranged between approximately \$3,000,000 and \$9,000,000 annually during the period 1931 to 1946, inclusive. While there are markets in the country with a larger volume of sales there are few if any with a larger grower volume. This market is open only during the local production season.

APPENDIX

Figure No.

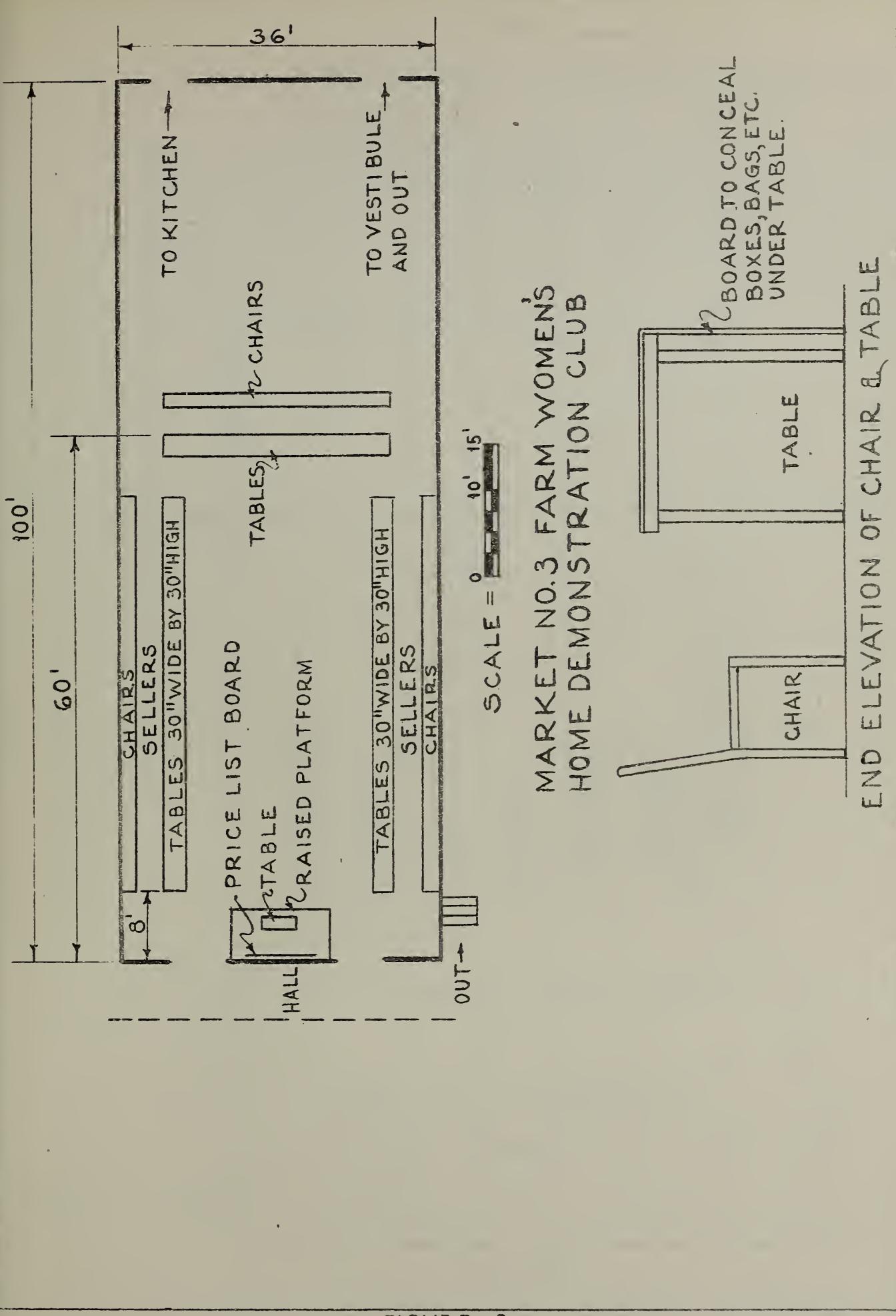
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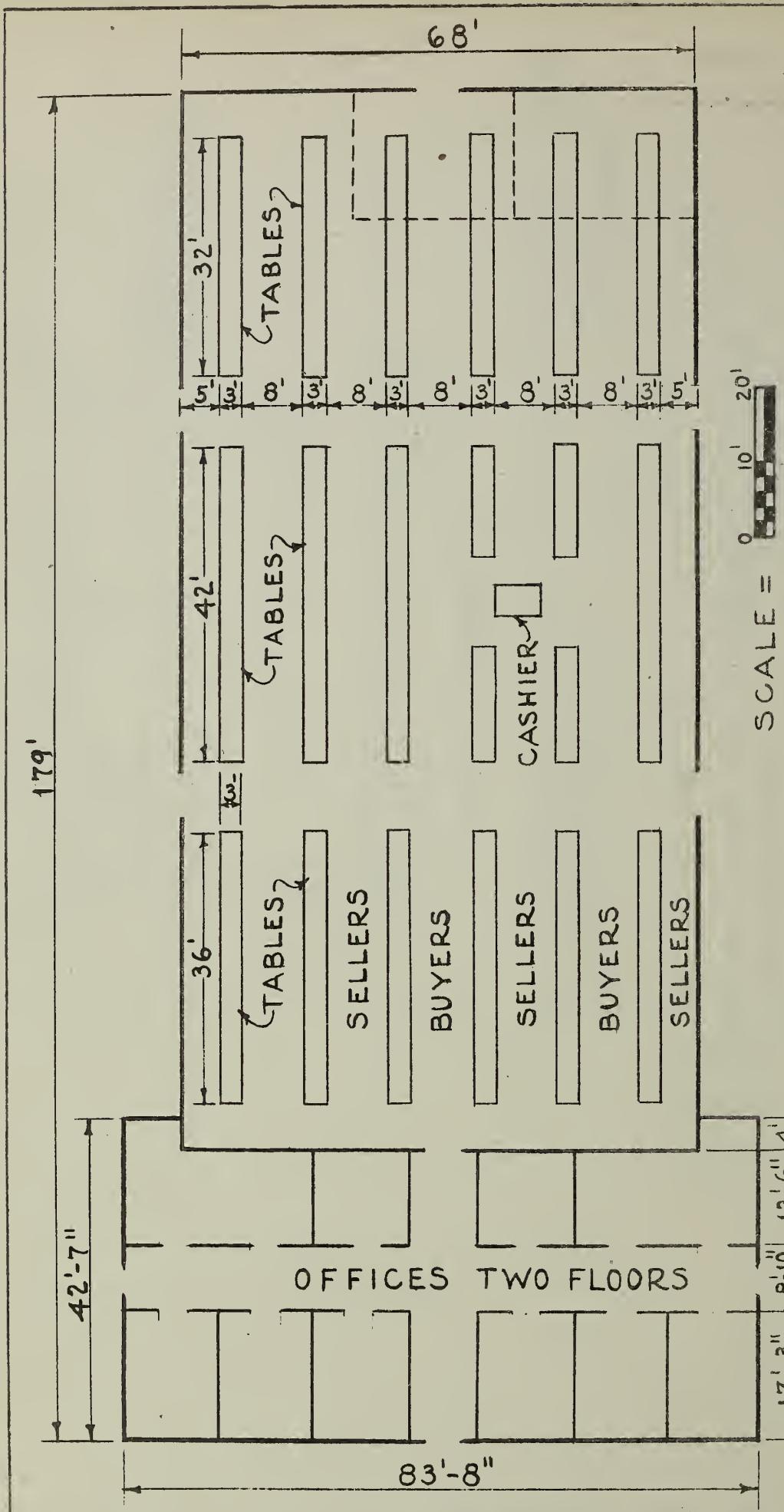
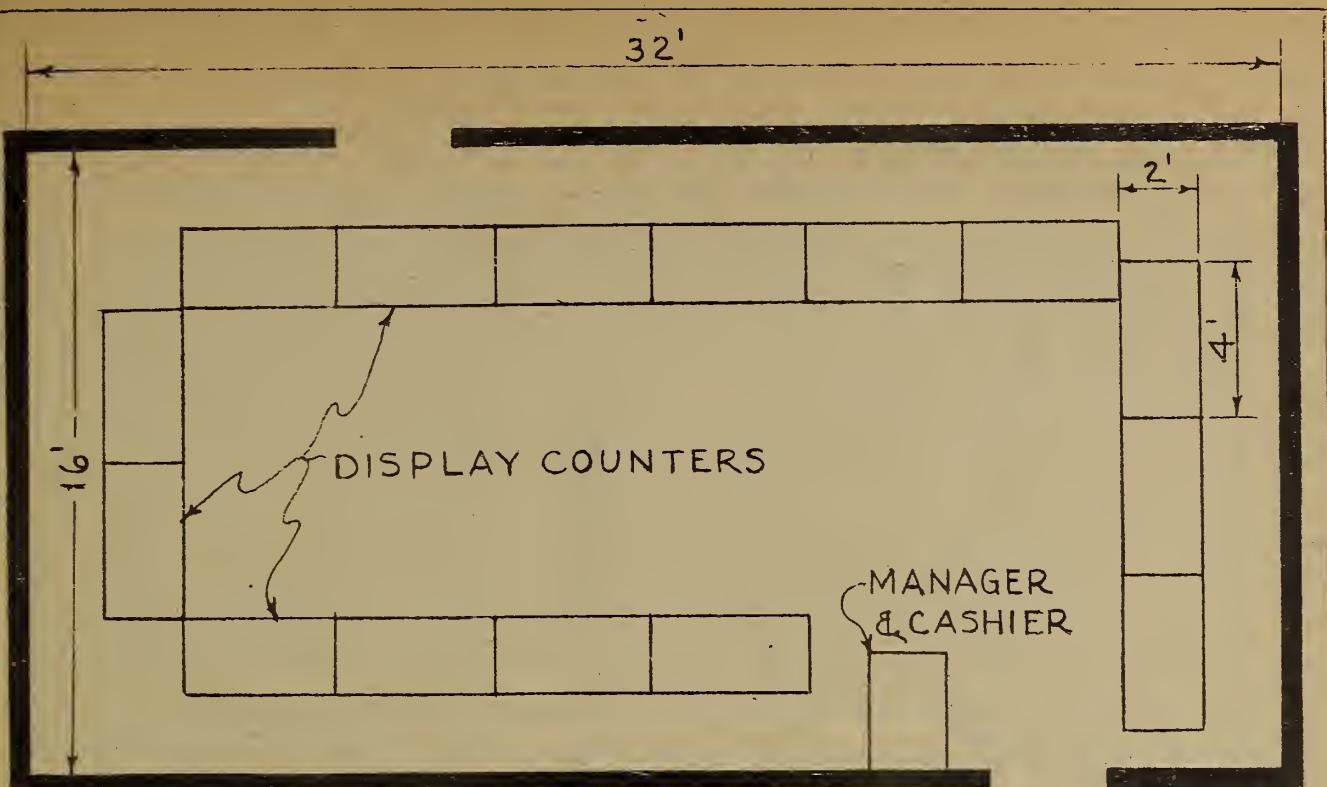
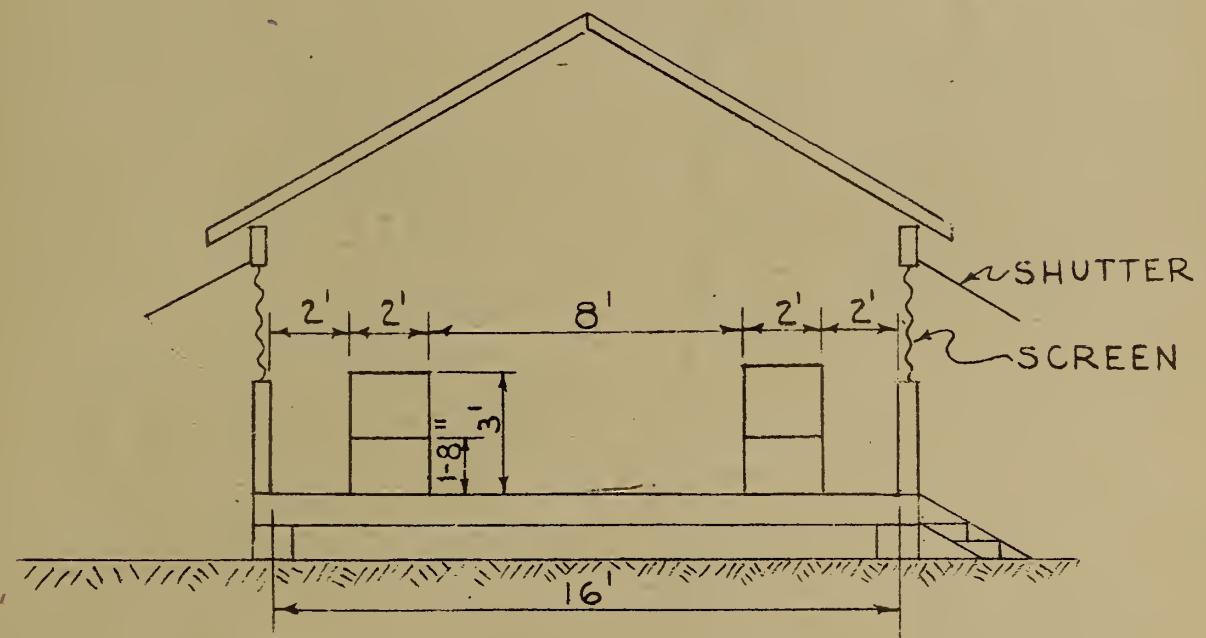


FIGURE 9



PLAN



SECTIONAL END ELEVATION

SCALE = 0 5'

FARM WOMEN'S COOPERATIVE, ROADSIDE LOCATION.
MARKET NO.11

FIGURE 10

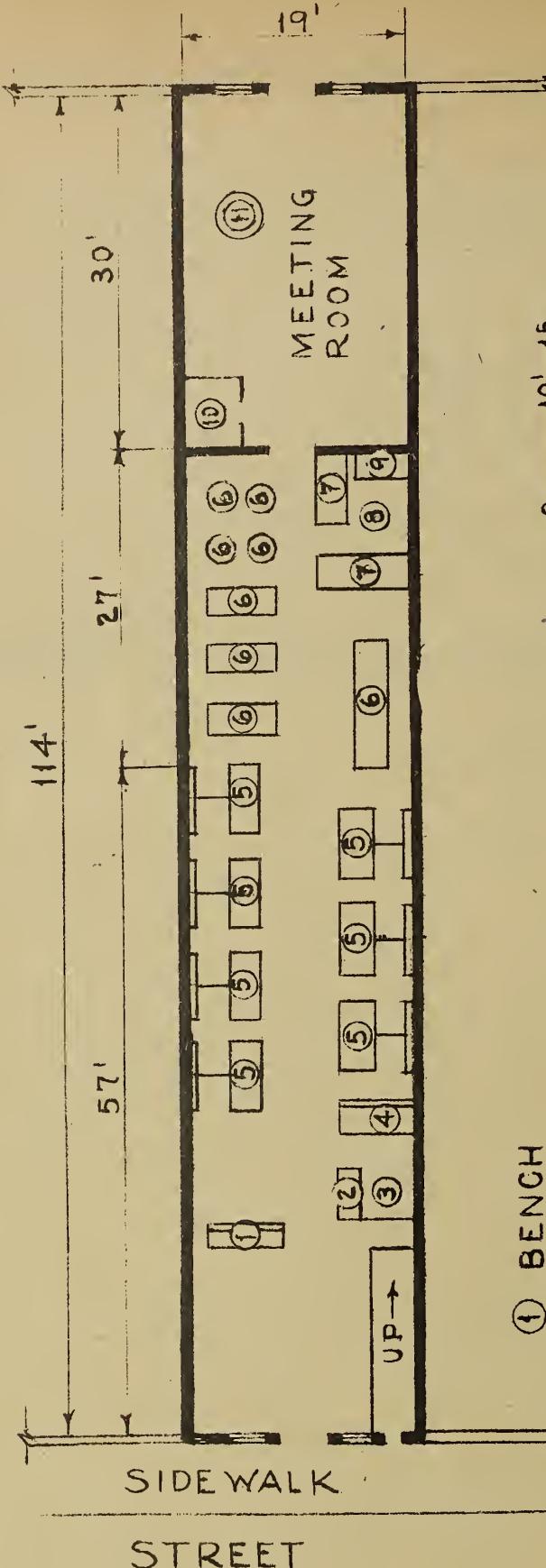
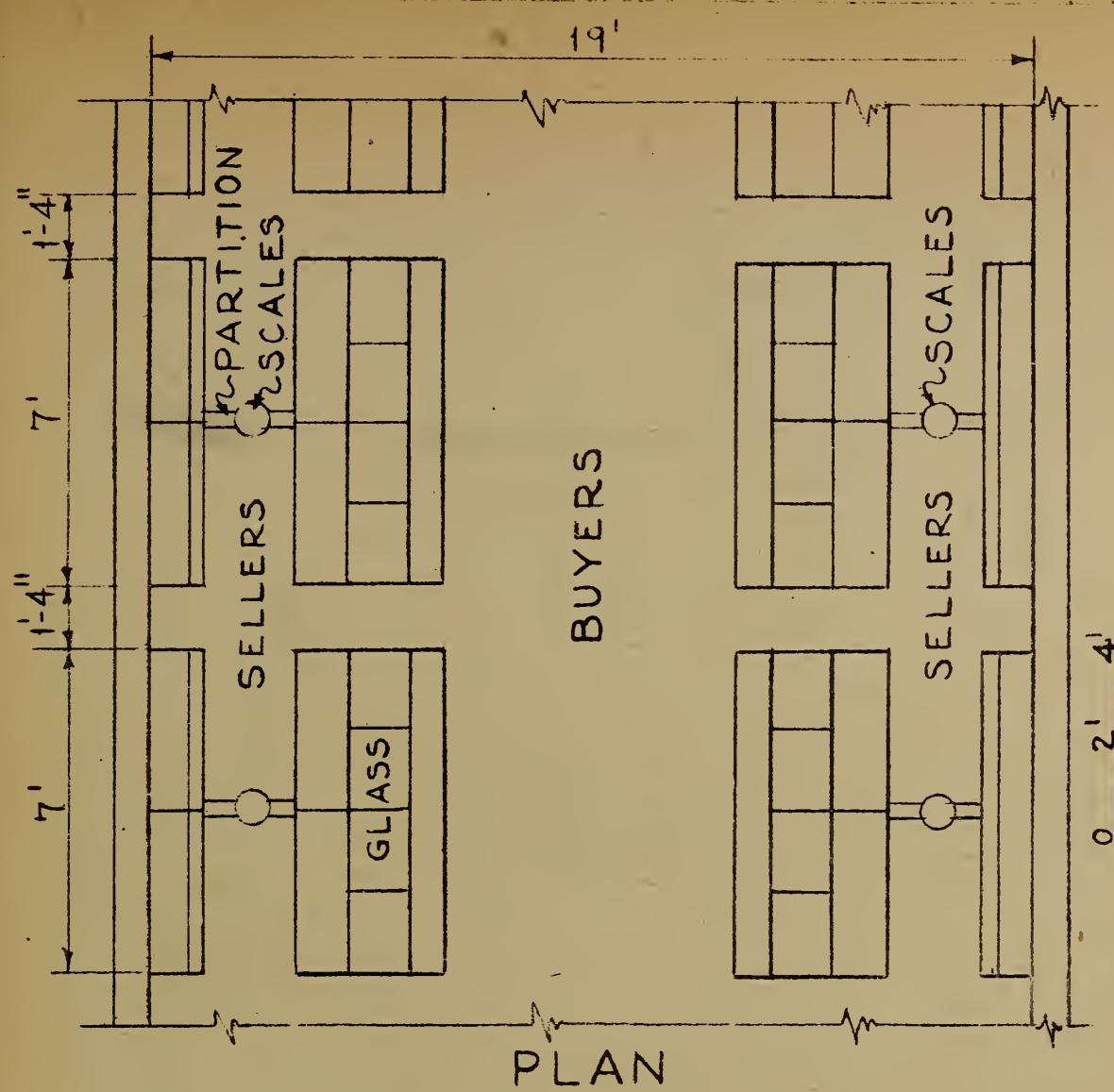


FIGURE 11



DETAIL OF SALES COUNTER - FARM WOMEN'S COOPERATIVE, MARKET NO. 19

SCALE = 0' 2' 4'

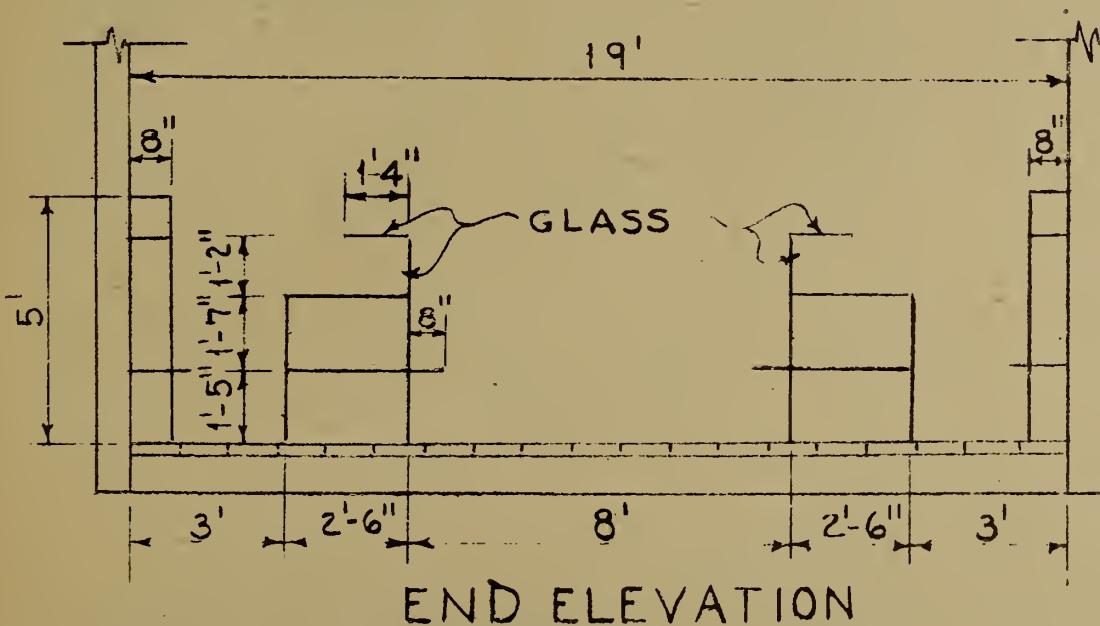
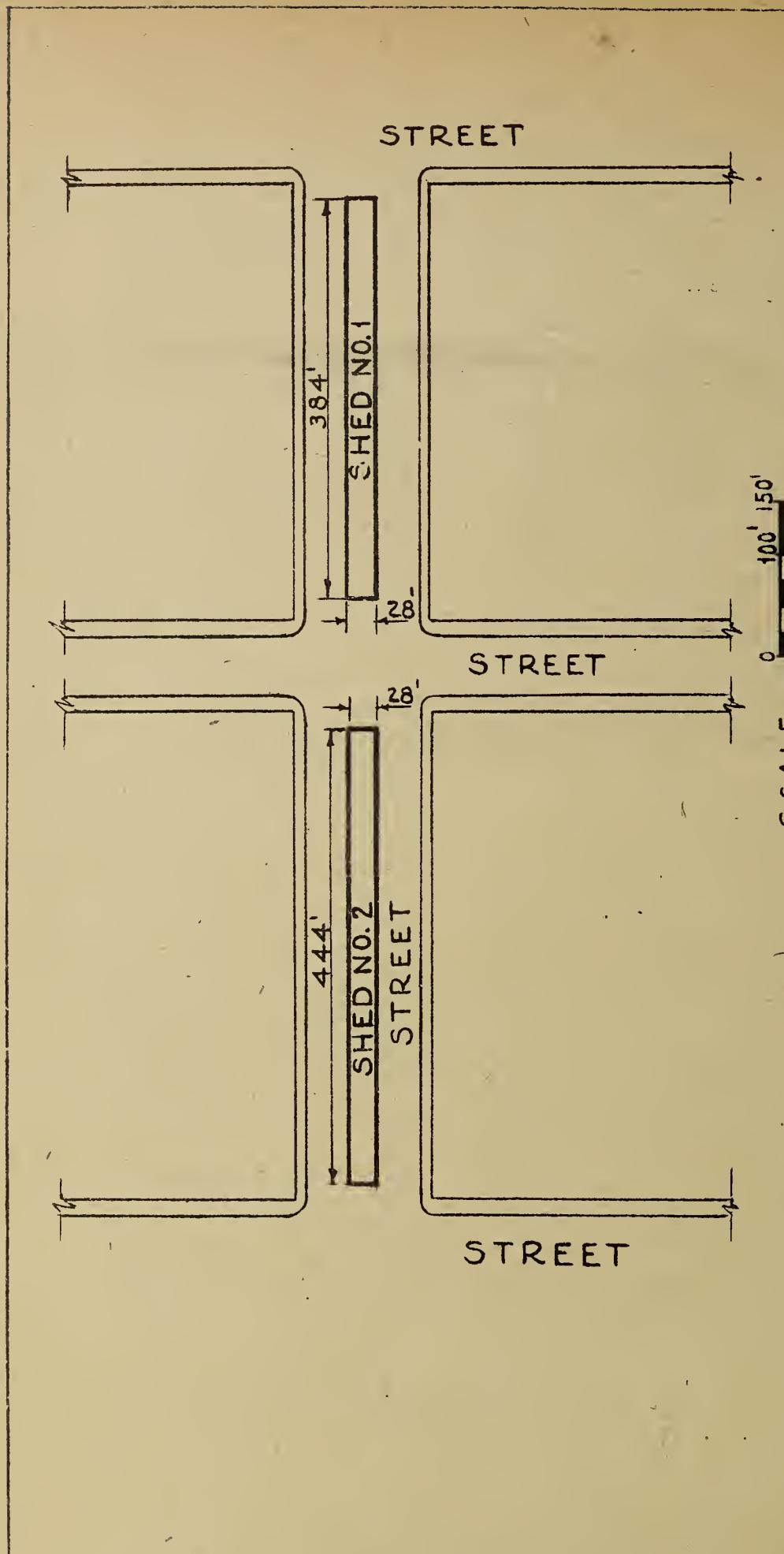
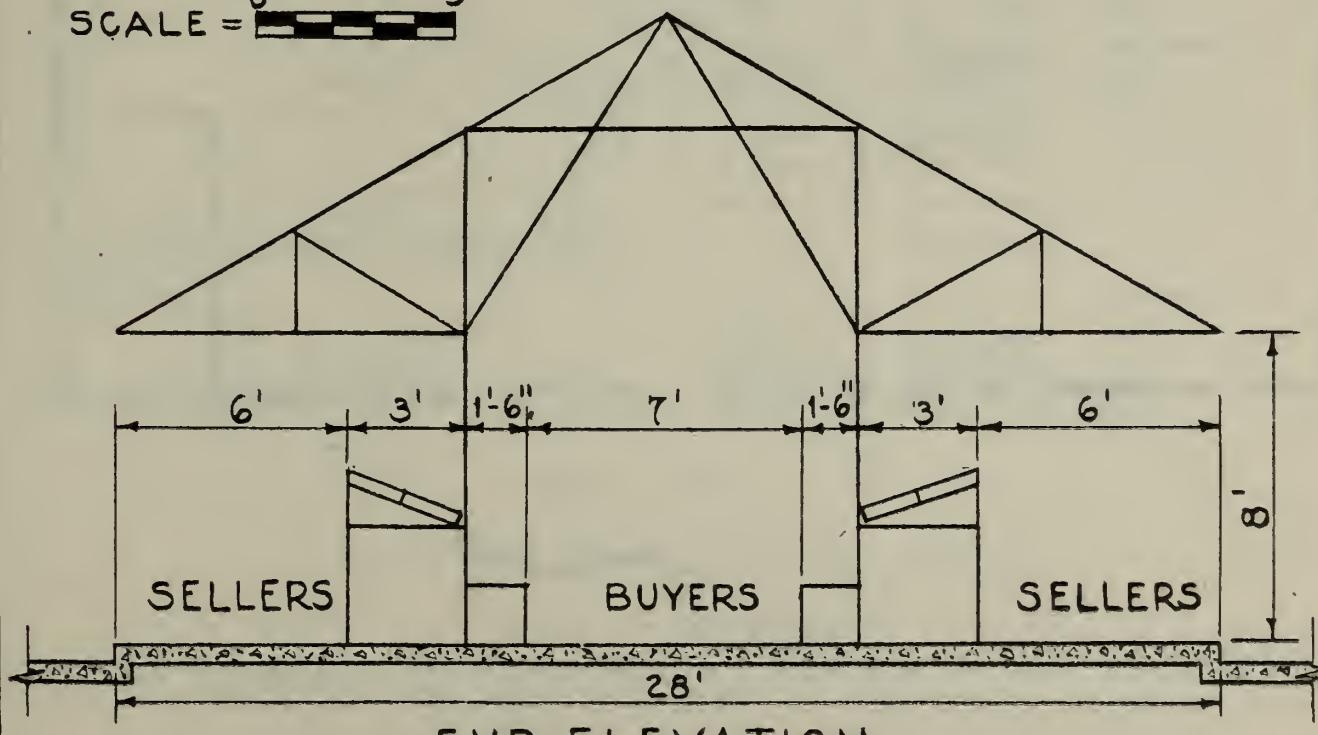
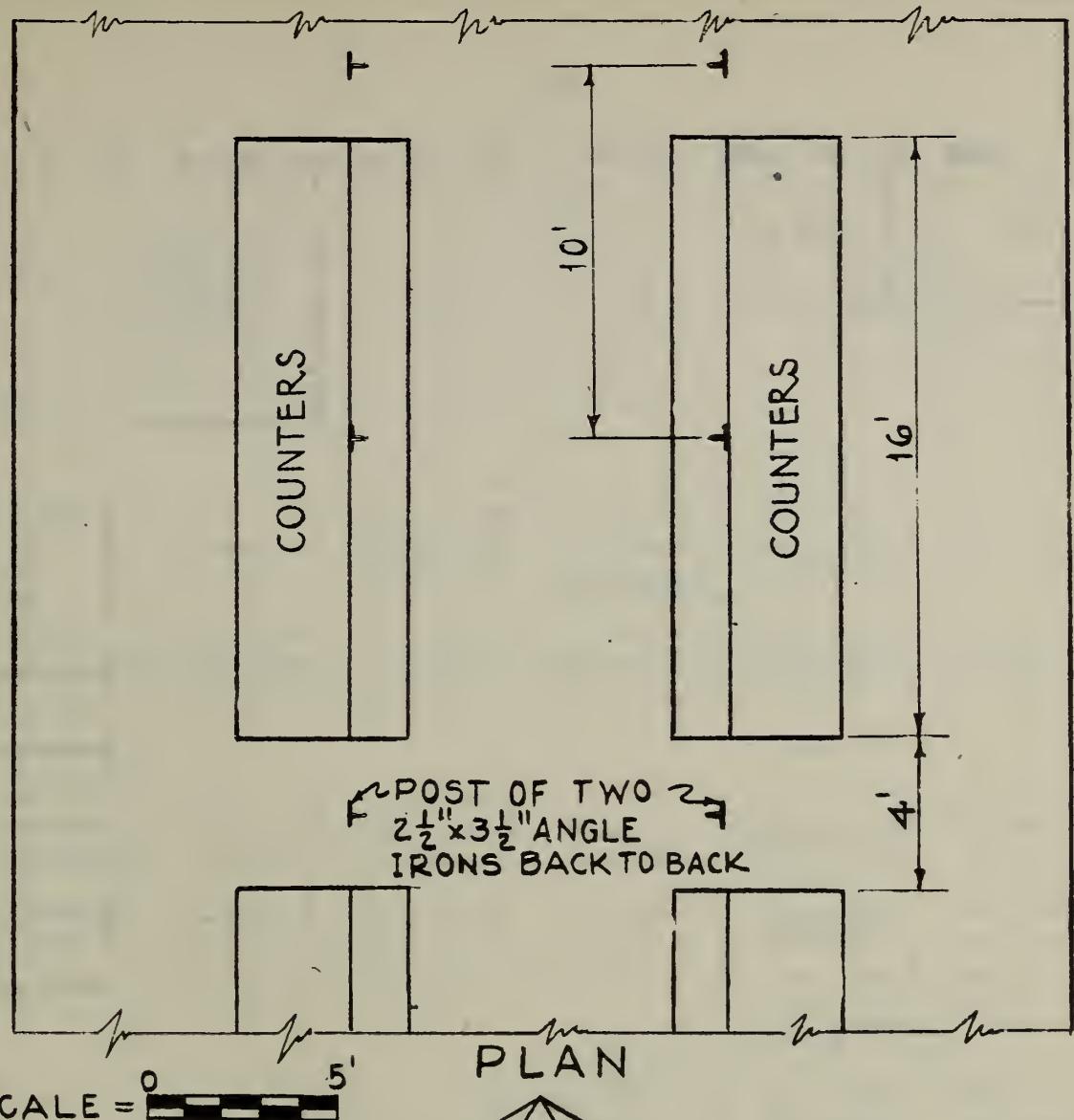


FIGURE 12



MARKET NO. 5
FARMERS' CITY RETAIL, MUNICIPAL.

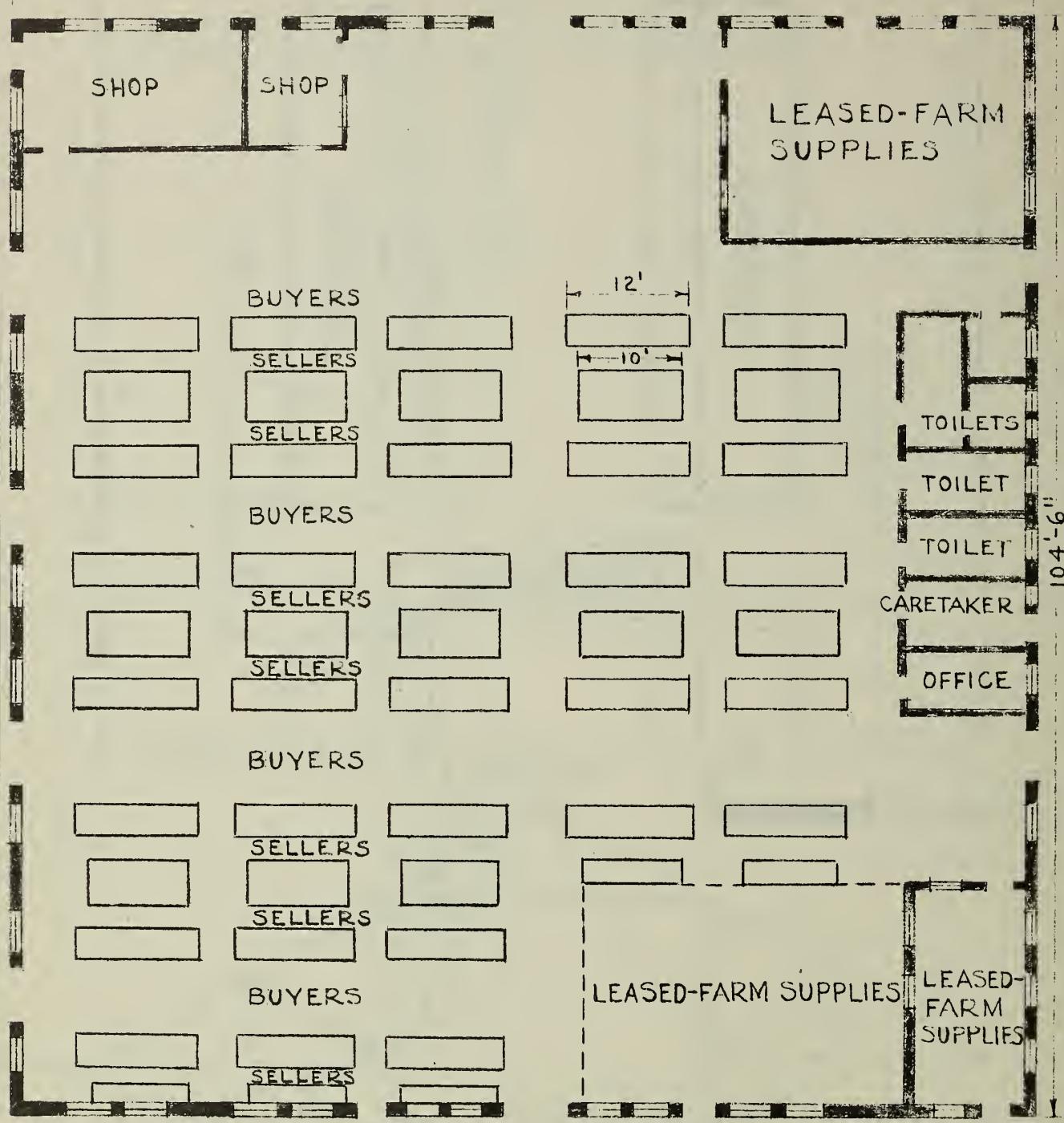
FIGURE 13



END ELEVATION
 MARKET NO. 5, SHEDS NOS. 1 & 2

FIGURE 14

98'

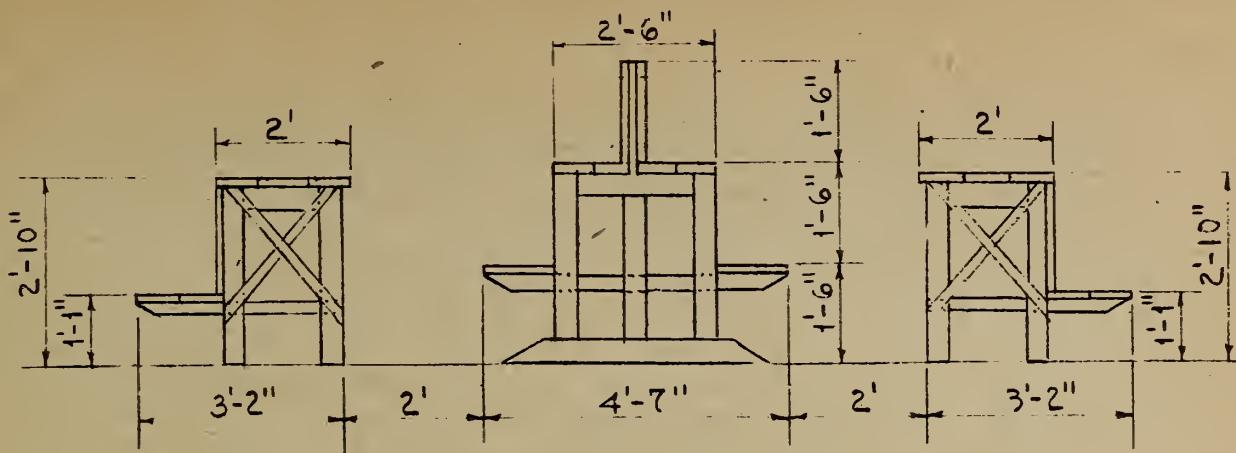


FLOOR PLAN

SCALE = 0' 5' 15'

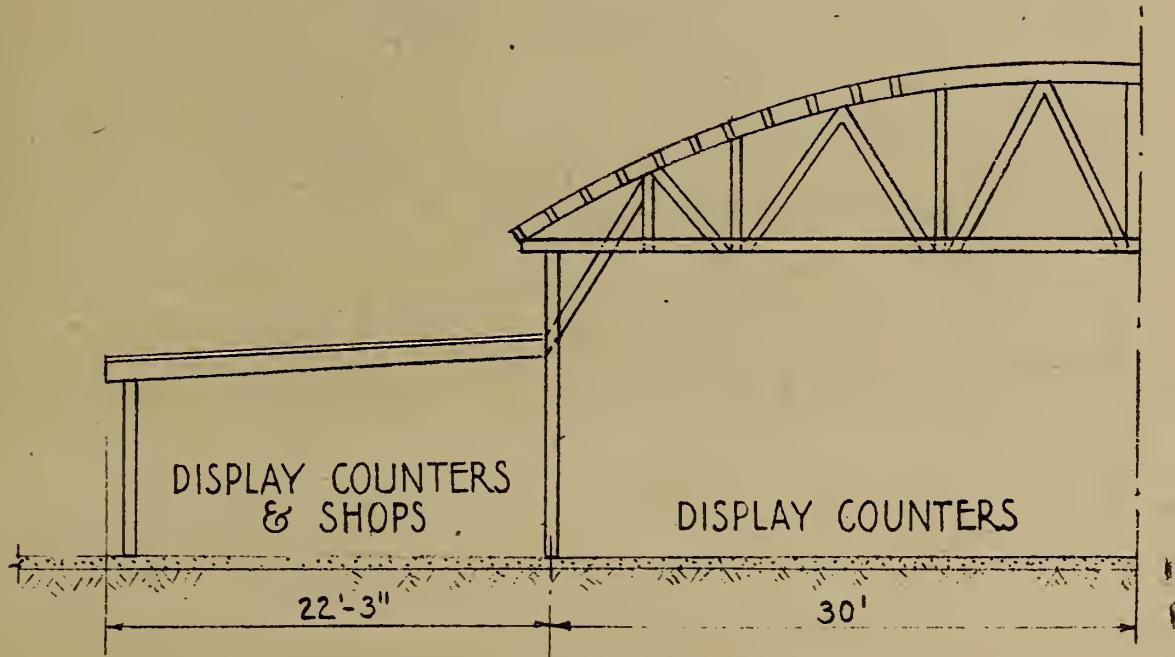
FARMERS' CITY RETAIL, COOPERATIVE-MARKET NO.12

FIGURE 15



END ELEVATION
SCALE = 0 1' 3'

DISPLAY COUNTERS , MARKET NO.12.



SECTIONAL HALF ELEVATION
SCALE = 0 5' 10'

MARKET BUILDING , MARKET NO.12.

FIGURE 16

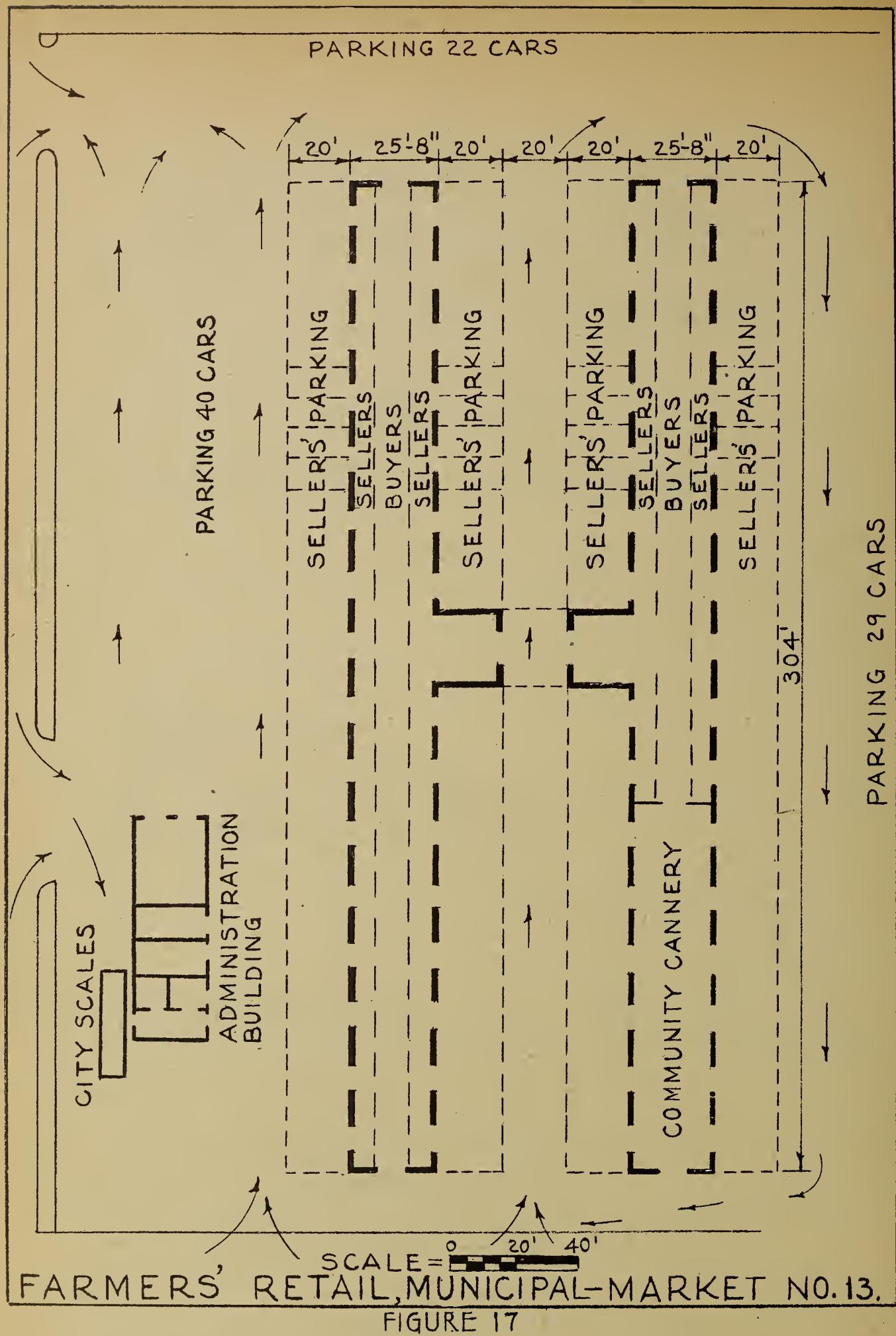
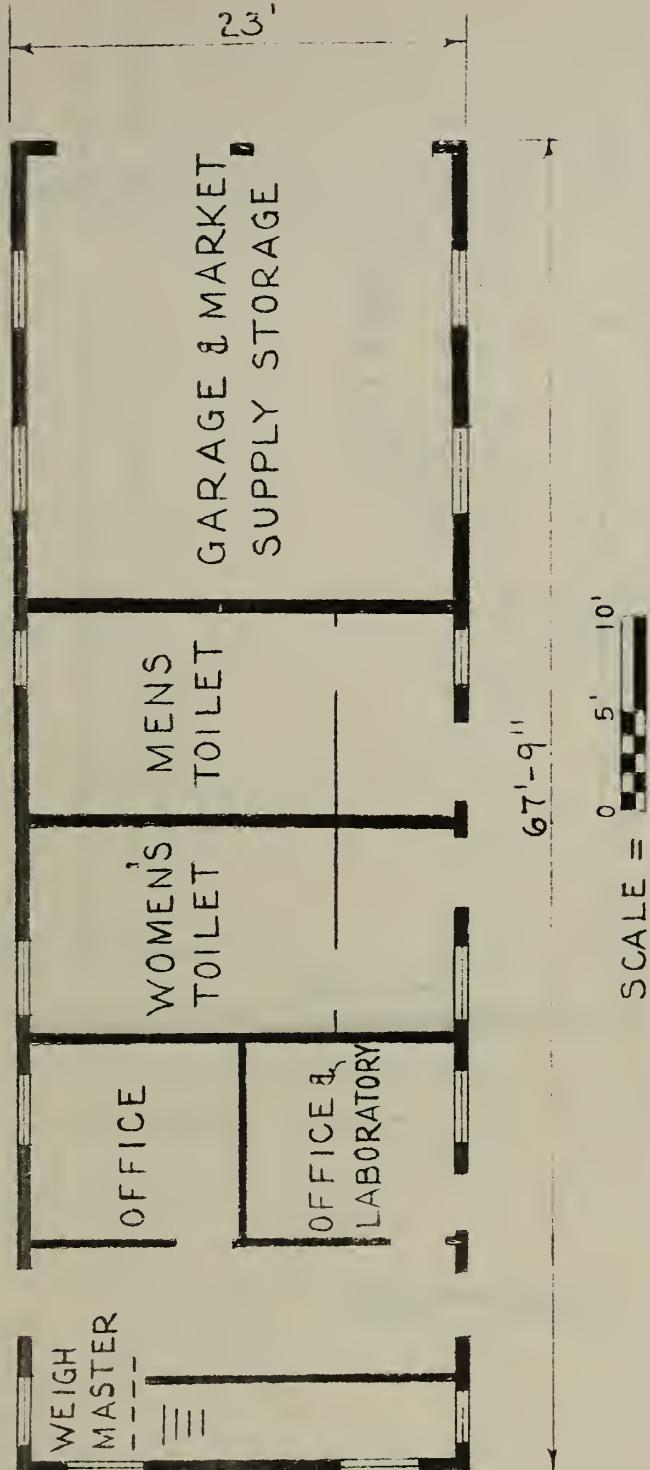


FIGURE 17

CITY SCALES
62,500 POUNDS CAPACITY



ADMINISTRATION BUILDING MARKET NO. 13

FIGURE 18

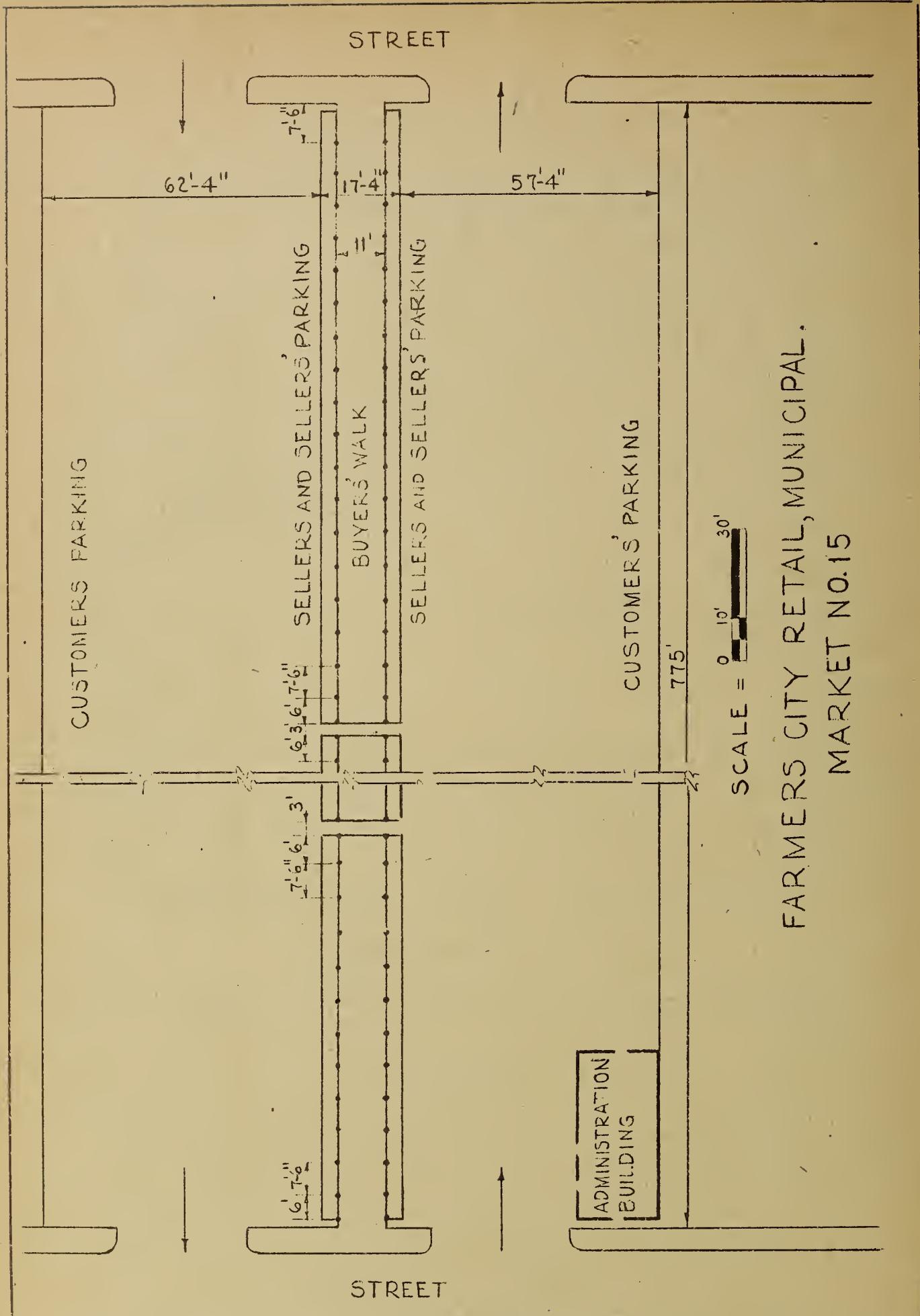


FIGURE 21

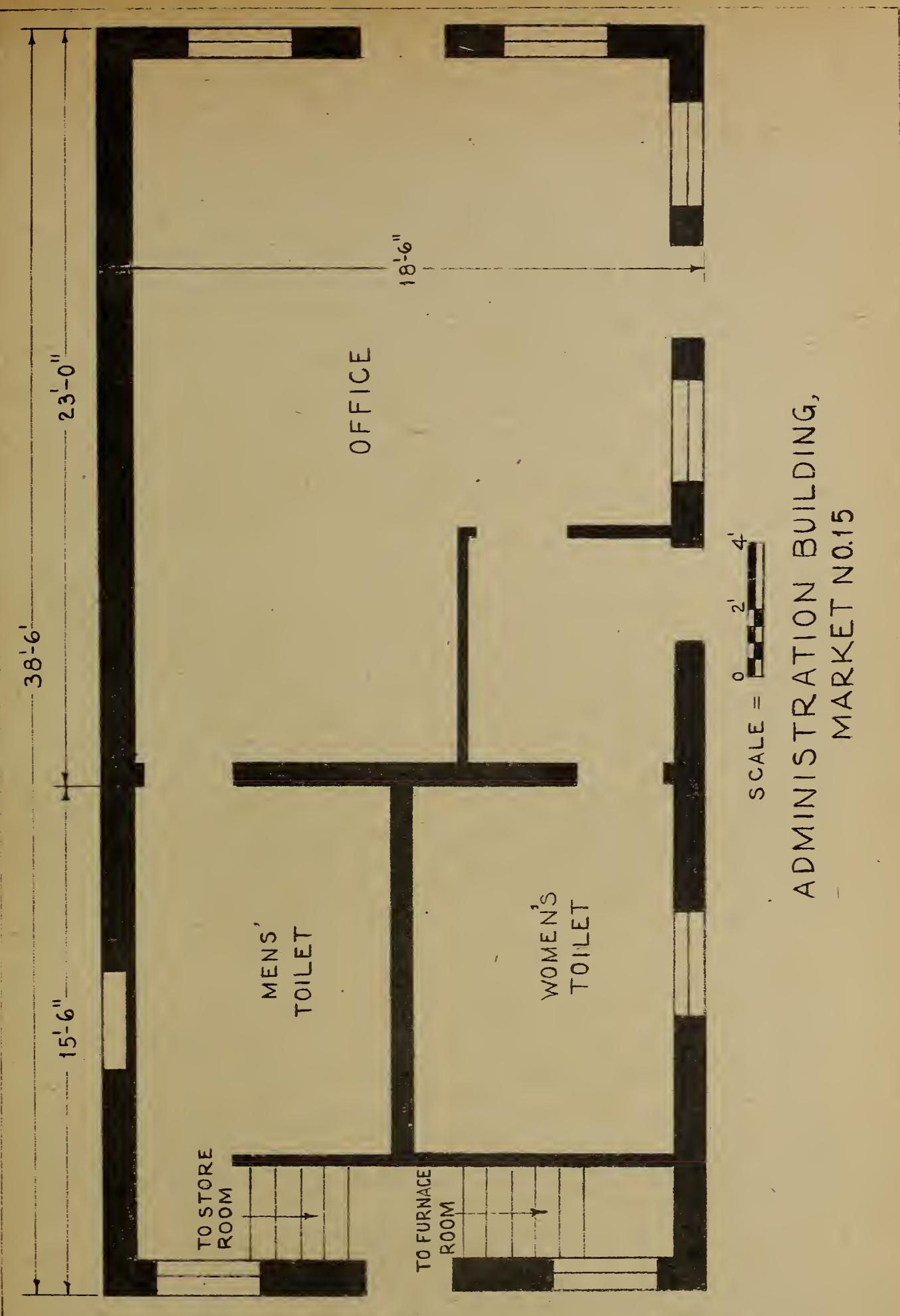
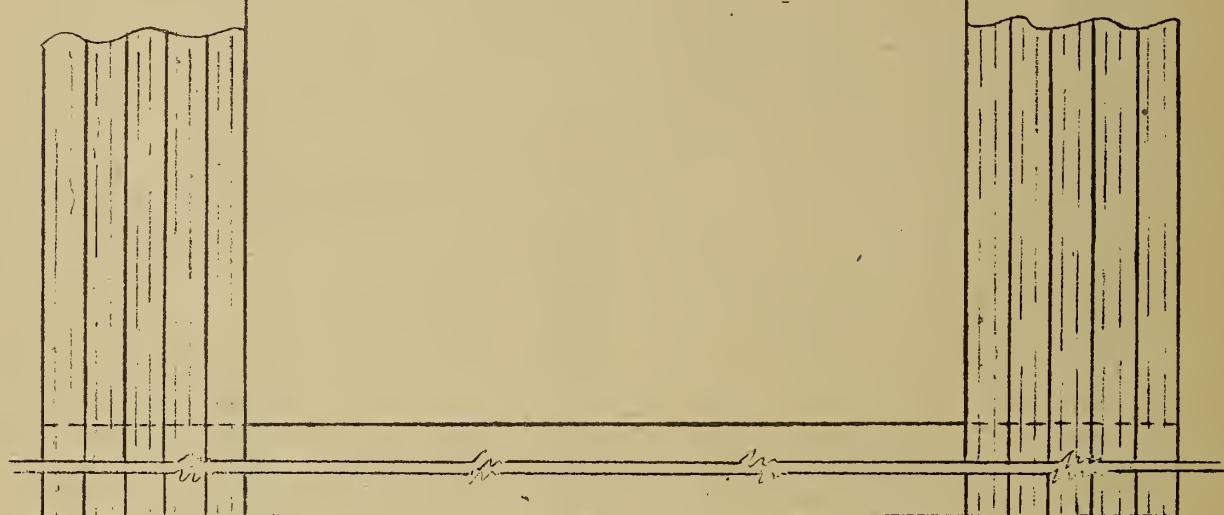
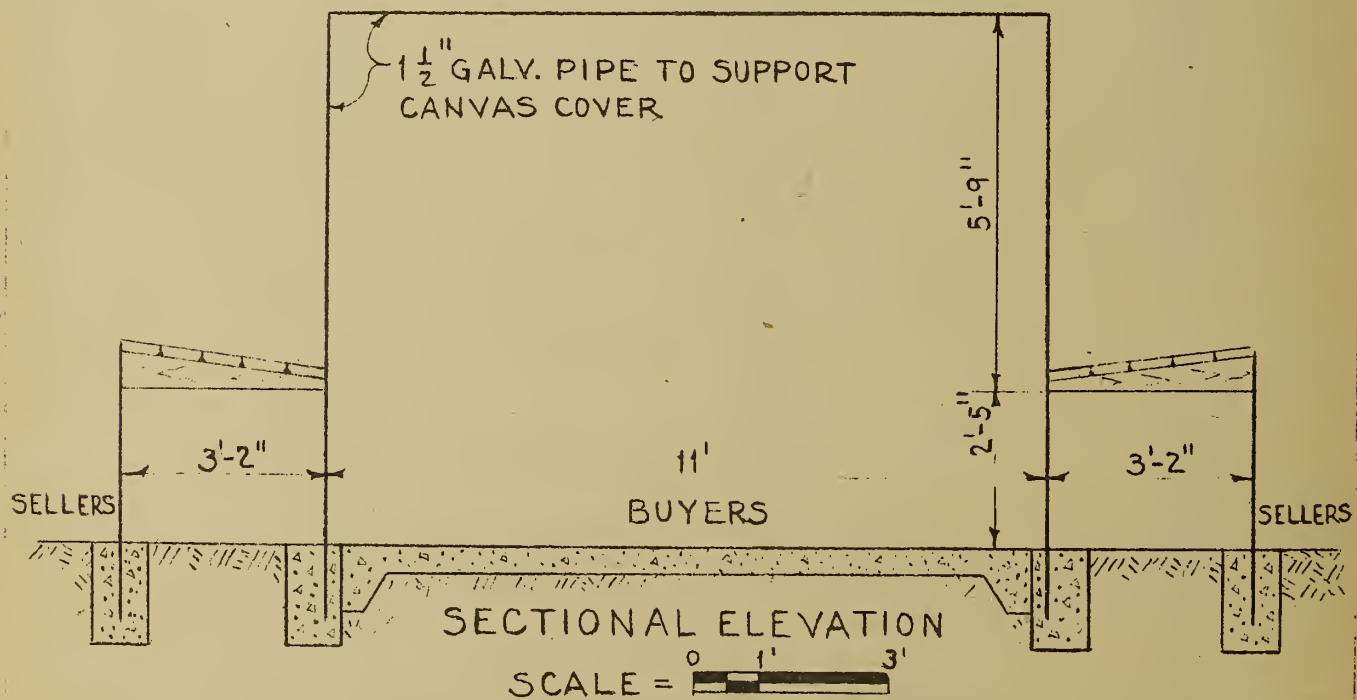


FIGURE 22

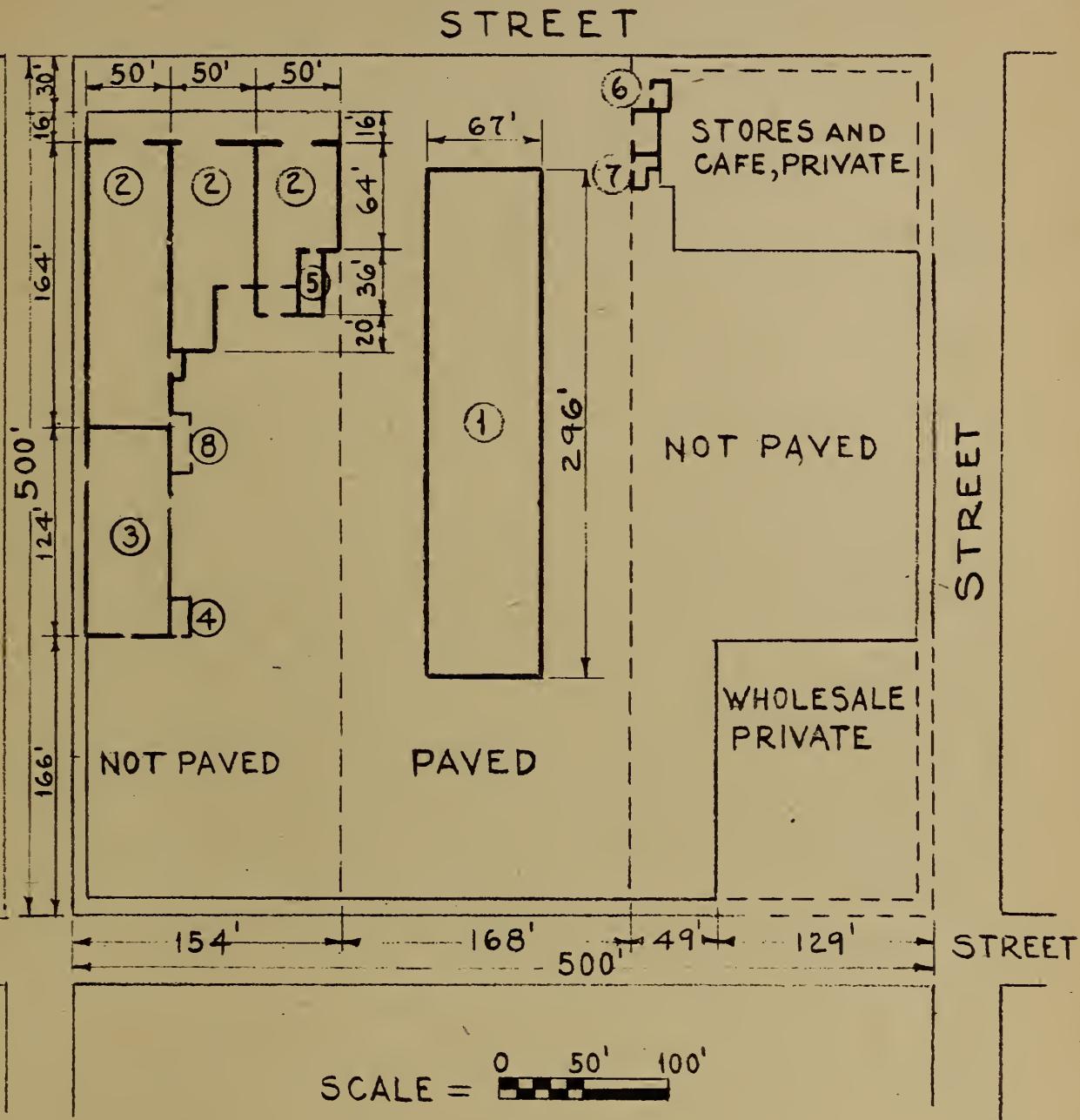


PLAN



FARMERS' AND DEALERS' STANDS, MARKET NO.15.

FIGURE 23



- ① FARMERS' SHED
- ② WHOLESALE ROOMS
- ③ COMMUNITY CANNERY
- ④ BOILER ROOM
- ⑤ COLD STORAGE
- ⑥ CAFE
- ⑦ OFFICE
- ⑧ TOILETS

MARKET NO. 2
FARMERS' CITY WHOLESALE, STATE.

FIGURE 24

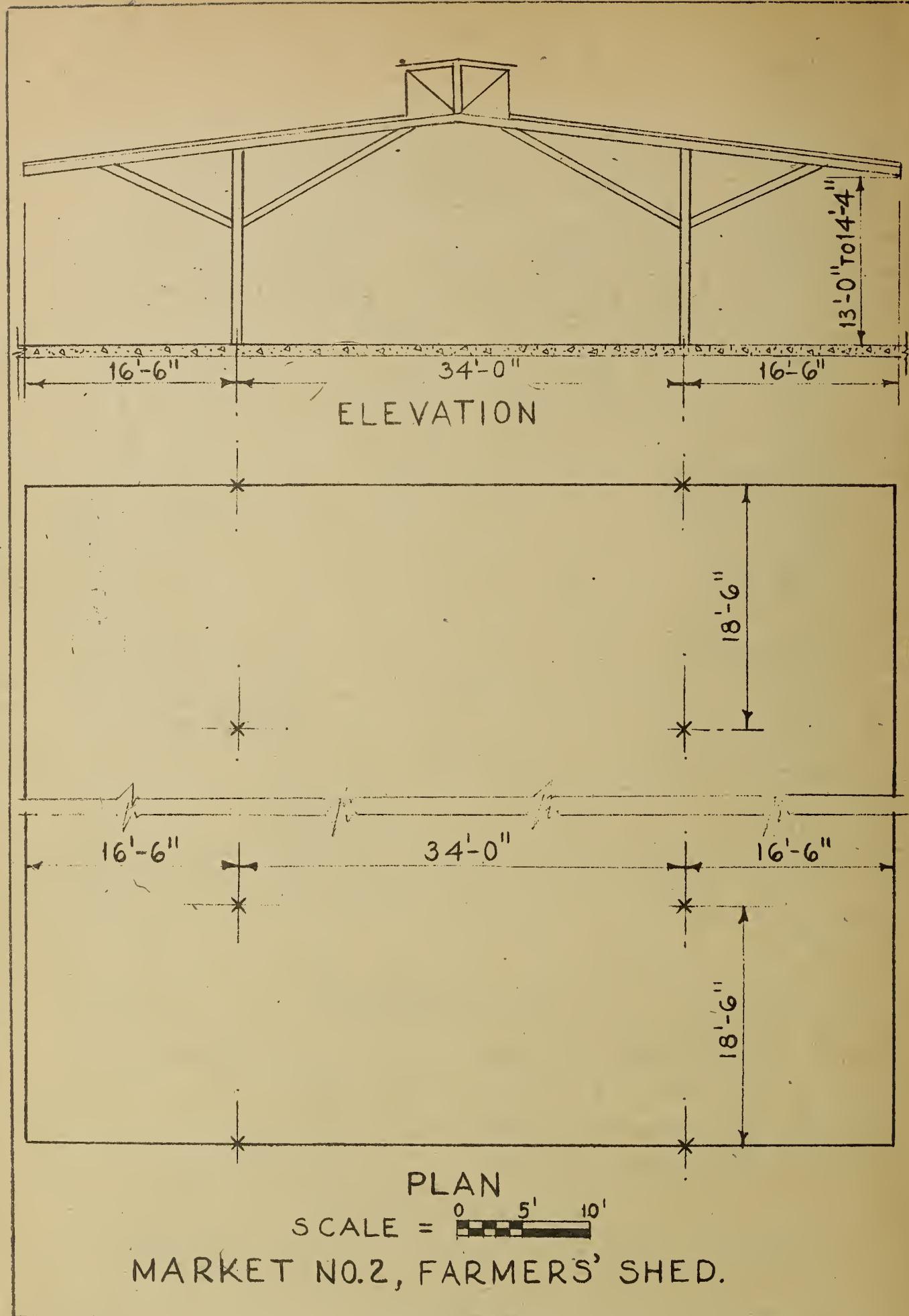
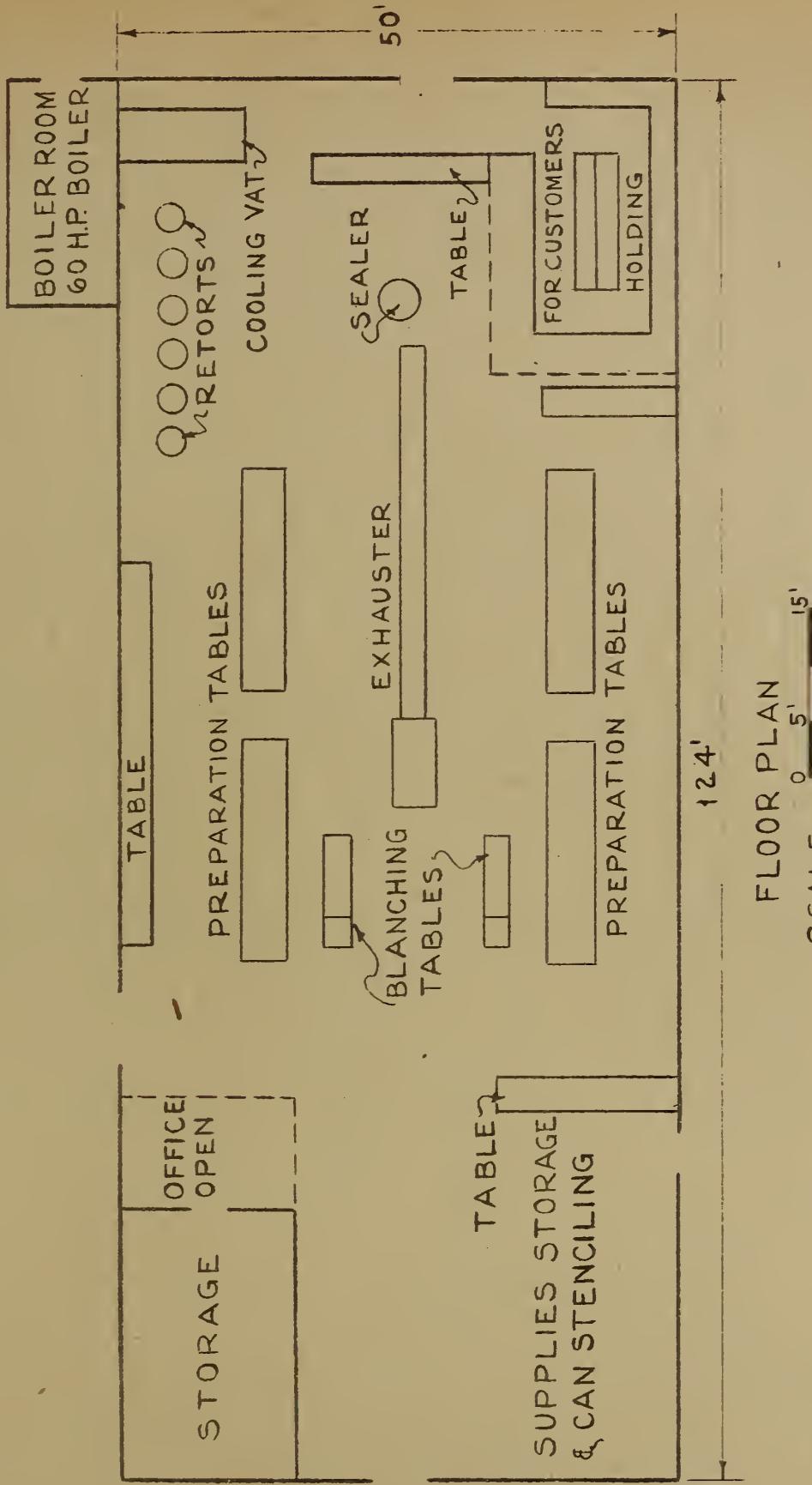


FIGURE 25



MARKET NO.2, COMMUNITY CANNER.

FIGURE 26

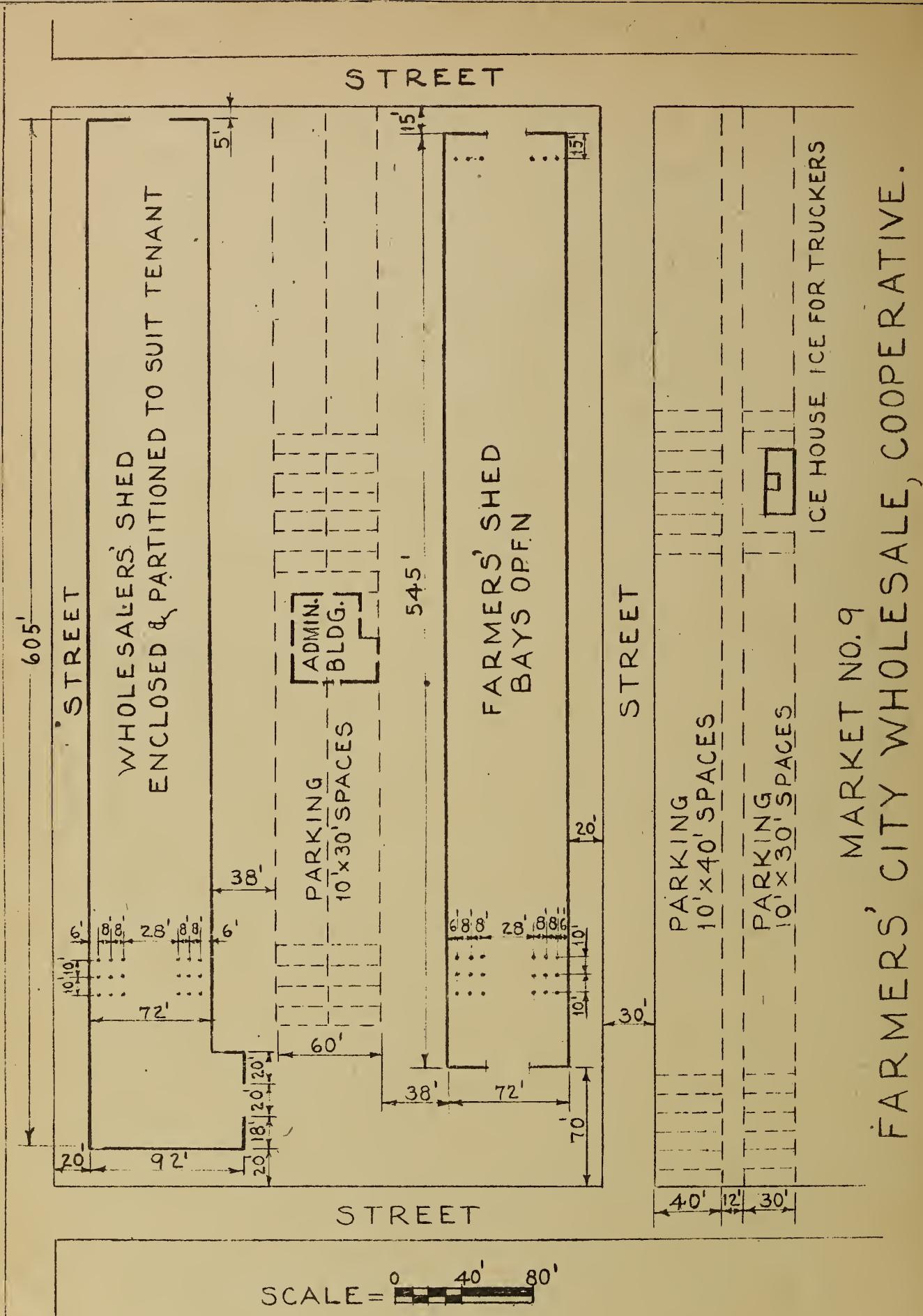


FIGURE 27

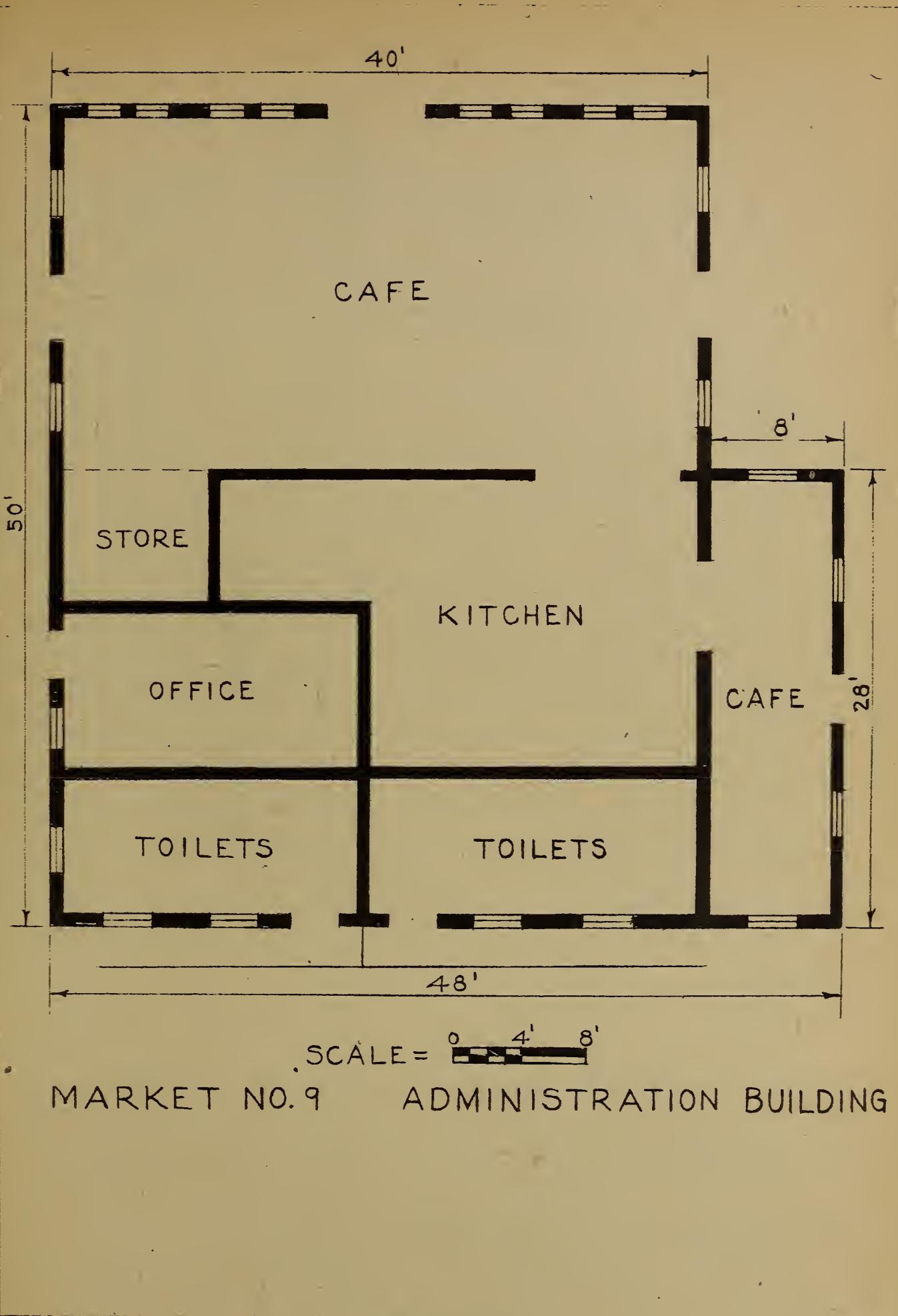
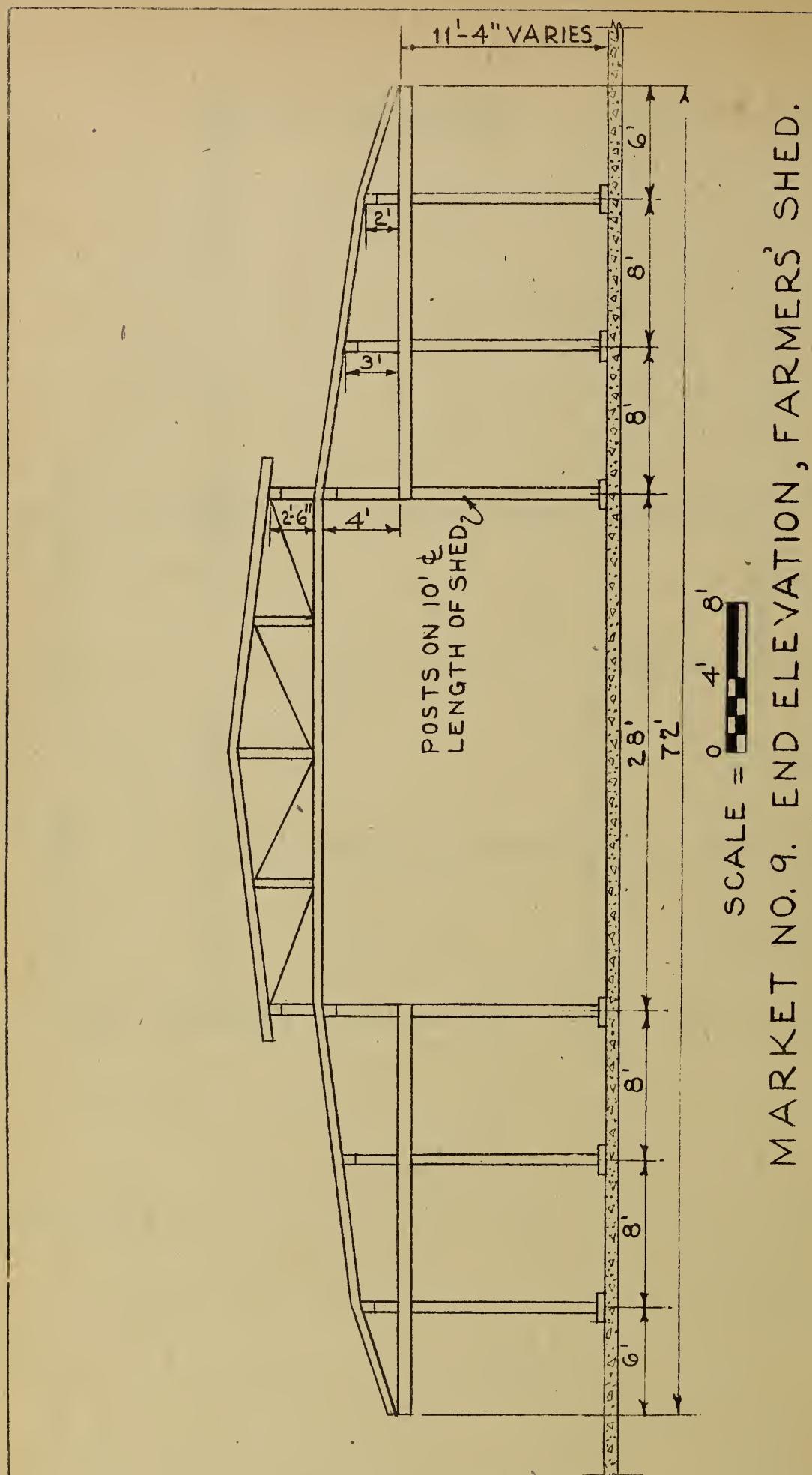


FIGURE 28



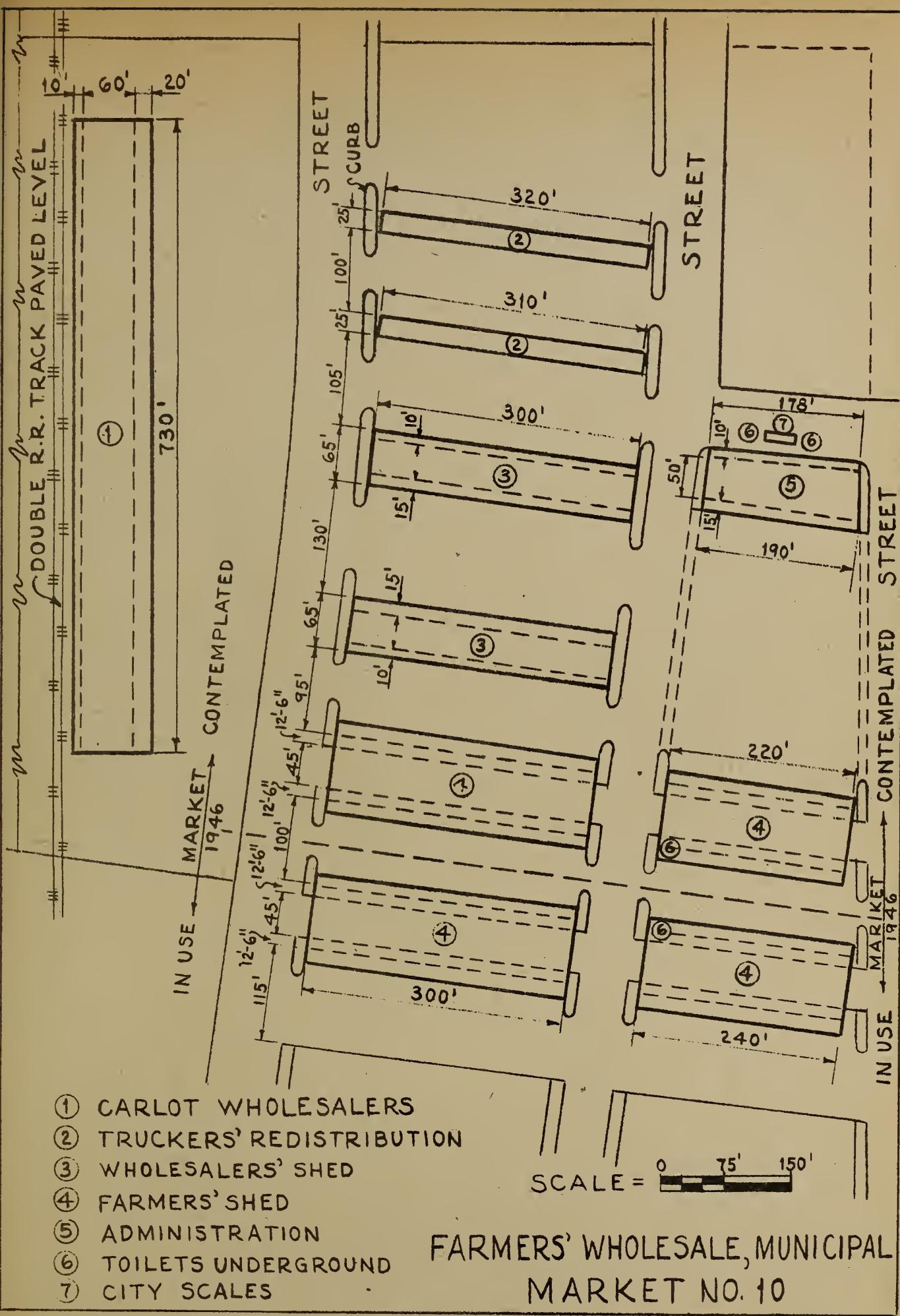


FIGURE 30

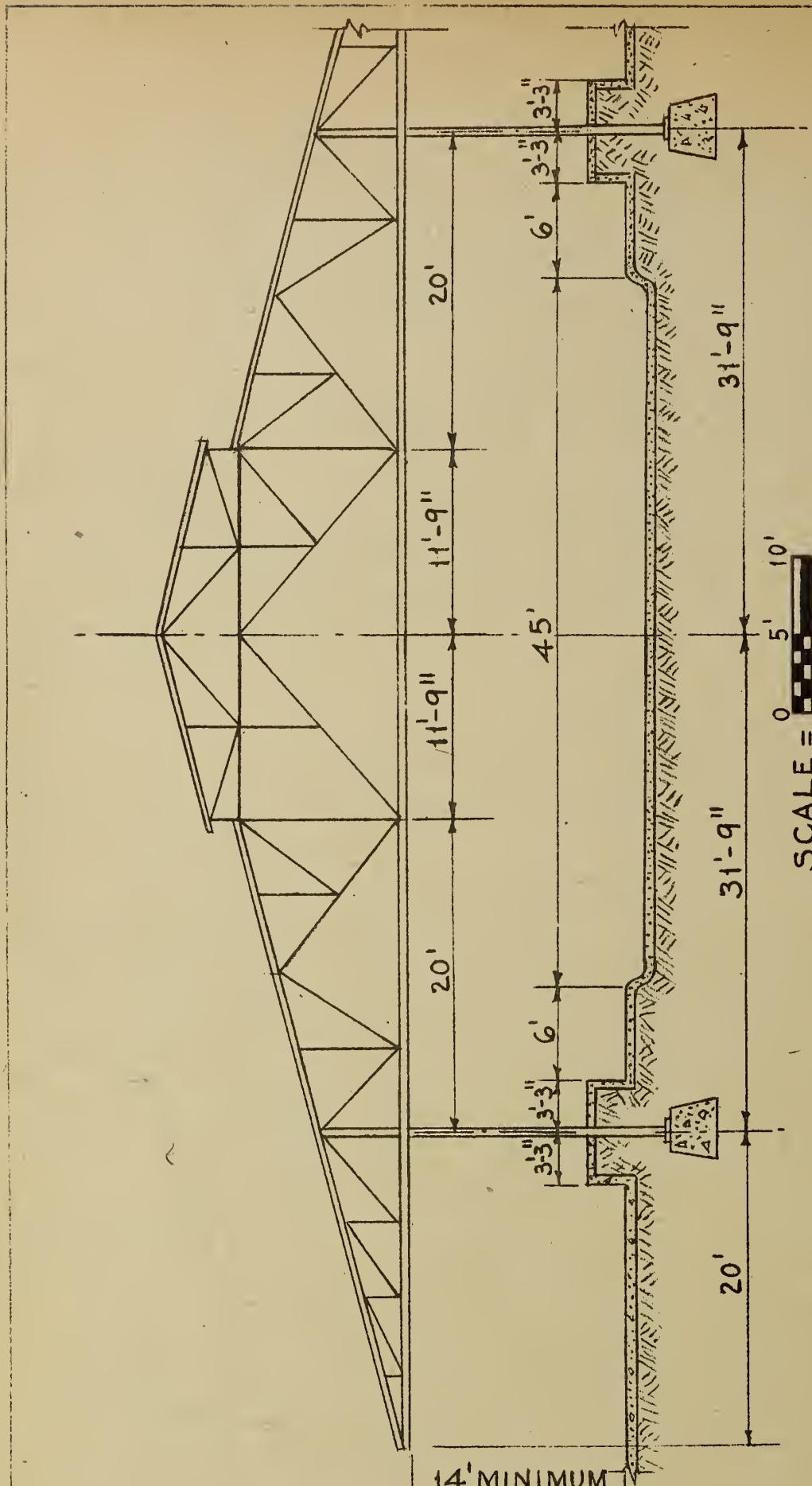


FIGURE 31

FARMERS' CITY WHOLESALE, MUNICIPAL — MARKET NO. 14.

① ADMINISTRATION BUILDING

② CITY SCALES

③ CURB STALLS

④ FARMERS' SHEDS

⑤ TRUCK LOADING SHED

⑥ FARMERS' SHED (FRUITS)

⑦ COLD STORAGE

⑧ DEALERS' SHEDS

⑨ MARKET SUPPLIES

⑩ TOILETS

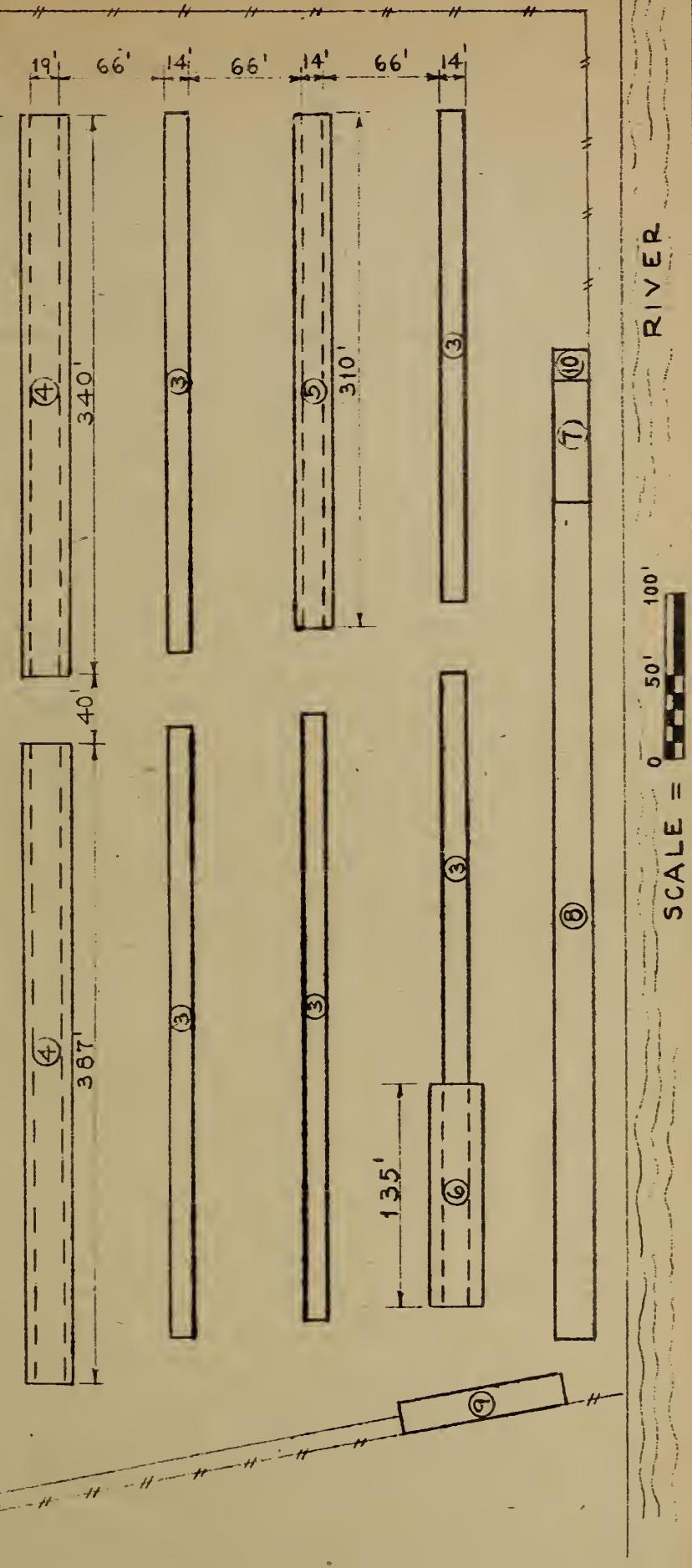
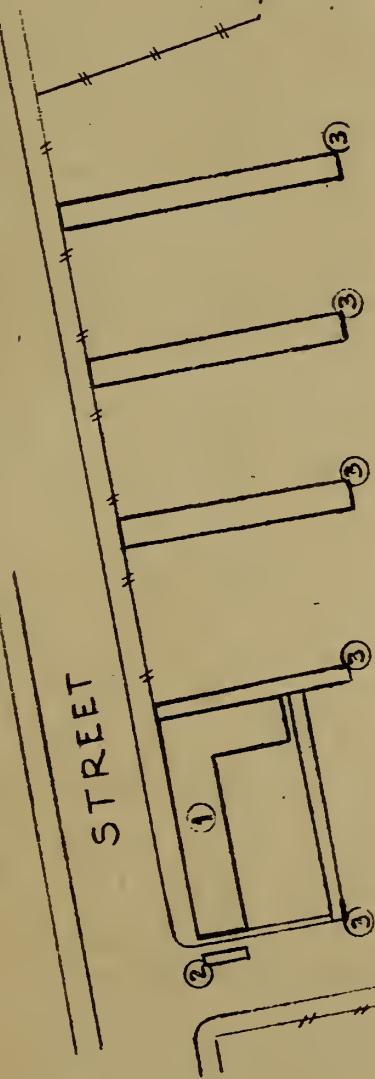
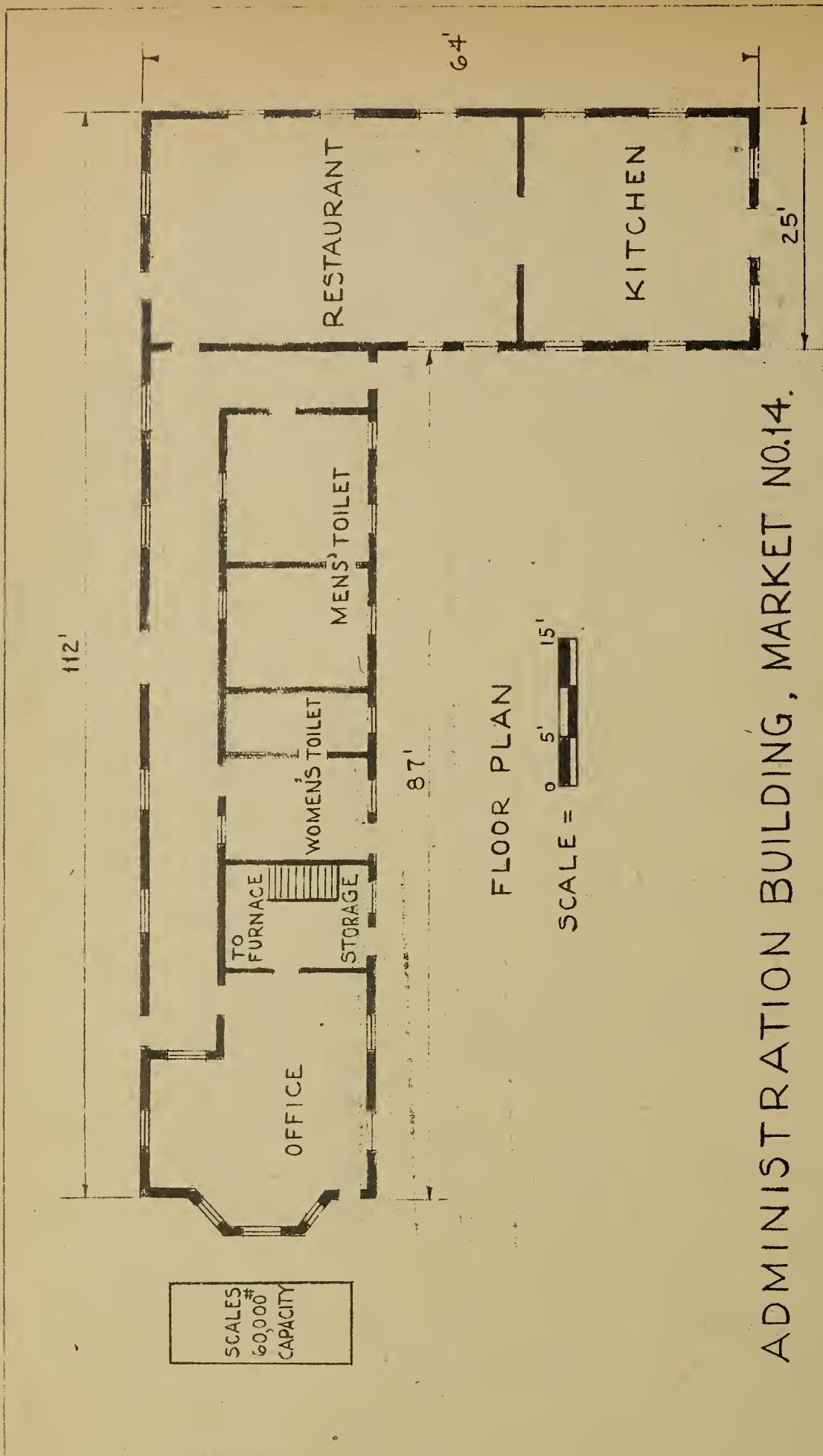
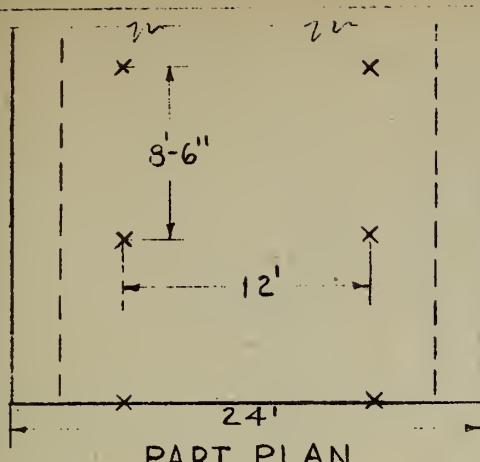


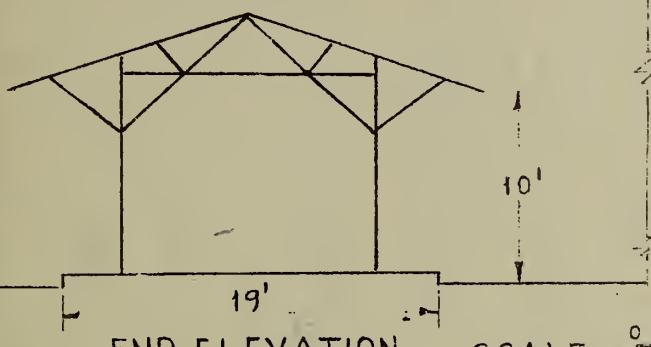
FIGURE 32



ADMINISTRATION BUILDING, MARKET NO.14.

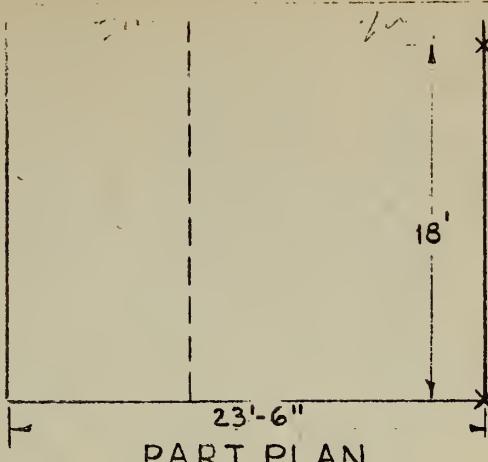


PART PLAN

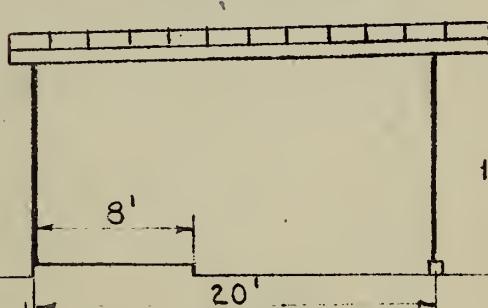


END ELEVATION
FARMERS' SHED

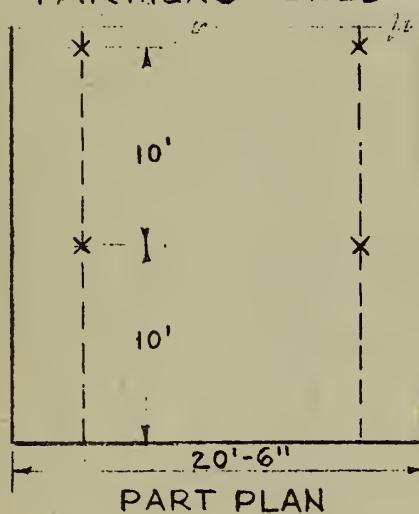
SCALE = 0 5' 10'



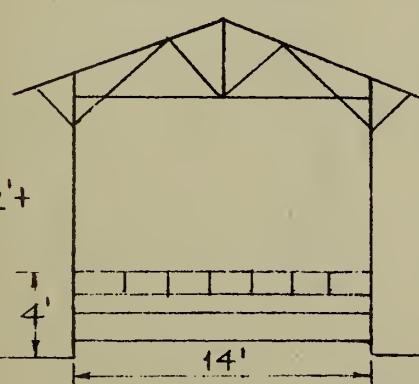
PART PLAN



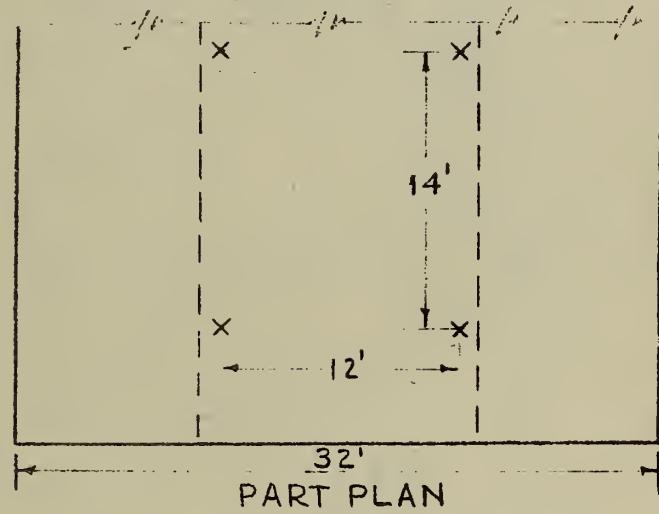
END ELEVATION
DEALERS' SHED



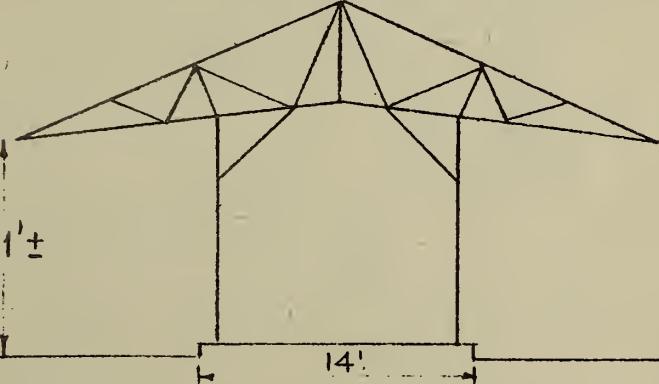
PART PLAN



END ELEVATION
TRUCK LOADING SHED



PART PLAN



END ELEVATION
FARMERS' SHED (FRUITS)

FARMERS' SHEDS AND TRUCK LOADING SHED, MARKET NO.14

FIGURE 34

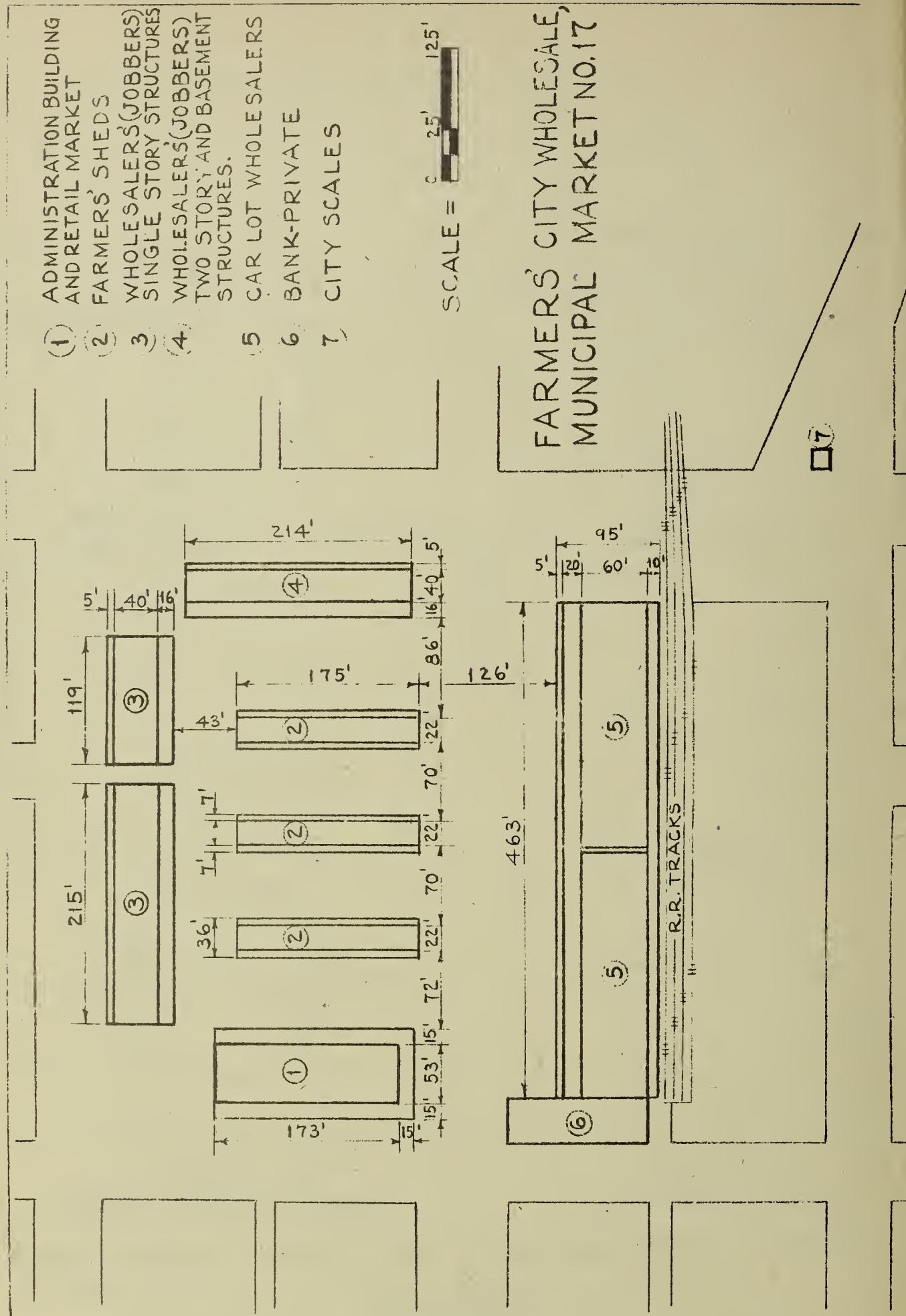


FIGURE 35

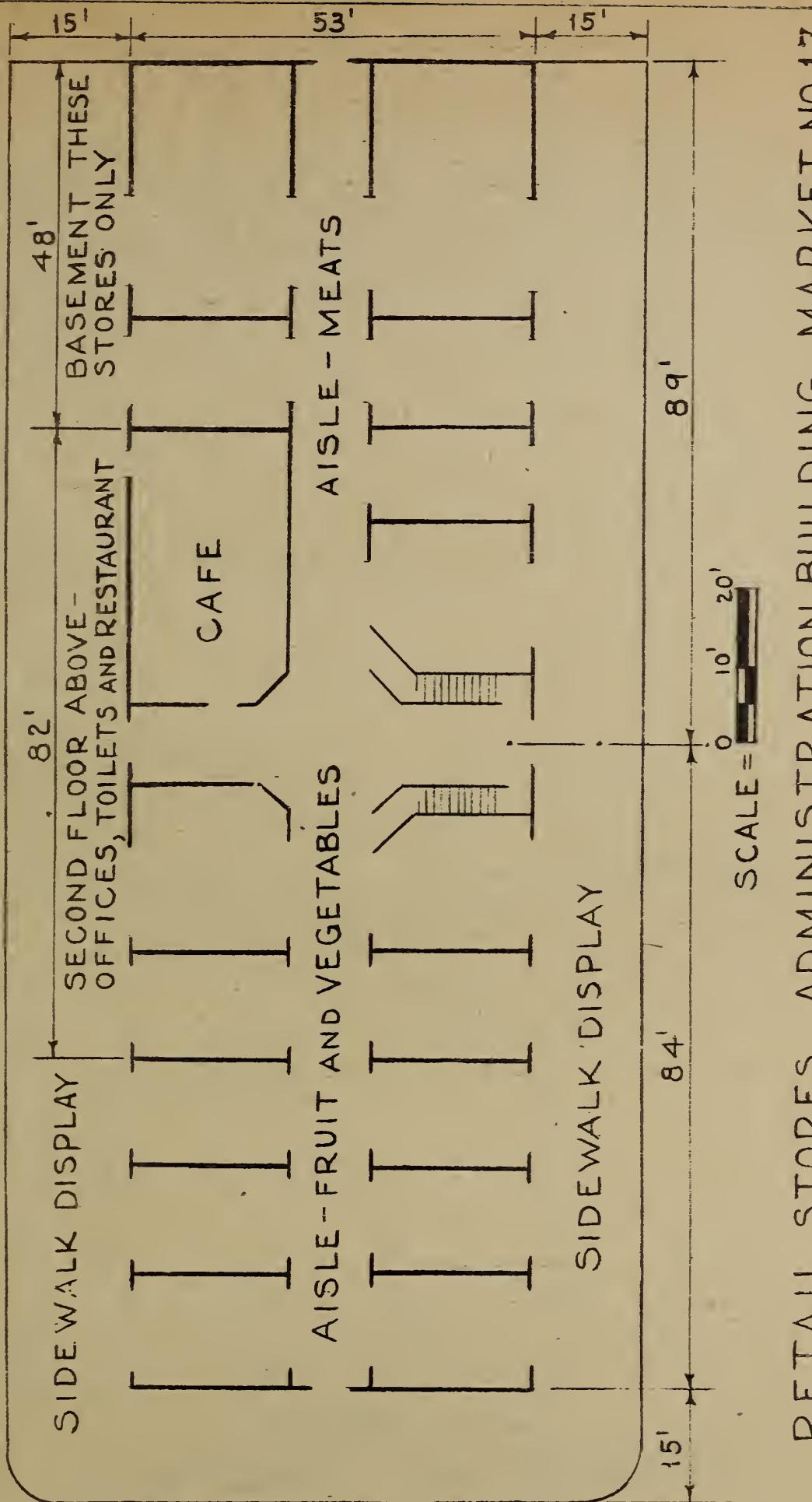
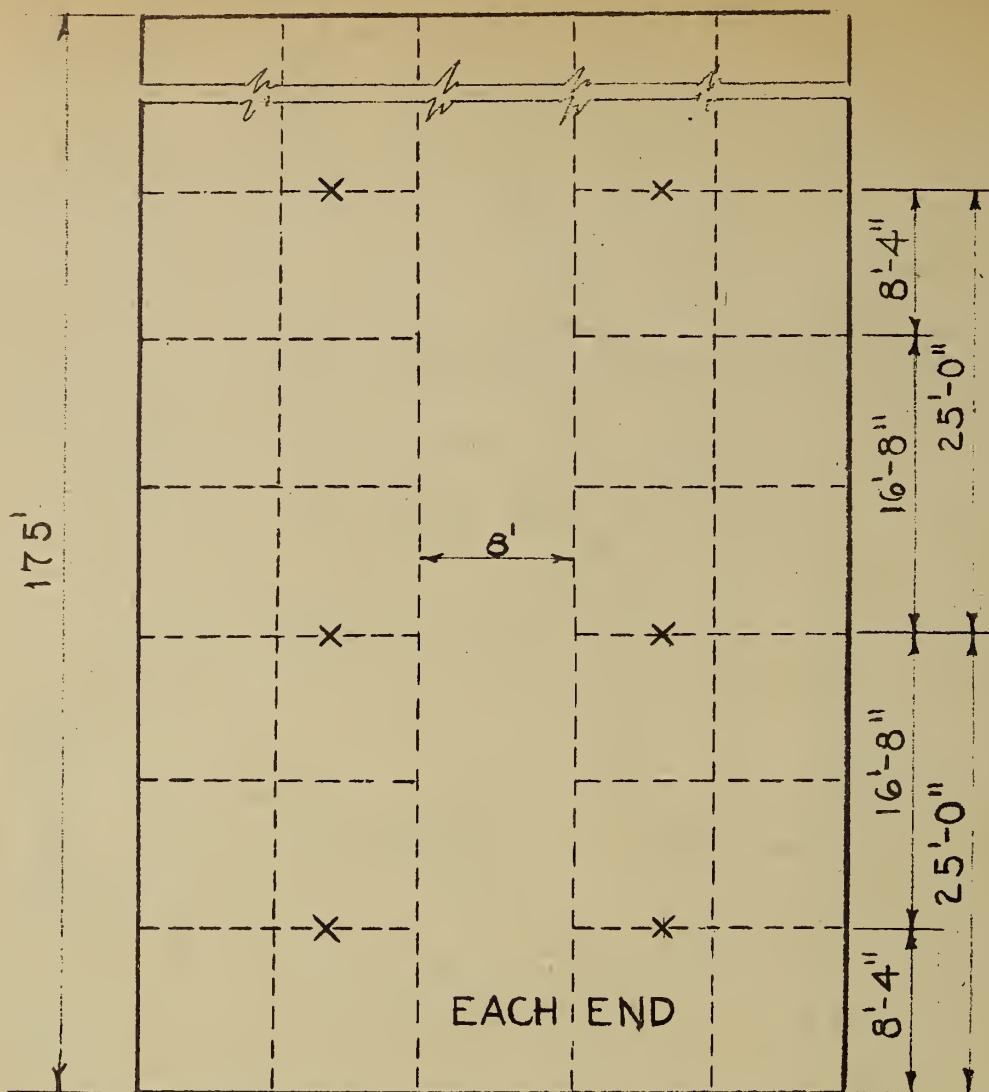
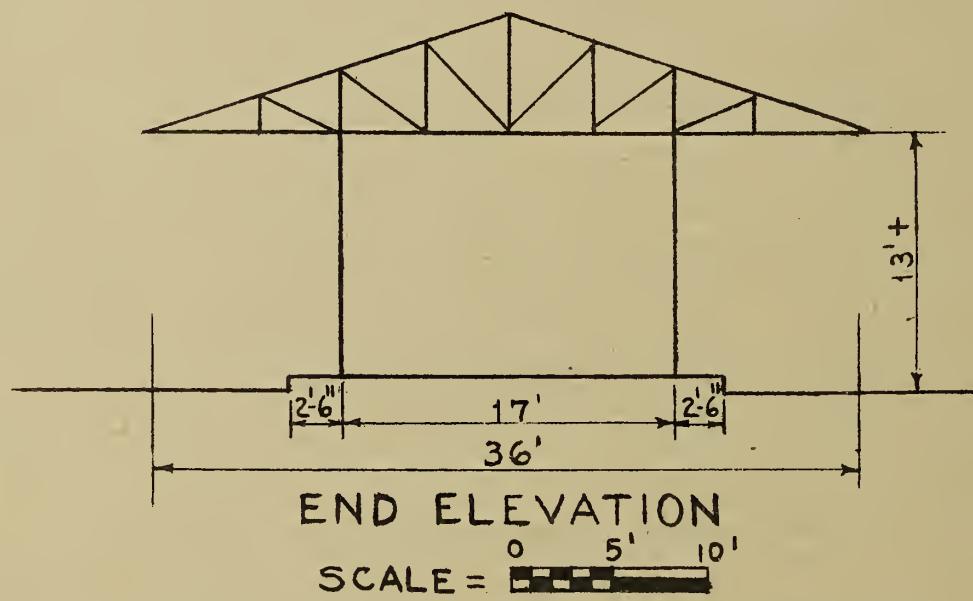


FIGURE 36



FLOOR PLAN

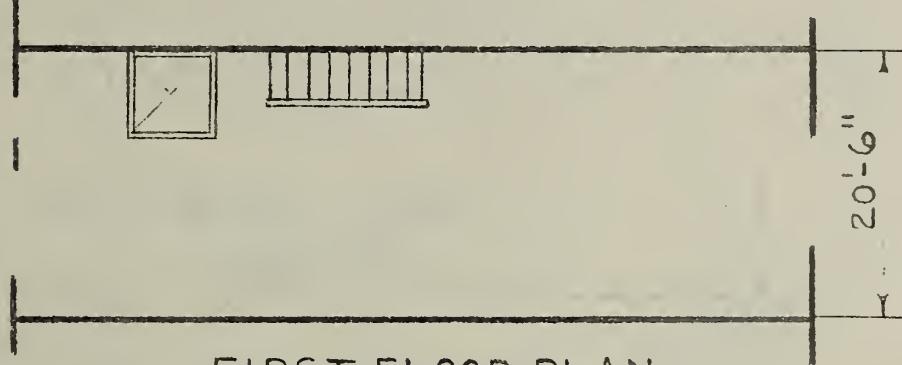


FARMERS' SHED MARKET NO.17

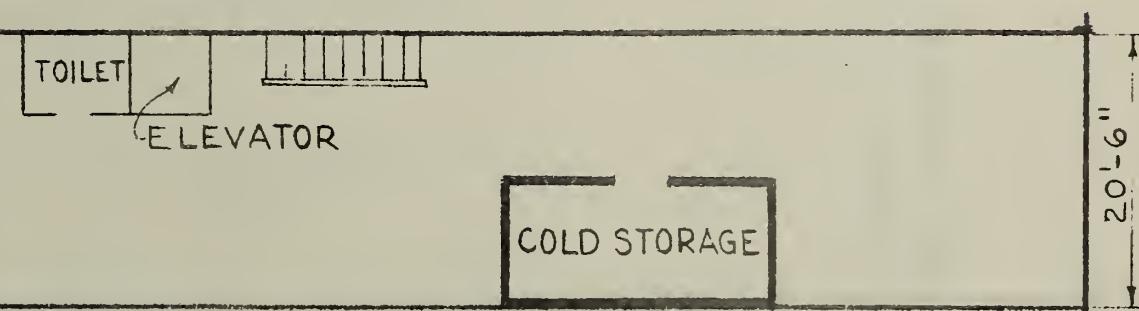
FIGURE 37



MEZZANINE PLAN

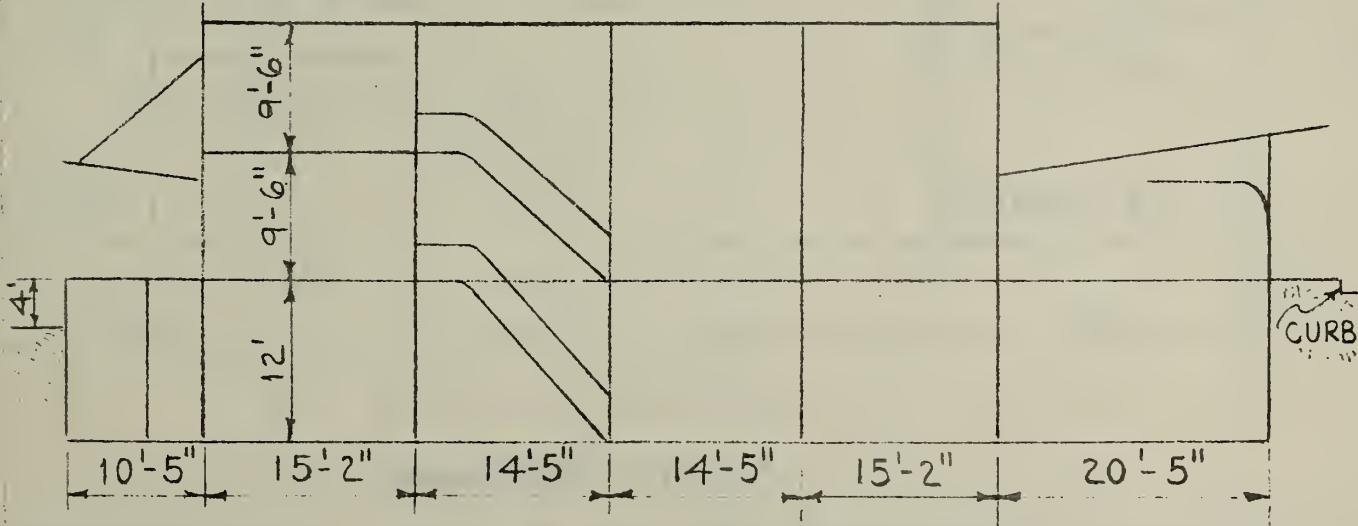


FIRST FLOOR PLAN



SCALE = 0 5' 10' 15'

BASEMENT PLAN

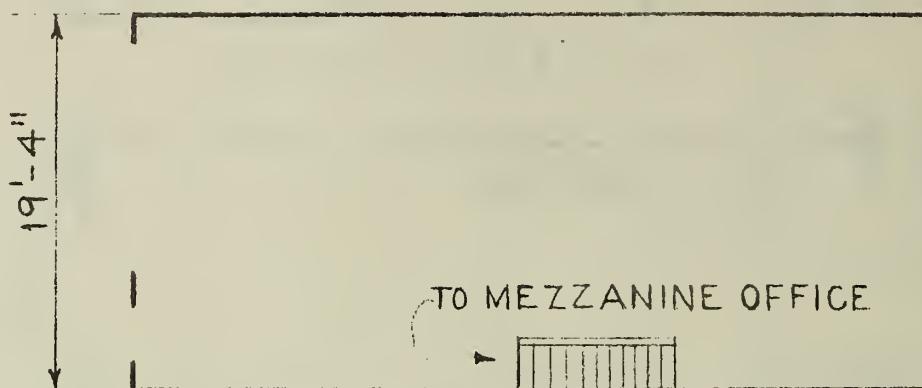


ELEVATION

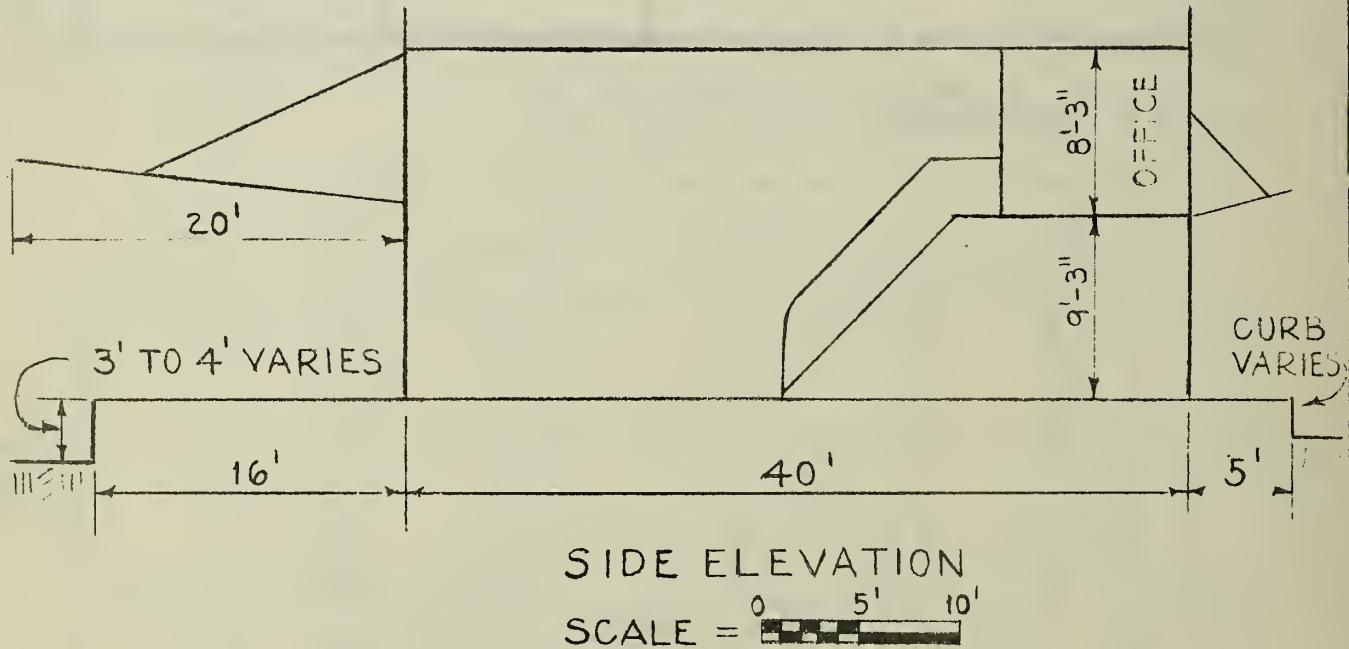
TYPICAL SECTION AND FLOOR PLANS
CAR LOT WHOLESALE BUILDING, MARKET NO.17

FIGURE 38

DISPLAY AISLE



RECEIVING AND SHIPPING DOCK



TYPICAL SECTION AND FLOOR PLAN OF SINGLE STORY STRUCTURE
WHOLESALERS' (JOBBERS) BUILDING, MARKET NO.17

FIGURE 39

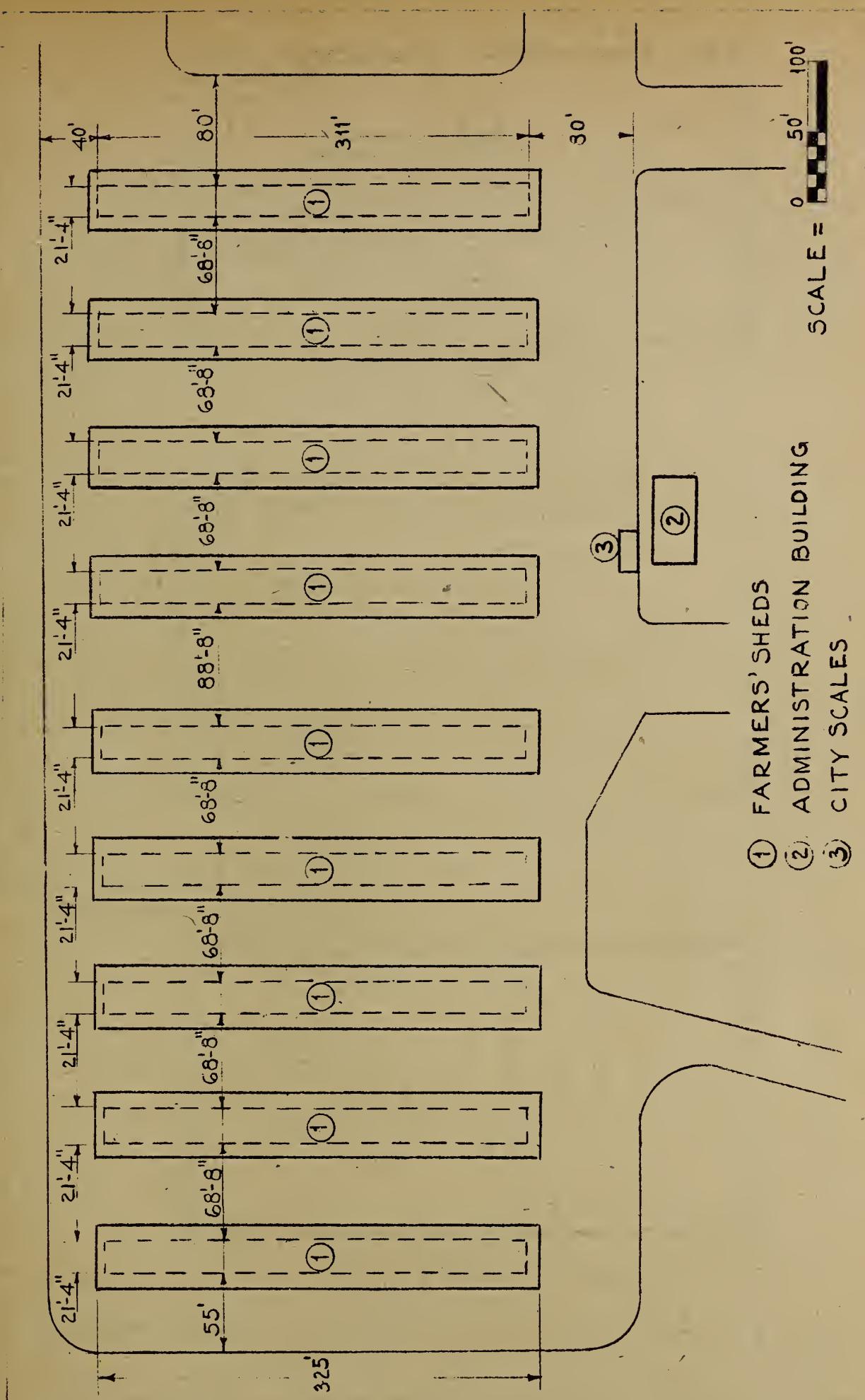
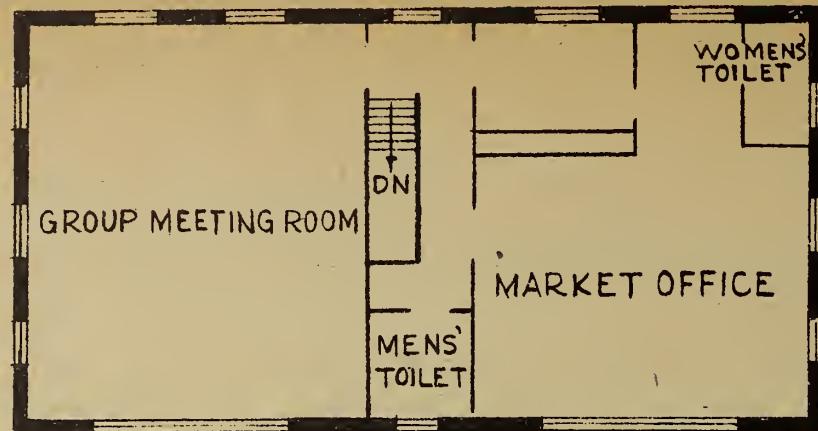
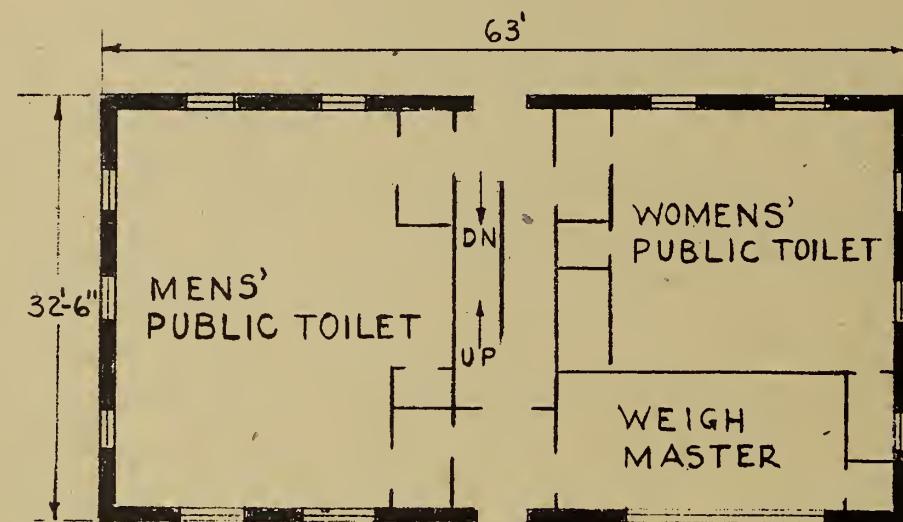


FIGURE 40

FARMERS' CITY WHOLESALE, MUNICIPAL. MARKET NO.20

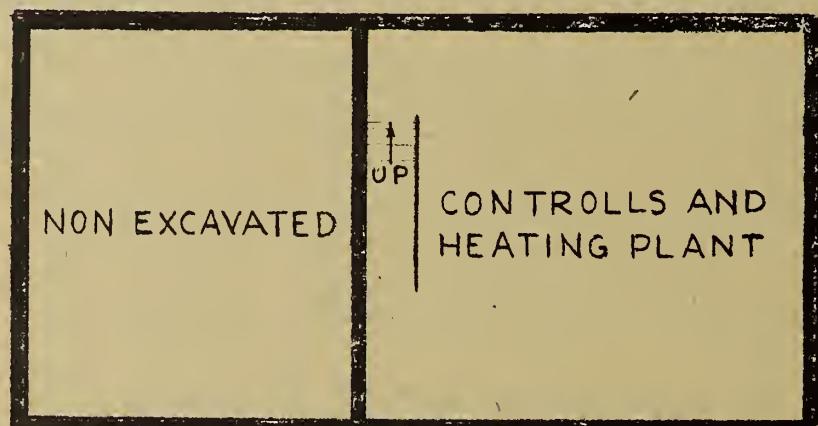


SECOND FLOOR PLAN



FIRST FLOOR PLAN

SCALE = 0 5' 15'



BASEMENT PLAN

ADMINISTRATION BUILDING, MARKET NO. 20

FIGURE 41

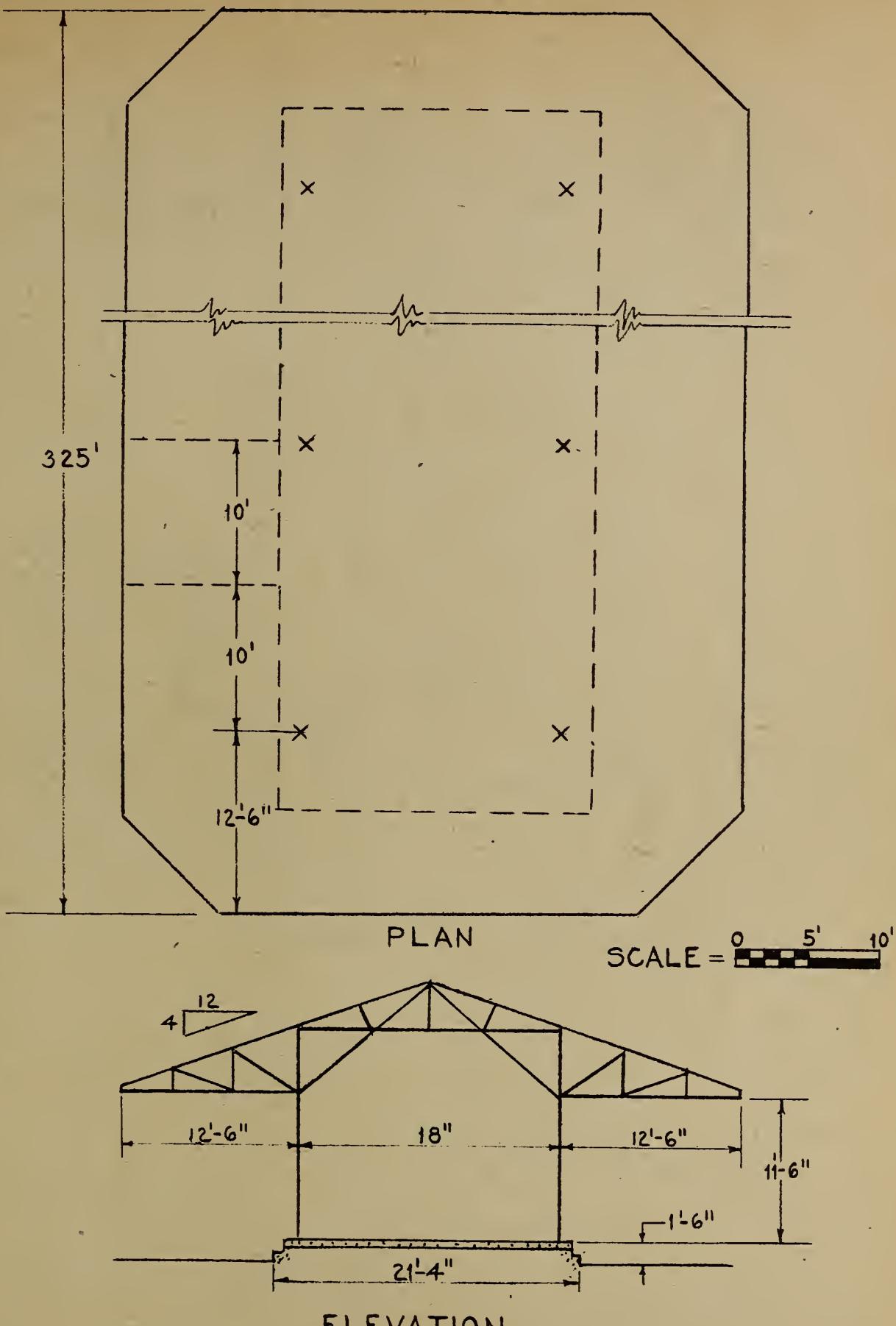


FIGURE 42

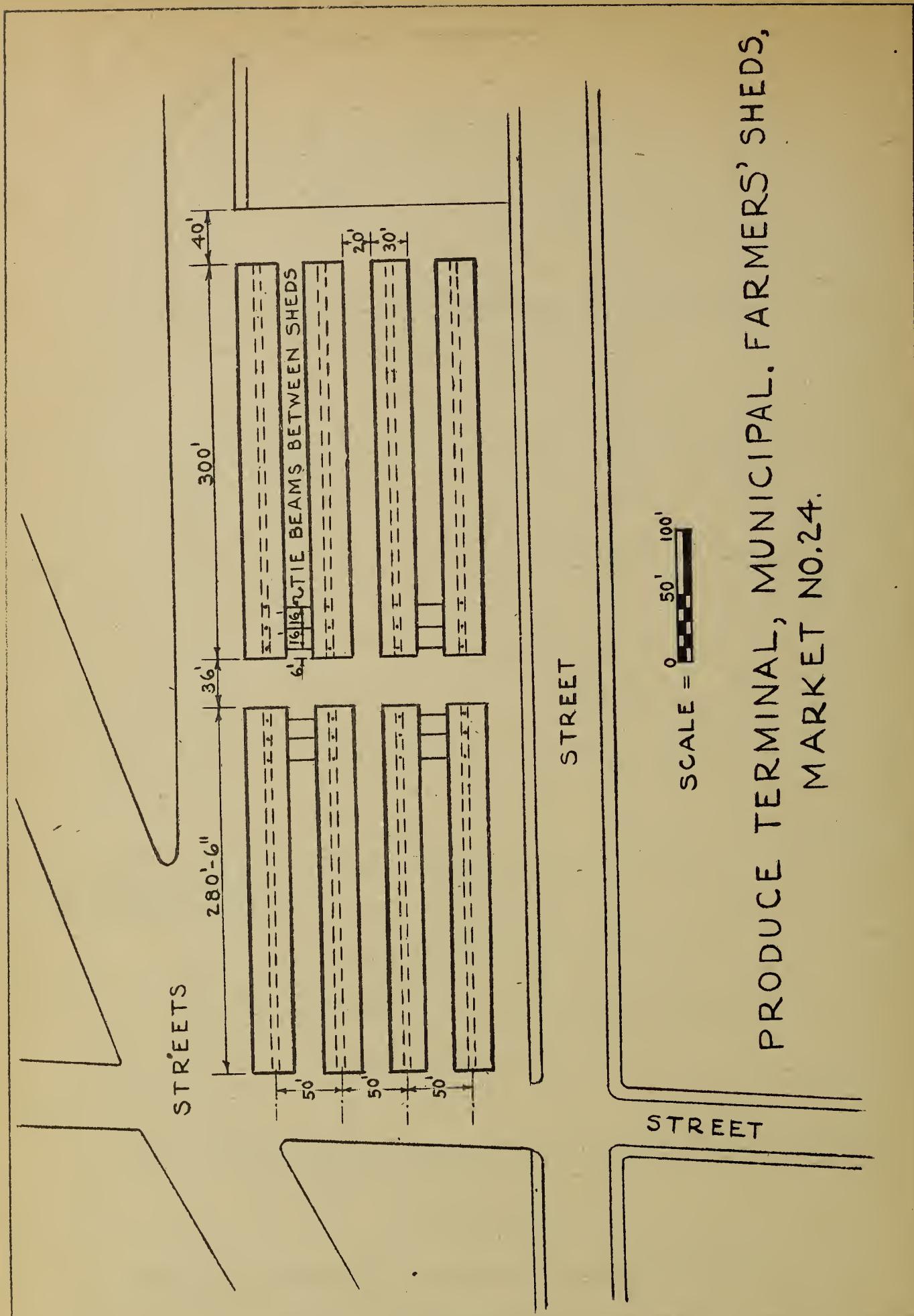
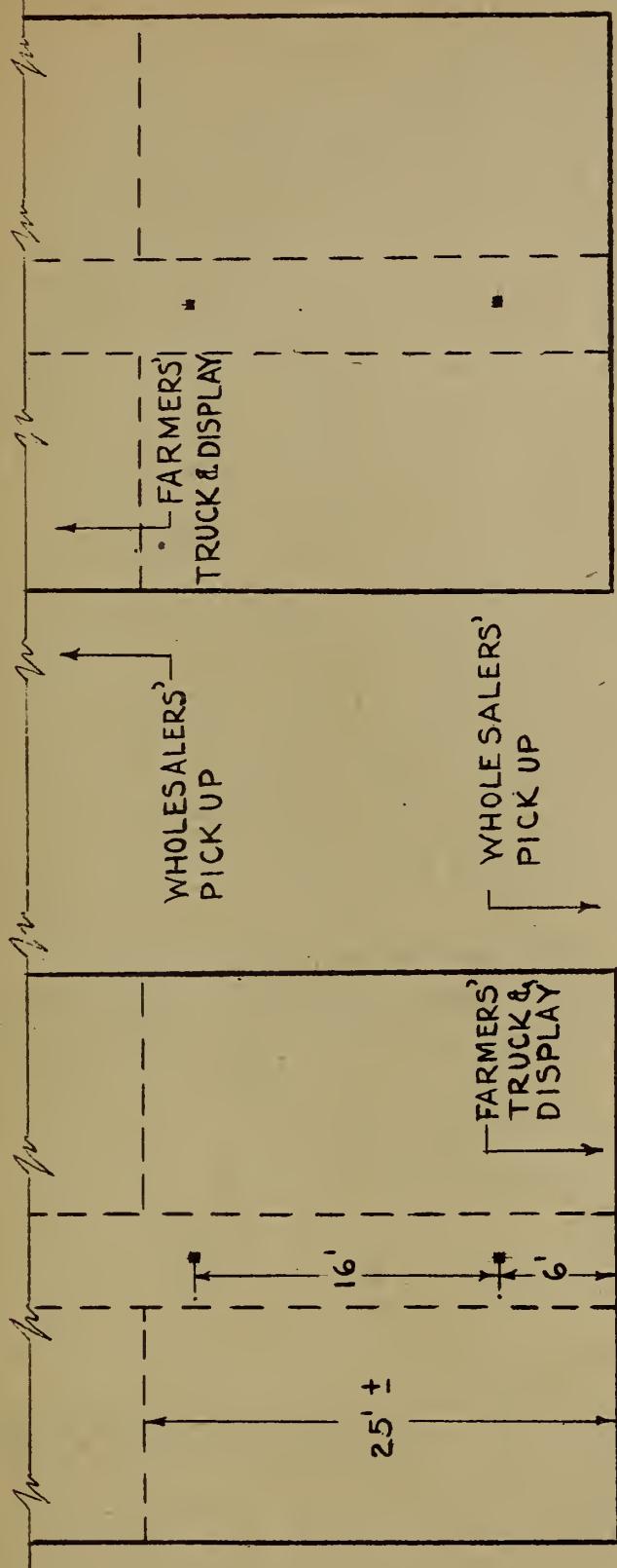
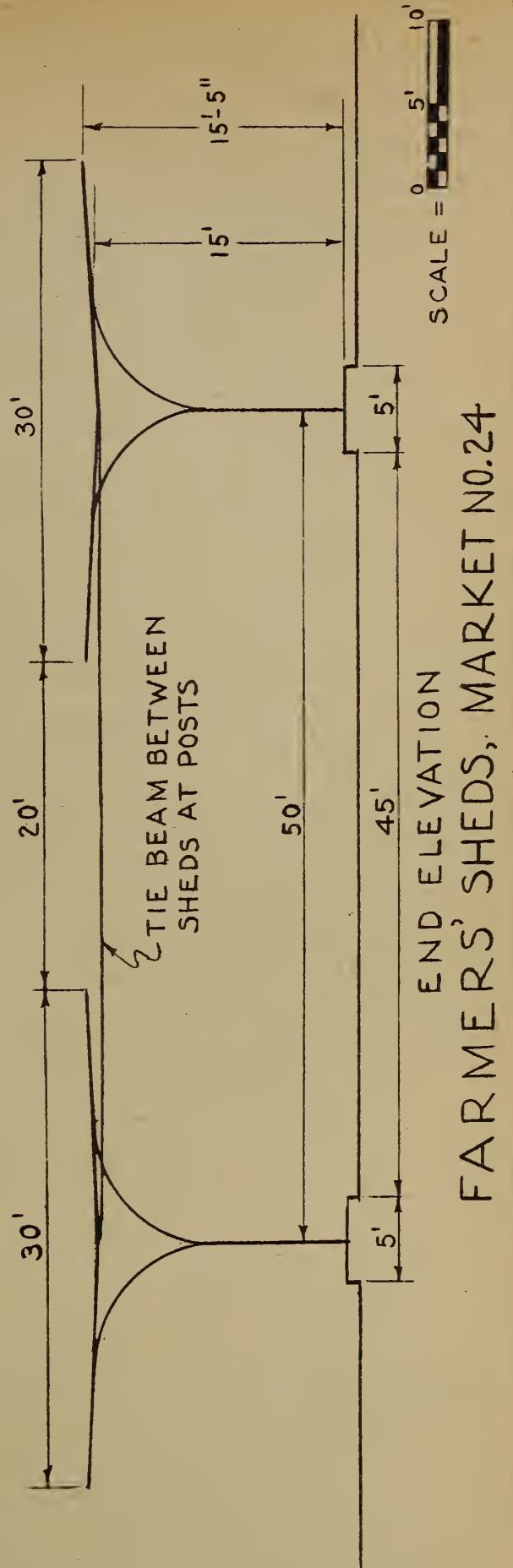


FIGURE 43



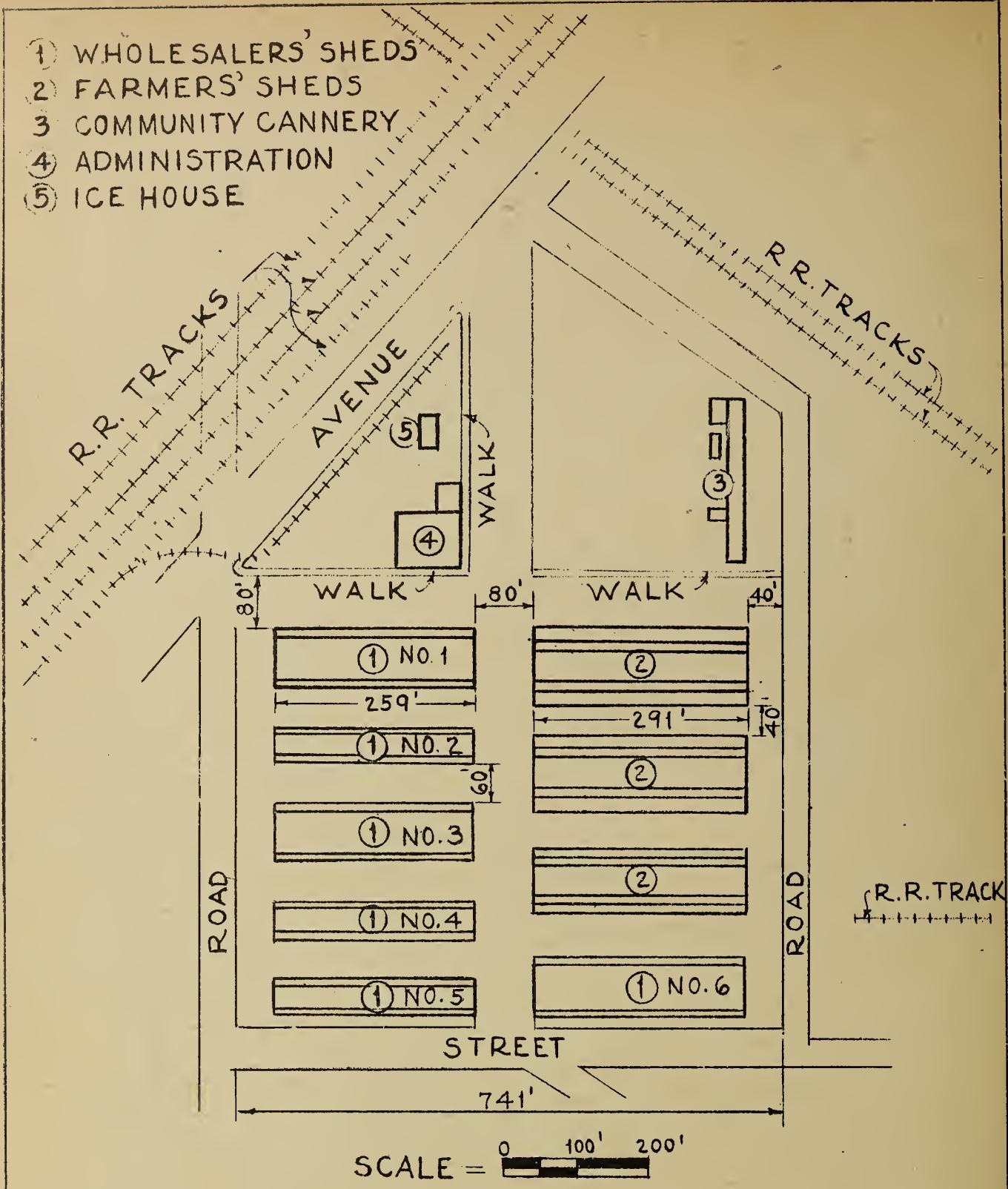
PLAN



FARMERS' SHEDS, MARKET NO.24

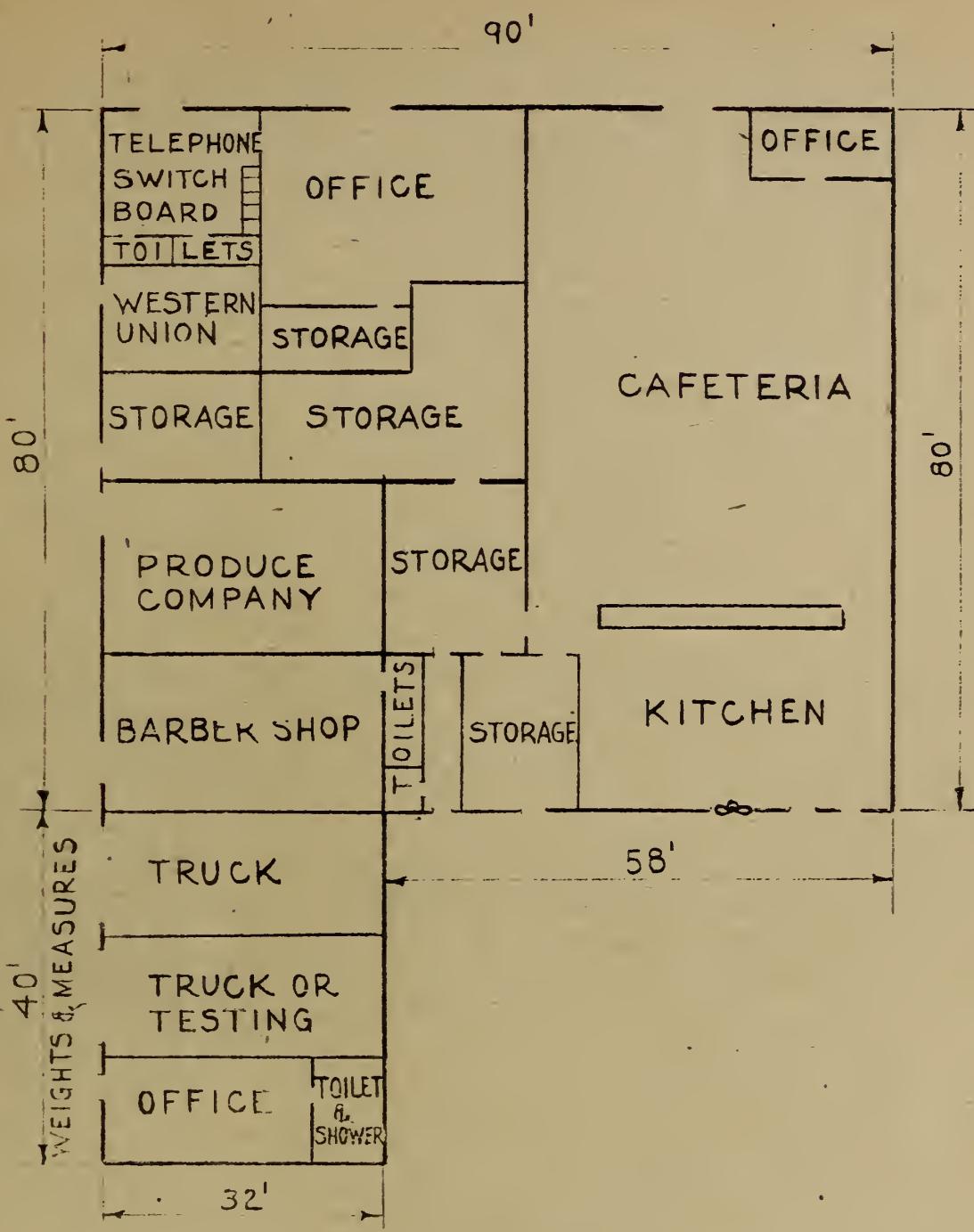
FIGURE 44

- ① WHOLESALE SHEDS
- ② FARMERS' SHEDS
- ③ COMMUNITY CANNERY
- ④ ADMINISTRATION
- ⑤ ICE HOUSE



FARMERS' WHOLESALE REDISTRIBUTION-STATE
MARKET NO.1

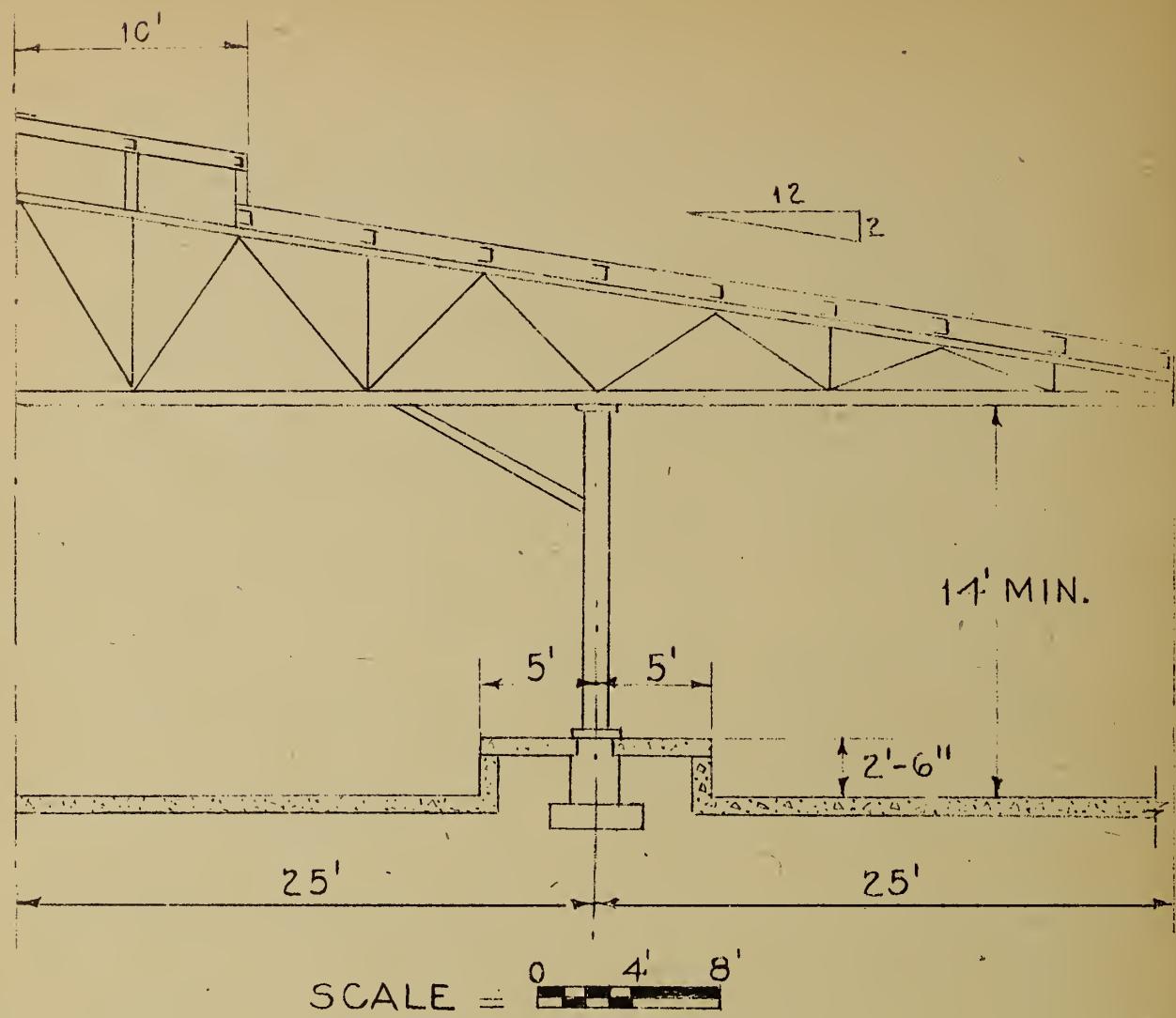
FIGURE 45



ADMINISTRATION BUILDING ^④ MARKET NO. 1

SCALE = 0 10' 20'

FIGURE 46

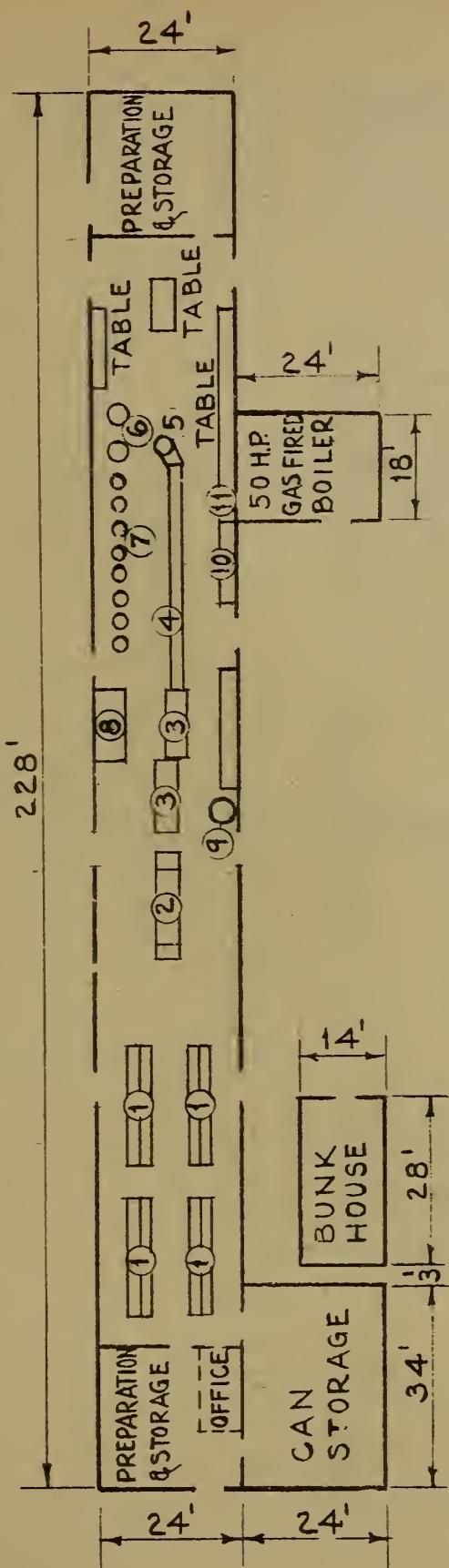


END ELEVATION

FARMERS' SHEDS

MARKET NO.1

FIGURE 47



COMMUNITY CANNERY

SCALE =

0 20' 40'

MARKET NO.1

- ① PREPARATION & WASHING TABLES
- ② BLANCHING
- ③ PACKING TABLES
- ④ EXHAUST BOX
- ⑤ SEALING MACHINE
- ⑥ RETORTS (LARGE)
- ⑦ RETORTS (SMALL)
- ⑧ COOLING VAT
- ⑨ STEAM JACKET COOKER
- ⑩ HOT PLATES
- ⑪ POWER MEAT GRINDER

FIGURE 48

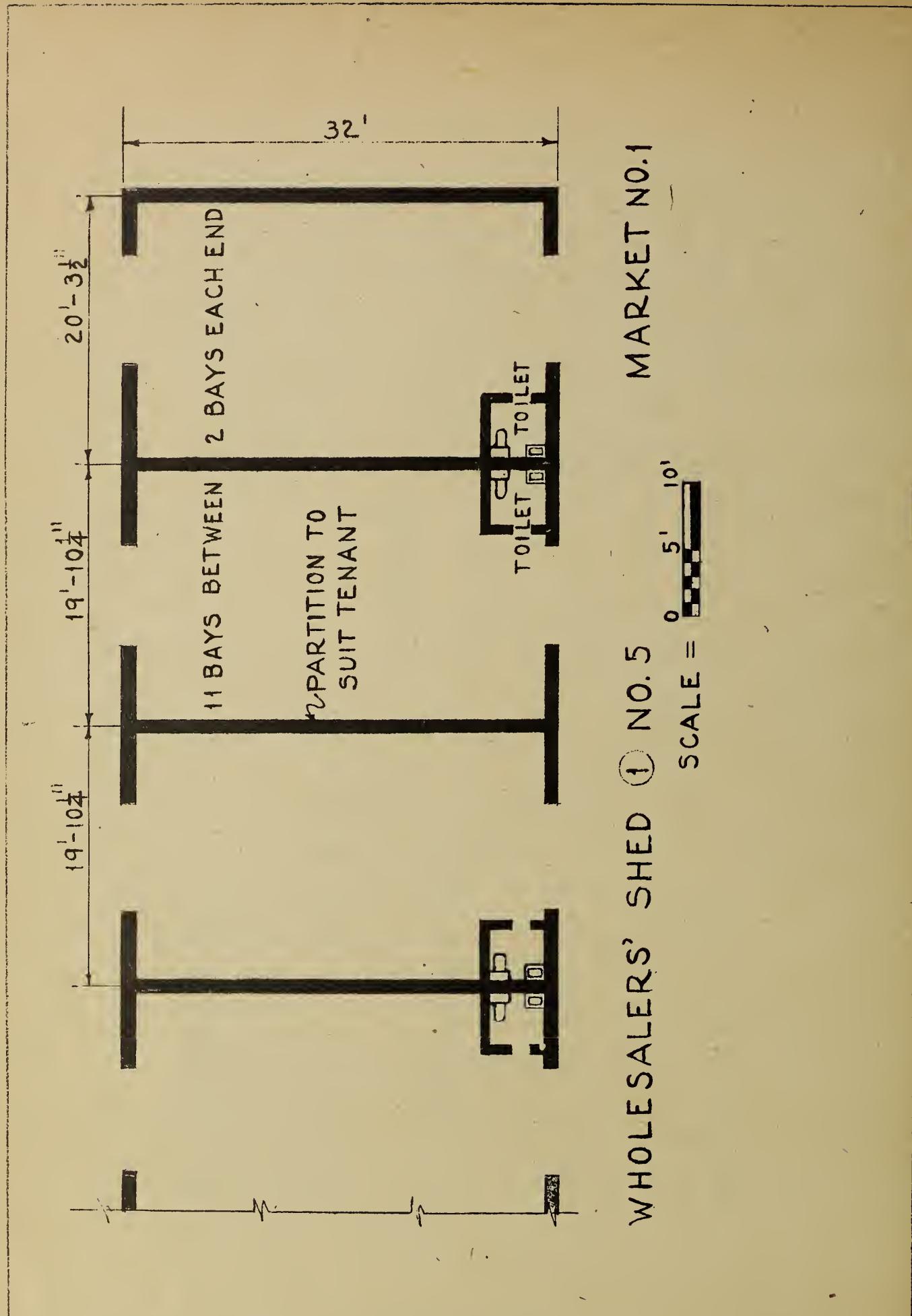
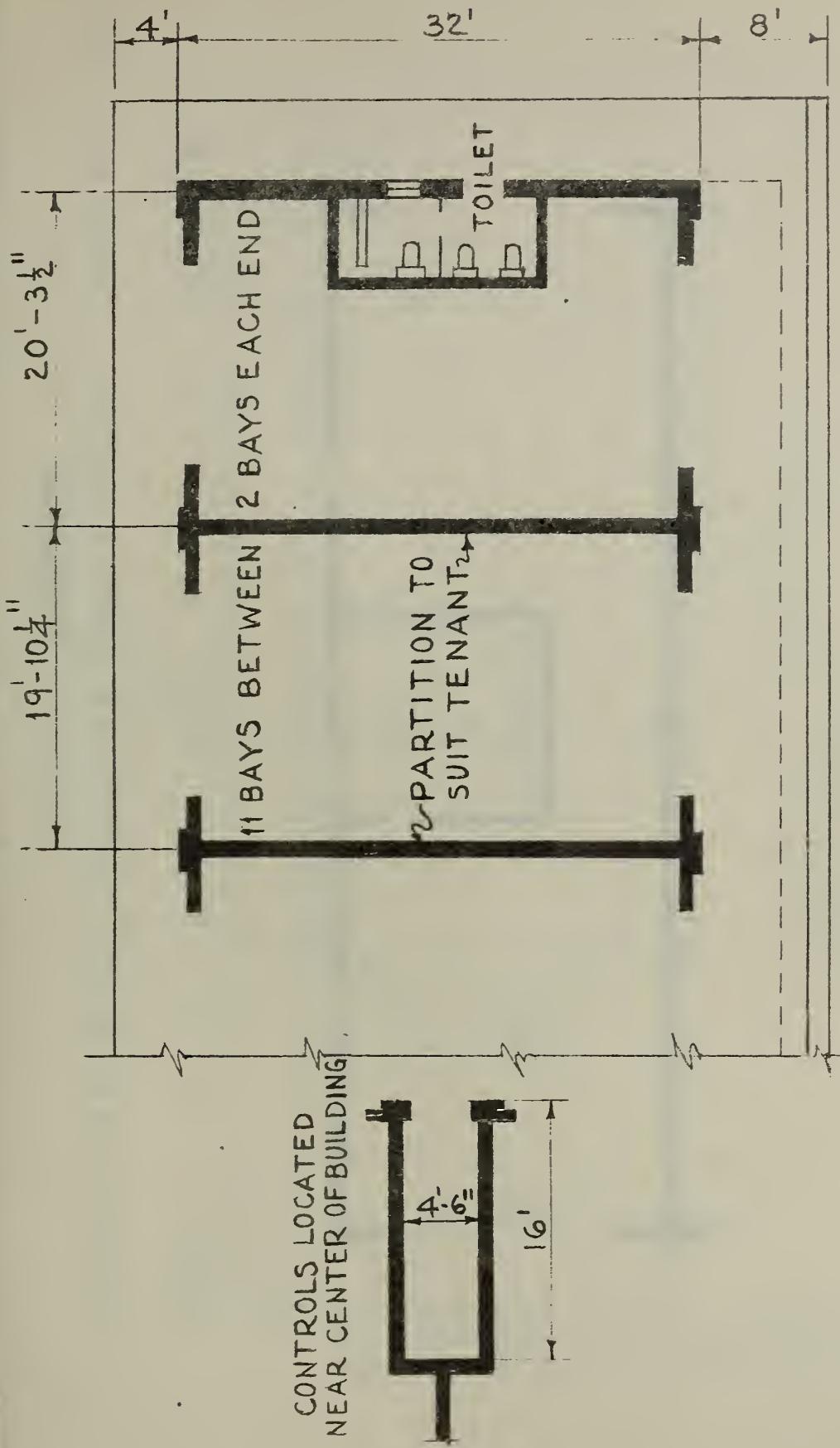


FIGURE 49



WHOLESALERS' SHEDS ① NOS. 2 & 4, MARKET NO. 1
 SCALE = 

FIGURE 50

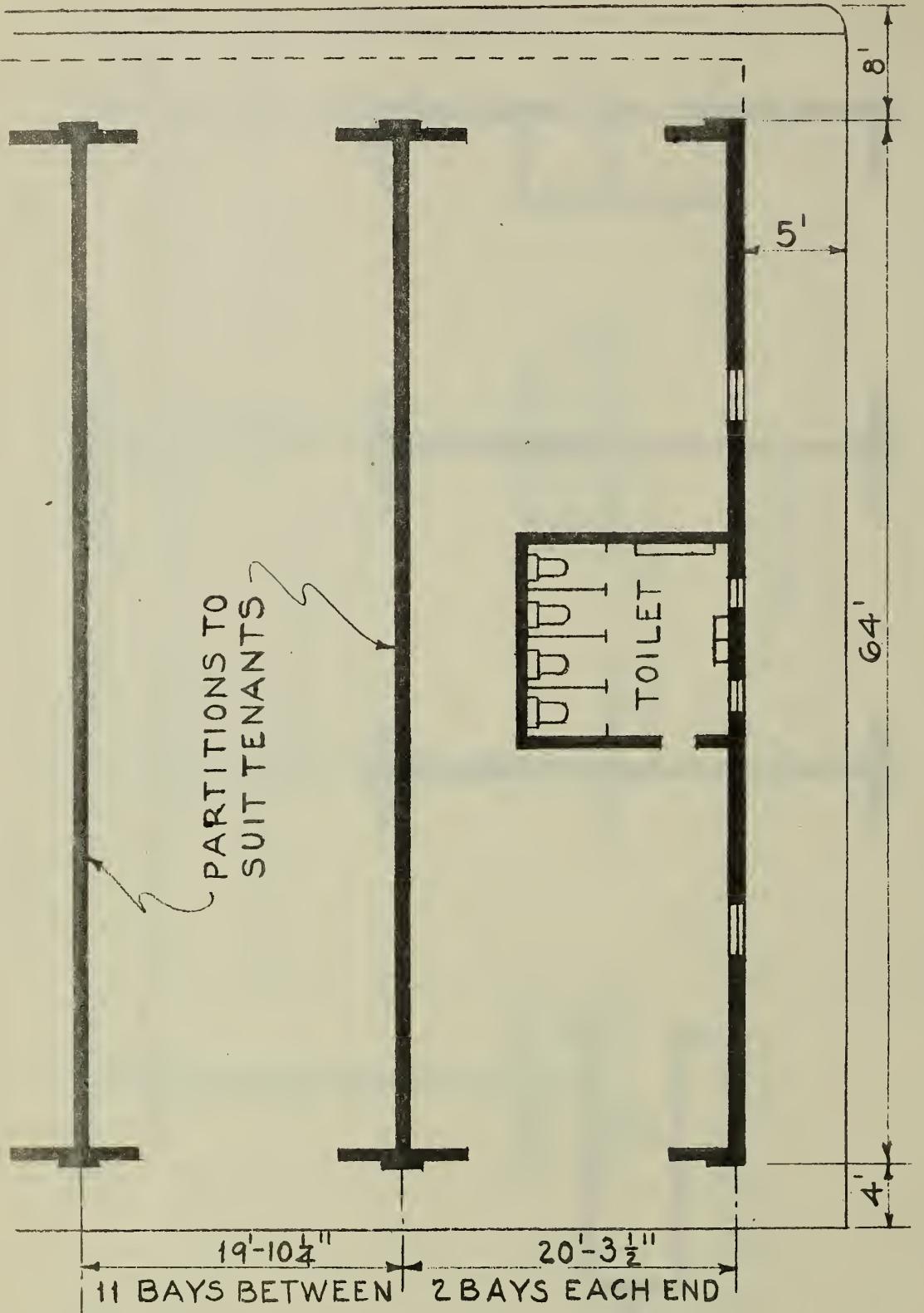


FIGURE 51

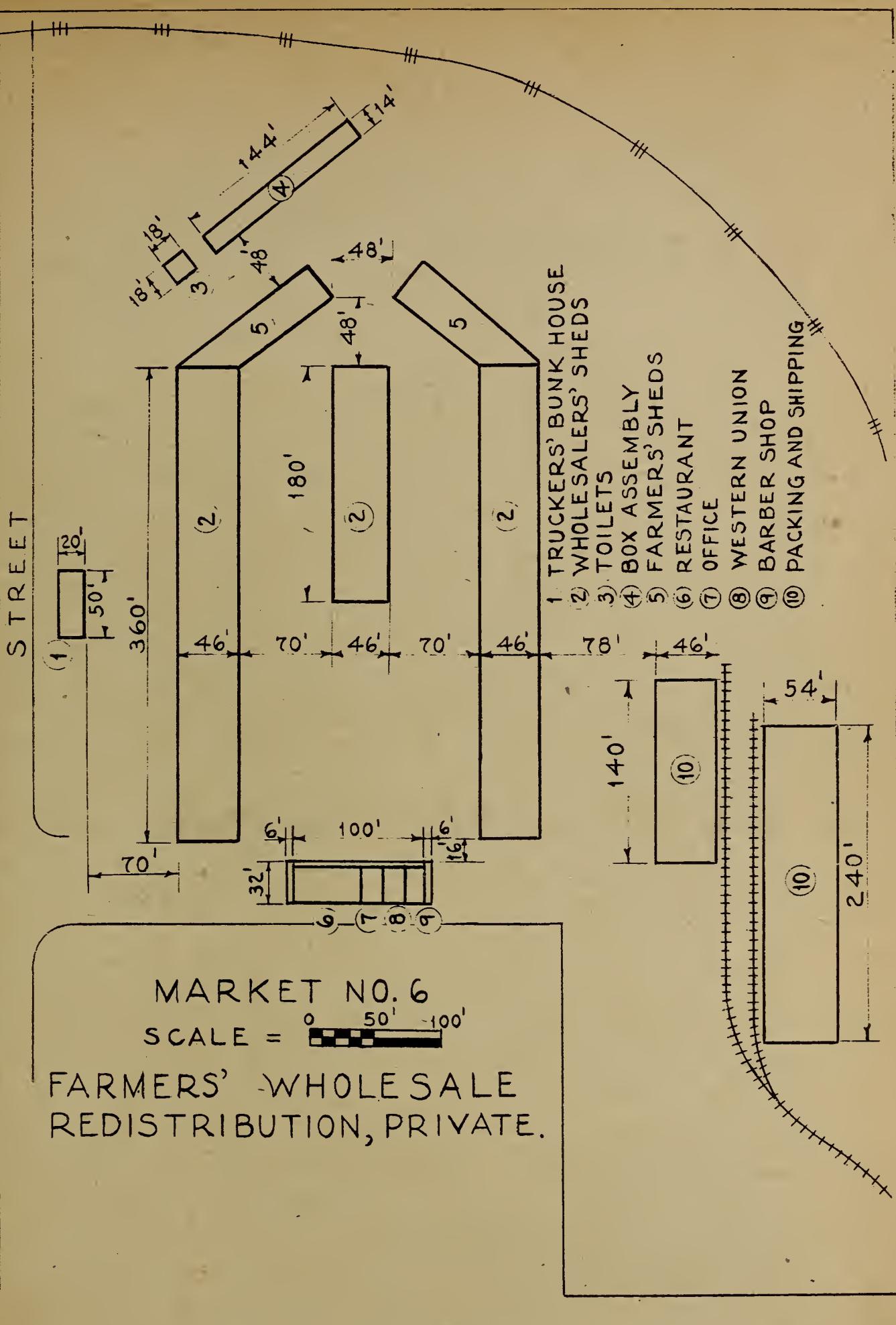


FIGURE 52

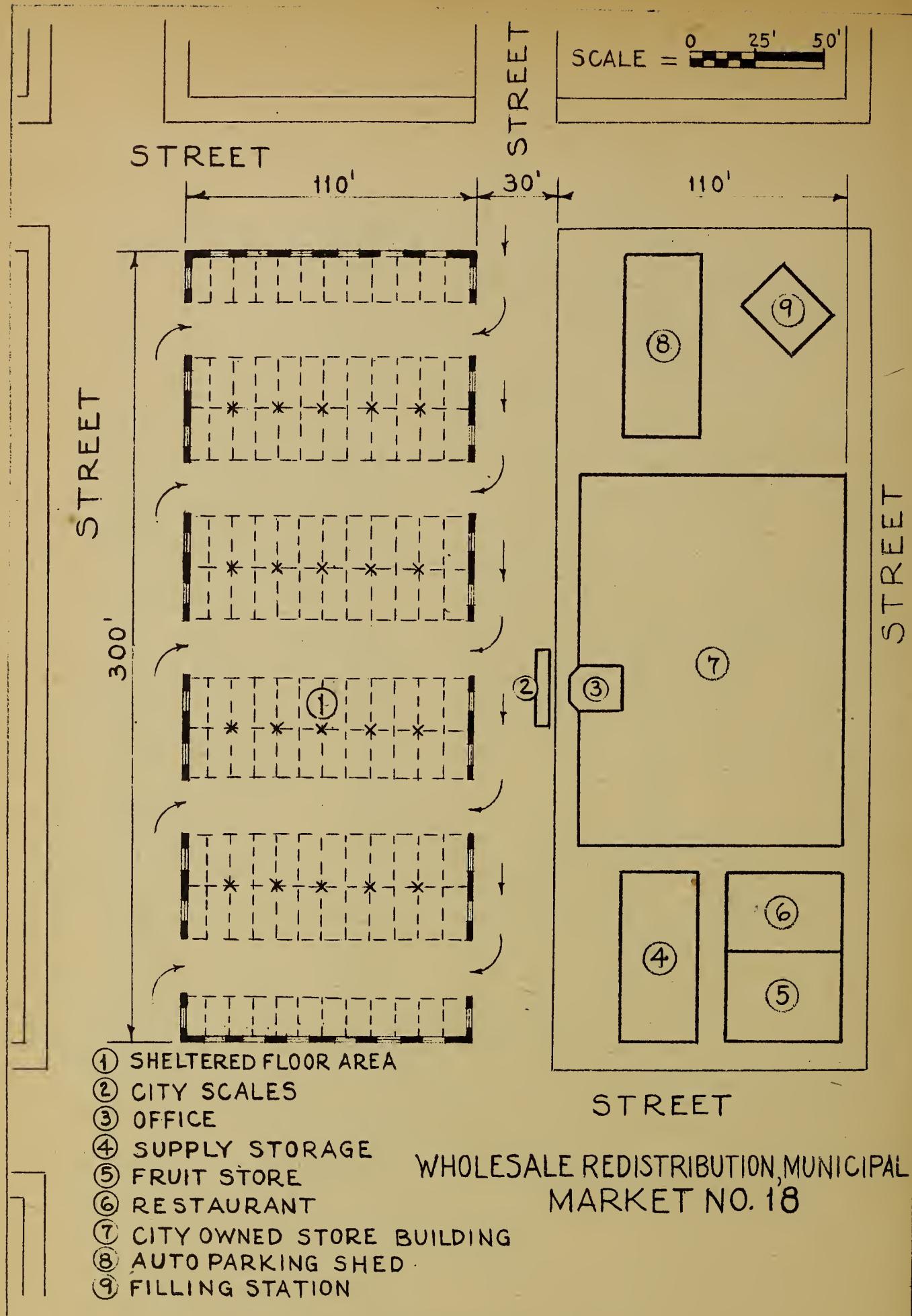
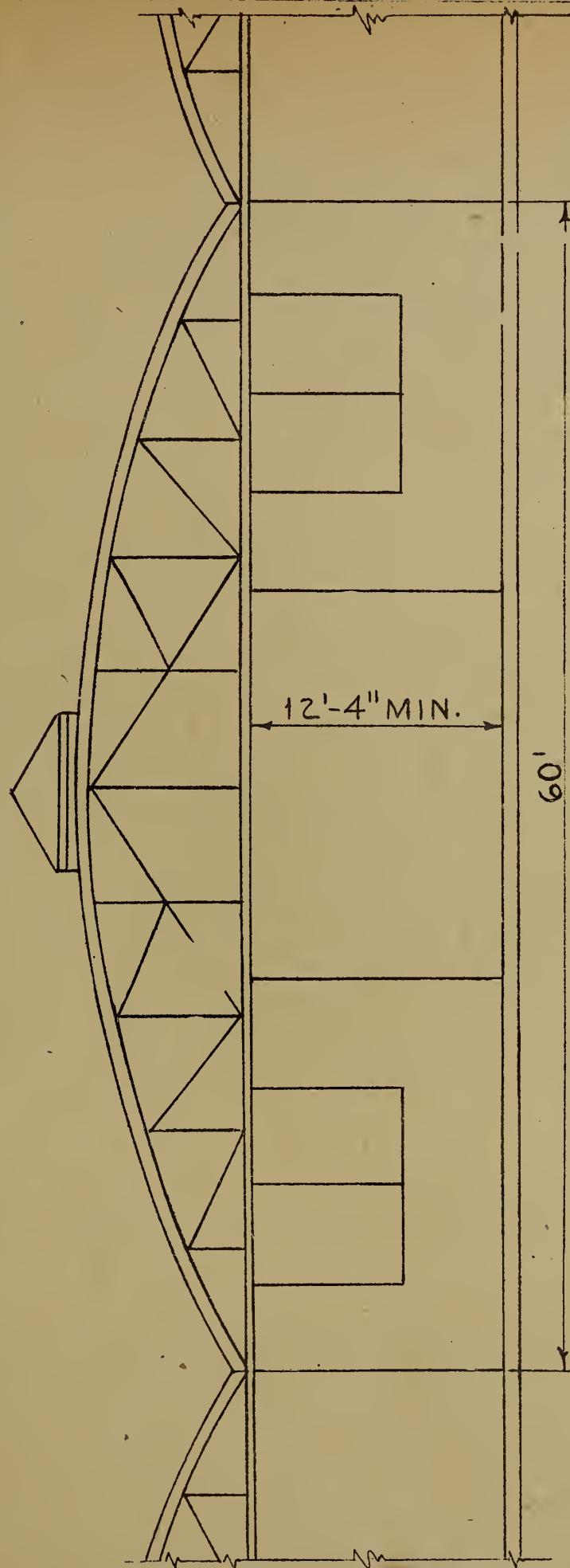


FIGURE 53



SECTIONAL FRONT ELEVATION
SCALE = 0' 4' 8'
ROOF SPAN FOR SHELTERED FLOOR RENTED BY WHOLE SALERS,
MARKET NO. 18

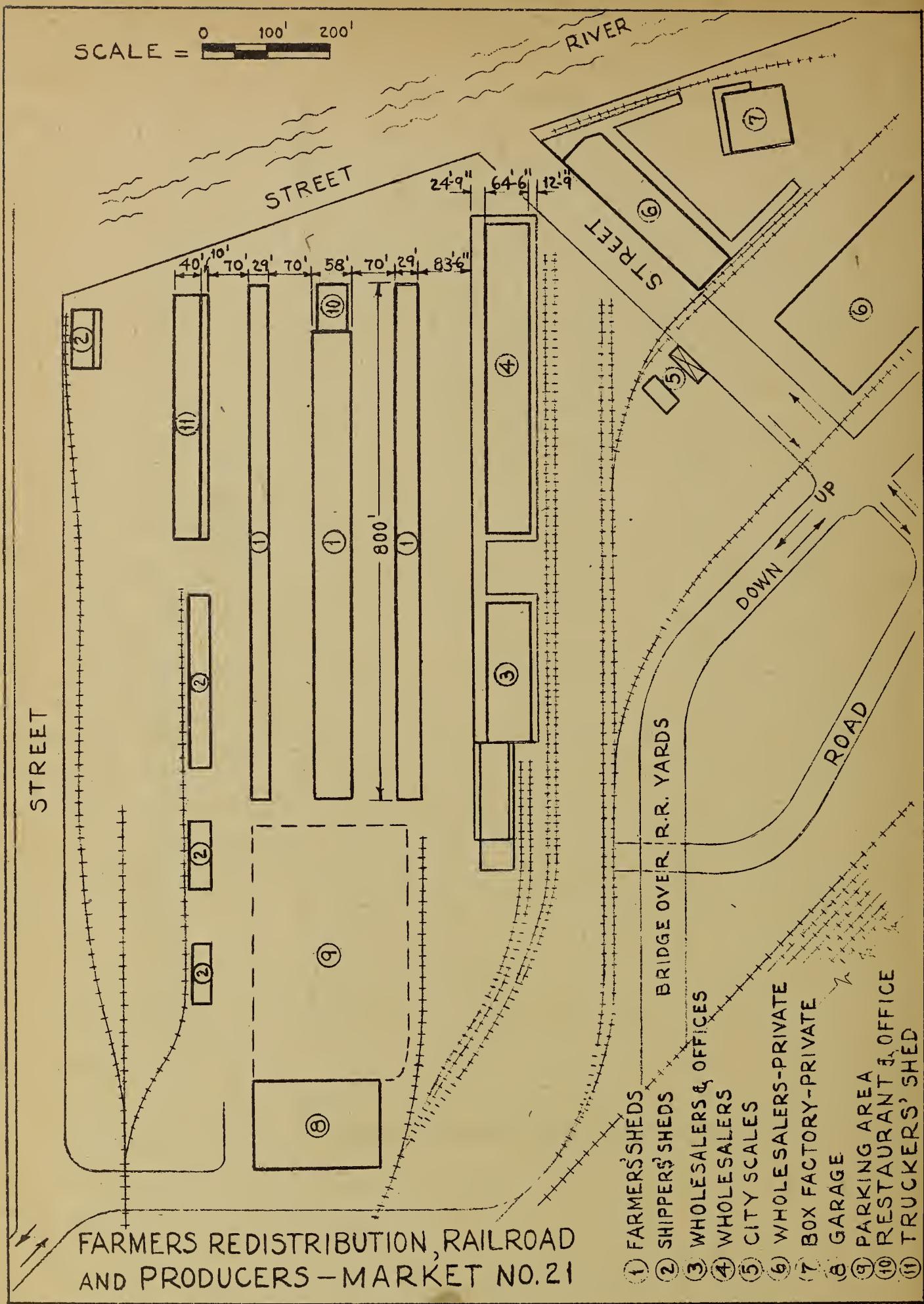


FIGURE 55

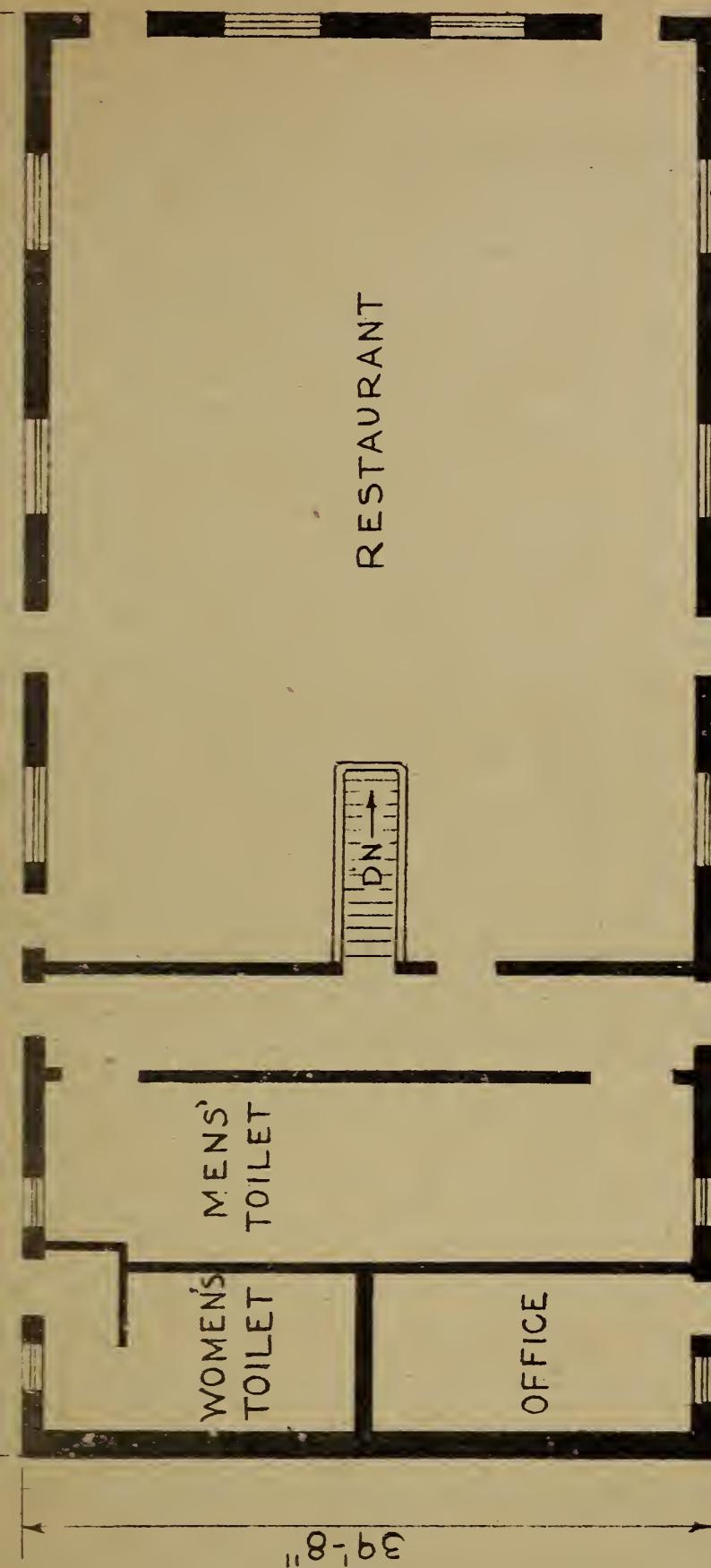
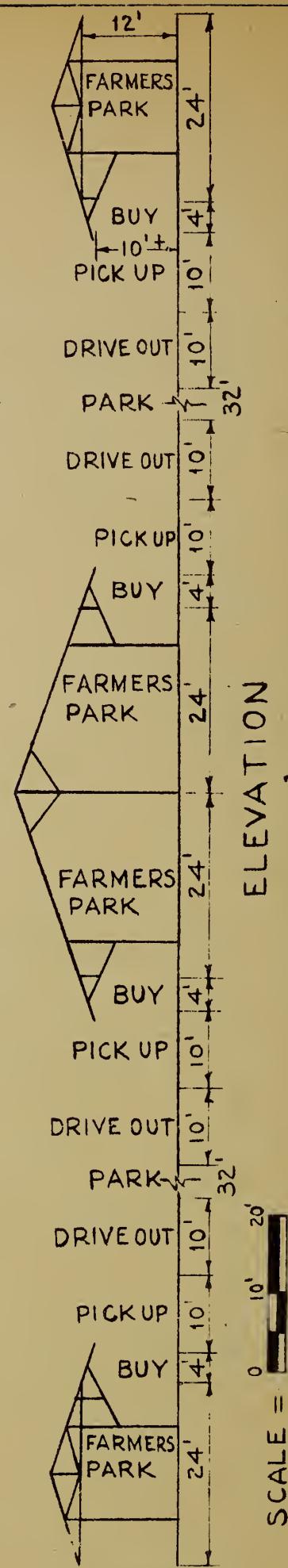
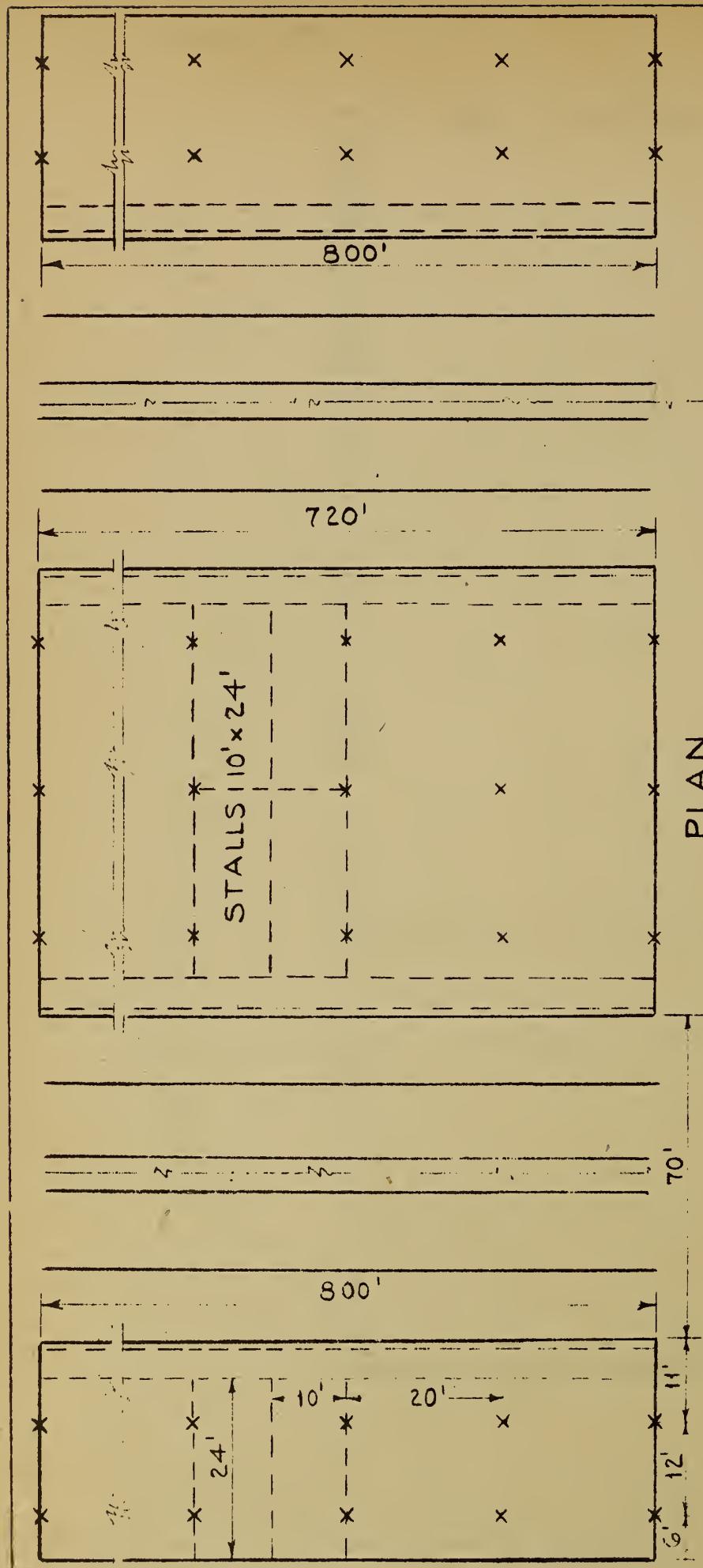


FIGURE 56

FLOOR PLAN
SCALE = 0' 5' 10'

ADMINISTRATION BUILDING MARKET NO. 21

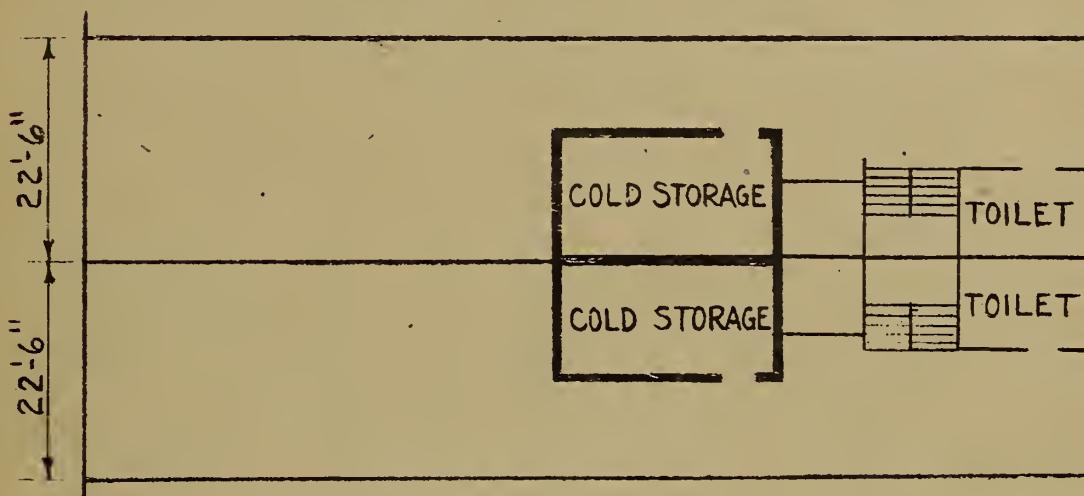
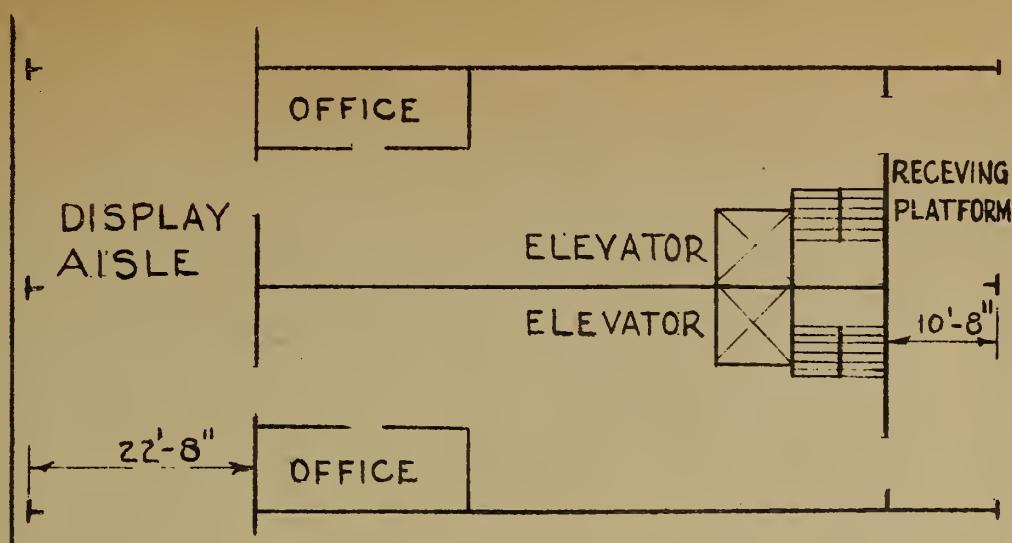


FARMERS' SHEDS, MARKET NO. 21.

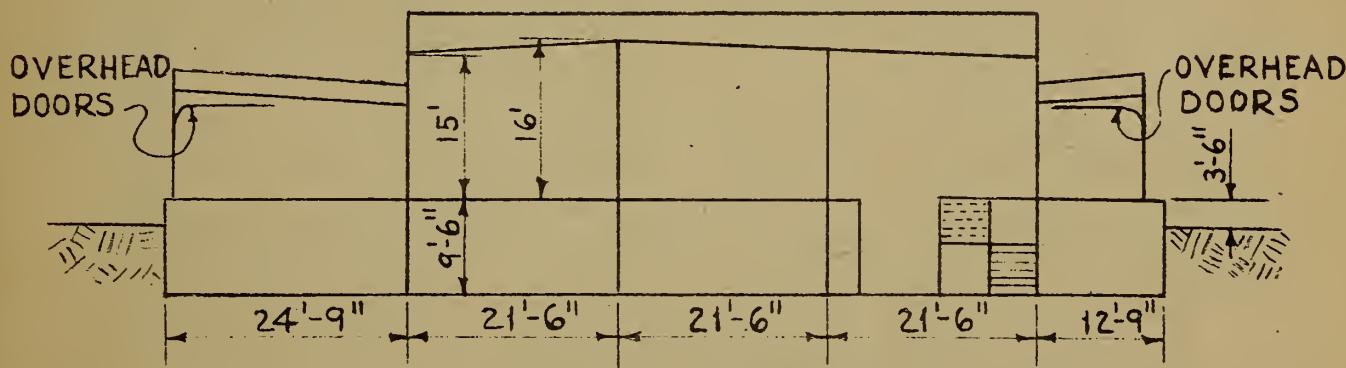
ELEVATION

SCALE =

FIGURE 57



BASEMENT PLAN

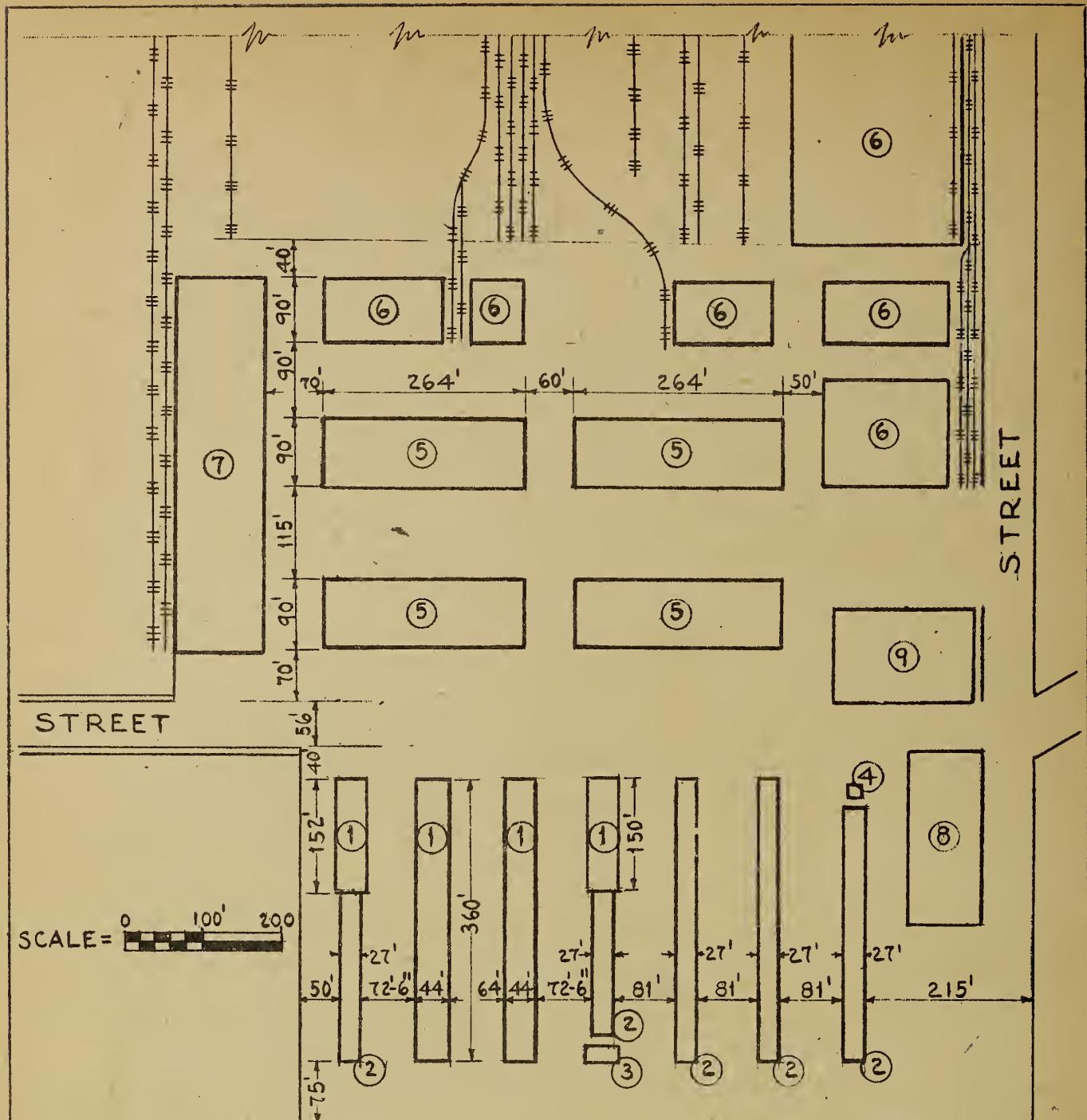


END ELEVATION

SCALE = 0 10' 20'

WHOLESALE'S BUILDING, TYPICAL SECTION AND FLOOR PLANS.
MARKET NO. 21

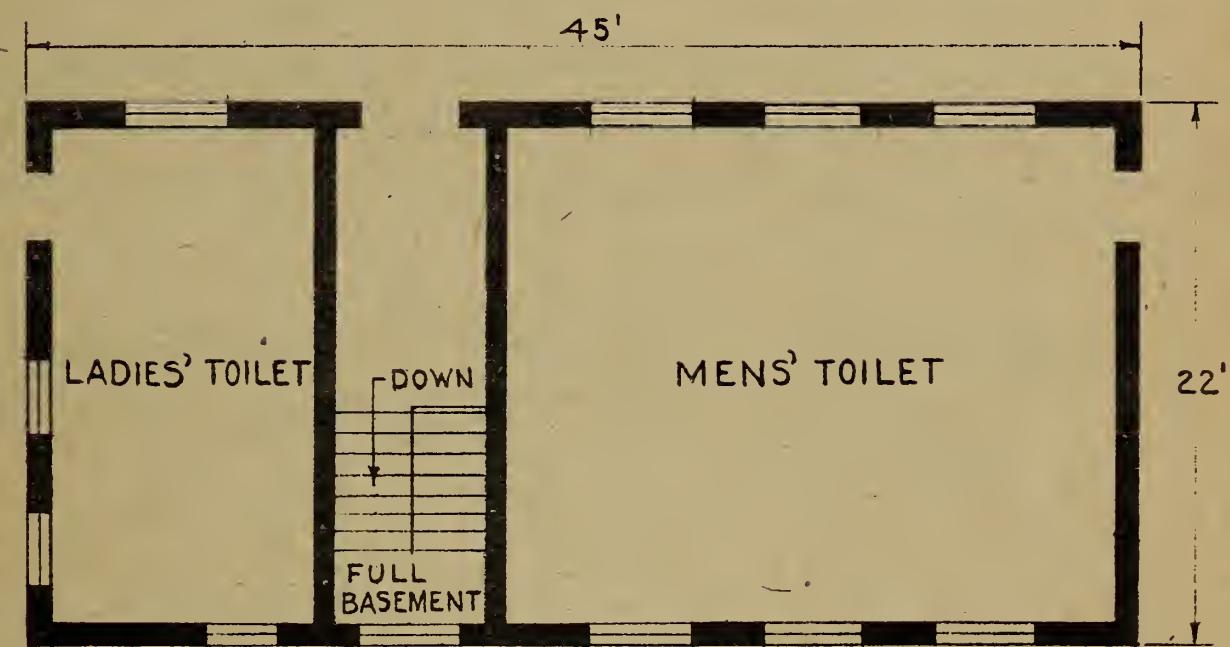
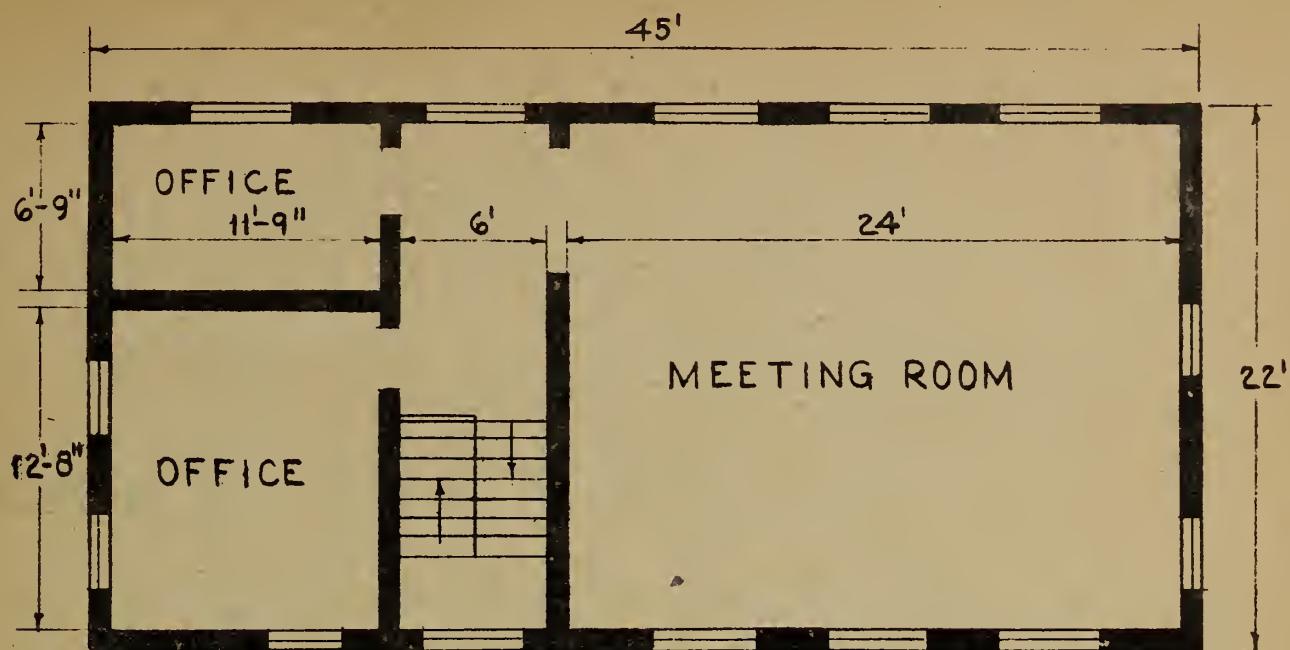
FIGURE 58



① FARMERS' SHEDS	⑥ WHOLESALE GROCERY FIRMS- PRIVATE.
② CURB STALLS	⑦ WHOLESALE BUTTER, EGGS AND STAPLES- PRIVATE
③ ADMINISTRATION BUILDING	⑧ FARM SUPPLIES - PRIVATE
④ FILLING STATION	⑨ FIRE STATION AND DWELLINGS
⑤ WHOLESALERS' BUILDINGS	

FARMERS' WHOLESALE REGIONAL-RAILROAD AND
FARMERS' COOPERATIVE - MARKET NO. 22.

FIGURE 59

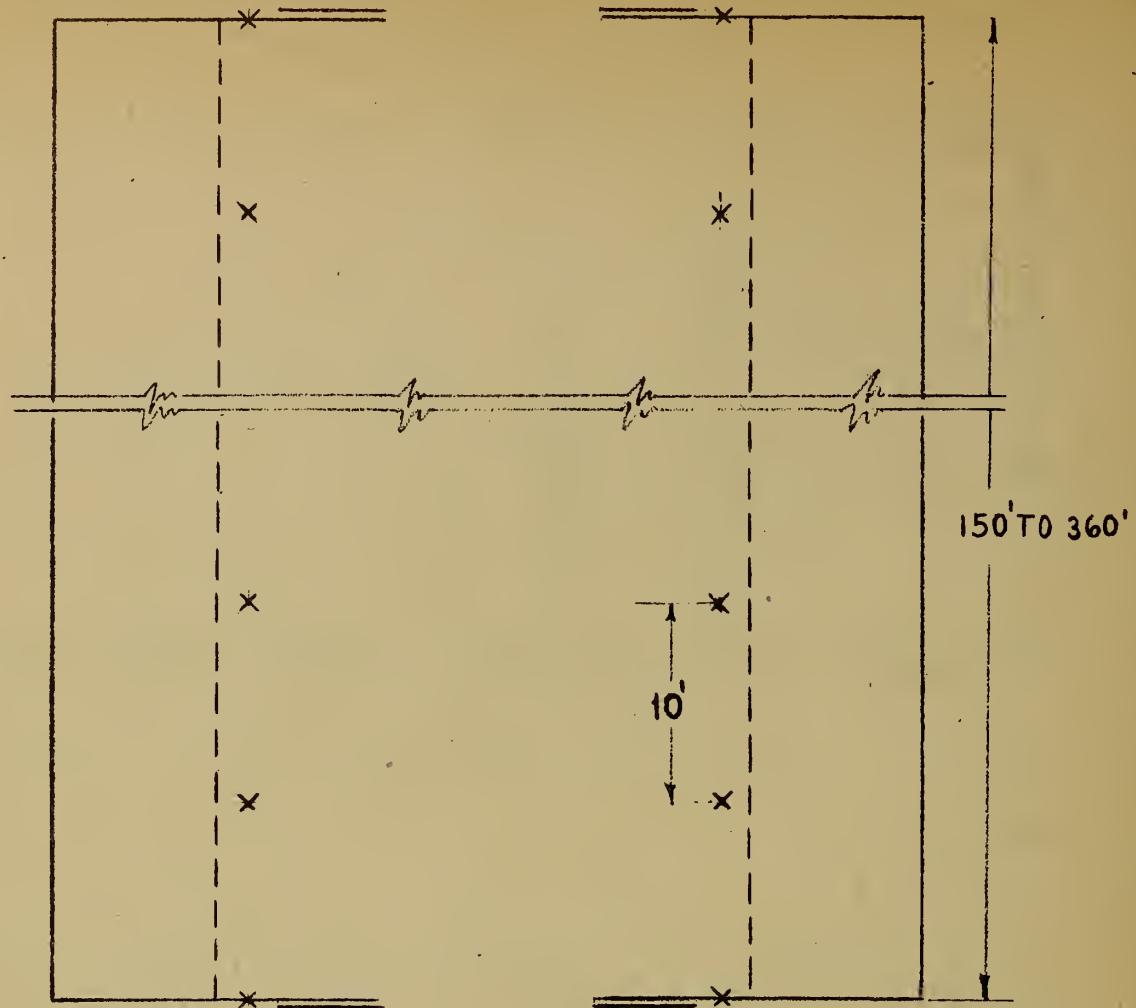


FIRST FLOOR PLAN

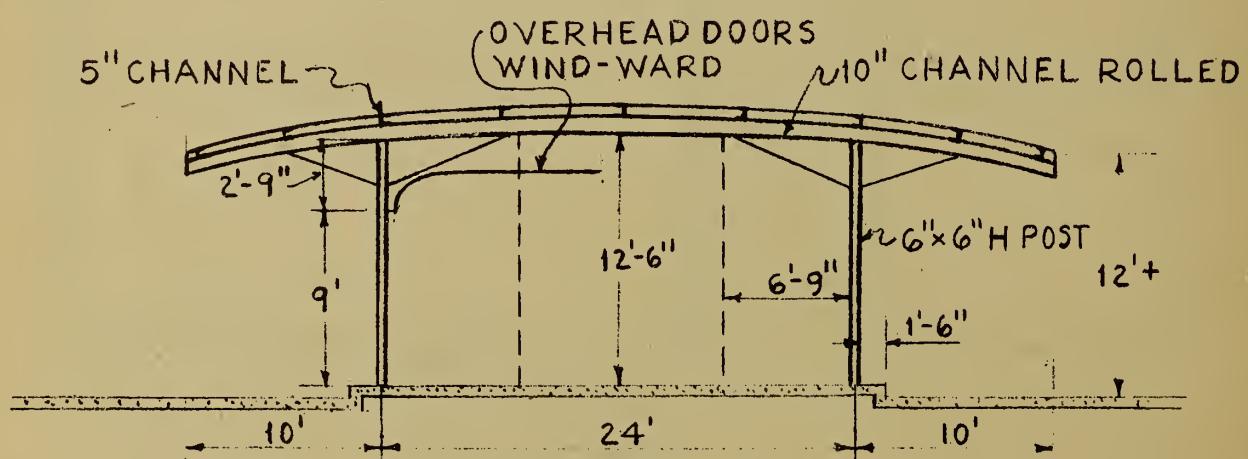
SCALE = 0' 4' 8'

ADMINISTRATION BUILDING, MARKET NO.22

FIGURE 60



FLOOR PLAN



ELEVATION

SCALE = 0 5' 10'

FARMERS' SHEDS, MARKET NO.22

FIGURE 61

FARMERS' CITY WHOLESALE, STATE AGENCY-MARKET NO.23

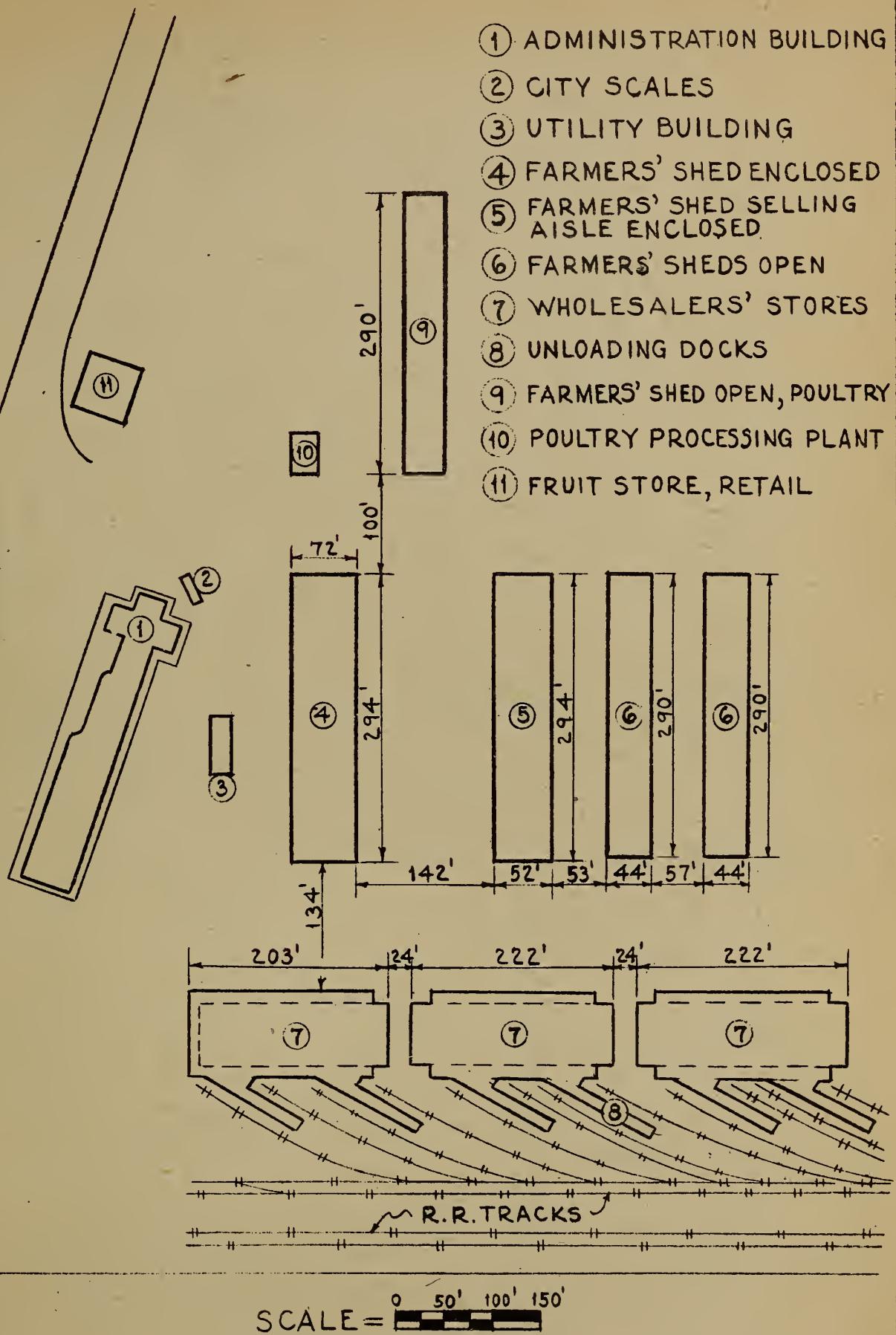


FIGURE 62

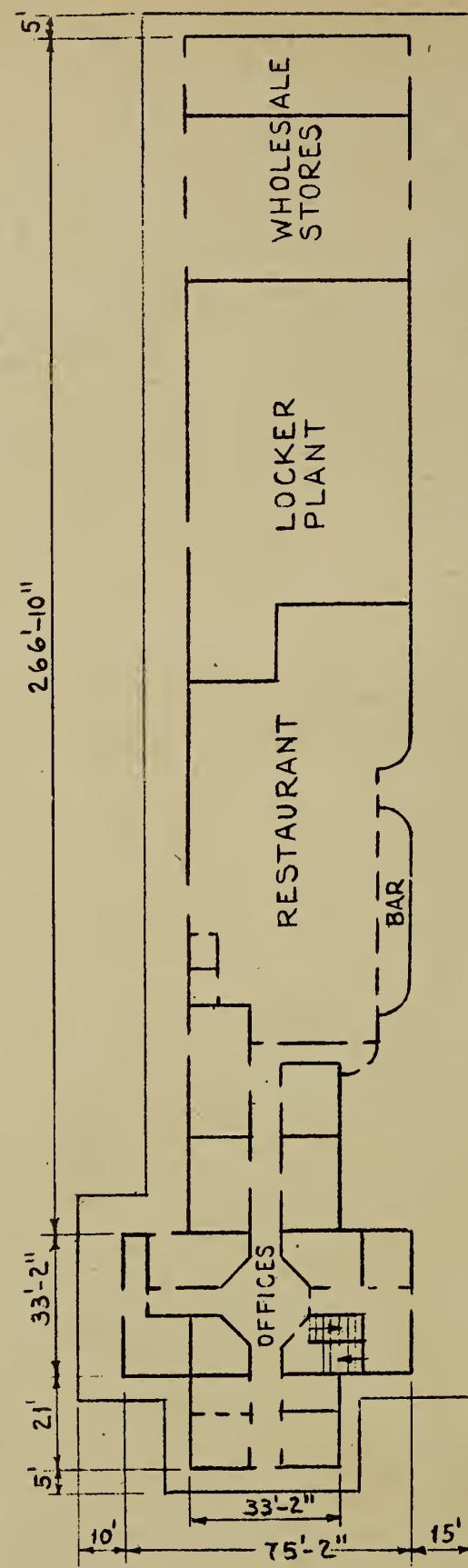
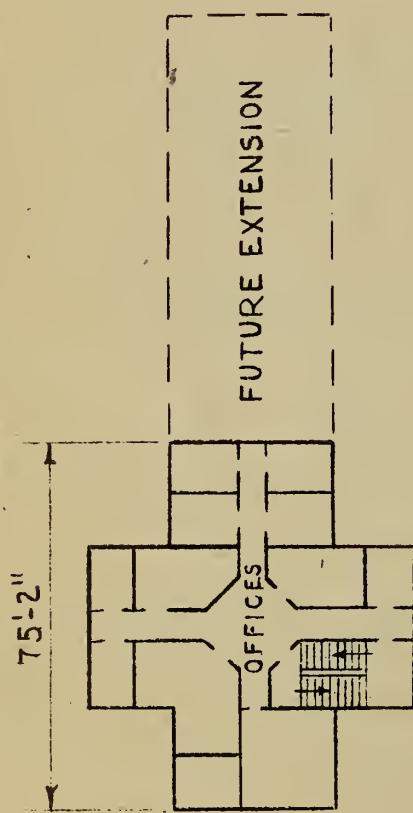
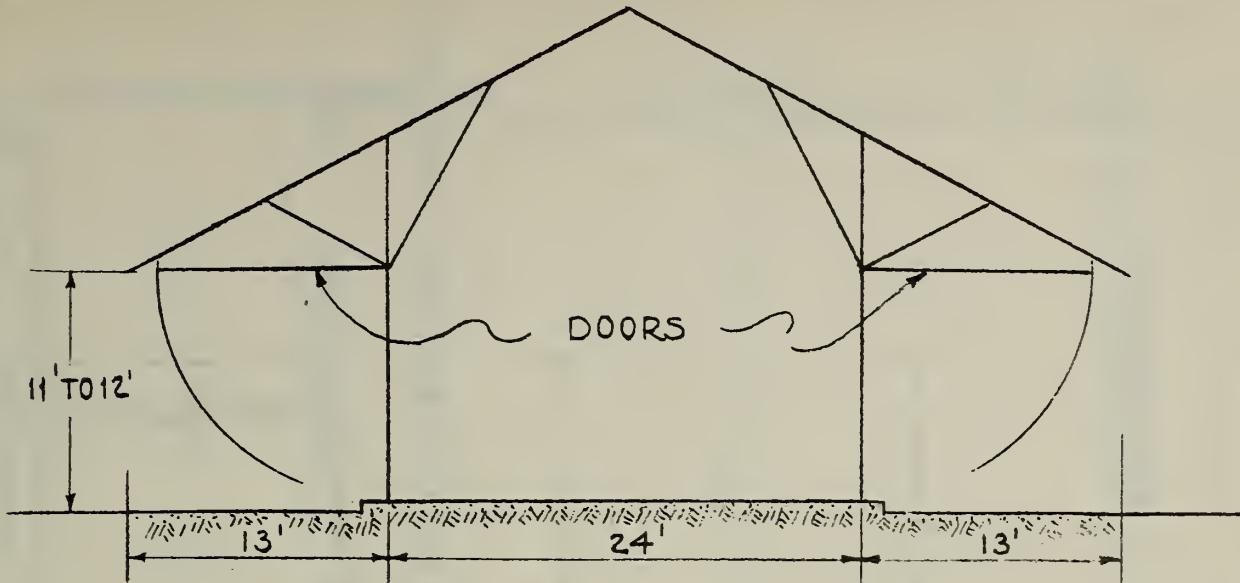


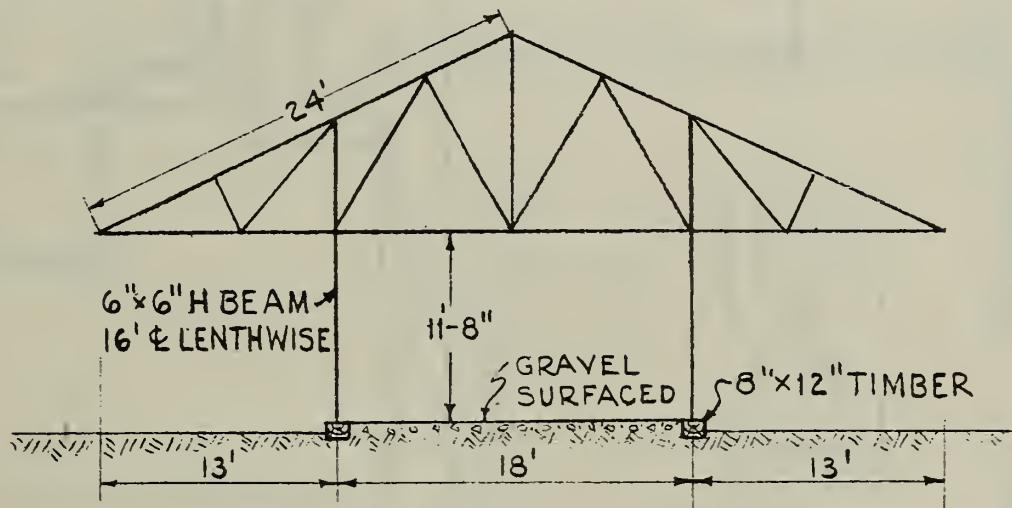
FIGURE 63

FIRST FLOOR PLAN
 SCALE = 0' 20' 40'

ADMINISTRATION BUILDING, MARKET NO. 23.

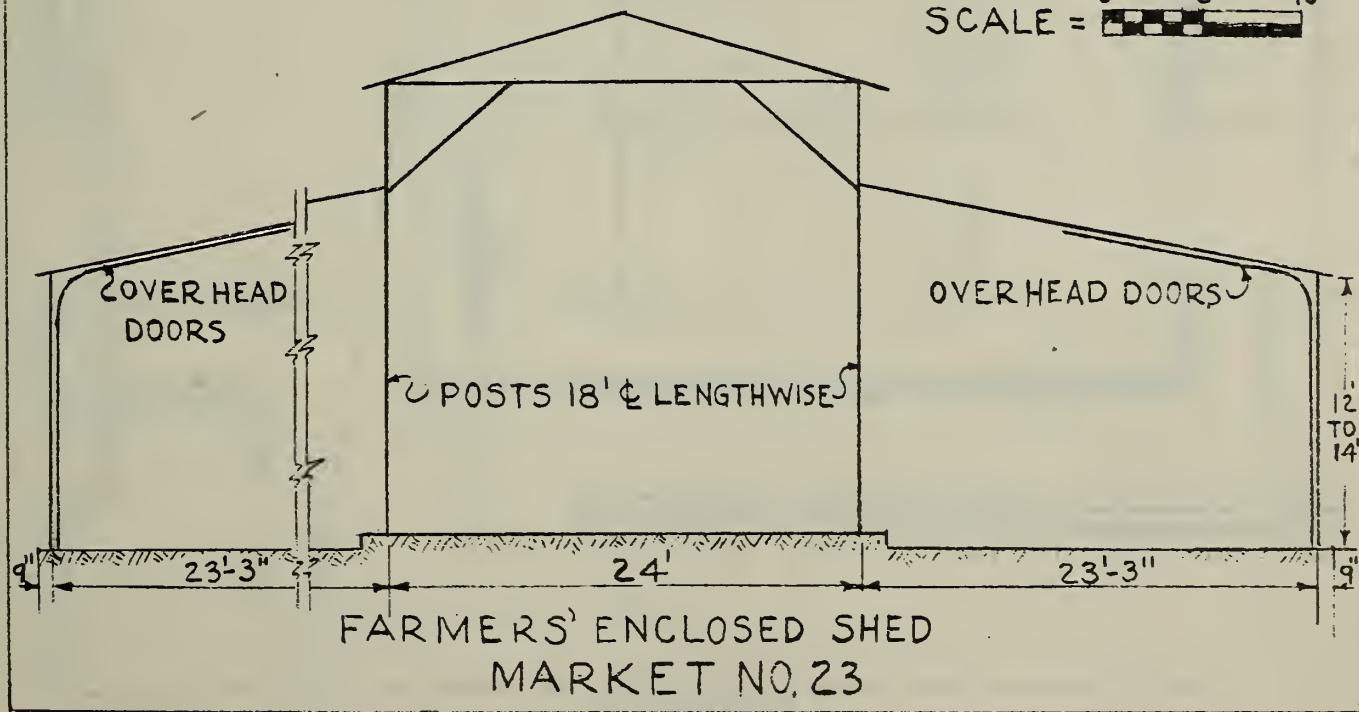


FARMERS' SHED WITH ENCLOSED SELLING AISLE



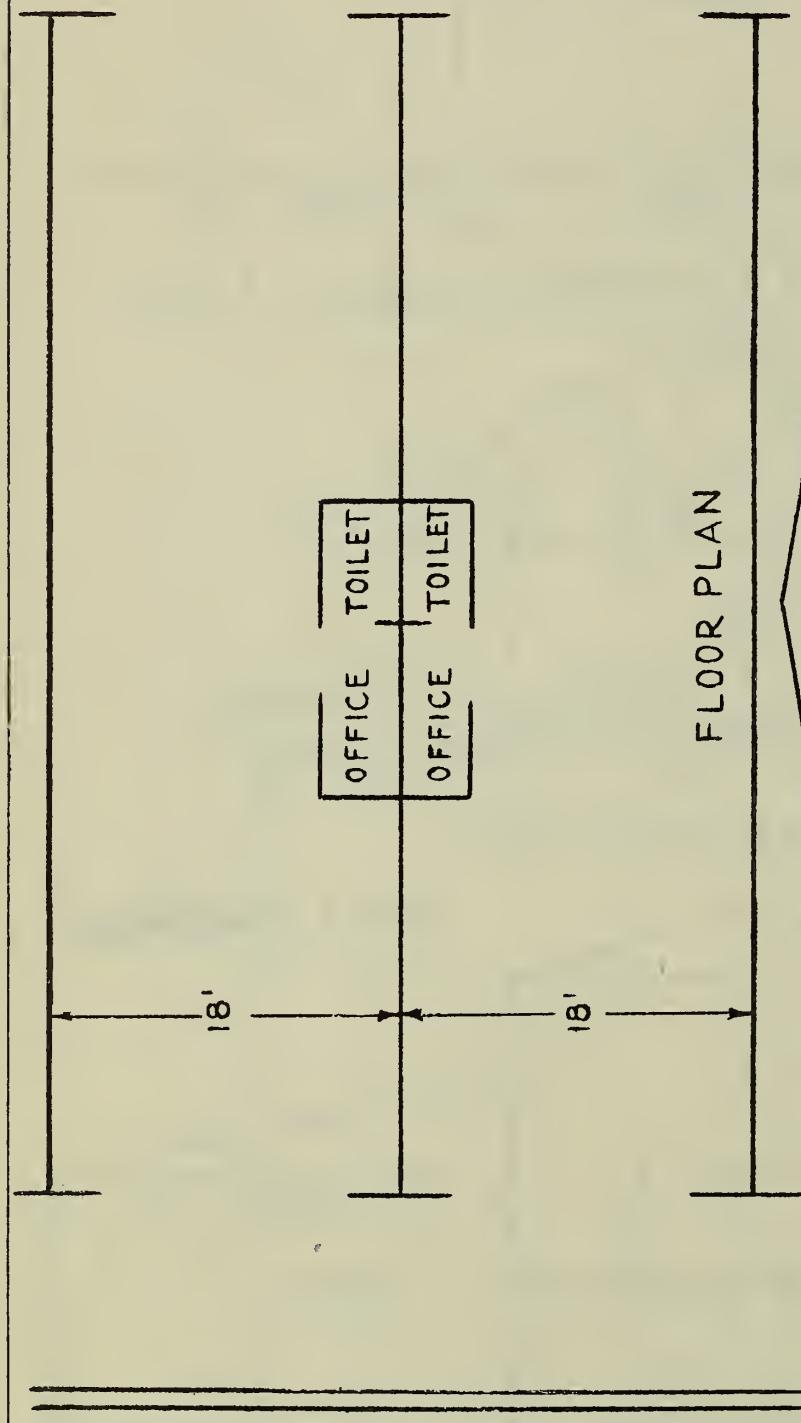
FARMERS' OPEN SHEDS

SCALE = 0 5' 10'



FARMERS' ENCLOSED SHED
MARKET NO. 23

FIGURE 64



WHOLESALERS' BUILDING, MARKET NO. 23

SCALE = 0' 5' 10'

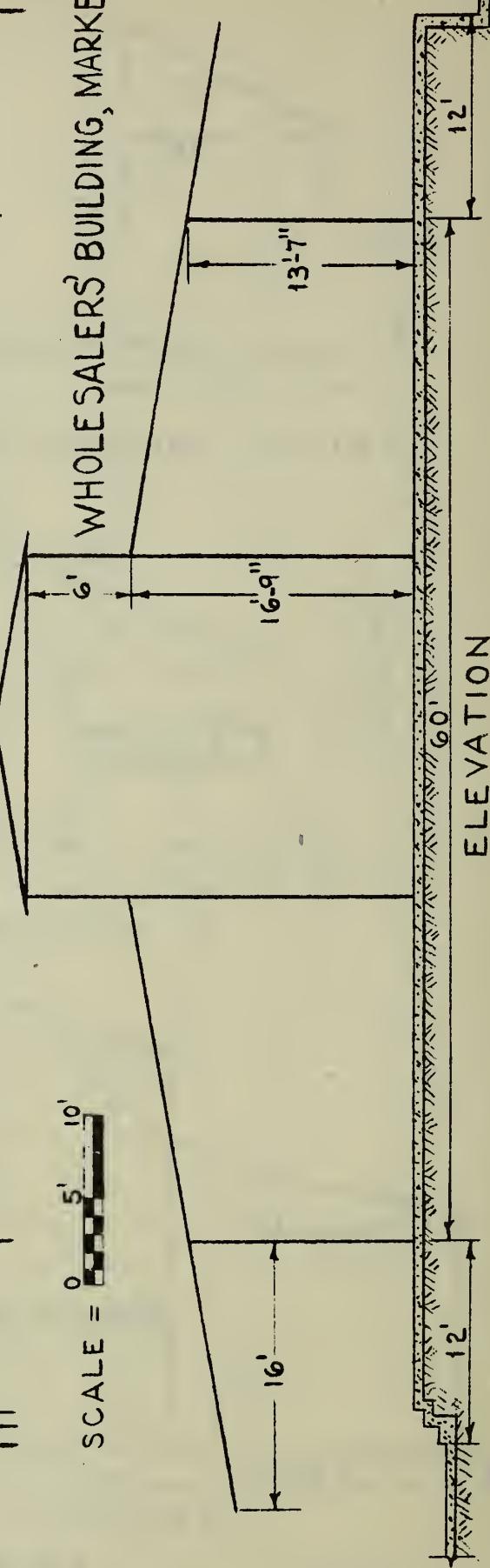


FIGURE 65

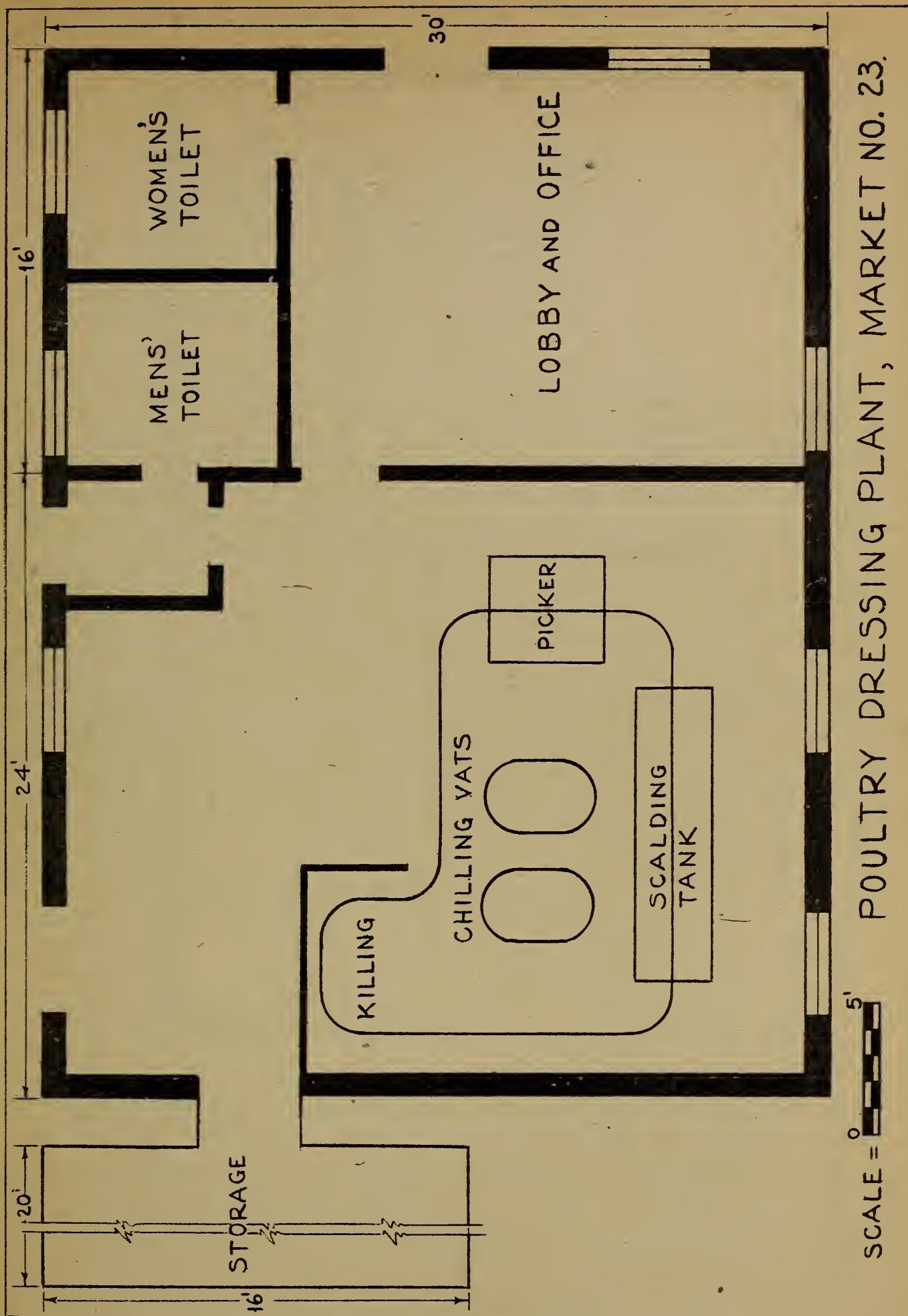


FIGURE 66

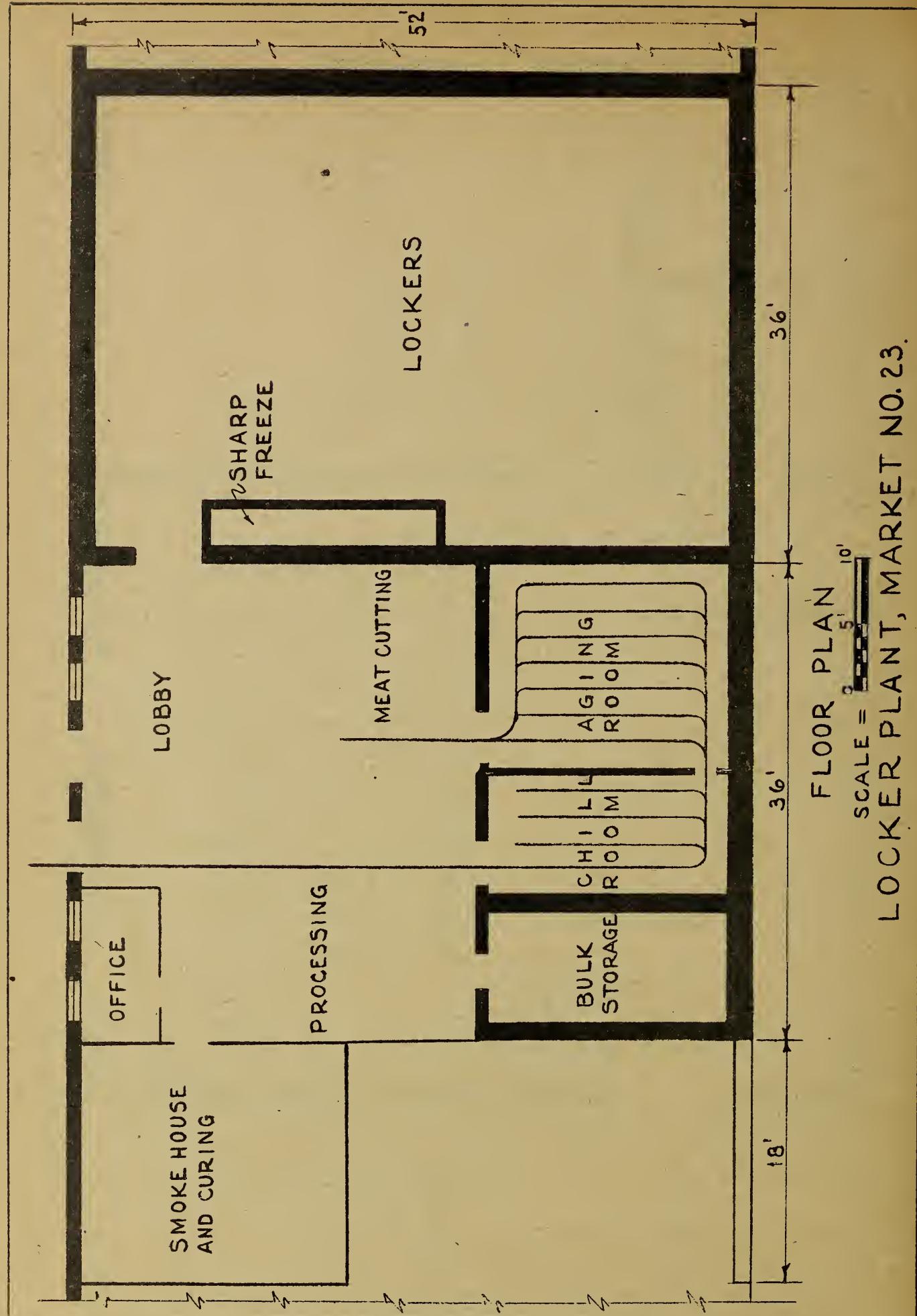


FIGURE 67

FLOOR PLAN
 SCALE = $\frac{1}{5'0''}$
 LOCKER PLANT, MARKET NO. 23.

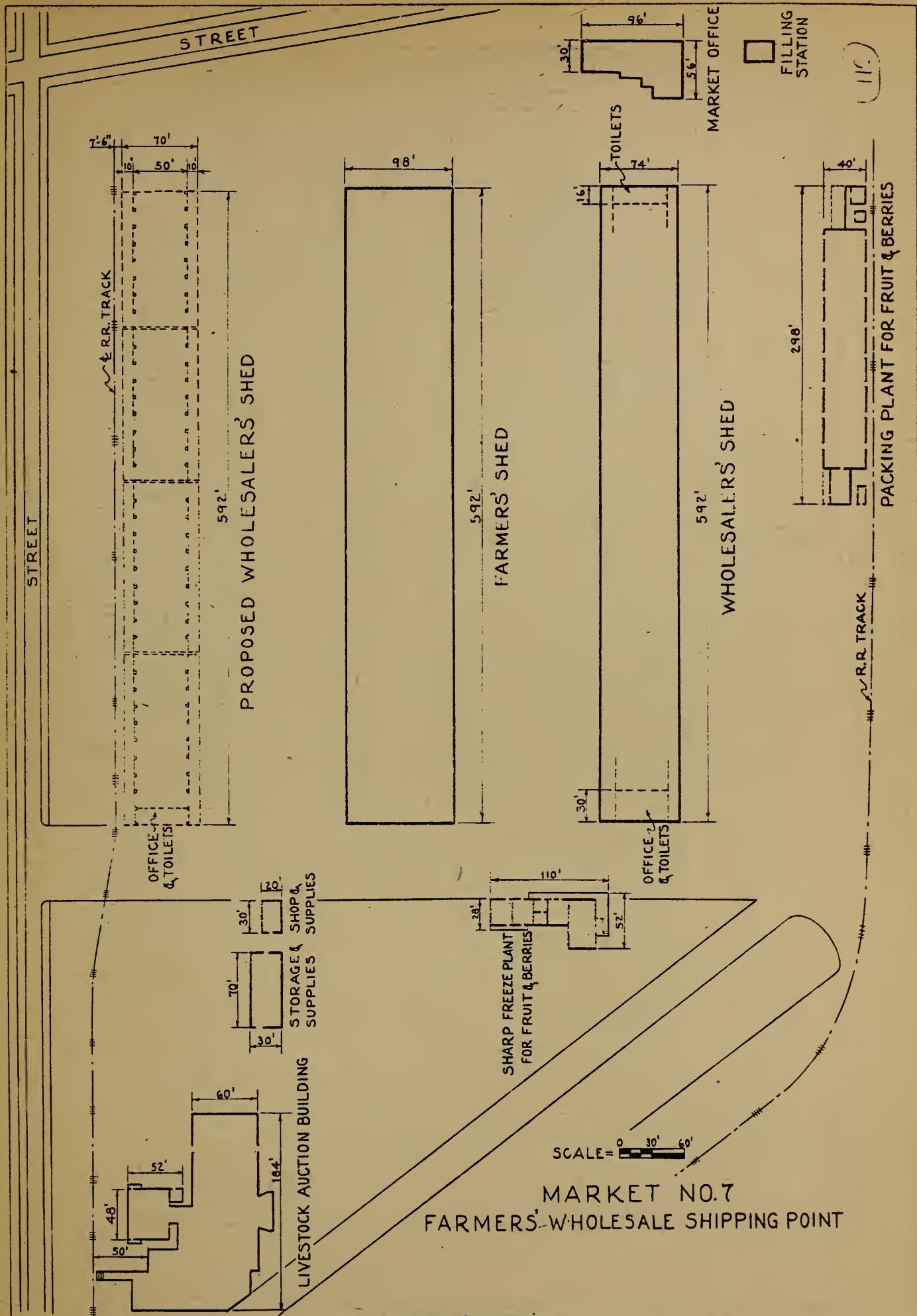


FIGURE 68

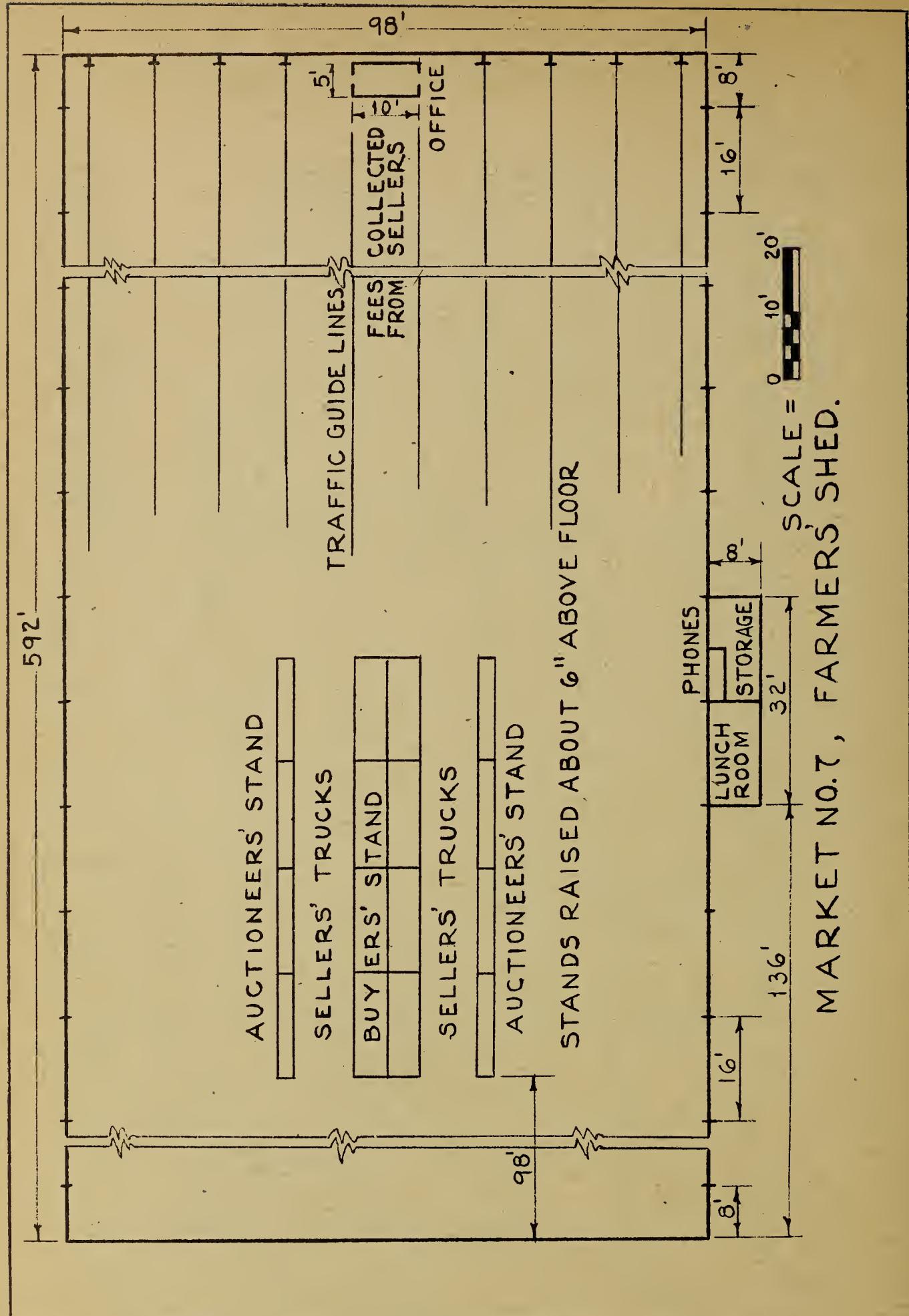
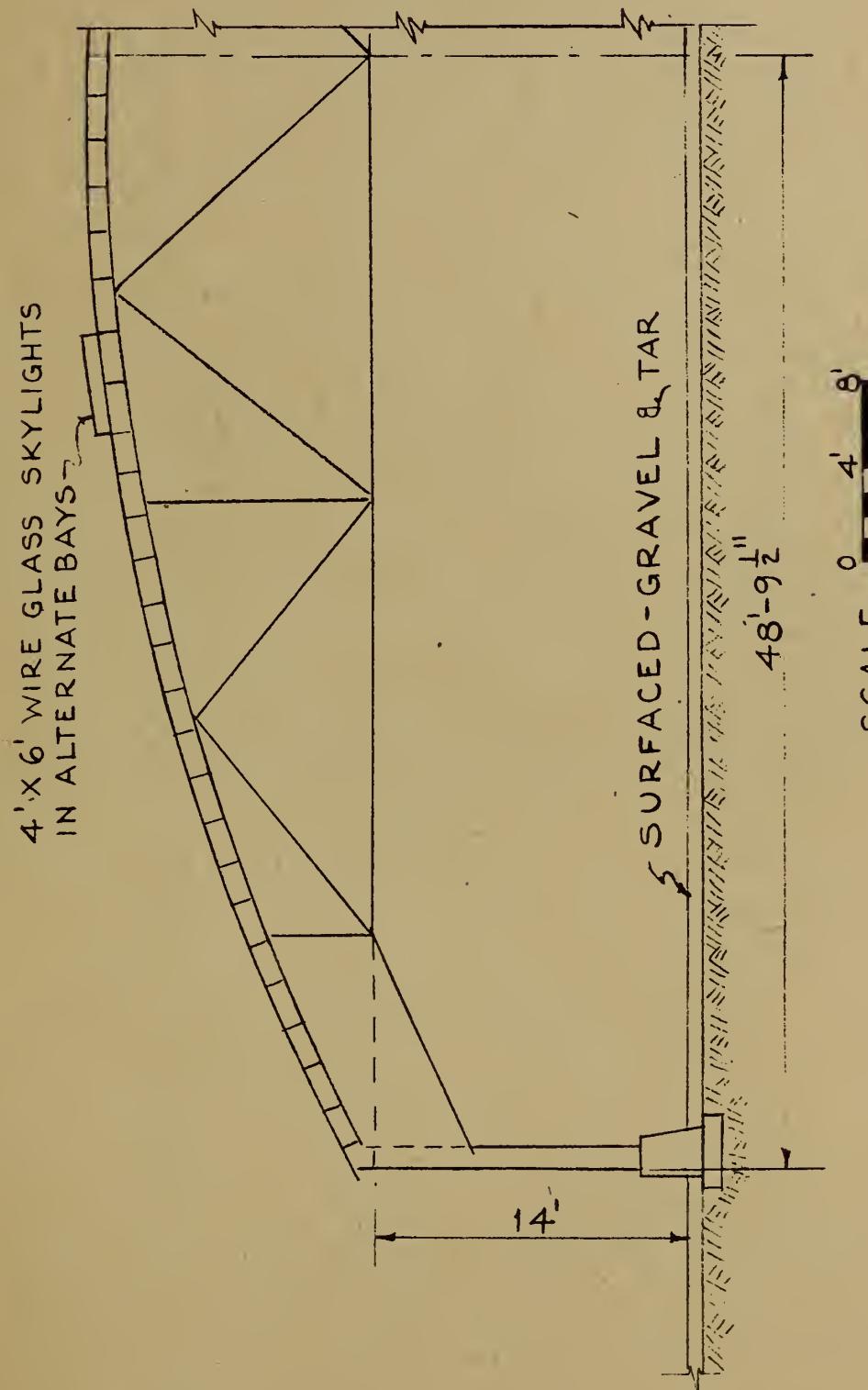
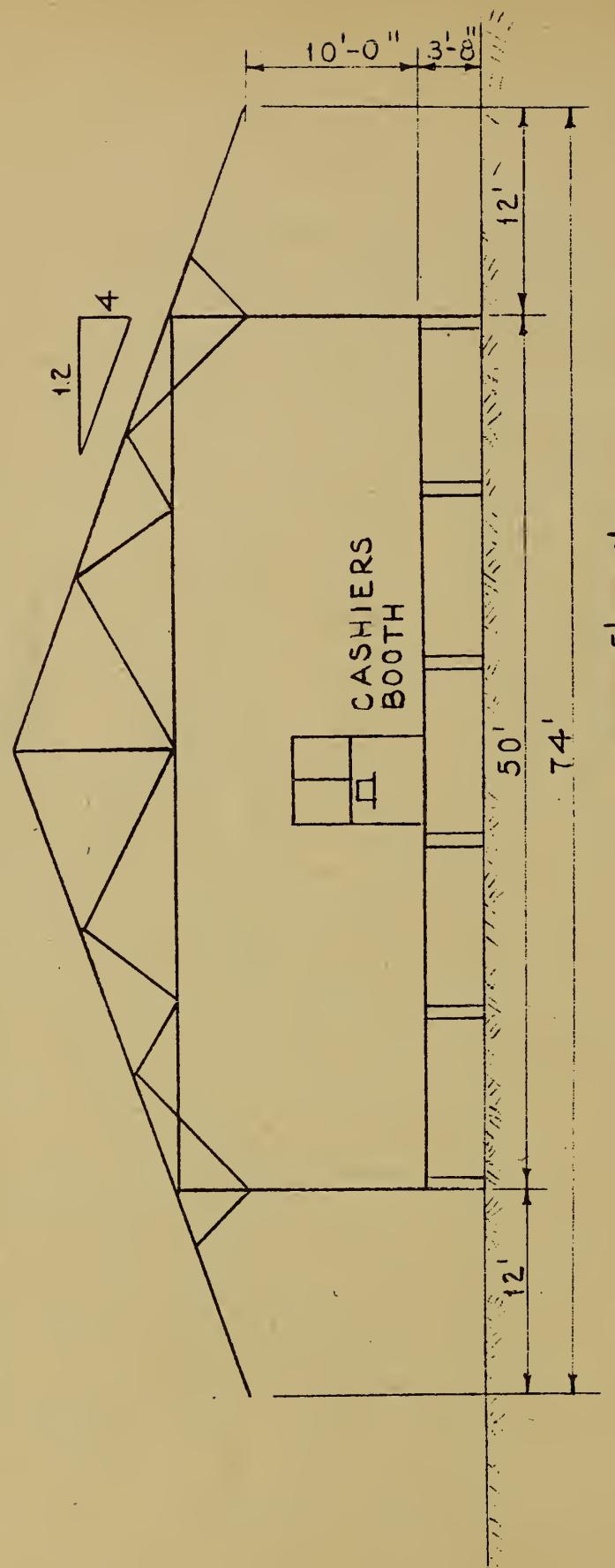


FIGURE 69



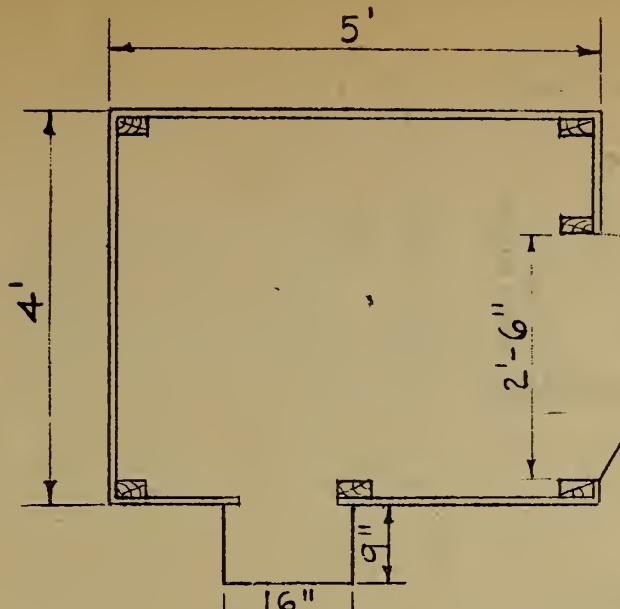
MARKET NO. 7. END ELEVATION FARMERS' SHED

FIGURE 70

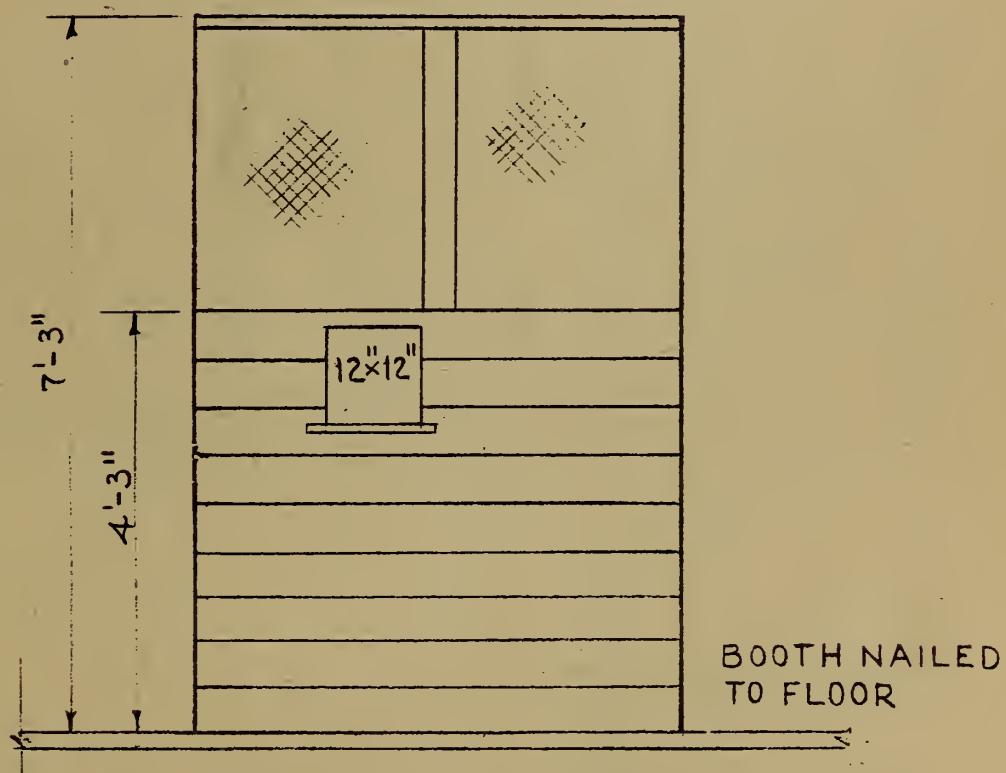


MARKET NO.7. END ELEVATION, WHOLESALERS' SHED.

FIGURE 71



PLAN

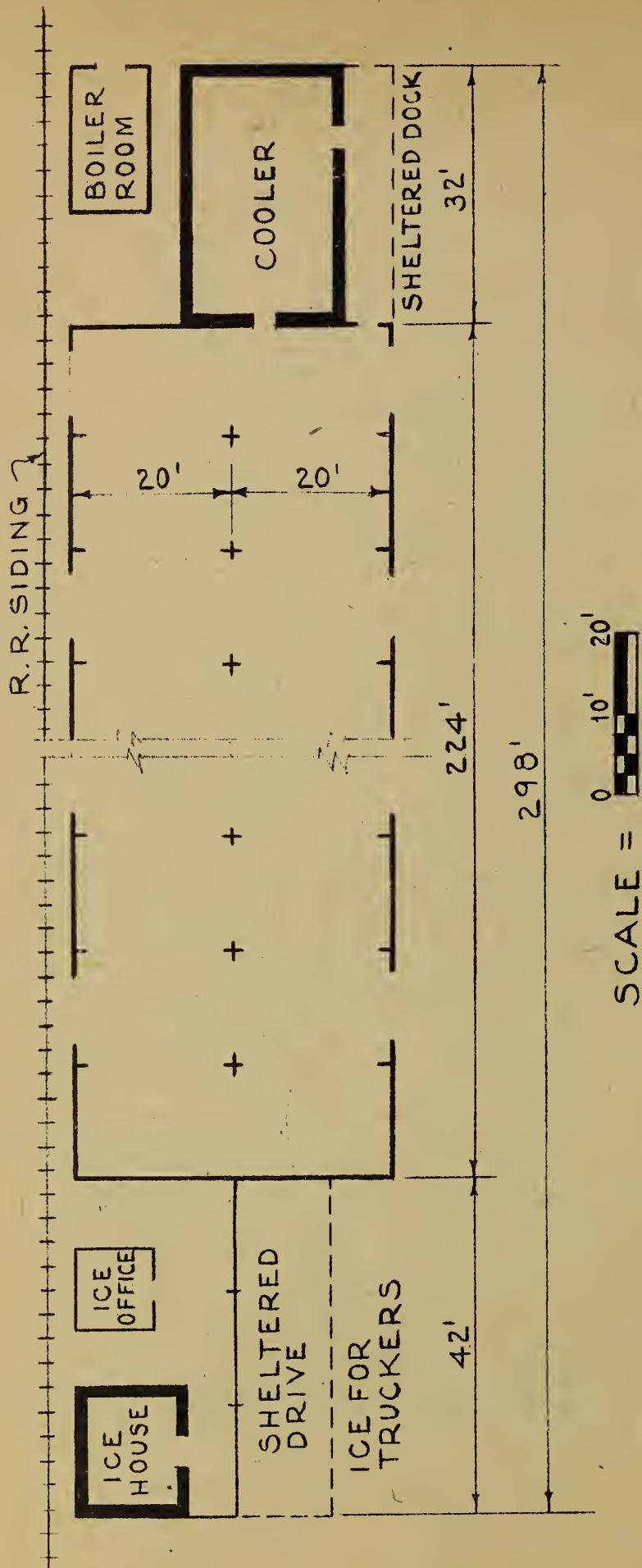


FRONT ELEVATION

SCALE = 0 1' 2'

MARKET NO. 7, CASHIERS' BOOTH FOR WHOLESALERS

FIGURE 72



MARKET NO. 7, PACKING PLANT FOR FRUIT & BERRIES

FIGURE 73

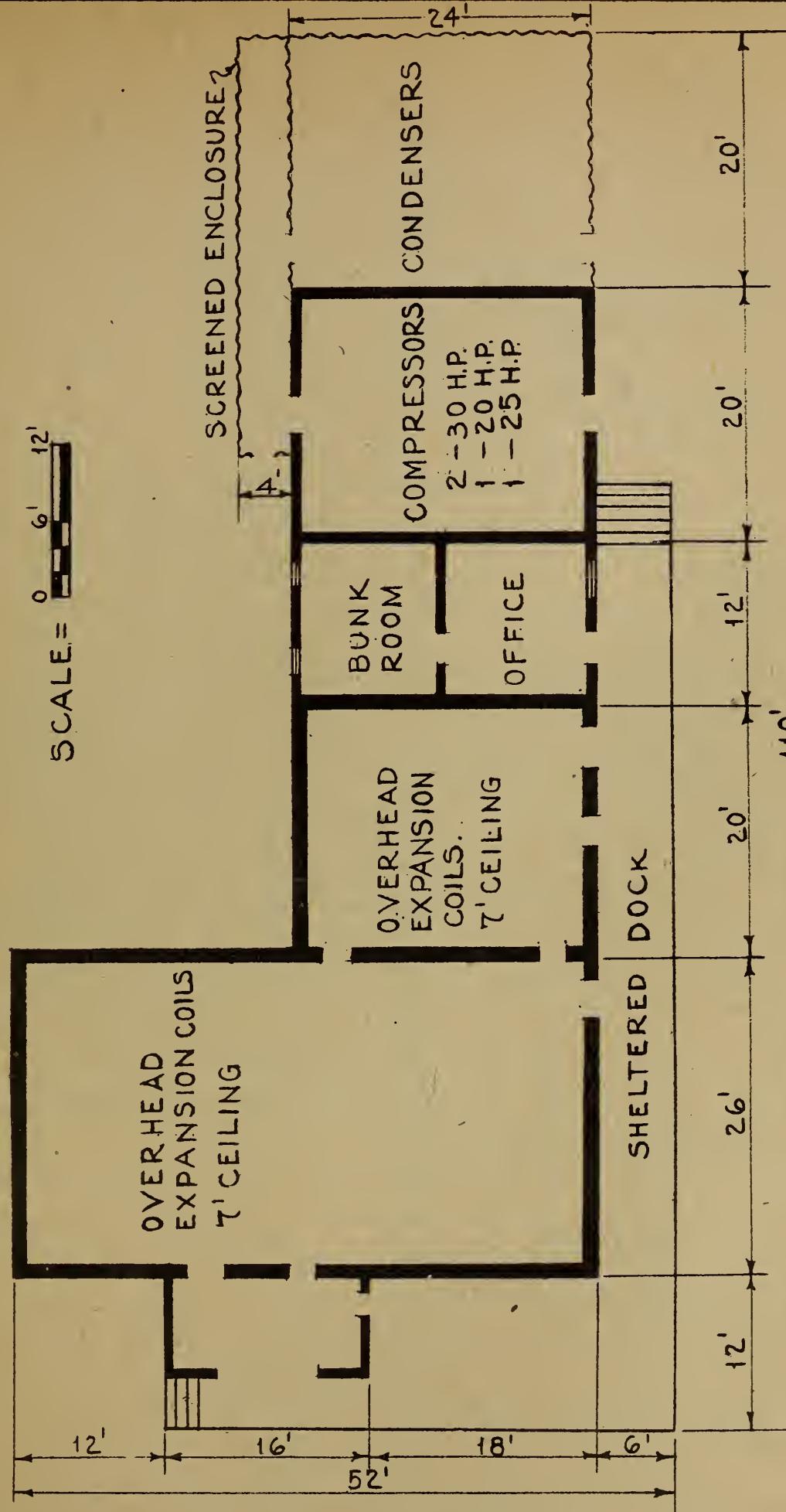


FIGURE 74

MARKET NO.7. SHARP FREEZE PLANT FOR FRUIT & BERRIES

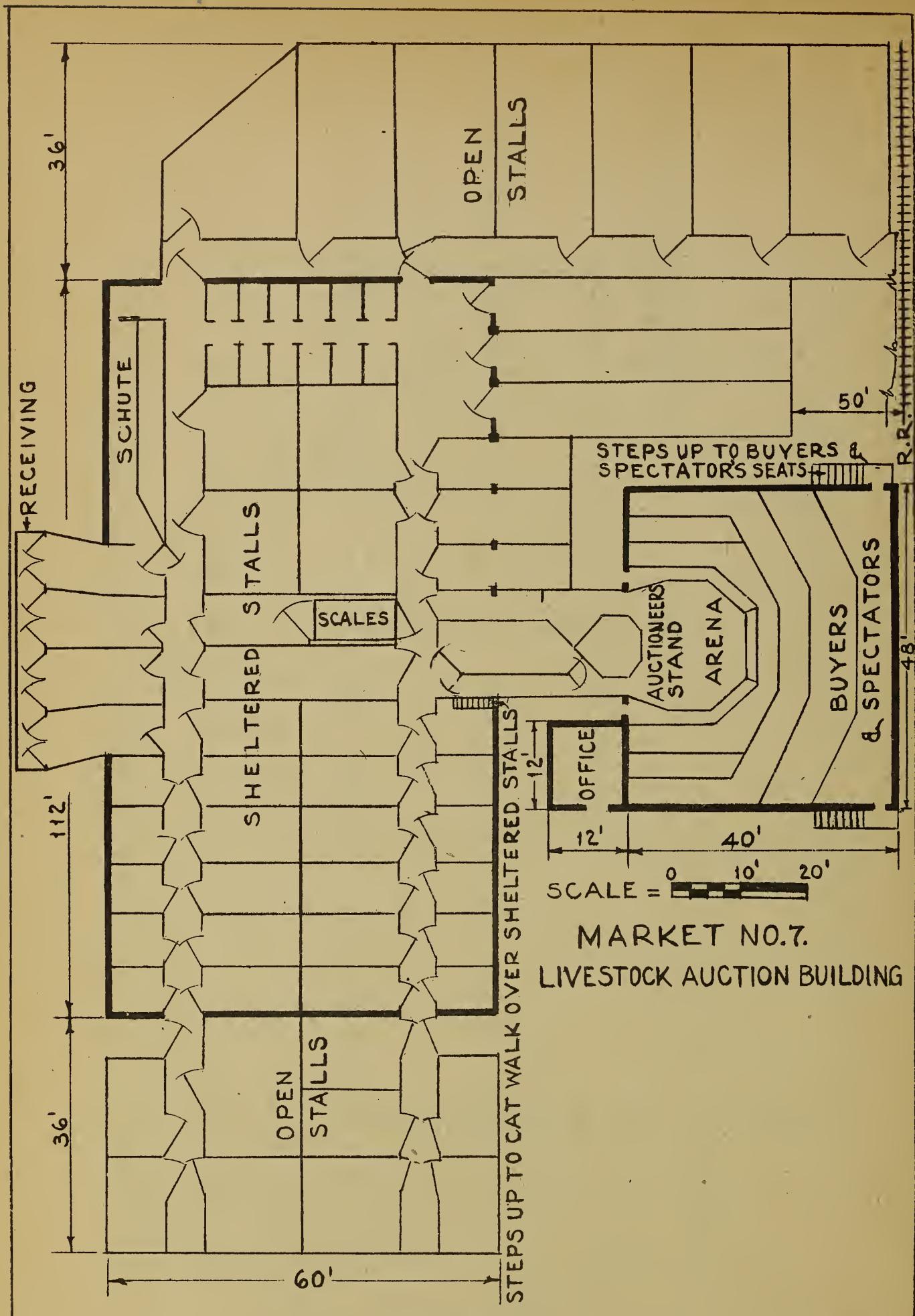


FIGURE 75

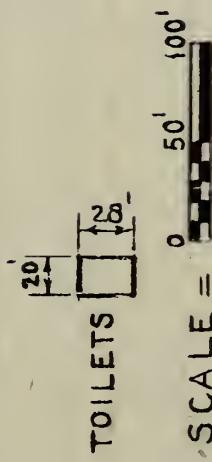
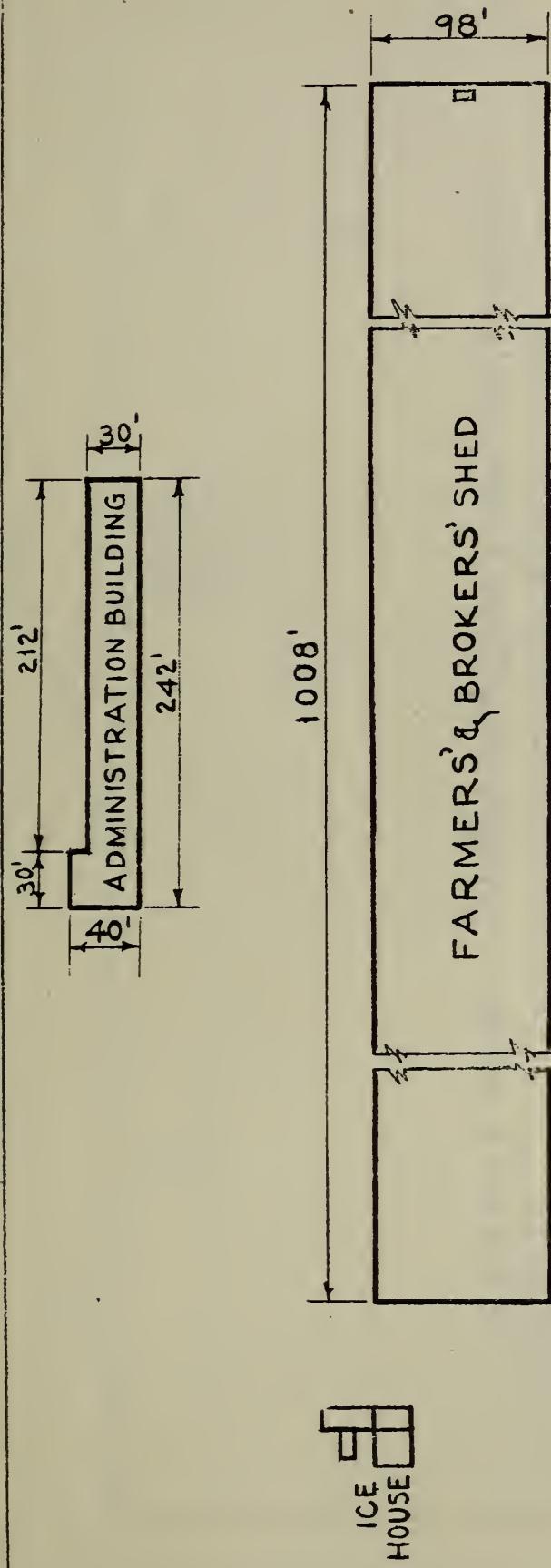
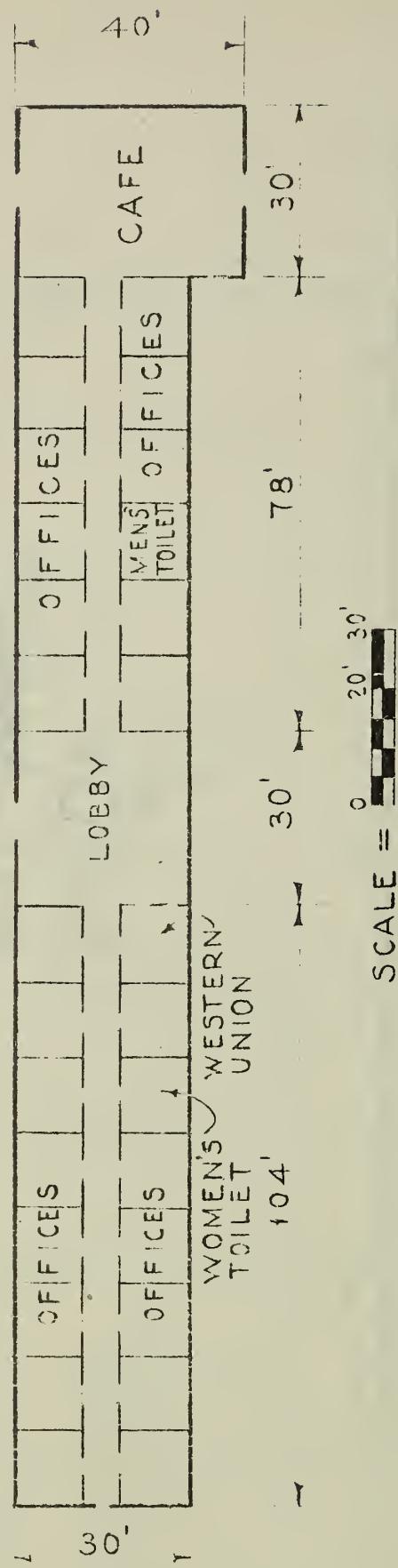


FIGURE 76

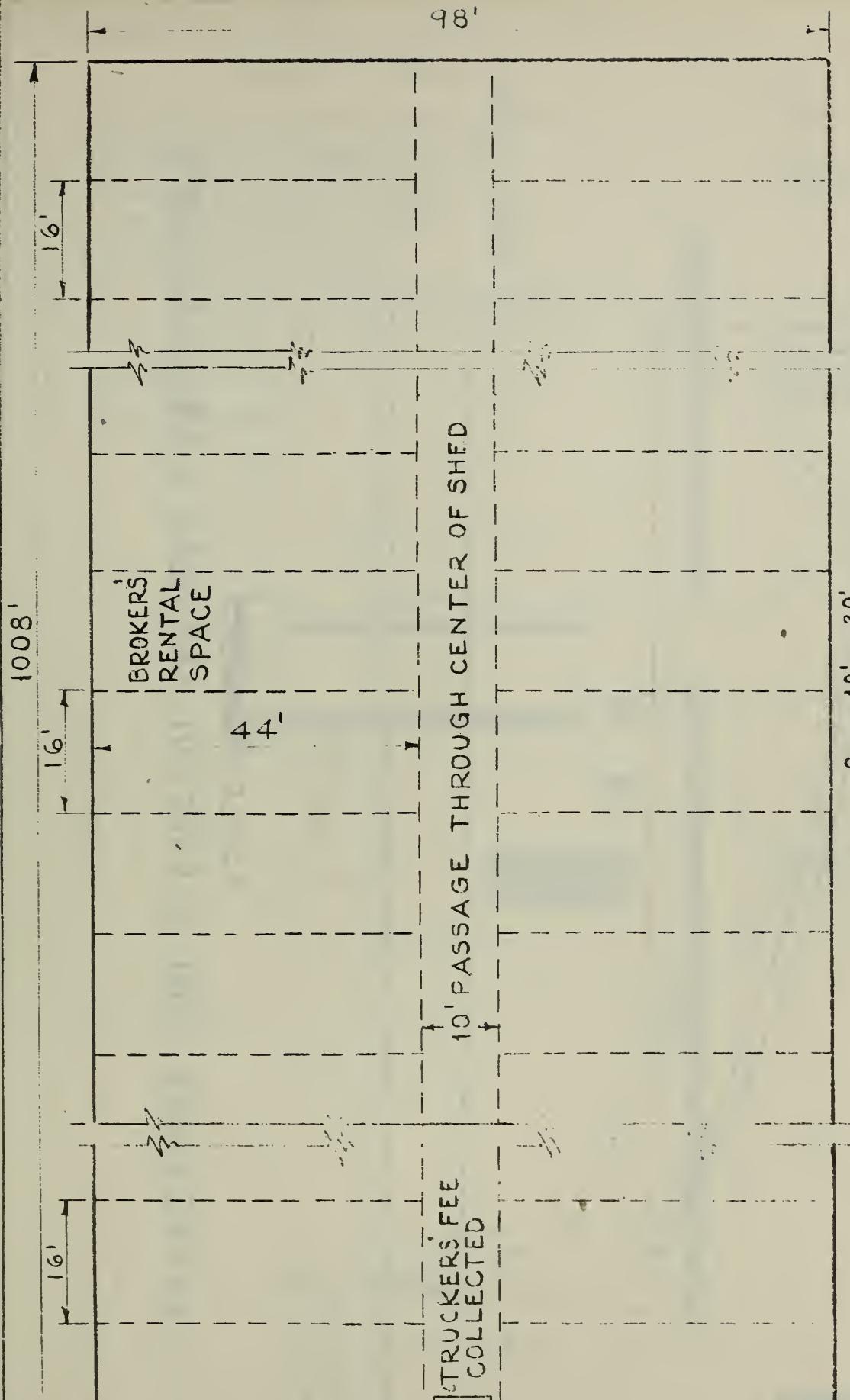
MARKET NO. 8
FARMERS' WHOLESALE SHIPPING POINT, STATE.

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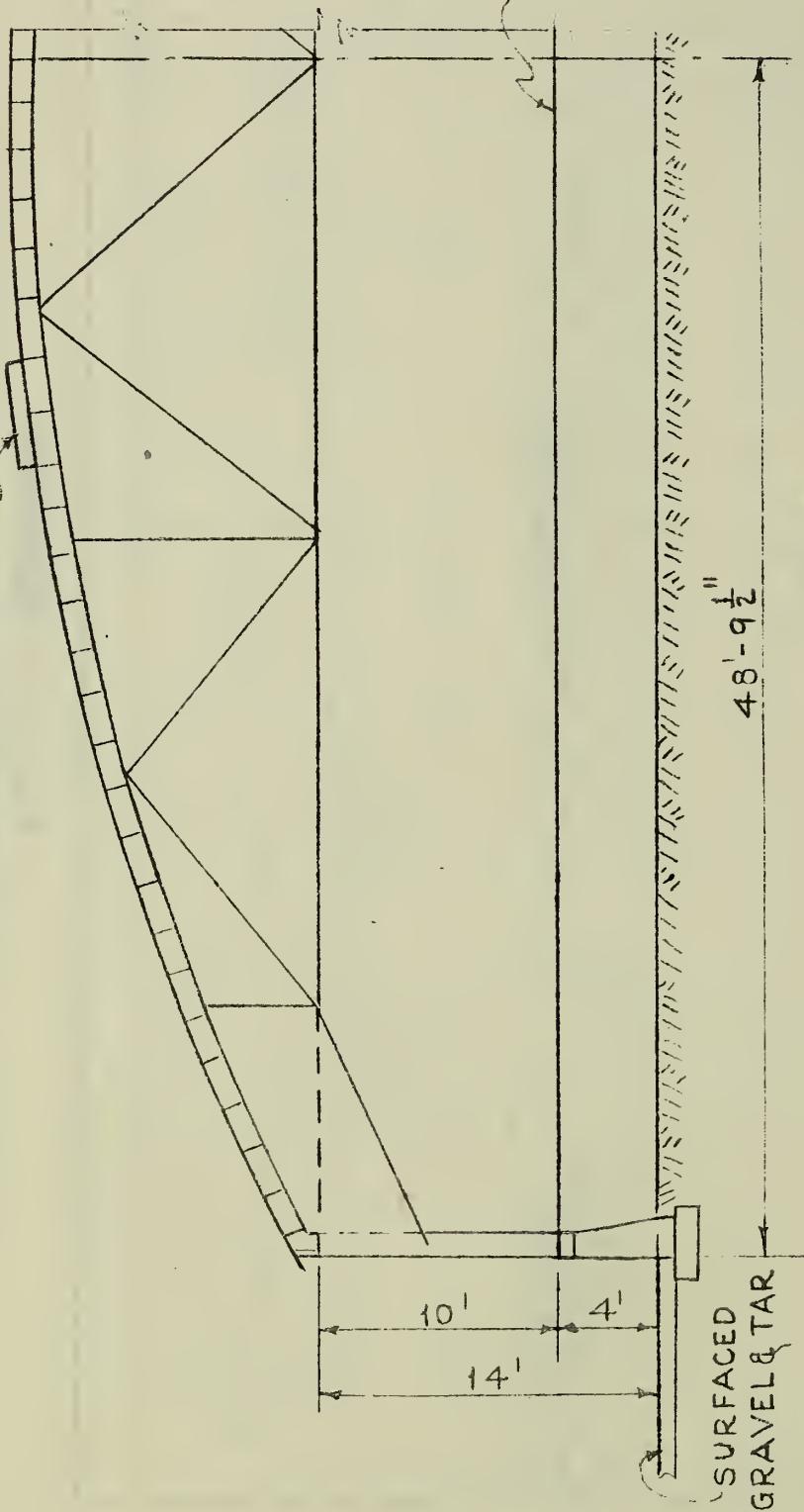
MARKET NO. 8, ADMINISTRATION BUILDING

FIGURE 77



MARKET NO. 5, FARMERS' & BROKERS' SHED.

4' x 6' WIRE GLASS SKYLIGHTS
IN ALTERNATE BAYS 2



M A R K E T N O 8. E N D E L E V A T I O N - F A R M E R S ' & B R O K E R S ' S H E D.

FIGURE 79

FARMERS' WHOLESALE SHIPPING POINT-
MARKET NO.16

- ① ADMINISTRATION BUILDING
- ② MARKET CLERKS OFFICE
- ③ WHOLESALERS' SHEDS
- ④ CURB - TRAFFIC GUIDE
- ⑤ DAY BUYERS' SHEDS
- ⑥ DAY BUYERS' DISPATCH OFFICE
- ⑦ TOOL ROOM
- ⑧ RETAIL SHED
- ⑨ RESTAURANT

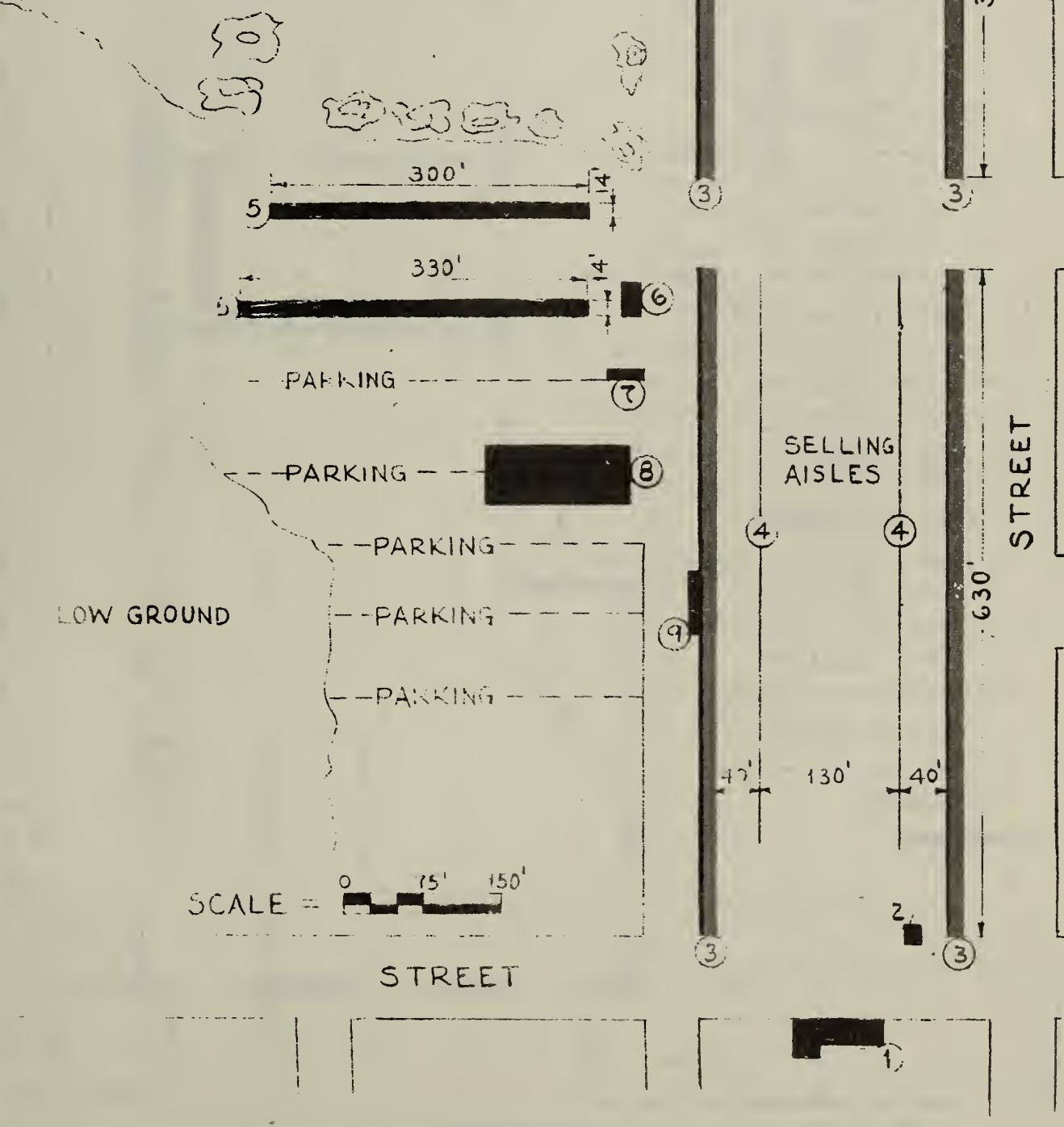


FIGURE 80

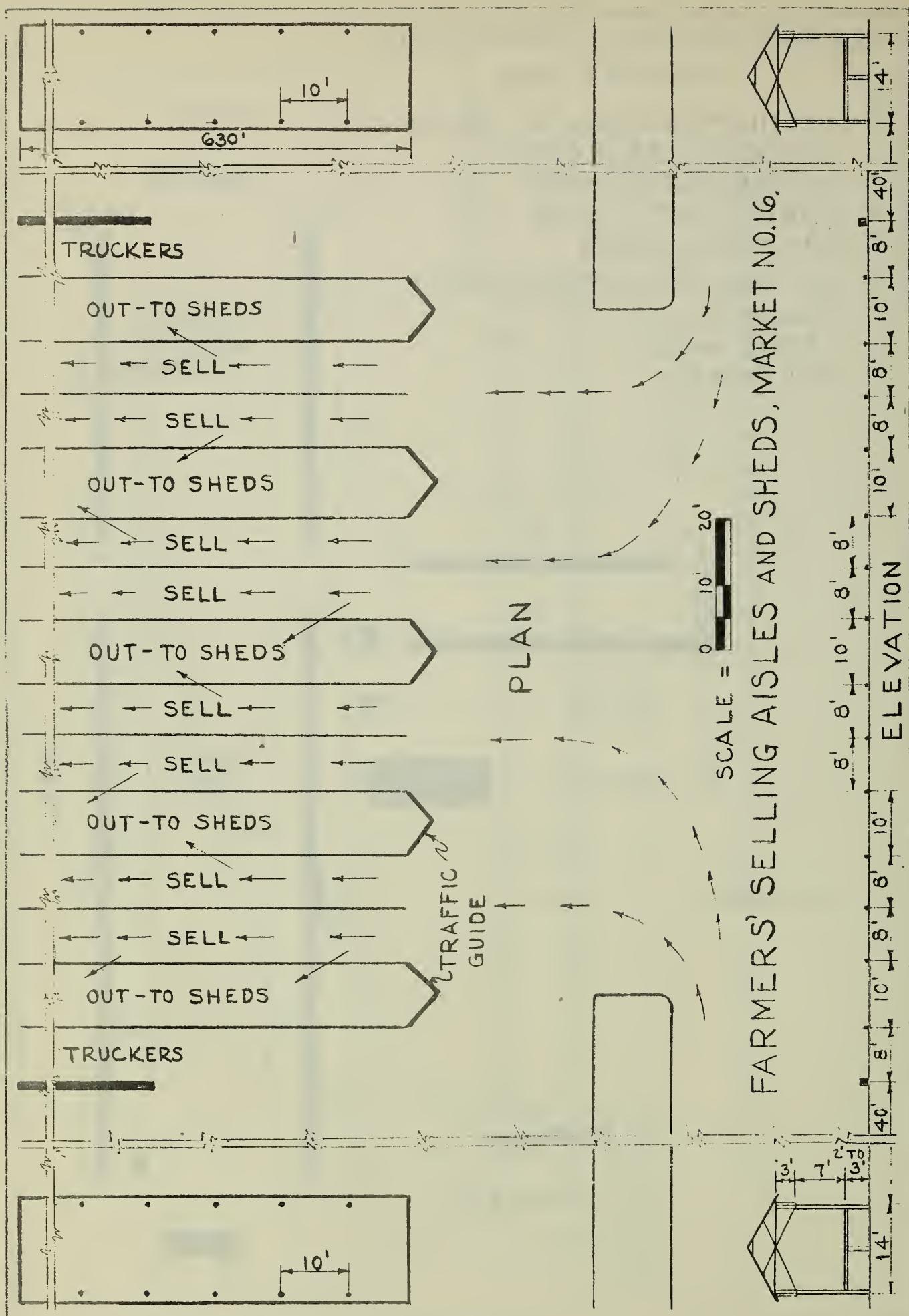
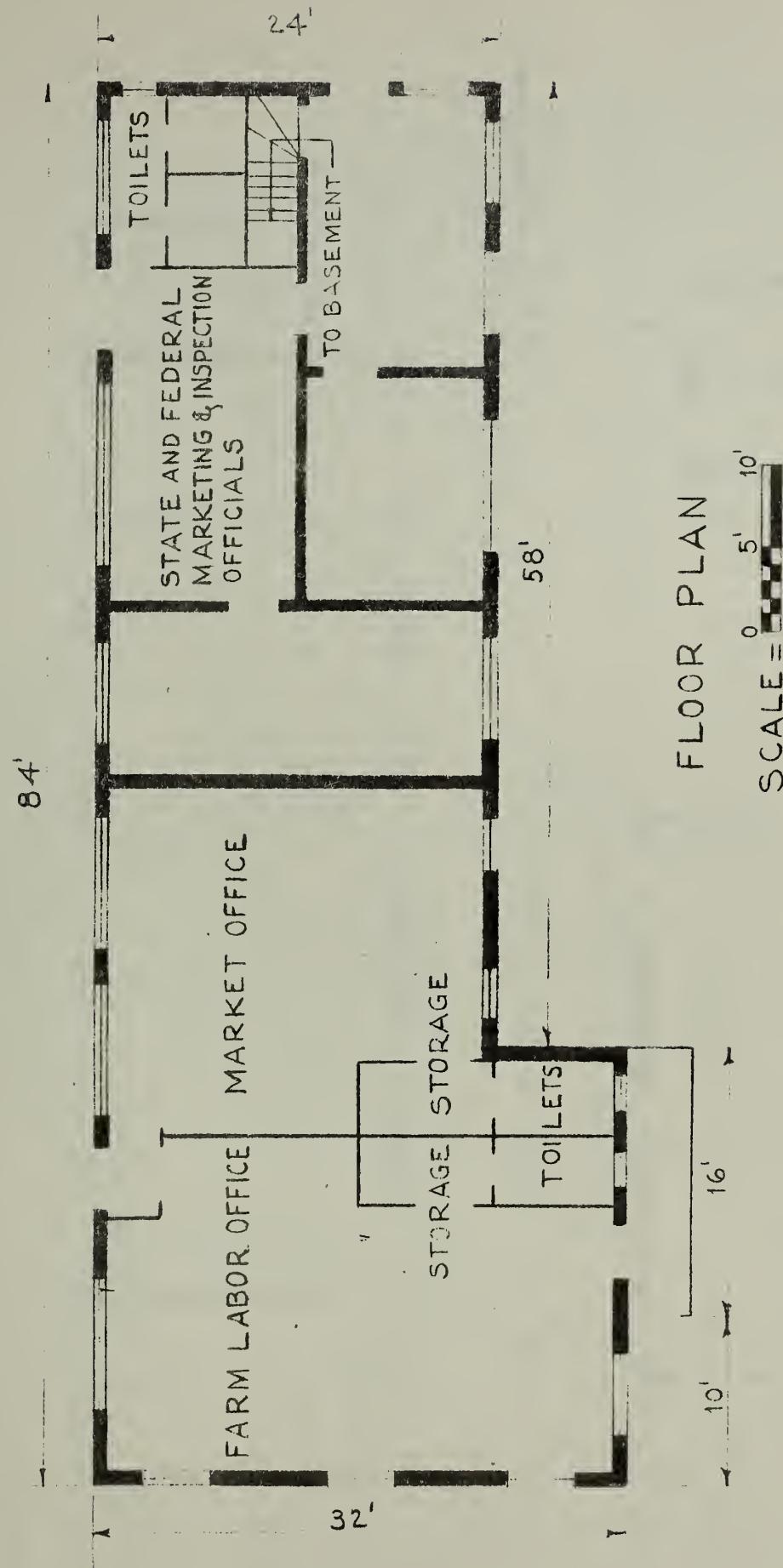


FIGURE 81



ADMINISTRATION BUILDING, MARKET NO.16.

FIGURE 82

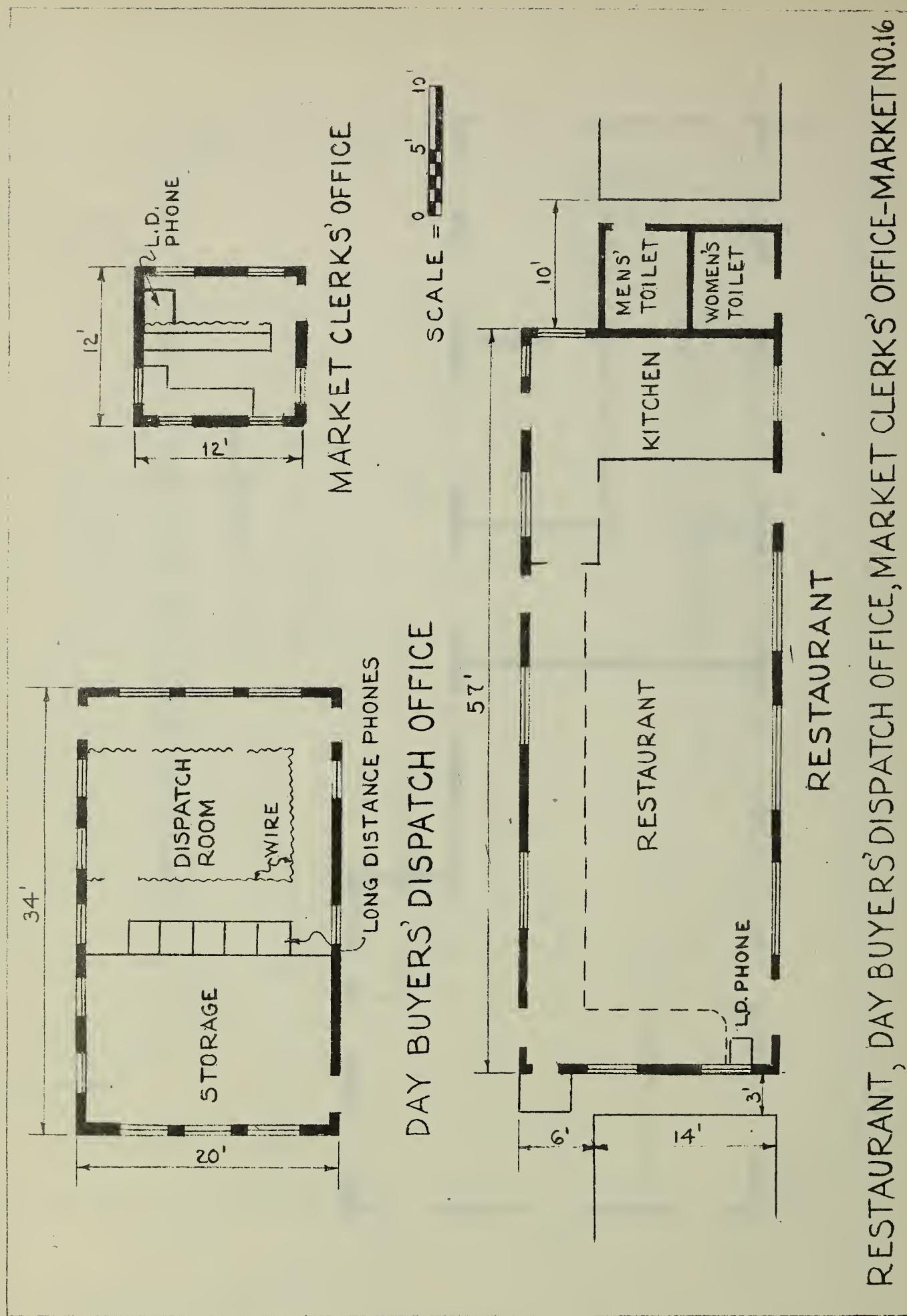


FIGURE 83

