

A COMMUNITY DEVELOPMENT WITH SPECIAL  
EMPHASIS ON COMMUNITY FACILITIES

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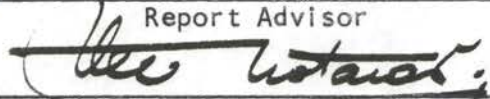
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## PREFACE

Most of the universities in the United States are now facing the problem of student and faculty housing. The purpose of this report is to give a general idea about the concept and the design of a neighborhood plan. The same concepts and design principles were applied for planning a different kind of neighborhood than the usual one consisting of housing for families in an urban or a sub-rural area.

Designs have been presented to illustrate a possible solution and explanations in this report are given regarding the factors considered in planning and general economy of the development and the various buildings therein. In the design process as well as in the report the subject has been restricted to planning facilities other than housing, such as a shopping center, an elementary school and community and recreation area.

Assistance in this study is acknowledged to members of the graduate faculty in the School of Architecture which includes Professors Alec Notaras, W. G. Chamberlain, John R. Cunningham, and special gratitude is given to my report advisor, Professor F. Cuthbert Salmon, for his kind and valuable guidance. Gratitude is also expressed to Mr. Ralph M. Ochsner for his assistance in the course of this study. I also extend humble gratitude towards my Father who helped in financing my studies during my stay in this country.

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CHAPTER I  
THE PROBLEM

The former Oklahoma Agricultural and Mechanical College, after becoming Oklahoma State University in 1957, is experiencing a continuing annual increase enrolment. Due to an increasing number of students, housing is a major problem now, which will be aggravated in the future. The problem was to develop a good environmental housing for the married students and the faculty and to locate other facilities such as a local shopping center, a nursery school, and a small church, etc., to serve the residents of the proposed developed area.

Stillwater is now the largest education center in the state of Oklahoma. Stillwater, being a small town, has ample space for further expansion and development.

The site selected for the problem is on the east side of the campus - approximately 380 acres in area. The site is bounded on the north by McElroy Avenue and on the south by Virginia and East Third Avenue. The west side is bounded by Perkins Road and the east by Jardot Street. The present housing in Stillwater on the east side of the campus extends up to Stallard Street and Virginia Avenue on the north.

The plot is L - shaped with the maximum level rising up to 50 feet from the surrounding grounds. From its highest point it affords a beautiful vista of the Oklahoma State University campus with its landmarks. The few scattered houses in the site were neglected for ease of planning.

## CHAPTER II

### COMMUNITY PLANNING AND NEIGHBORHOOD CONCEPT

#### Community Planning

When prehistoric men found land which would support them in relative safety and comparative permanence they formed towns. Mutual aid in times of danger and cooperation toward a general improvement in their living conditions encouraged the development of the city; people realized they could create more things for themselves by working together than they could individually.

With the development of the large city certain important qualities of village life have been lost, and the advantages of city life have been offset, to greater or lesser extent, by attendant disadvantages. One of the characteristics which distinguishes mankind from the rest of the animal world is his social quality, the need and ability to live with other people. People with common interests assemble in groups to secure for themselves protection and the maximum amenities of life. The primary expression of this need throughout known history has been the family; in primitive society the secondary organism was the tribe, which became the community or village as civilization developed. As the city grew in size some areas within it assumed certain homogeneous qualities which we have identified as neighborhoods.<sup>1</sup>

<sup>1</sup>Lewis Harold Maclean, Planning the Modern City (New York, 1955), p. 1.

## The Neighborhood - Concept and General Planning Principles

### Importance of the Neighborhood

Elie! Saarinen has compared the plan of a healthy city to the pattern of a cross-section of living tissue. Each is a series of cells, the city cell being the neighborhood unit. The cells are surrounded by the lymphatic system, the major street system of the city, through which they have their necessities provided and their products distributed. But each cell is a somewhat complete entity in itself, with its own interior circulation and parts.

### Principles of Neighborhood Unit Planning

The neighborhood unit is one of the modern concepts of our community planning. The neighborhood unit principle was developed originally by Clarence Arthur Perry for the regional plan of New York.

The essentials of the neighborhood unit formula were outlined by Perry as follows:

1. Size

A residential unit development should provide housing for that population for which one elementary school is ordinarily required, its actual area depending upon its population density.

2. Boundaries

The unit should be bounded on all sides by arterial streets, sufficiently wide to facilitate its bypassing, instead of penetration by through traffic.

3. Open spaces

A system of small parks and recreation spaces, planned to



meet the needs of the particular neighborhood, should be provided. The absence of open space is an urban curse.

One of the most vital aspects of community living, and the one which has been too frequently avoided, is adequate space for recreation.

4. Sites for schools

Sites for schools and other institutions having service spheres coinciding with the limits of the unit should be suitably grouped about a central point.

5. Local shops

One or more shopping districts, adequate for the population to be served, should be laid out in the circumference of the unit, preferably at traffic junctions and adjacent to similar districts of adjoining neighborhoods.

6. Internal system

The unit should be provided with a special street system, each highway being proportioned to its probable traffic load, and the street net as a whole being designed to facilitate circulation within the unit and to discourage its use by through traffic.<sup>2</sup>

Other factors controlling the size of a neighborhood are the desirable walking distances to various facilities therein. The maximum distance which a child should be expected to walk to school generally is taken as 1/2 to 3/4 of a mile. The maximum distance to a shopping center should be 1/2 mile. From the foregoing standards it can be readily seen that

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<sup>2</sup> Ibid., p. 4.

the ideal size for a neighborhood is something under one (1) mile square.

The neighborhood unit is not some sociological phenomenon; it embraces no particular theories of social science. It is simply a physical environment in which a mother knows that her child has no traffic streets to cross on his way to school, a school which is within easy walking distance from the home. It is an environment in which the housewife may have an easy walk to the shopping center where she may obtain the daily household goods, and the man of the house may find convenient transportation to and from his work. It is an environment in which a well equipped playground is located near the home where the children may play in safety with their friends; the parents may not care to maintain intimate friendship with their neighbors, but children are so inclined and they need the facilities of recreation for the healthy development of their minds and spirit.

#### The Neighborhood is People

The neighborhood is necessary as a unit with which the city may be reconstructed, but it is not a physical element alone. It is the people who really make the neighborhood, and whether or not they participate in community affairs as personal friends need not be the thread upon which their welfare hangs. People are obliged to act in unison with their fellowmen for continued maintenance of standards for schools, recreation, utility improvements, zoning and such other civic enterprises as the community may embrace. This responsibility is shared by all regardless of where they live and under what conditions. It is the act of citizenship, and the neighborhood is the smallest denominator within the city for effective expression of civic consciousness. In the process of discharging these obligations the people grow to know each other, and they form group

activities which generate civic interest, clubs for social, political, or intellectual discussions, as well as recreation, are formed, and through these media local problems are aired and common resistance to undeniable trends is generated or greater amenities encouraged. The people thus will produce profound changes in the city, but the neighborhood must retain the basic, the elementary, physical characteristics which mark it as a unit for service to the people who live within it.<sup>3</sup>

The common objective of a neighborhood is the maintenance of a living environment suited to the nature and desires of the people who are part of it. The neighborhood is not a strange or a new element in the city. It means the area in which we live, our houses and those of our neighbors, the stores where we shop our daily necessities, our school and its playground, and our local park.

<sup>3</sup>Arthur B. Gallion, The Urban Pattern (Princeton, 1950), p. 237.

## CHAPTER III

### PLANNING THE NEIGHBORHOOD

#### Relation to the Community

The plan of the new development must fit into the pattern of the community. The location of existing or proposed major streets, park and recreation areas, schools, lines of transportation and public utilities must be determined. Traffic and pedestrian arteries should be carefully related to the proposed community facilities. If the area under consideration is extensive, it may be found necessary to incorporate sites for schools, churches, playgrounds and parks. A concern of every family in a residential development is the accessibility of a local shopping center; moreover a well planned and adequate commercial group is a definite asset to the neighborhood. Major items for consideration in the planning of such a center include location, auto, and pedestrian accessibility, and parking and service areas.

The smooth functioning of the community center will depend on the location and design of special or non-residential facilities. When stores, churches, schools, play areas, and the like over build or over crowd their sites or fail to provide for the proper handling of their functions, they can become nuisances. Adequate parking space, wide front and side yards, protective walls and planted areas may easily reduce the undesirable features of non-residential facilities, which, if properly located and designed to serve the neighborhoods, are assets rather than liabilities.

### Site Patterns

Two planning patterns are possible in the development of residential groups. That for a small site will often be governed by the existing pattern in the areas immediately surrounding it. One need not necessarily conform in every detail to the nearby development; indeed, the good site-planner may build many new values into any residential area. The laying out of a small site, however is often a real challenge to the planner, for troublesome handicaps are likely to be encountered here.

When the site is relatively large, a pattern quite independent of the surrounding development is possible. In this case it is necessary to give critical attention not only to the planning design as it specifically relates to the size and disposition of the residential buildings (without their related servicing elements) but also to the possible provision of those community facilities or amenities which should form a part of a well designed neighborhood - - - neighborhood schools, shopping facilities, park and play areas, and so forth.

### Preservation of Natural Assets

Mature trees and tree groups, streams or other topographical features may, through their preservation, become assets to a development. A careful survey should be made and wherever possible such features should be incorporated into the site plan. Most of our public housing lacks landscaping. Although it is difficult to determine suitable locations for the buildings merely by adjusting them to existing tree groups or other natural features, nevertheless it is definitely unsound to say that land must be entirely cleared to permit proper disposition of the buildings.

### Site Organization and Planning

The development of the land and the design of the buildings are directed to one end only - to serve as a satisfactory frame for the lives of the people. The site plan is of necessity influenced by social, economic and legal factors which are brought to bear on the design of new developments. Climate, site topography, tradition, local housing customs, social institutions, available material and labor, land costs, the income and composition of the families to be housed, local housing standards, and the requirements of lending and insuring institutions are also governing factors which must be constantly considered in the development of the site. Within the possibilities or limitations of the above, there must be an attempt to provide the most suitable and satisfactory living environment possible.

### Topography

The more severe the demands of the topography, the more its features govern. For the sake of economy, structures as well as streets must be approximately parallel to the contours. Heavy cuts and hills not only are costly but often require the reshaping of considerable surrounding land, and they involve the removal and replacing of quantities of top soil, the destruction of trees and creation of conditions that encourage erosion.

The topography also governs the street pattern. Proper surface drainage and the installation of sanitary sewers in rights of way must be assured. Though utility and sewer connections to the main lines restrict the placement of buildings, they nevertheless must be maintained.

### Grouping of Buildings

Building to building relationships are vital. Although buildings should be relatively close together to minimize the cost of utilities, they should be sufficiently far apart to insure privacy and open areas. Orientation is another general criterion in the disposition of the buildings. The basic problem of orientation is involved and many-sided: it includes orientation to sunlight, to wind direction, to topography, to views, to open areas, and so on. Buildings should be so placed as to take full advantage of desirable breezes and at the same time to shut out undesirable wind.<sup>4</sup>

### Circulation

**Vehicular** - The various uses of the automobile should be clearly defined, and proper provision must be made for each use. Major approach roads must be designed as such, and local and service roads must be planned in accordance with their functions. The safest intersection is one in which the streets meet at approximately right angles.

**Pedestrian** - Safety and convenience is the keystone of pedestrian ways. Passage on foot from house to house or from any house to all the necessary facilities should be safe, fairly direct and pleasant. Pedestrian ways should be entirely separated from the vehicular ways and that crossing at grade level should be eliminated wherever possible.

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<sup>4</sup>Talbot Hamlin, Forms and Functions of Twentieth Century Architecture (New York, 1952), pp. 204 - 210.

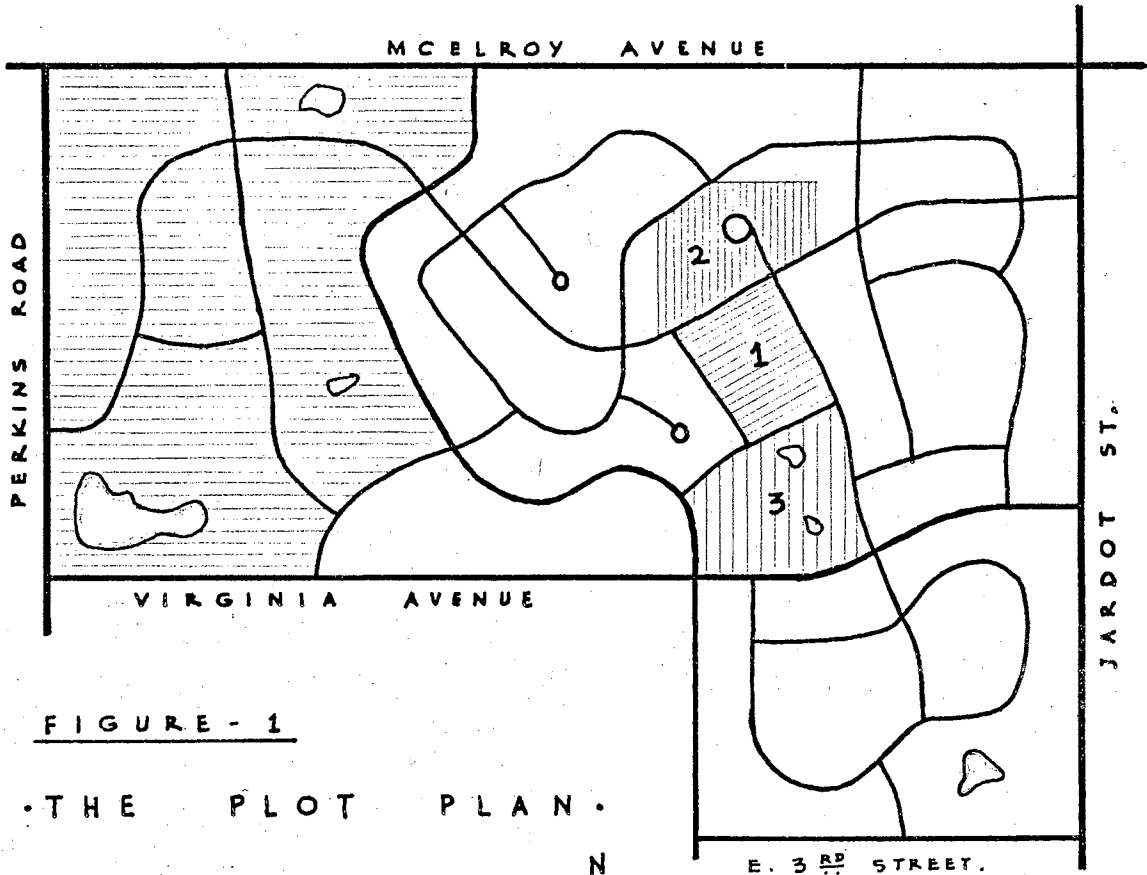


FIGURE - 1

THE PLOT PLAN.

TABLE 1

Schedule of Areas	
Total site area	380 acres
Total developed area	260 "
1 Shopping Center	10.4 "
2 School and playground	8.9 "
3 Community and Recreation	12.4 "
Streets, Green belts and open areas	143.3 "
Housing - 290 lots	85 "
each lot 80'-0" x 160'-0"	



## The Plot Plan

The main idea in developing the plot plan was to get away from the usual grid-iron pattern of planning. For the purpose of economy it was desirable to maintain the contour lines as far as possible, for the design of streets. The site covers an area of approximately 380 acres, which can accommodate about 800 families.

The developed area of approximately 260 acres contains only 300 plots. More plots could have been provided in the same area, but the main emphasis was given to provide enough open and play areas, greenbelts and to have a better street system. The plan consists of curvilinear, loop and cul-de-sac street systems. Practically all the natural features have been preserved and are part of the whole landscaping. The existing street patterns and the outside major streets were given primary consideration. Each plot measures 80'-0" x 160'-0"; some of the plots being even bigger than that. Four or more plots can be combined to construct row-houses.

The major street on the east side of the site, the Jardot Street, will be a bypass route for Highway 51 in the future. Taking this into consideration, all the plots on the Jardot Street are protected by buffers, a sort of greenbelt with dense tree plantations to insure safety and minimize the noise disturbance from the highway traffic. There is no access to any single plot from this street and also there are very few exits.

Most of the area on the west side of the site has not been developed due to possibilities of flooding. But still a general street pattern has been worked out so that the area can be divided into housing units in the future, after measures for flood control have been taken. The whole area is rather unuseful for housing development at present but

there are some attractive natural features such as large group trees, and large ponds which can be developed and used as a recreation area or a resort place. This area is approximately 120 acres, which will accommodate about 200 families in the future.

The shopping center has been centrally located in the developed area. It will retain its central location after the area on the west side is developed in the future. It has been designed to serve more people than demanded by this neighborhood as there are no adequate shopping facilities nearby for the surrounding areas on the south side. The center is located a little away from the major thoroughfare for better traffic circulation. The shopping streets merge in four different directions to connect with the major thoroughfares. It is most convenient to arrive at the shopping center by car or it should be within walking distance; practically from any house. The maximum distance from any house to the shopping center will be about 1/2 mile. The street on the north side of the shopping center will serve as a major service road for the trucks coming from the highway.

The school is located north of the shopping center area. It was assumed that there will be only a nursery school in the beginning as there already exists an elementary school at the junction of Stallard and East 3rd Avenue. The site covers an approximate area of 8.9 acres which includes a large playground. The same site can accommodate a small elementary school in the future.

South of the shopping center is the community development area. A church for a congregation of 300 people has been designed to serve also as a small community center. It covers an area of approximately 12.4 acres. In the future it could be developed as a large community center.

Other features of the plot plan -

1. An effort has been made to provide a small play area for children for different groups of houses.
2. Underpasses are provided at all major street junctions for the safety of children going to school.
3. All the natural features of the site are incorporated in the same manner.
4. Sheltered areas for picnics and a drive-in restaurant has been provided in the recreation zone.
5. A small service station has been located near the shopping center.
6. The open spaces in between the row of houses at the back will be used for service purposes.
7. Pedestrian walkways are provided throughout the site to move from one house to another and to all other facilities.

## CHAPTER IV

### THE SHOPPING CENTER

#### Planning and General Considerations

The market-place as an institution for the exchange of goods goes back to the earliest days of history and has remained more or less unchanged through the centuries. It was one of the first manifestations of community life, curiously similar in the most widely separated parts of the globe. Prehistoric man exchanged the deer he had slain for a necklace of pretty shells. The modern housewife acquires a package of frozen food in exchange for some round pieces of metal. Gratification of needs and desires motivates both transactions. Only the conditions under which they take place have changed.

The shopping center is one of the few new building types created in our time. Because shopping centers represent groupings of structures and because of the underlying cooperative spirit involved, the need for environmental planning for this building type is obvious. Planning is needed not only to bring order, stability, and meaning to chaotic suburbia; it is necessary in order to establish a strong logical framework within which individual merchandising enterprises can flourish and provide crystallization points for suburbia's community life.

When environmental planning is applied to the designing of new commercial facilities, many conditions must be analyzed, criteria weighed, requirements met, and problems solved. These all involve in various

ways and to varying degrees the needs and desires of the shopper. It is deeply significant that the term is "shopping center", not "selling center". This indicates clearly that the wishes and desires of the shopper take priority over those of the seller.<sup>5</sup>

The basic need of the suburban shopper is for a conveniently accessible, amply stocked shopping area with plentiful and free parking. Good planning will create additional attractions for shoppers by meeting other needs which are inherent in the psychological climate peculiar to suburbia. By affording opportunities for social life and recreation in a protected pedestrian environment, by incorporating civic and educational facilities, shopping centers can fill an existing void. They can provide the needed place and opportunity for participation in a modern community.

#### What Makes A Shopping Center?

In general these are the ingredients for a good shopping center:

1. A site layout that will provide a store group with minimum walking distances, both from parking areas and within the parking group itself.
2. A store group that can be merchandised to provide the greatest interplay between stores.
3. An arrangement that dominates all poor store locations and difficult parking stations.
4. A management that is efficient and capable of obtaining cooperation from individual tenants for the benefit of the whole center.

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<sup>5</sup>Gruen Victor and Larry Smith, Shopping Towns U.S.A. (New York, 1960), pp. 17 - 24.

5. Separation of foot traffic and automobile traffic and elimination of all service facilities from the public consciousness.<sup>6</sup>
6. A unified architectural building group that looks like a shopping center and not as an assemblage of miscellaneous stores.

#### The Neighborhood Shopping Center

It is a retail establishment, built as a unit and operated on rental basis. A center of this type draws its volume of sales from within the neighborhood only. Therefore it is essential that such a center be planned for a sufficiently large market area. If for example, the shopping center is to serve only a part of the neighborhood, the required minimum market area is believed to be a "sub-neighborhood" of 500 families. This population can however only support a small center consisting of not more than about six shops. The neighborhood of 4,000 to 5,000 persons should be able to support a center of about ten (10) shops including a food store, drug store, and several service stores such as laundry, dry cleaning, barber, beauty shop, etc.

#### Location

An extremely important prerequisite for a successful shopping center development is proper location. Accessibility is the main factor considering location. In analyzing a location, attention must be paid not only to the existing population but to prospects for future growth. This question does not arise particularly in the case of small neighborhood centers.

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<sup>6</sup> Architectural Record Book, Design for Modern Merchandising (New York, 1954), p. 147.

An important factor influencing the determination of trade area and zones is the time it takes patrons to travel to and from the shopping center location. It has been proven that, all other conditions being equal, customers will travel greater distances to reach a shopping center with outstanding planning characteristics and a greater number of comparison shopping facilities than they will to one with a limited choice of stores and poorer planning and design characteristics.

Neighborhood shopping centers would normally attract business from an area not more than 5 to 7 minutes driving time distance. Shopping centers are products of the automobile age and depend to the largest degree on customers arriving by private automobile.

#### Size and Shape of the Site

The most desirable size for a site should permit the construction of a shopping center in which all its essential elements can be placed easily. The shape of the site must be such that advantageous planning is feasible. The land must be in one piece, free of intervening roadways, rights of way, easements, or major waterways, etc.

#### Planning the Site

Pedestrian traffic should be separated from the vehicular traffic. Traffic planning is an integral part of planning the site and the surrounding area. When considering the question of traffic it is essential to keep in mind that the shopping center is not to be planned to serve traffic; rather traffic is to be planned to serve the shopping center. The customer should be given a free choice to drive to any of the parking areas which surround the center so that he may come as close as possible to the store when he intends to make his first purchase.

When the center is near a residential area, it is necessary to insulate against any adverse effect of commercial use upon the adjacent residential developments. A buffer street at least 20'-0" wide and densely planted should be used.

#### Parking

The aim of the parking lot layout for a shopping center should not be to achieve the greatest possible number of parking stalls, but rather to assure the greatest possible turn-over of cars during a given period of time. The road net surrounding a center must have the capacity to carry peak traffic loads as well as normal traffic without strain. The ratio of rental area to parking area should be between 1:3 and 1:4.

#### Circulation in Parking Area

The shopper should be able to find his (or her) way around easily without any previous study of the site. The most satisfactory pattern consists of parallel parking bins perpendicular to the stores with a major feeder road or ring road at the end of the bins away from the stores. This kind of parking affords clear vision of the stores for the customers.

Although 90° parking with two way traffic takes slightly more space per car than 60° parking with one way traffic (295 sq. ft. compared to 276 sq. ft.), 90° parking is preferable. Cars can move in both directions, and sight lines are improved.<sup>7</sup>

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<sup>7</sup>Victor Gruen and Larry Smith, Shopping Towns U. S. A. (New York, 1960), p. 41.



## Pedestrian Areas and Their Circulation

The shopping center is one of the few new building types which represents a response to the emergence of the automobile as a means of transportation. It is a grouping of buildings and related spaces establishing a new environment in Twentieth Century life, not only for shopping but for many other activities as well. Its building group and related spaces are not strung along existing roads but constitute a new planning pattern of their own. This new environment is dedicated to pedestrian.

The primary objective of the merchandising planner is to select stores and to arrange them in such a manner that the greatest possible number of customers are attracted to the shopping center and funneled through it; thereby creating maximum amount of pedestrian traffic and inter-store shopping opportunities.

The creation of exclusive pedestrian areas was the most revolutionary measure introduced by pioneers of shopping center planning. Shopping is inherently more than just a utilitarian activity. The environment should be so attractive that customers will enjoy the shopping trips, will stay longer and return more often. In order to fulfill the vast potentials, these spaces must be more than narrow lanes between long rows of stores. They must represent an essentially urban environment. They must not make only walking enjoyable, but must also provide places for rest and relaxation. They must be busy and colorful, exciting and stimulating, full of variety and interest.

## Landscaping of Pedestrian Areas

Trees and flowers, music, fountains, sculpture and murals, and the architecture of free-standing structures are vital parts of the overall composition as well as landscaping. The combination of water, in ponds,

basins or fountains with sculpture and landscape is as old as man's artistic endeavors. Playing water appeals to the eye and to the ear. Like fire, it holds eternal magic. Covered cross walks can be widened in parts to form information and announcement boards.

### Kiosks

Kiosks are small structures either free standing or attached on one side to a cross-walk. These can be used for minor sales activities, such as news stands, tobacco shops, book stalls, souvenir and key shops. Because of their free standing locations, kiosks if not properly designed, may block vistas. Their construction must be extremely light: by the extensive use of glass. Their generally high construction costs is justified if rented to tenants with high sales per square foot and good rent paying potential.

### Shop Fronts and Their Control

Show windows and entrances are arranged on all frontages adjacent to parking lots or pedestrian walks. Architectural treatment is shaped by the desire to create walks protected from sun, rain, snow and wind along all frontages. This represents one of the important contributions which shopping center design makes for the convenience of shopping activities.

Architectural and design unity is recognized as an important ingredient of the overall character of a shopping center. How far such design unity should go is, however, a moot question. Complete control of store fronts is not only difficult to enforce in the long run, but also illogical and undesirable. As store fronts of various merchandising categories and qualities have greatly divergent needs, e.g., a food store needs a

store front of radically different character from a high price fashion store. However there must be a frame work of architectural control.

Exteriors should be considered from the view point of the possibility of giving architectural expression to the building.

The general size, location and character of firm signs should be determined by the architect.

There should be a definite guide line below which signs cannot be placed.

A maximum letter height should be determined and general color scheme also set which should contain a wide range of colors.

Paper signs and stickers on show windows or flashings, illuminated signs, should be forbidden.

In the interest of safety it is necessary that store entrance doors must be recessed in order to avoid their swinging onto walkways.<sup>8</sup>

#### The Parcel Pick-up Service

On shopping centers some system is desirable which will encourage the customer to take parcels home in his own car, even with items as large as card tables or small chairs. A system which transports parcels from the store to the customer's car makes shopping easier and can cut down the store's overhead.

If the shopping center is to reach its maximum sales potential, the customer must want to shop even during the busiest time. He will be more inclined to do so when he can park wherever there is an available spot, shop where he pleases, have his purchases deposited at a parcel pick-up station, and then drive to the pick-up station to get them. Such kinds

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<sup>8</sup> Ibid., pp. 132 - 169.

of stations are very much useful for supermarkets. The packages from the market are taken to the pick-up station through conveyor belts installed in the basement in between the two structures.

#### Structure, Lighting and Mechanical Equipment

A structure which to a large degree will contain small tenant stores may require less depth than one with larger tenant units. Thus depth may vary from 60' to 120'.

Column spacing must be carefully considered because it has a controlling effect on the manner in which the total selling space may be divided into individual stores. If columns are placed too closely together the freedom of dividing will be seriously diminished. Too close column spacing will also interfere with the ability of the individual tenant to arrive at an efficient merchandising layout.

Leasing of space is frequently, but by no means generally, done in multiples of 10, 15, or 20 feet. A ten (10) foot wide space will probably describe the minimum size of a tenant store; larger stores will often be rented at widths of 20, 30, 40, 50, 60, 70, 80 and so on. Thus 20 foot column spacing has often proved successful. For smaller store spaces and in smaller projects, a column spacing of 30 feet provides great flexibility of frontage. The column spacing in depth may be equal to the one in length.

In selecting materials and structural methods for partitions in individual stores and for hung ceilings, consideration should be given to the changeable tenant pattern, even though long term leases may be the rule. Partitions therefore should not be used as bearing walls and should be built of materials and by methods which assure easy removal and the reusability of the material.

The arrangement of utilitarian facilities - tenants' wash-rooms, toilets, stairways, etc., must be carefully studied. In the case of smaller tenant units such facilities can be provided in groups, instead of for single ones, provided the building code permits. Thus, construction cost can be saved as well as space which can be put to more effective use.

### Lighting

The ultimate goal of a store's electrical and lighting system is to help provide an environment of sales stimulation.

Attraction through lighting, except for signs, begins with show windows. A problem here is the visual barrier caused by reflections from sky, ground and street objects. These barriers can be overcome partially by overhangs to keep out sun.

On the inside of the store, high brightness of relatively small displays gains attention. A shopper will be drawn to a display with 200 ft.c. lighting placed near an aisle with 20 ft.c. of general lighting. Size, color, form, texture, and finish of merchandise are the factors which influence the choice, the type, intensity and color of a lighting system.

In general, uniform fluorescent lighting will result in a flat, monotonous appearance, while direct down lighting alone will create too much brightness and shadow. But the two together augmented by show-case, valance and cove lighting will give good color and sparkle.

Luminous and louverall ceilings have become very popular, but if used indiscriminately with large unbroken expanses of the same material, they tend to become monotonous and even hard on the eyes. Such areas should be broken up into large elements with solid ceiling separating them.

In order to avoid reflections of light sources in show cases or countertops, fixtures should not be located directly over them. When bare lamp fixtures are used, as in supermarkets, the lighting quality is better if fixtures are suspended rather than surface mounted.

Walkway lighting should aid in unifying the shopping center. It should be sufficient for safety and comfort, but not too much to detract from show-windows. Parking areas should have from 1 to 2 ft.c. Lighting should not be aimed from roofs of low buildings at the parking area, as this will blind shoppers walking toward the stores.

Poles or towers 40' to 60' high with 750 to 1000 watt flood lighting are effective and inexpensive.<sup>9</sup>

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<sup>9</sup>Architectural Record Book, Architectural Engineering (New York, 1955), p. 286.

TABLE II

## ELECTRICAL EQUIPMENT FOR A HYPOTHETICAL SHOPPING CENTER

Shops	Powered Equipment
Women's and Men's Apparel Shops	Power outlet in Tailor Shop Burglar Alarm
Food Market	Power outlet for: Cash registers Check-out conveyors Belt conveyors Door openers Refrigerated cases Meat Preparation Coffee grinder Soft drink machine Sound system for music Burglar alarm
Barber Shop and Beauty Shop	Outlets: Barber shop - 3 receptacles on one circuit per chair, outlets for sun lamps and dryer.  Beauty shop - Separate heavy duty circuit for dryer
Restaurant	Power outlet for: each appliance (Correct voltage, phase and capacity) Infra red food warmers Music distribution Phone booth Burglar alarm Separate circuit for cash register

TABLE III  
ELECTRICAL EQUIPMENT FOR A HYPOTHETICAL SHOPPING CENTER

Shops	Lighting	
	Types and location	Effects and recommendations
Women's and Men's Apparel Shops	General lighting concealed (Fluorescent) lighting in racks, shelves, show cases and niches	Soft, warm for Women's shops Soft, cool for Men's shops
	Down-lights (incandescent) Floods and spots, mirror lighting	For highlights on selected displays Well diffused
Food Market	General lighting Perimeter lighting	High intensity, special emphasis on shelves
	Concealed light in refrigerated cases Baked goods lighting Down lights over fruits and vegetables	Deluxe cool white fluorescent  Deluxe warm white fluorescent
(1) Barber Shop (2) Beauty Shop	(1) General lighting	High intensity, cool white illumination; large area, low brightness, semi-indirect luminaires to avoid uncomfortable glare
	(2) General lighting Valance lighting	High intensity, warm white illumination; luminaires similar to barber shop
Restaurant	General lighting	Low to medium intensity, incandescent lighting suited for atmosphere; warm fluorescent lighting suited for high traffic. Avoid high intensity, glare, bright spots on diners
	Spotlights for planting areas	Adds life to green plants
	Kitchen and dishwashing area  Vapor-proof hood lights	Cool white fluorescent, recessed fixtures, with flat glass bottom and gaskets for easy cleaning



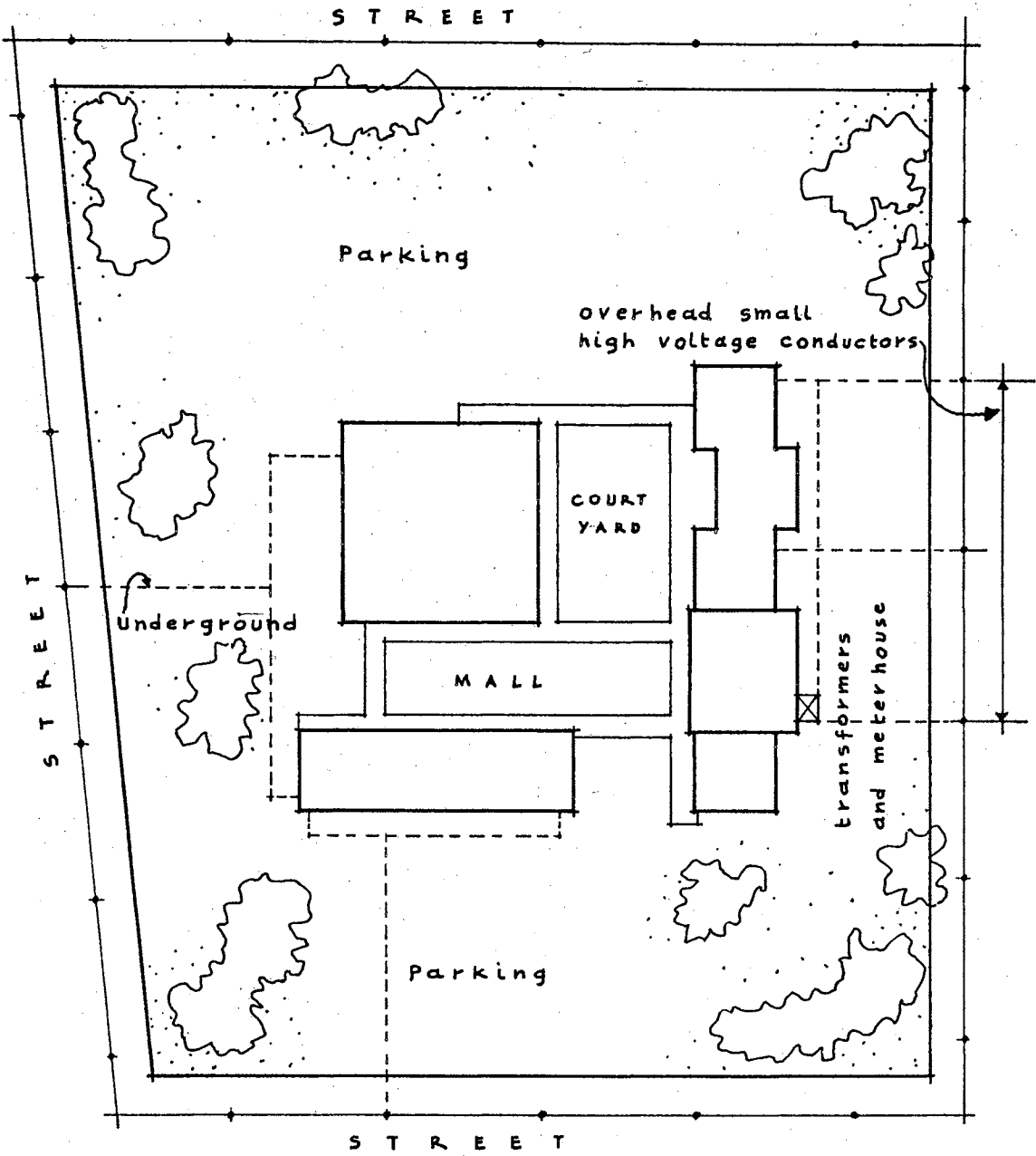


FIGURE - 2

• Economical Compromise for Outside - Wiring of The Shopping Center .

## Mechanical Equipment

The plant for both heating and air-conditioning provides the most economical solution as far as capital cost and operating costs are concerned. But in some respects individual units are better as they permit the tenant to operate his air-conditioning as he pleases, and those tenants who remain open for longer hours than the normal shopping center schedule require this flexibility. Control of a central plant is far more complex, and provisions must be made for remote controls and transfer switches for individual tenants.

## The Planned Shopping Center

All the shops are planned by considering the supermarket as being of primary importance. Because the supermarket is more dependent upon adequate adjacent parking than upon foot traffic created by other tenants, it has been situated at the outer edge of the building cluster. Customers can enter the shopping center either from the northwest or the southeast end. Parking area on the northwest side is bigger than the one on the southeast side. As the supermarket is located on the northwest end, more customers are likely to come from the northwest end, buy their groceries, deposit them at the parcel pick-up station, and then come down for other miscellaneous shopping.

A separate service and truck entrance has been provided for the supermarket on the southwest side. All the major shops and restaurant on the northeast side are also served by a separate entrance. The same entrance also serves the drycleaning shop for its drive-in window facility. Parking for about 15 cars has been provided for the customers who come from the northeast side. All the minor shops such as the barber shop, beauty shop, hobby shop, etc., are located along the southeast

TABLE IV

## SCHEDULE OF AREAS - SHOPPING CENTER

## Supermarket:

Grocery Department	13824	sq. ft.
Storage, cold room, offices, etc.		
Women's Apparel	6912	
Men's Apparel	3600	
Dry-cleaning shop	3060	
Laundromats (two)	1800	(each)

## Restaurant:

Seating Area	4600	sq. ft.
Kitchen and store	1760	
Barber shop	1700	
Drug store	3000	
Hobby store	1800	
General store	1800	
Beauty shop	1700	
Public Toilets (for men and women) (2)	600	(each)
TOTAL	<u>52,156</u>	

Parking for 260 cars

Total area of parking lots and  
service area 157,700 sq. ft.

(i.e. the ratio of shopping area  
to parking area is 1:3)

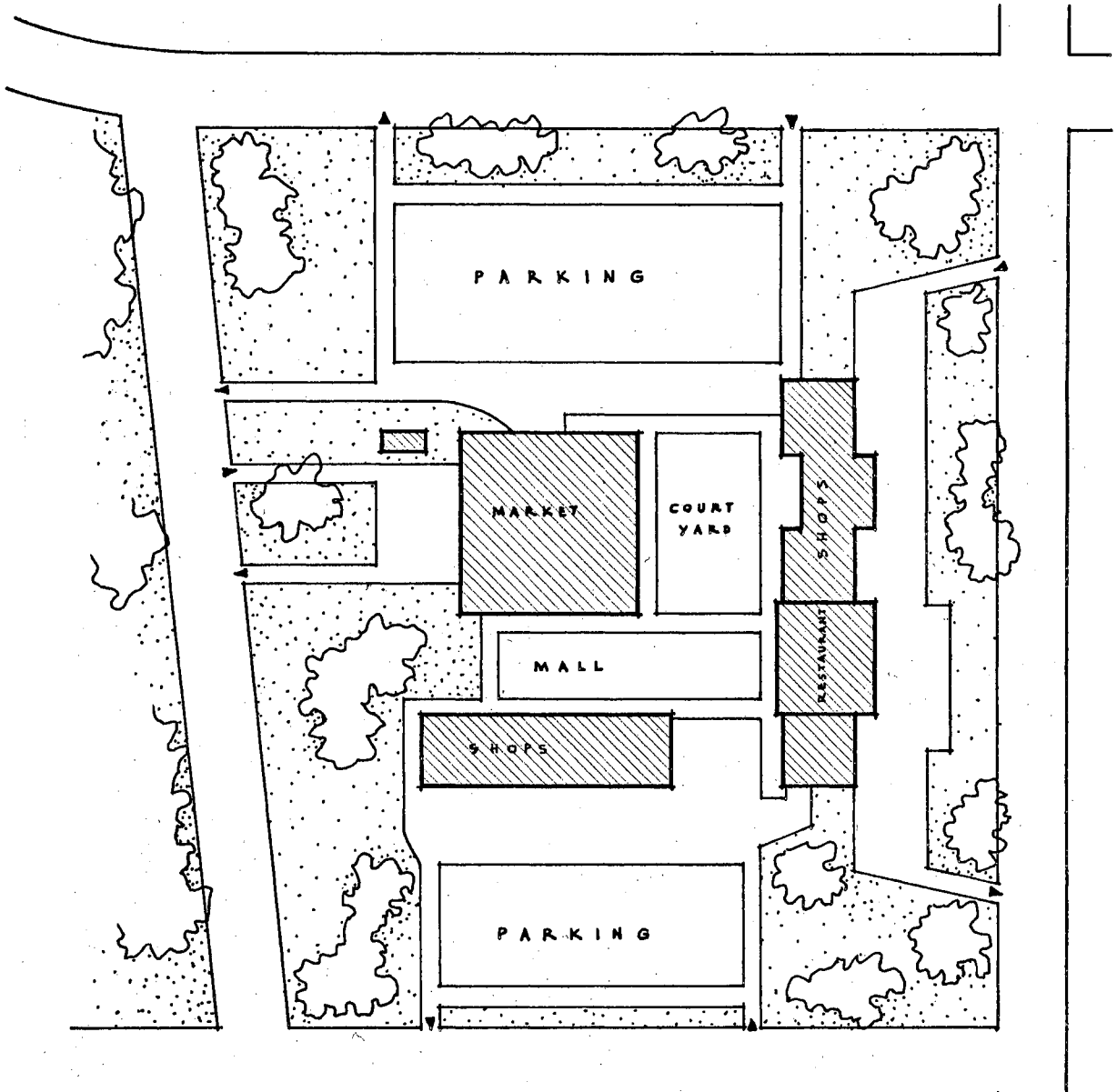


FIGURE - 3

- SHOPPING CENTER
- GENERAL LAYOUT



parking lot. These kind of shops really do not need a separate service entrance. A pick-up station has been provided near the supermarket for the convenience of the customers.

The restaurant is on the second floor which is centrally located in the center; and forms an attraction for the customers coming to the shopping area. As the restaurant is on the second floor, one can have a beautiful vista of the shopping mall and the various landscaping elements such as the pond, flowerbeds, sculptures, trees, etc.

All the walkways connecting the shops are covered for convenience of shopping in any season. They also help to control the morning and the evening sun to a great extent and will protect the glass fronts of the stores. This naturally would bring down the load on the air-conditioning plant, and make it more economical in its operation. The large courtyard and the mall will create an enjoyable and stimulating environment for the customers with its various interesting elements. Both the areas have facilities for relaxation and drinking water. Children can play in the courtyard while the mother shops around.

#### Structure and Construction

All other shops except the supermarket are divided into a 30' module in length as well as depth; and the individual shops designed accordingly. Major shops are 60' x 60' consisting of four bays each 30' x 30' square, which will be an economical span. The beams are steel I sections and the columns are of steel pipe. The roofing consists of light weight concrete channel slabs supported on steel purlins running at right angles across the main beam.

A special steel roof truss has been designed to span the restaurant as well as the minor shops. The truss is cantilevered 15'-0" on both

sides from a central column of concrete encased in steel. Two such trusses combined form a hinge joint in between the span which takes care of expansion and contraction. The details of the truss are shown in the drawings.

The supermarket will be constructed of nine hyperbolic paraboloids each 50' x 50', supported on a column 3' x 3'. The air-conditioning ducts are carried through the columns which will help to strengthen them. The tenth hyperbolic paraboloid will be constructed for the shopping center entrance on the northwest side. Ten such repetitive forms will be quite economical to construct on the site.

#### Mechanical Equipment

The plant for heating and air-conditioning is located centrally below the restaurant in the basement. The control of such a plant will be far more complex but has been adopted due to economy in capital cost as well as operation.

All the air-conditioning ducts will be carried through the tunnels located under the side walks, and then distributed to different shops. This kind of duct system will help to melt the snow in the winter time and make the walkways clear for pedestrian traffic. The air-conditioning ducts in the supermarket are carried through the columns of the hyperbolic paraboloid. Equipment for a center of this size will require a cooling tower of about 40' x 40'. It was not possible to locate this on the top of some buildings and make it an architectural feature. The pond in the mall is quite large enough to be used as a cooling tower. It will have to be about 2 or 3 feet deep. A number of waterjets coming out of the pond for the cooling purposes can be a nice feature in the mall. Each shop will be provided with remote control and transfer switches for their convenience.

## CHAPTER V

### COMMUNITY CENTER

#### The Church

The church has made enormous efforts in education, in sound action, in psychology and pastoral care. The function of the church building is to convert visitors into worshippers. Space is the symbol of God. With today's building materials and techniques it is possible to achieve architectural space of symbolic power. No form in itself will answer the problem of church design.<sup>11</sup>

The facilities required for protestant churches generally are most conveniently stated in terms of a three-fold program - worship, religious education, and social recreation. These general requirements are fairly uniform, even across denominational lines, and they vary more with local situations than with denominations. There must be an overlapping of facilities for the reason of cost.

The Sunday school is a peculiarly American Protestant institution and, compared with the church and architecture, relatively new. During the last third of the 19th Century, most churches used the main church auditorium for this purpose. It is now a common practice to provide a separate classroom for Sunday School, the size depending upon the age-groups.

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<sup>11</sup> Architectural Record Book, Religious Buildings For Today (New York, 1957), p. 6.

All through the United States history the church has been in varying degrees a civic and social center, especially in rural regions and small towns. As a concomitant of the strong liturgical movement, emphasizing the special character of the sanctuary, there is an increasing demand that provisions for the social and recreational activities be completely separate from the sanctuary but usually coordinated with the facilities for religious education.

The social recreation program of the modern seven-days-a-week church is a vital and integral part of the whole life of the congregation and the community. The program is centered largely in the general-purpose social hall, including a complete stage and an adequate kitchen. The social hall can be used for different types of activities during the course of a week. Its use for public and semi-public functions may require that it have independent access direct from the street and at the same be properly related internally to the remainder of the church buildings.

The religious edifice must have a distinct, recognizable, and somewhat monumental character.

Plan - The basic plan is a rectangle, dynamic in its progression from one end to the other climaxing in a focus of special interest and richness as to architectural forms and decoration. The longitudinal plan, is practical, logical, and psychologically valid both for the Protestant and for the Catholic Church. Even without regard to the architectural tradition of the church, it may be advocated for several practical reasons.

1. In a rectangular plan, with either a center or a side pulpit, a much larger percentage of the group is in front of the speaker as well as in full direct view of the chancel.
2. The rectangular plan makes more efficient use of the gross



area. Rectangular blocks of straight pews, using the same unit spacing, permit 14% more seating in the same area than curved pews and radiating aisles.

3. For a given area the roof spans are shorter and there is also economy in the repetition of the simpler units. Assuming correctness of the rule-of-thumb principle that the cost of trusses is proportionate to the square of the span.
4. Volume is a factor not only in original cost but also in maintenance and heating. In general, the greater the maximum span the greater the height and hence greater the volume for a given area.
5. The rectangular plan, with the source of sound at one end, approaches the ideal acoustical shape. Columns, exposed trusses and other elements which break up the volumes and the mall areas are a help rather than a hindrance to good acoustics.

The tower - A major element in the basic architectural tradition of the church is the tower, which has given to churches a recognizable silhouette ever since Christians began to build them. An important part of the function of the church building is to announce in a more or less monumental manner the institution which it houses. The church tower has been one of the most universally understood elements in the architectural vocabulary, from Constantine's first basilicas to the most recent United States Army chapel. The tower is a part of the church program for valid reasons, and should be given appropriate interpretation.<sup>12</sup>

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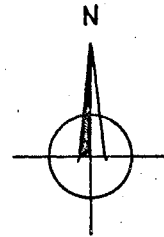
<sup>12</sup>Talbot Hamlin, Forms and Functions of 20th Century Architecture (New York, 1952), pp. 339 - 358.



FIGURE - 4

COMMUNITY CENTER  
GENERAL LAYOUT

1. The Church
2. Library
3. Parking Lot
4. Parking Lot



## The Planned Church

The plan consists of a sanctuary for a congregation of about 300 people. There is a small library attached to the church which will be mostly used for religious purposes. The reading room in the library can seat about 50 people. The library hall can also be used for social functions. The stack room will contain about 5,000 volumes.

In between the library and the main church are located the other facilities and services such as offices, toilets, one classroom for Sunday school and a mechanical equipment room. People can enter the church from the library or from the narthex at the other end. Enough parking is provided on both the sides. The corridor on the east side in between the buildings and the sun-breakers on the east facade of the library are provided as sun controlling devices.

There is a large raised paved terrace in front of the building. In the midst of the terrace stands a campanile or tower 60 feet in height.

### Structure and Construction

The columns in the sanctuary are placed at 20'-0" centers and 40'-0" apart. The columns are of steel I sections encased by concrete. There will be a light steel roof truss across the 40' span at each column spacing. The roof and ceiling is parabolic in section with laminated plywood on the roof as well as ceiling. This kind of roof has been designed to give a special effect and character in the exterior and interior of the church. The roof has an overhang of 10' on both the sides. The columns are 6'-0" away from the interior wall which forms as an aisle for circulation.

The rest of the construction consists of steel columns, beams, open web joists and Q-decking as roofing material. The campanile will be

constructed of two vertical steel roof trusses joined with horizontal bracings for stability. The trusses will be covered with plaster on lath.

#### Mechanical Equipment

The air-conditioning and the heating unit is located in between the two structures. This will be located in between the two structures. This will economize the cost to a great extent. The cooling tower is situated on the top of the library building, very near to the mechanical equipment room.

TABLE V

## SCHEDULE OF AREAS - THE CHURCH

## Church:

Sanctuary or Nave	4200 sq. ft.
Narthex	1080
Choir and Baptistry	288
Offices	280
Toilets (men and women)	280
Sunday School classroom	560
Mechanical equipment	280

## Library:

Reading room	1538
Stack room	576
Office	168
Entrance	192
Connecting passage	700
<b>TOTAL</b>	<b>10,142 sq. ft.</b>

## CHAPTER VI

### SUMMARY

The neighborhood is essentially a spontaneous social grouping, and it cannot be created by the planner. All he can do is to make provisions for the necessary physical needs by designing an area which gives the inhabitants a sense of living in one place distinct from all other places, and in which social equipment like schools and playing fields are conveniently located.

The neighborhood must stem the insidious growth of obsolescence within its confines and aid adjacent communities to do the same. While an improvement can increase value, deterioration can cause slums. Blocking the road to decay is a primary task before a neighborhood and wise planning is the first step; planning and constant community vigilance are the tools with which the urban community may become a desirable place in which people may live and work rather than merely a commodity to be sold or traded for at a profit.

Probably the most effective method of generating community life is to use the shops as the basis and place with them those buildings which serve the other needs such as community center, public library, school, etc. The shops and the shopping center provide the most important element in the design of the neighborhood. It is there that our communal relations really start. The school basis for the theory of neighborhood has been built up round a children's community. The first aesthetic problem in the design of a neighborhood is how to give the area its own physical identity, how in

fact to make it a place with its own character distinct from that of the other places.

The study of the subject will be of great help as it gives a general idea of planning procedures for a community with completely different needs and requirements than in my own country. The solution might change to some extent according to climate and local needs but the basic elements and concepts of neighborhood planning remain the same. The solved problem will not only be useful for Stillwater but can also be useful for another site development anywhere in this country having the same requirements and site situation. The same plan can even be adopted for the layout of a residential community in an urban or a sub-rural area.

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