PRAKANONG SUBURBAN CENTER

BANGKOK, THAILAND

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INTRODUCTION

Suburb is a word which comes from Middle English, derived from the Latin "suburbium", meaning "an outlying part of a city or town". So the meaning of suburban center is a place in or around which the activity of a smaller community adjacent to a city concentrates. This has been in basic parts of the suburb in the United States.

The growth of the suburbs is essentially demographic and ecological.

The primary interest lines in the analysis of the facets which gave rise to suburbanization are the extent of its growth, its demographic character, and the implication of suburbization for social theory.

The sociology of the suburbs is organized around questions relating to the fundamental, definitive social structure ans processes of the suburban community. The social organization of the suburbs, suburb on life styles and suburban problem are basic principles of suburban community which characterize the formal and institionalized organization in the suburbs.

Suburban center in Thailand are still scattered or disordered confuse organized which the villager. The

old center in each community was a market fair or fresh food market and some villages had only morning-market fair.

The new center at Prapanong would be composed of markets, department stores, shops, specialty shops, an office building, a restaurant and a recreation area to serve townsfolk and villagers that would be served by traditional as morning-market fair, clothing market and fruit market, on the other hand. The modern merchandise was served in this center and prepared for the future.

The new type of shopping center is still in a period of dynamic growth. But if it is planned now with a full appreciation of its potentialities, then it may modify the present pattern of retailing to the advantage of almost everyone.

CHAPTER II

PROLOGUE

General background of Europe: In medieval times the focal point of the market and fair might have been at the local bridge or site adjoining the church or monastery walls.

In modern Europe, France, Spain, Italy, and Georgian England grouped the buildings together and the first thought was imitation of almost any type of building considered fashioable.

In Thailand, wat (church) and both sides of klong (canal) are the center and downtown of the community. At present, in Bangkok, the country folk could see the morning-market fair and floating-market along the klong.

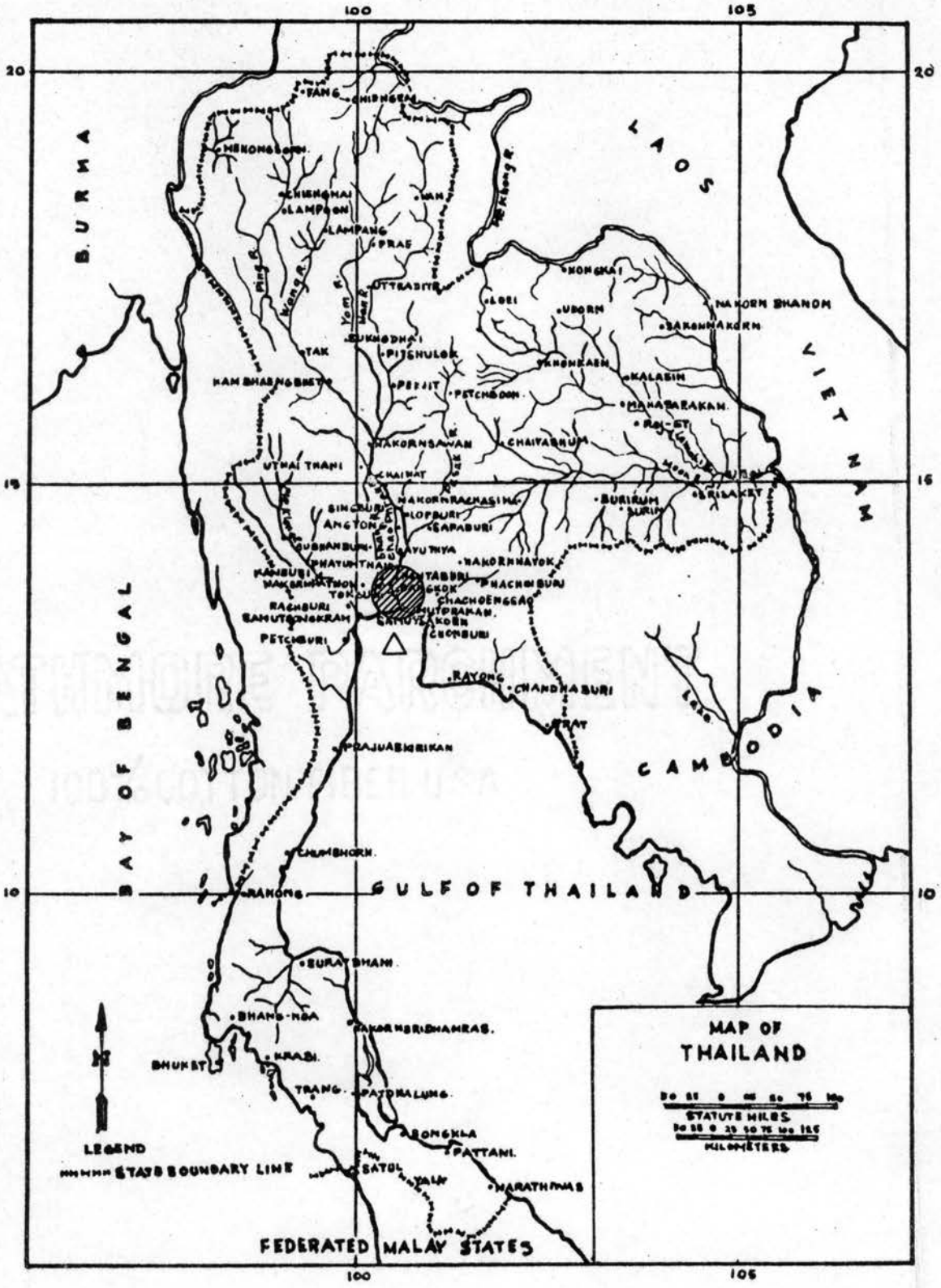


Figure 1. Location Map

CHAPTER III

THE PREREQUISITE

Thailand

Thailand, kingdom of Southeast Asia, was known as Siam until 1939 and again between 1946 and 1949. It is located in the center of the Indochinese Penensula. The main part of the country is bounded on the west and northwest by Burma, on the north and northeast by Laos, on the southeast by Cambodia, and on the south by the Gulf of Siam. The country has an area of 198,500 sq. mi. approximately the combined area of Alabama, Georgia, South Carolina, and Florida. Thailand is the only country of Southeast Asia that has never been ruled by a European power. Today its capital, Bangkok, is the seat of the Southeast Asia Treaty Organization (SEATO) and the United Nation Economic Commission for Asia and the Far East (ECAFE).

The central alluvial flood plain extends southward from Uttaradit about 300 mi. to the Gulf of Siam. This almost level plain is the heart of the country and constitutes the valley of the Chao Phya River. Most of the plain is flooded each year in late summer and early rainy season. The lower plain, particularly north and west of Bangkok, is latticed with an elaborated network of canals

(klong) constructed to control the flood and used for irrigation.

Thailand lies entirely within the region of tropical and monsoonal climate. The weather is warm throughout the year. As is the characteristic of monsoonal areas, the changes of seasons are determined by the direction of prevailing winds and the resulting rainfall. The summer is rainy and wet, some rain falls everyday, whereas winter and early summer are dry. Most of the country receives 40 to 60 in. of rain annually.

Transportation of goods and passengers on the extensive inland waterways of central Thailand is of major importance. Most of this commerce is carried on by small, privately operated craft.

Thailand's economy is heavily dependent upon foreign trade. The principal export, rice, goes to other parts of Asia and amounts of some $200,000,000 annually. Rubber and tin are the other important exports. The most important and fundamental form of production is agriculture, although there is increasing diversity in economic activity.

The overwhelming majority of the Thai live in rural areas. Their traditional mode of living is the cultivation of paddy rice. Villages are located in alluvial valleys and on the plain, often strung along the canals or rivers. The homes, of wood or matting are built on piles to avoid the floods and marauding animals. Urban society is more complex. There the effects of the rather elaborate

structure of the traditional royal court, modified by substantial elements of Chinese and Western social ideas, predominate. Upper, middle, and lower classes are distinguishable and subdivided by ethics line of Thai and Chinese.

Bangkok, city and capital of Thailand, is located in the southern part of the country near the Gulf of Siam. The city, situated astride the shallow, winding Chao Phya River, approximately 23 mi. from the gulf, is built on a flat alluvial plain surrounded by marshlands. Bangkok is the administrative financial, commercial, and cultural c center and principal part of Thailand. Considerable quantities of freight move along the river or on the many canals, on the other hand it is a pleasant modern city with wide streets and boulevards and with many well-traveled canals all interconnected with the Chao Phya River.

Climate of Bangkok

1. Topography: Bangkok, the capital city of Thailand, is situated at latitude 13° 44' N., longitude 100° 30' E., with the height of about 2 meters above mean sea level. The total area is about 889 square kilometers. The city is on a flat plain along the left bank of Chao Phya River. It is about 30 kilometers north of the Gulf of Siam.

2. Main Climatological Features: The climate of Bangkok and the adjacent regions are distinctly seasonal, that is, in the cold weather season, November to February,

being controlled to a large extent by the generally dry continental air mass and in the wet season, mid-May to September, by the warm moist maritime air mass.

Cloudiness and rainfall are minimum during the northeast monsoon, the cold weather season, which is the best time of the year that satisfies the tourists.

3. The Seasons: Meteorologically, the seasons for this region may be divided into four seasons, namely,

3.1 Cold season or Northeast monsoon season, November to February, is the mild period of the year, and the cold spells are short lived. The coldest ever had, registered a lowest temperature of 9.9° C. (50.0° F.) on the 12 January 1955.

3.2 First transitional season, March to mid-May is the hottest period of the year when the extreme maximum temperature had risen up to 39.9° C. (104.0° F.) on the 27 April 1941.

3.3 Rainy season or Southwest monsoon season, mid-May to September, is the wet period of the year.

3.4 Second transition season, October, changeable weather, that is, frequent rains with thunderstorms in the first half of the month and becoming generally dry and cool in the second half.

4. Temperature: Because of the location, Bangkok is in the tropic then the temperature is generally high especially in the afternoon. Even though in the cold season, November to February, the mean minimum temperature

in the early hours is about 21.5° C. (71.0° F.) but in the afternoon the mean maximum may rise to 31.7° C. (89.0° F.) which shows great variation. In the hot season, March to mid-May, the temperature will climb up to the highest in April or the beginning of May. The highest one was 39.9° C. (104.0° F.) on the 27 April 1941. However, the mean maximum temperature during this season is about 35.0° C. (95.0° F.) with 2-3° C. above the mean value. The factors reducing temperature are sea breeze and rains. Sea breeze is the principal factor that usually occur in the afternoon till evening and sometimes the speed will increase to 20-25 miles per hour. Besides, this sea breeze is very useful in kite flying being one of national sports which they usually do during this season due to its steadiness.

In rainy season, the temperature is uniform except for the dry spell it may rise to a high level.

5. Rainfall: The average annual rainfall at Bangkok is 1531 mm. (60 ins.) with 131 rainy days. Its amount may be divided as follows: 60% occur in the rainy season, 34% for both transitional seasons and 6% in the cold season.

After the Southwest monsoon has established, rains will generally be somewhat continuous through out the season. The date of establishment varies to some extent, however, most frequent in the middle of May with the deviation of about one week. The maximum peak of rainfall will be experienced in September with about twenty-three rainy

days. Toward the end of rainy season, there may be some revolving storms approaching or entering the area, which cause substantial rains. In the transitional seasons, thunderstorms with heavy showers and gusty winds may occur locally in the area. Rainfall is light and infrequent in the cold season.

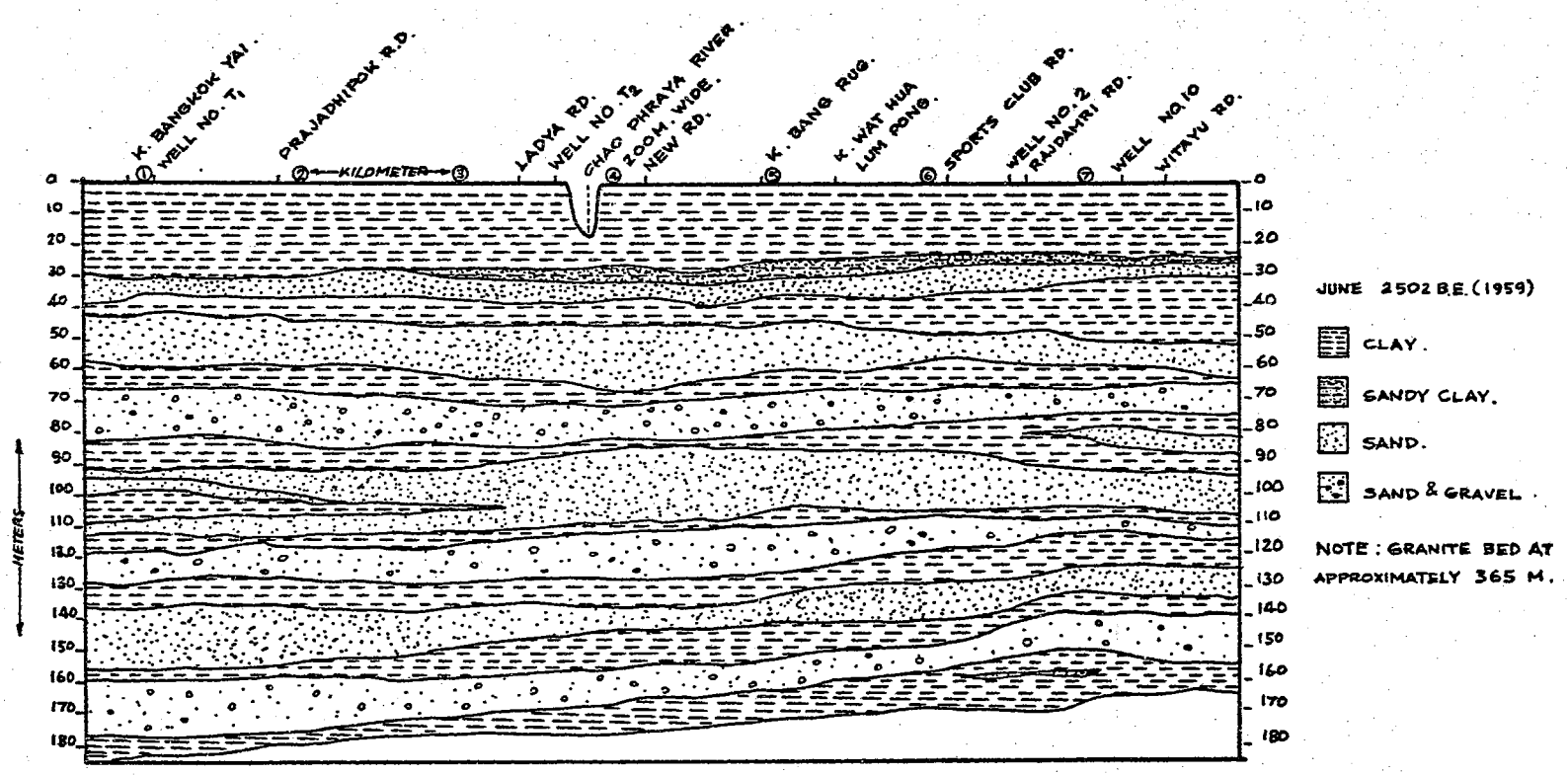
6. Relative Humidity: The average relative humidity is high because of the nearness of the sea. The annual average is about 80% with the maximum value of about 85% in rainy season and minimum value of about 75% in cold season. During the cold spells, most frequent in January, the apparent relative humidity may be reduced to 30% depending on the strengthening of the northeast monsoon. In Bangkok although the day temperatures may not be excessively high, slight air movement and high relative humidity, produces the low cooling condition. Sensible temperatures are, therefore, excessively high, even the actual thermometer readings may not indicate abnormal heat.

7. Winds: Surface winds and rainfall are closely related. During the Southwest monsoon (wet) season, mid-May to September, winds are generally west and southwest directions. In October, variable winds with easterly tendency prevail and occasional gust due to thunderstorms will occur in the first half of the month. From November the winds shift, cool weather sets in gradually till February, the winds are mostly from the north and northeast directions. From March through mid-May, surface winds are

CLIMATOLOGICAL DATA OF BANGKOK

PERIOD B. C. 2480 - 2505 (A. D. 1937 - 1962)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year B. C.
Temperature(C)													
Mean	26.2	28.0	29.3	30.1	29.7	29.0	28.5	28.4	28.1	27.7	26.9	25.6	2480-2503
Mean Min.	20.2	22.7	24.4	25.2	25.1	24.9	24.5	24.5	24.3	24.1	22.8	20.3	2480-2501
Mean Max.	32.1	33.0	34.3	34.7	34.3	33.0	32.5	32.3	31.9	31.3	30.9	30.8	2480-2501
Rainfall (mm)	9.0	28.6	34.3	89.4	166.3	170.7	177.9	190.9	305.9	254.7	57.3	7.1	2474-2503
Humidity %	71.4	74.1	73.6	74.3	78.6	79.4	79.4	80.1	82.1	82.7	79.3	73.5	2480-2498
Wind Direction %													
N	15.1	5.0	2.8	2.0	0.9	0.7	0.6	0.8	5.1	21.4	33.9	34.6	2493-2497
NE	22.6	12.1	7.2	4.7	2.6	0.8	1.2	1.0	4.3	16.5	22.5	24.1	" "
E	14.5	16.5	7.9	5.6	5.0	2.1	3.0	1.5	4.9	7.7	6.7	6.1	" "
SE	3.6	12.5	11.1	13.7	12.1	9.7	8.8	5.7	7.6	6.2	1.3	0.3	" "
S	7.6	20.7	35.0	37.5	30.1	35.7	25.9	26.3	19.3	7.1	0.8	0.3	" "
SW	4.8	14.0	18.5	16.7	18.2	24.5	27.4	25.9	20.8	5.5	1.5	0.1	" "
W	4.0	2.3	2.8	4.7	8.0	8.1	12.1	20.5	12.9	6.3	2.8	2.3	" "
NW	8.0	3.0	1.0	1.3	1.3	0.3	2.1	2.6	3.9	7.4	10.7	18.8	" "
Calm	19.9	14.0	13.7	13.9	21.8	18.0	19.0	15.6	21.2	21.8	19.9	13.4	" "
Extreme Max(BF)	5.0	5.8	6.4	7.4	7.4	7.8	7.8	7.6	6.2	6.4	6.8	5.2	" "
Average Force	1.2	1.5	1.7	1.9	1.4	1.5	1.5	1.6	1.3	1.2	1.1	1.3	" "
Sunlight (hr)	292.6	214.4	270.6	268.6	180.6	167.4	132.3	150.5	143.1	215.4	265.0	265.8	2505



GEOLOGIC CROSS - SECTION OF BANGKOK - THONBURI.

Figure 2. Subsoil Condition of Prakanong Suburban Center

again variable with the tendency of south direction. However, sea breeze has a considerable effect in rendering the wind direction to steady from the southerly directions in the afternoon and most of the times lasting until late in the evening. Frequent gust due to thunderstorms may rise up to a high value. The highest speed was 64 miles per hour on the 13 April 1952.

8. Subsoil Condition: The central plain has a basic variety of heavy dark clays; superimposed upon these by the Chao Phya floods are deposits of fine sandy and silty soil. The banks of river are where the lighter soil is found.

A vertical sequence of soil types is as follows:

a. The depth 10 m. from surface is black clay.

b. Light brown to yellow clay for a depth of about 10 m.

c. From 4-8 m. is sandy clay.

d. Clay and gravel are layers in various depths.

The Influence of Nature in Tropical Design

1. Sun Direction: The sun direction forces buildings' side elevations to east and west in order to avoid sun exposure and keep wide areas on south and east sides. Heating is reflected by clouds and ground. (The amount 33% of all radiation is the sun energy as an average for the northern hemisphere.) The angle of the sun is avoided by louvers. The desired temperature is 70° F to 72° F.

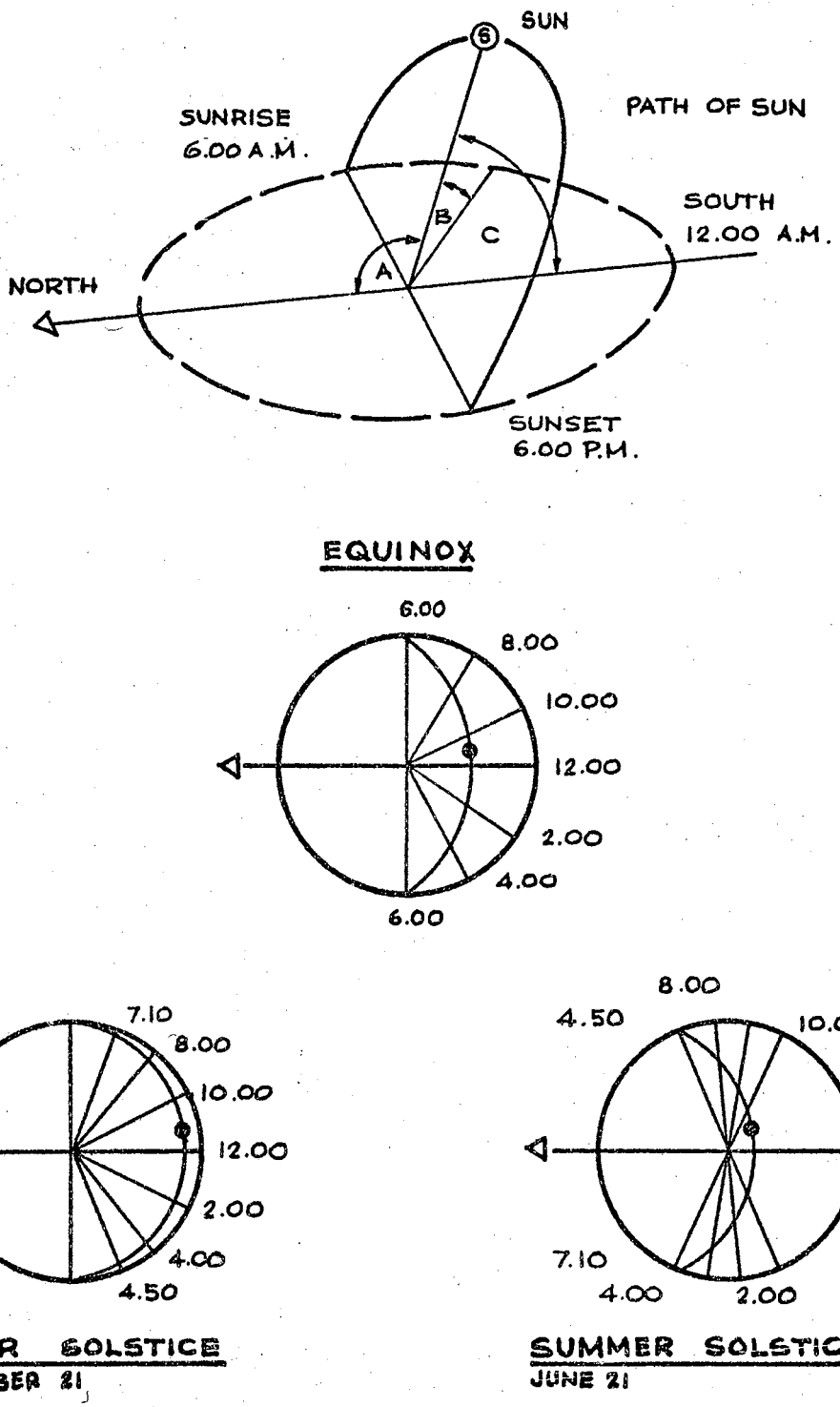


Figure 3. The Influence of Sun Direction

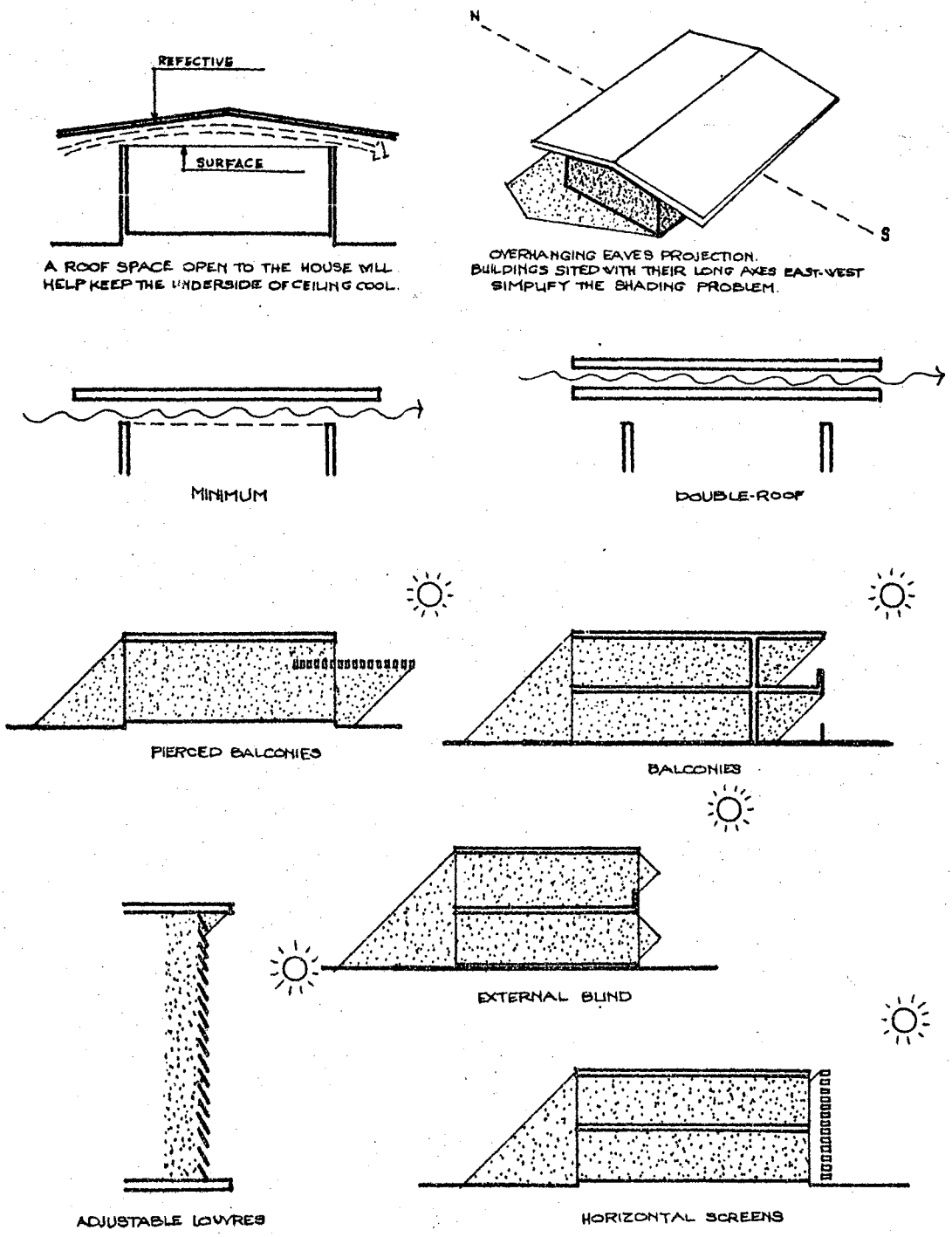


Figure 4. Temperature Deduction Sources

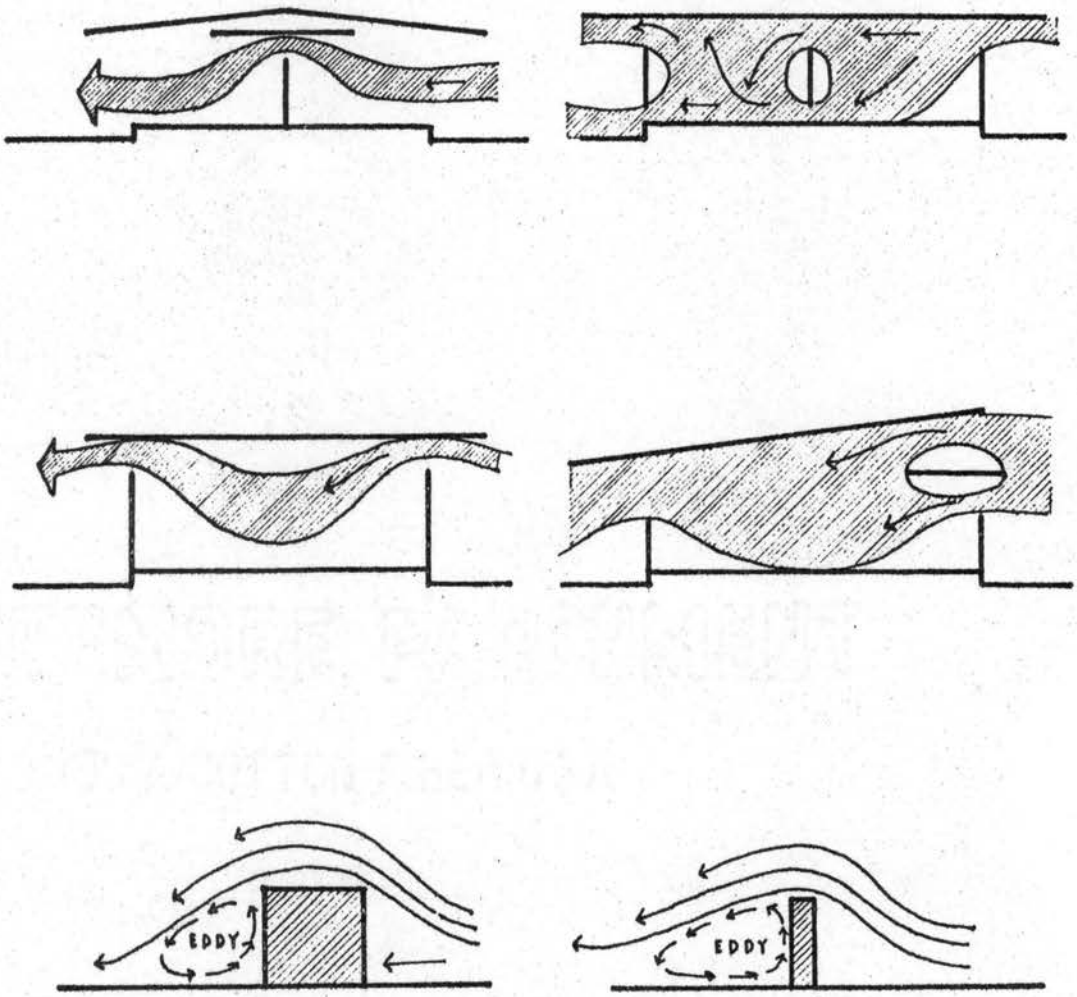


Figure 5. Determinant of Air Flow Pattern and Eddies

The various structure members such as the roof, ceiling, walls and floors are used to help achieve this desired temperature.

2. Wind Direction: The wind necessitates that the longest side of the building be against its direction in order to create air movement and natural ventilation. The location and type of inlets are collected for designing.

3. Rainfall, Humidity and Temperature: The temperature affecting building depends on environment, season, atmospheric imputities, wind and air-mass movement, and altitude. The natural factor reducing temperature are rain and sea-breeze, plants, and trees. Blinds and water cooling are the technological principles of the cooling effect in the tropical zone. Drainage systems must be provided for the great amount of rainfall in the rainy season.

Requirement of Site Selection

1. Location of Site: The eleven standard requirements of the site selection.

3.1 The site must be located in the general area established as most desirable by the economic survey.

3.2 It must be owned or controlled by the developer, or its acquisition must be feasible.

3.3 The cost of the land must be in keeping with overall economic consideration.

3.4 Existing zoning must permit usage of the site for shopping center purpose.

3.5 There must be enough land to allow construction of facilities that will meet the sales potential.

3.6 The shape of the site must be such that advantageous planning is feasible.

3.7 The land must be in one piece, free of intervening roadways, left-of-ways, easement or major waterways, that would force the development into separated portions.

3.8 The surrounding road pattern and the accessibility of the land must allow the full utilization of the business potential of the projected center.

3.9 The possibility of achieving visibility of the shopping center structure from major thoroughfares must be present.

3.10 Surrounding land uses should be compatible with the operation, free of competitive developments.

2. Zoning of Site: A site zones for commercial use ordinarily costs more than one zoned for residential or agricultural use. The intent of zoning is to bring a semblance of order into dynamic but anarchistically expanding areas and to guide their growth along more desirable lines. As zoning legislation matured, attention was turned to such factors as the size, shape and location of buildings in relation to each other and to lot lines.

3. Physical Characteristic: The physical characteristic of site has been flat plain, one side toward the canal and one side close to a highway. Undesirable topographic conditions are sometimes coupled with exceptionally low land costs. If land cost is normal, however, the extent and cost of such additional site preparation must be given careful consideration.

4. Accessibility of Site: Accessibility is judged not only on the basis of carrying capacity of the surrounding road system but also on a basis of smooth and convenient transfer from the road system to the site. It may be possible to establish satisfactory transfer by the construction of ramps, overpasses, cloverleafs, signaling devices or similar measures.

5. Surrounding Area: This relationship exists between a shopping center and its surrounding area. A well-planned center can exert a highly favorable and envigorating influence on the area surrounding it, and a well-planned surrounding area can add, in large measure, to the prosperity of the center.

Tenant Requirements of Suburban Center

1. Tenant Needs: The dissimilar requirements of various tenants must be taken into consideration in arriving at a fair rental and in discussing planning specifications. The nature of the solution of problems will vary not only with the type of tenant, but also with the

relative bargaining strength of developer and tenant. The size and character of the center. Certain principles are applicable concerning to the relationship between the landlord and the tenants in each type of project.

Whether or not certain tenant types are available for a particular project will depend not only on the size of the project and the quality of the location, but also on merchandising practices and consumer buying habits in the city under consideration. The extent to which these store types would be included in smaller projects would depend upon the circumstances in each case.

2. Tenant Types

Food
Supermarket
Delicatessen
Fish
Bakery
Candy
Nut shop
Produce
Meats
Fruit shop
Dairy products
Carry-out foods
Beverage store
Health foods
Spice and condiments

20 Department Store
Major department store
Junior department store

20 Variety
Teen shop
Children's wear
Infant's wear
Children's shoes
Family apparel
Family shoes
Casual wear
Beach wear
Cotton shop

Apparel
Women's apparel
Women's specialty
Women's sportswear
Dress shop
Women's shoes
Linerie
Foundations
Hoisery
Women's accessories
Bags and gloves
Millinery
Maternity
Men's wear
Men's shoes

Custom Shirt Shop
Men's accessories
Ties

Youth Shop
Home equipment
Plumbing supplies
Electrical supplies

Drugs
Super drugs
Drugs
Pharmacy

Silk shop

20 Furniture and Home Furnishing
Furniture
Appliances
Draperies
Lamps and shades
China and glass
Floor covering
Antiques
Modern design
Pottery
Radio and television
Interior decorating
Special furniture
Bar and patio

Hardware
Hardware
Paint and wallpaper
Silver
Stationary
Sewing machines
Toys
Sporting goods
Hobby shop
Tropical fish supply
Pet shop
Auto accessories
Tires and batteries
Garden shop
Key shop
Lending library
Souvenirs

22 Services
Barber
Beauty salon
Shoe repair
Cleaner
Laundromat
Photographer
Travel agency
Tailor
Service station - gas and oil
Airline ticket office

Eating and Drinking
Snack Bar
Cafeteria
Restaurant
Coffee shop
Cocktail lounge
Fountain lunch

Other Stores
Gifts and cards
Religious goods
Art supplies and frames
Music and records
Jewelry
Florist
Fabrics
Liquor
Leather and luggage
Perfume and cosmetics
Tobacco and news
Camera shop
Post office
Loan office
Medical and dental offices
General office
Insurance
Accountants

Recreational
Theater
Auditorium
Bowling alley
Kiddieland

Institutions
Banks

CHAPTER IV

PLANNING

Site Planning

1. Basic Categories: The location of a suburban center depends on an analysis of economic accessibility. The economical analysis considers the distribution, its buying power, the location of competing centers, the means of access to the site and their capacity, the time distances involved, and customary routes of travel for other purposes. Armed with this information one should plan by carefully allocating portions of the land to specific usages, and these are the basic categories by Victor Gruen and Larry Smith.

2. The Basic Principle of Site Planning:

2.1 Structure

a. Structure for retail purposes (retail area).

b. Structure for service purposes (air-conditioning plants, electric substations, maintenance shops, truck roads, loading docks, equipment storage, etc.)

c. Structures for public usage such as civic and social facilities (community center, auditorium, exhibition space, children's play areas,

areas, etc.)

2.2 Car Storage Area

a. Surface parking lots.

2.3 Pedestrian Areas

a. Malls, courts, lanes, plazas.

b. Covered pedestrian areas, such as public corridors, covered malls or courts, etc.

2.4 Automobile Movement Areas

a. Distribution road system on site.

b. Magazine roads, etc.

2.5 Public Transportation Area

a. Bus roads, bus terminals, taxi stands, etc.

2.6 Buffer Areas

a. Landscaped areas separating car storage areas or service areas from the public road system, or areas separating parking areas from each other or parking areas from service areas.

2.7 Reserve Areas

a. Portion of site to be held in reserve for the planning growth of the shopping center.

Suburban center at Prakanong has to prepare spaces for waterway transportation such as:

a. Taxi-boats, freighters, merchant ships, fishing boats.

b. Service stations and gasoline stations.

The composition of a center in regard to the types and sizes of stores can only be judged on completion of

market and financial analysis, with the balance between kinds of tenants being quite significant. It is now possible to draw some definite conclusions as to what adherence to these principles will bring forth in the way of planning for suburban center site and surrounding areas.

Planning for the Traffic

An integral part of planning is traffic, site and surrounding area, but keeping in mind that a suburban center is not to be planned to serve traffic; rather, traffic is to be planned to serve the suburban center.

"The Aims of Traffic Planning"[1]

1. Easy traffic flow on the surrounding road system.
2. Effective transfer of road traffic into the shopping center site.
3. Even and effective distribution of traffic on the site.
4. Convenient and efficient arrangement of car storage facilities.
5. Separation of service vehicles from customer car traffic.
6. Provisions for separated movement and loading areas for public transportation vehicles.

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[1]Gruen, Victor and Larry Smith, Shopping Town U.S.A., pp. 121-131.

Planning for Merchandising

1. Physical Aspects of Plan: Merchandising planning attempts to create a situation in which each member of the retail entity, the tenant and the shopper, functions in a manner that benefits each.

The primary objective of the merchandising planner to select main structures and arrange them in such manner that the greatest possible number of customers are attracted to that point and funneled through it, thereby creating the maximum amount of pedestrian traffic and inter-store shopping opportunities. By placing customer attractors in a location where they function as magnets, customers are pulled through the center, from one magnet to the other, past the doors of the tenants who fall into the category of traffic users.

2. Factor Affected Merchandising Plan: The relationship of planning elements and degree of skill of planners have much effect on merchandising plan. If the center is in a strong bargaining position, it is likely that the owner will be able to negotiate terms and location favorable to it. Factors such as methods of promotion during the early development period, timing of various phases of the project, and demonstrated ability in selecting and signing major tenants could affect the degree of confidence in management necessary to carry the project through.

Suburban Center in Tropical Zone

The true center of the modern Tropical Town is the market, which is larger, more active, more colorful, and more social than anywhere else in the world. Its influence appears to spread, not only into local markets and many forms of street trading, but into the shops or stores which, much more than in the temperate zones, expose their goods to the streets and invite subsidiary or attracted traders to them.

Since both market and store are unsolved problems it may be helpful to outline the primary and sometimes uncalled-for demands of each:

1. A lorry park which is both shaded, surfaced, drained, and combined with a filling station.
2. Stalls arranged so that they are shaded and approached preferably by shaded and surfaced walks which are well drained.
3. The stalls themselves should be sufficiently and permanently covered, drained, well raised above ground level, and provide for a variety of trades and grades of stall holders.
4. There should be good sanitary convenience and rubbish collection facilities.
5. Efficient market control should be provided.

The question of the desirability of surfacing and draining the ground can hardly be overstressed.

It must not be forgotten that in most wet tropics the open market performs something of the function of an outdoor club, and shady trees and spaces are more than welcome. The market is usually the least carefully designed of Tropical Town buildings, being so often an age-old survival.

The shop or "store" still shows signs of its origin, a shop in the western sense being a newcomer. The original "trader" usually came from overseas and lived over his store, frequently in one of the prefabricated wooden structures set upon posts, with his store below. His supply-source being remote, he sold from his store direct, and often as a wholesaler to men or to women who traded in the market.

Elements of this "store" origin are still to be seen in many a tropical shop. The climate discourages "window shopping"; the interior of the shop, thrown open to the street, forms the "display," but when not in use closes up securely with the possibility of theft or riot in mind. However, so rapidly is life in the humid tropics changing, that now some of the best self-service stores are to be found there on a pattern adapted to local usage. Thid rapidity of change, commented upon earlier in the book, is nowhere discussed with the energy and vision it requires.

Recent research shows that light intensity in the tropics may be double that in temperate zones, with the possibility of a deep light penetration into office

buildings provided that the element of glare can be dealt with effectively, thus enabling deeper section in buildings than would be possible in countries with temperate zones and consequent building economy.

There is a difference between an air-conditioned building and one relying on natural ventilation. In the first, it is a problem of preventing by every means possible the entry of the heat, and beyond the limits of good working conditions, of light, because de-humidification of humid tropical air throws an initial burden on the refrigeration machinery. It is therefore necessary to cut out any source of heat gain to the interior that will increase the air-conditioning load.

Walls and windows must either be brought down to shade temperature by shading devices such as sun-breakers, louvers, etc., or curtain walls, with few contacts with the frame, must insulate the interior, and the roof must be especially studied as receiving the longest and most direct exposure.

It may happen that the hours of work will permit the walls to store up a certain amount of heat and flatten out the graph of high and low temperatures which result from these curtain walls and stress the machinery at peak loads.

The problems are not solved entirely in favor of the curtain wall while contraction and expansion, the penetration of driving rain and condensation continue to give trouble. The ideal is as stable an indoor temperature and

humidity as possible before air-conditioning begins to function.

The difference in exposure between west and south and east and north is considerable and should influence both the siting and the design of air conditioned buildings.

The problems of traffic, separation of pedestrian from vehicular movement, and the rational parking of the motor car remain problems to be solved, with the additional necessity for greater protection from sun and rain. Thus assigned streets in front of shops, stores, and public buildings are a benefit, and forms of town design that allow road access and parking to be provided for every important urban building without interfering with the free movement of the pedestrian. This is especially important in the core of the city where a paved square or other outdoor place of assembly for public meetings may be required.

It could be said of civic building groups in tropical countries that if they wish to avoid looking like any other modern building group anywhere in the world they will pay close and particular attention to the effects of their climate and the means of overcoming their worst deficiencies. Granted that every modern city has traffic problems and must deal with a high concentration of people and affairs, these should emerge from the climatic conditions of form and plan markedly different and distinctive buildings arising in the one form from its high rainfall and humidity, its abundant, colorful vegetation under changing

cloud and sun, its free "outdoor" life. And in the other form, its arid, dryness, the supercharged heat of the day bleaching all color and setting a premium on shade, the welcome of evening. These are elements bearing ceaselessly upon the lives of all inhabitants to give them the character of their region, and modeling the habits and customs by which they live.

Designs' Problem of Prakanong Suburban Center

As in every other shopping center the first steps were the hardest. The number and type of stores and their speed of building must be continually modified to fit available capital and the demands of prospective tenants. Inevitably, the design and layout of the stores becomes subject to all sorts of compromises though they seem to have been fewer here than in almost any other center of comparable size.

Prakanong Suburban Center should be the new center's trump card in attracting customers from beyond the immediate neighborhood.

As a condition of entering Prakanong Center, the owner insisted upon the developers finding these tenants to be their neighbors in the new center: a department store, a grocery store, variety stores, a restaurant, drug stores and service shops, also a theatre.

All of these, plus furniture and jewelry stores, women's apparel stores, a gift shop, a drive-in bank, and

a gas station. In this area, the office building was fixed for the advantage of this center.

Colonial stores supermarket, in particular, have attracted trade from far beyond the immediate neighbornood.

The standard canopy (13 ft. wide) which runs unbroken along the front of the stores, was originally designed as a cantilever. It turned out to be less striking in appearance, but far less expensive in its present form, supported by thin lally columns at the outer edge.

The standard red brick facing of the stores is relieved by section of common brick and stone, which add considerably to the character and variety of the building front. The landscaping will also contribute greatly to the charm of this center, once the flowering shrubs and trees have become established.

In areas that are subject to intense electrical storms, as are many parts of the tropics, the provision for lightening protection must be engineered at an early stage in the design of the structure, and the British Standard Code of Practice C.P. 326-101 (1948), General Series, should be consulted. This includes information on the following:

Materials, appliances and components

Design consideration

Inspection and testing

Maintenance

The chief point of detail that concern the architect

is that lightening conductor tapes must be taken to the ground by the shortest and straightest route, and must have no bends of less than 90°. The larger the angle at a band, the more it may be necessary in certain cases to arrange for holes to be left in concrete slabs or eaves of timber roofs to allow a straight passage of the conductor to the ground.

The development of water resources in the dry and humid tropics is often of vital importance to expanding populations in this area. Water in the humid tropics is obtained mainly from streams, rivers, lagoons and lakes which could otherwise be controlled or eradicated altogether.

In many areas the supply of water is dependent on seasonal variations of rainfall and during long dry spells the supply dwindles and may dry up altogether.

A further method of supply, particularly in isolated areas, is the collection of rain water from roofs and, in certain cases, paved areas and storing this water in large tanks.

CHAPTER V

PROJECT PLANNING

Bangkok Municipality is planning a development in Prakanong residential area to serve the increasing metropolitant. Prakanong is bounded on the north and the west by old centers, on the east and southeast by residential areas and fishing villages, changwad Samuthprakarn, on the south by changwad Thonburi. The new (21) suburban center should be placed on Prakanong District (Sukumvet Highway).

Prakanong Suburban Center is planned to provide the following:

1. Preparing new center to serve the metropolitant in that area and around it.
2. Designing new center to fit with climatic condition and modern merchandising are suitable with this merchandising characteristic.
3. Combination between traditional and modern merchandise altogether placed on suitable area.
4. Tenant buildings are provided for markets, department stores, apparels, drugs, eating and drinking areas, services, institutions and recreational.

The site of Prakanong Suburban Center location is eight miles from the old center.

Boundaries: Southwest is bounded by Sukumvit Highway. Southeast is bounded by a new canal. The North is bounded by a new street. Northeast is bounded by a rice field.

Gardiner and clothing markets should be located where there is more natural light and reflection. On the other hand, electrical light is provided as necessity demands for these tenant building types and preserved for emergency.

On the lower flat plain, an upper level of water content should be advantageous in landscaping design as tropical plants will create a pleasant center all year long.

1. Location: Thailand largely escaped both damage and postwar disorder resulting from World War II. Since the war, trade has continued to flourish, and Thailand is well off by Asian standards. This intensification of economic activity has been reflected in a continuing increase in population. The municipalities of Bangkok and Thonburi are located within the changwads (province) of Pranakorn and Thonburi respectively. But urban growth has already begun to extend into Changwad Nonthaburi to the north, and Changwad Samuthprakan to the south. Accordingly any definition of the Bangkok - Thonburi Greater Metropolitan Area must include all or portions of four changwads.

2. Population of Bangkok and Thonburi: Population by Amphurs, Bangkok and Thonburi Municipalities B.E. 2500

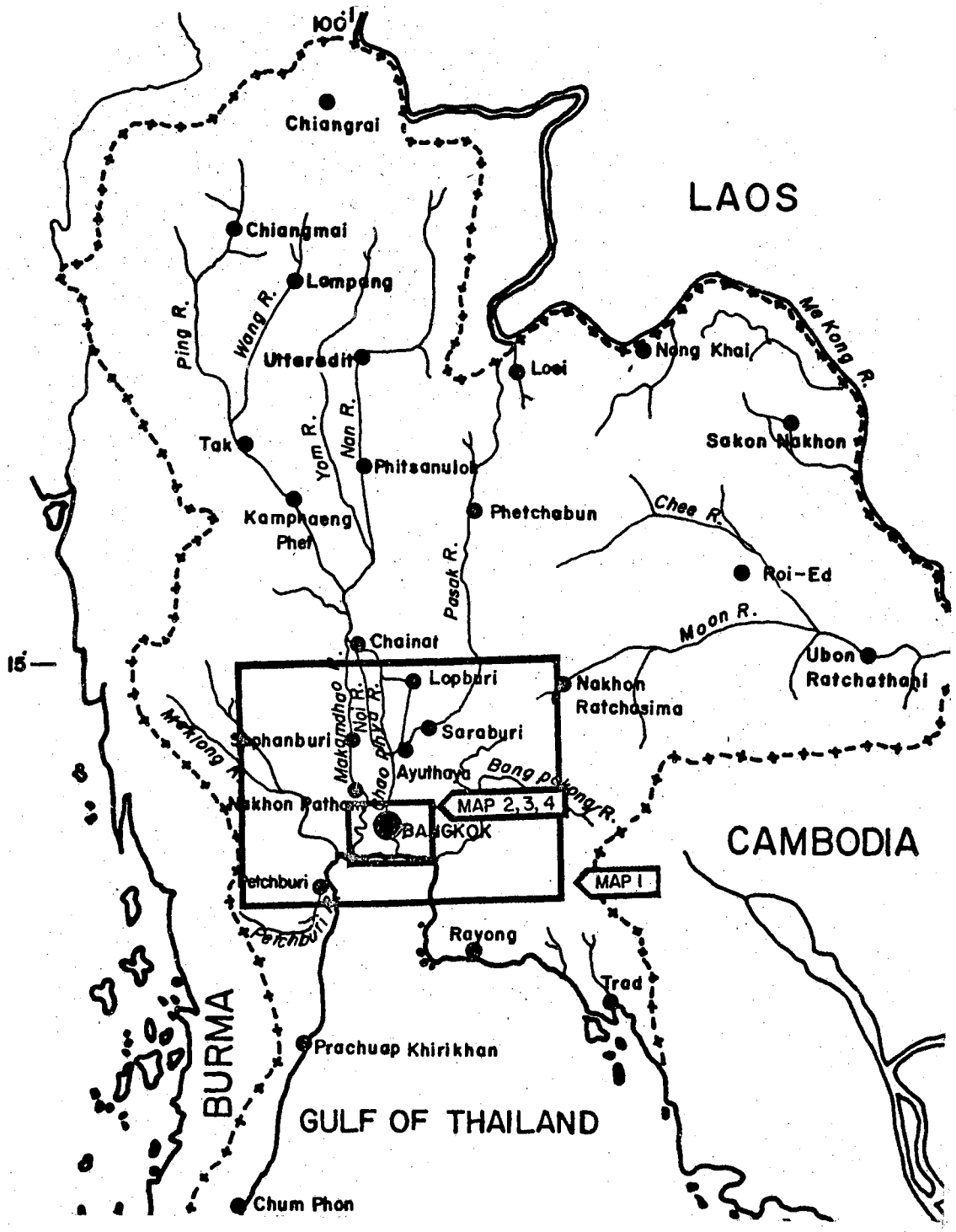


Figure 6. Key Map of Prakanong Suburban Center

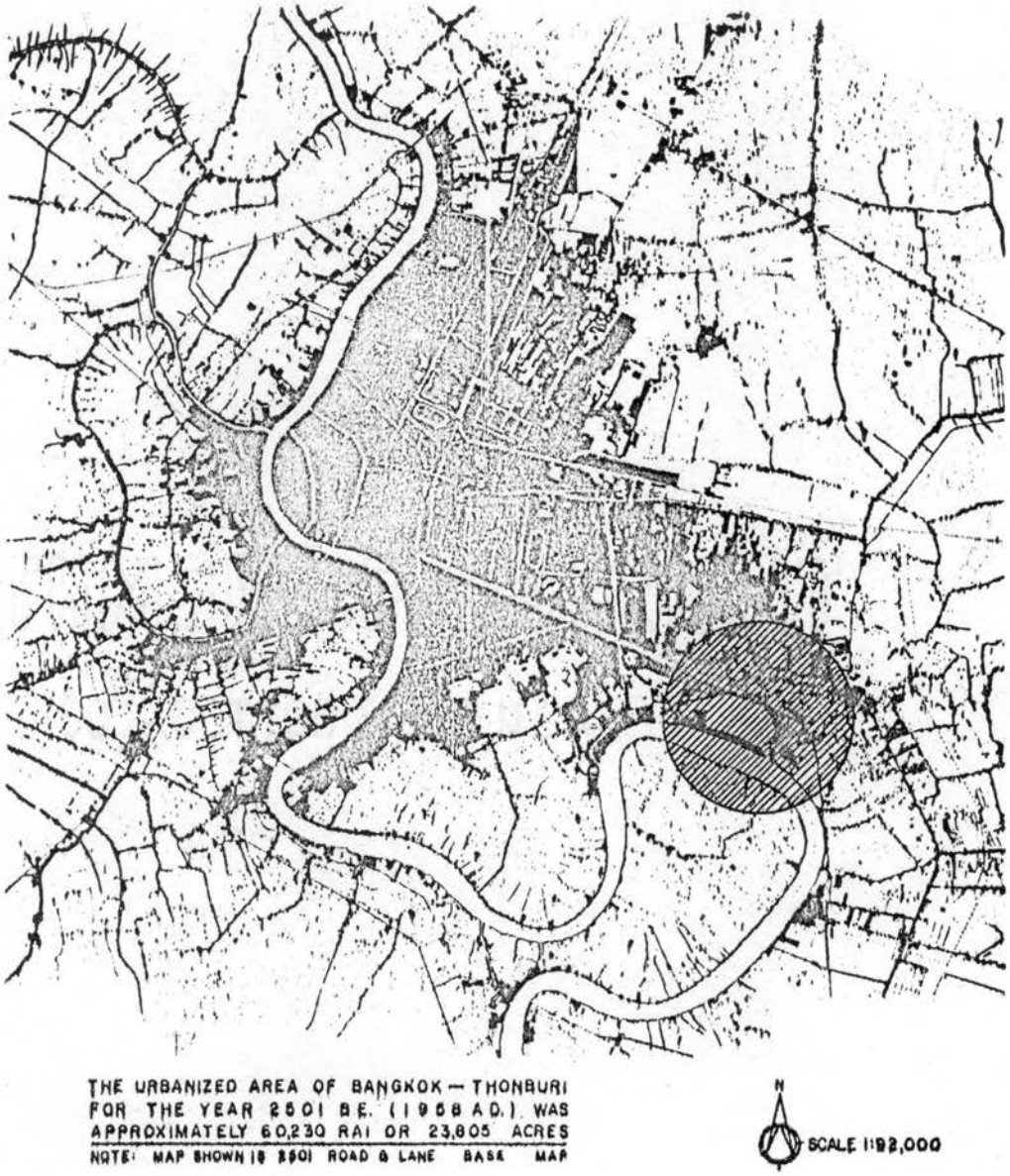
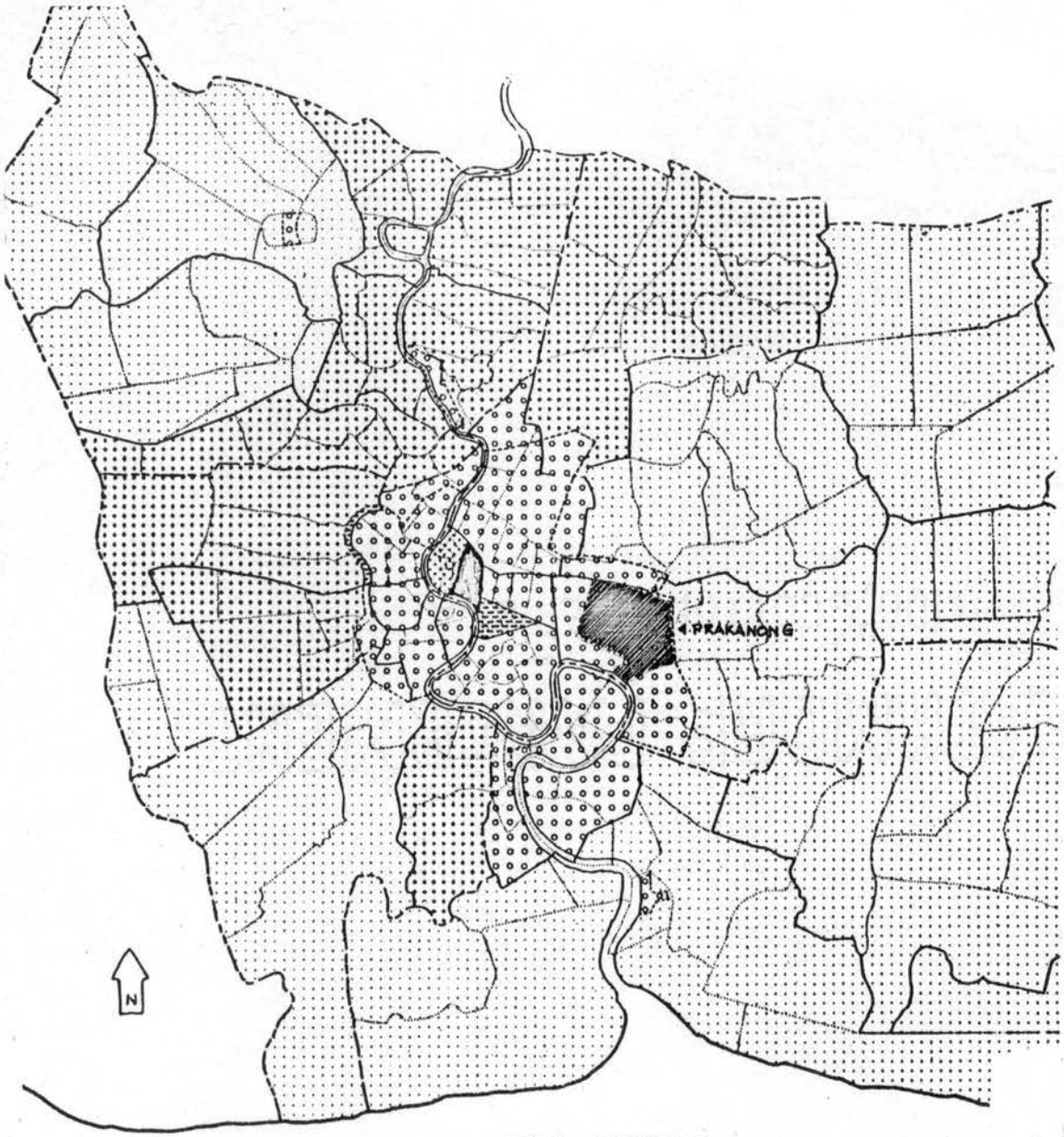


Figure 7. General Site Map
(Map No. 2)



SCALE 1:372,000.

PERSONS PER RAI			PERSONS PER ACRE		
.0	—	.49	.0	—	.196
.50	—	.99	.2	—	.396
1.0	—	19	.4	—	7.60
20	—	39	8	—	15.6
40	—	69	16	—	27.6
70	—	100	28	—	40.0

POPULATION DENSITY G. M. A. BY AMPHURS 2499 B.E. (1956)

Figure 8. Population Density Map (Map No. 3)

Figure 9. Citizenship M.A. Percent by Amphurs 2501 B.E. (Map No. 4)

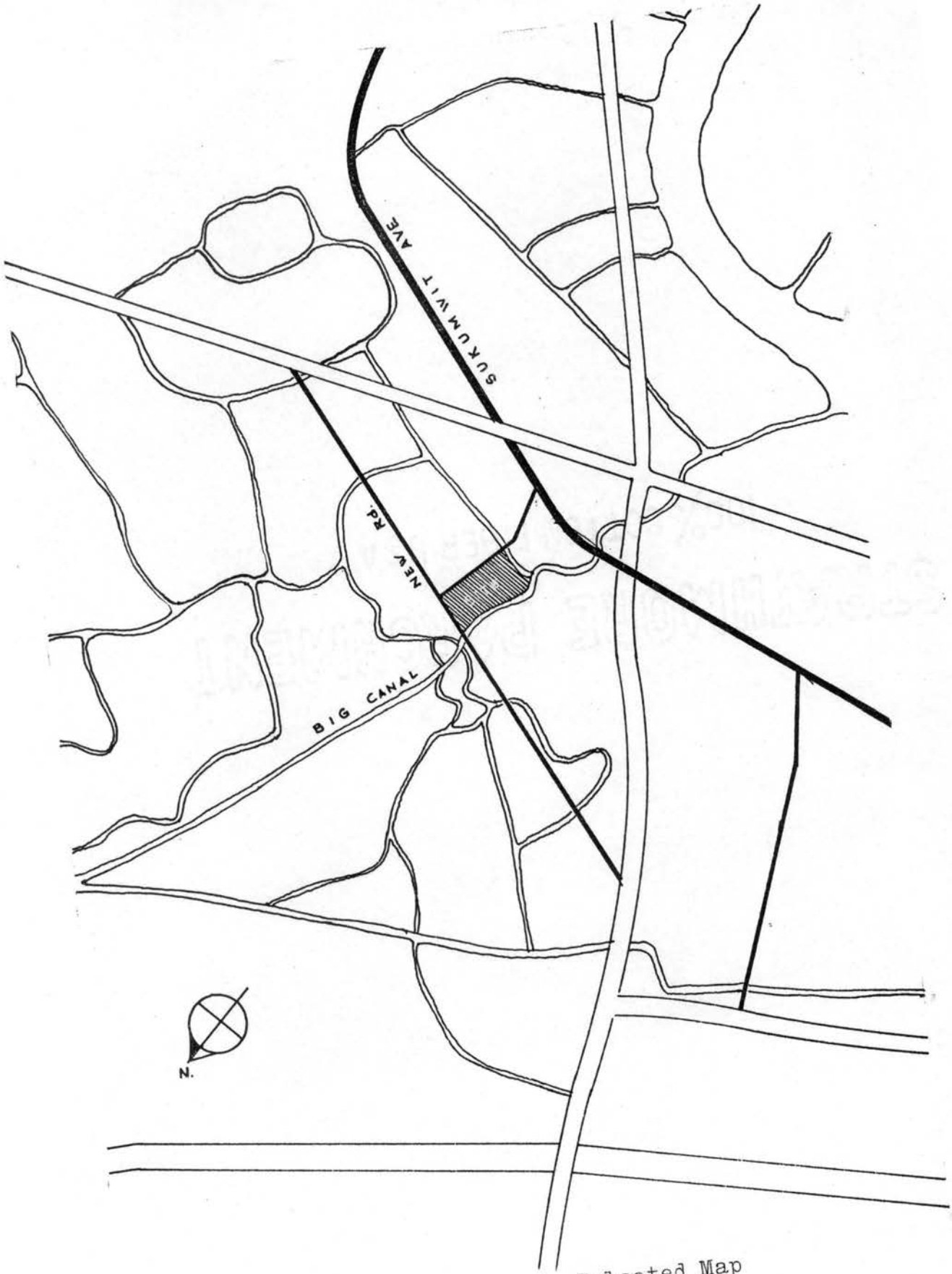


Figure 10. Site Selected Map

(1957).

Bangkok Municipality	Total Population
City	1,204,894
Puyatai	194,133
Dusit	144,205
Yannawa	139,052
Pranakorn	130,910
Patoomwan	157,401
Prakanong	112,390
Bangrak	102,581
Pomprab	138,673
Sampantawongse	85,549

Thonburi Municipality	Total Population
City	319,909
Bangkok Hoi	73,631
Bangkhuntien	9,159
Taling Chun	3,514
Pasi Chareon	12,155
Bangkok Yai	35,777
Klong San	77,874
Thonburi	107,799

3. Income and Expenditure of Families: "Over one-half (51 percent) of all families in the area received less than 12,000 to 36,000 baht; and 11 percent received 36,000 baht or more. Money income of individual families varied considerably and was highly related to family size-the average monthly income of one-person families was about 540 baht, and average income increased with the size of family to 2,267 baht for families with eight or more persons.

On the average, families in the Municipal Area reported a total monthly expenditure of 1,438 baht for living expenses, gifts and (11) contributions and taxes. About 45 percent of the total went to purchase food and non-alcholic beverages, 9 percent was spent for clothing,

and 16 percent went for shelter and maintenance of the home. Health and personal care took 7 percent and another 6 percent was paid for transportation cost. Over 13 percent of the total was spent for reading material, education, recreation, alcholic beverages, tobacco and miscellaneous items."[2] (See pages 42-45.)

4. Surrounding Area: The site of Prakanong suburban center is located eight miles from the old center.

Southwest is bounded by Sukumvit Highway.

Southeast is bounded by New Canal.

North is bounded by New Street

Northeast is bounded by rice field.

Maps are one of the basic tools in the development of any planning program. Before base maps for the project were designed, scale and land area to be included within the limits of the maps.

5. Automobile Scale: An analysis of vehicle registration trends is fundamental in urban planning in that these trends serve as indices of urban physical and economic growth. They also consitute an important explanatory factor for the development and causes of traffic congestion.

In the Bangkok area one sees every type of vehicle, from the modern bus and sports car to hand- and animal-drawn carts. As previously noted, registrations of

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[2]Advance report, "Household Expenditure Survey," B.E. 2505, pp. 15-16.

Household Expenditure Survey B.E. 2505
Average Monthly Incomes and Expenditures of Families
Bangkok - Thonburi Municipal Area

From wages and salaries
785.00 baht

51.7%

From Business and family enterprise
564.00 baht

37.1%

From other sources

11.2%

Average Income
1,519.00 baht

Report savings 75.00 baht
Balance unaccounted for 6.00 baht

Food and beverages
646.00 baht

44.9%

Housing and Furnishing
233.00

16.2%

Clothing
129.00 baht

8.9%

Other goods and services
4.33 baht

30%

Average Expenditure
1,438.00 baht

House Expenditure Survey B.E. 2505
Average Monthly Family Expenditures for Food and Beverages
Bangkok - Thonburi Municipal Area

	Percent of Food and Beverages
Food and beverages away from home	25.0
Cereals and flour products	15.2
Meats	14.2
Fish and seafood	9.6
Poultry	4.1
Vegetables	7.2
Fruits	4.6
Eggs	4.0
Spices and condiments	2.5
Sugar and sweets	1.0
Non-alcholic beverages and ice	5.1
Prepared meals to comsume at home	4.6
Milk products, oils and fats	2.9

Average Expenditure (baht)

	Subgroup Total	Group Total
Rice	87.59	98.52
Cereal foods	10.93	
Meats	92.12	
Fish and seafood	62.05	206.59
Poultry	26.43	
Eggs	25.99	
Fruits	29.48	
Vegetables	29.48	75.95
Milk products	9.05	
Oils and fats	9.50	18.55
Spices and condiments	16.29	
Sugar and sweets	6.53	22.82
Non-alcholic beverages		32.84
Prepared meals consumed at home	29.67	
Food and beverages away from home	161.48	191.15

Household Expenditure Survey B.E. 2505
Percent of Families Owning Selected Durable Consumer Goods
Bangkok-Thonburi Municipal Area, March, 1962

Item	Percent
Radio	55.8
Television	14.4
Phonograph	4.7
Refrigerator	8.6
Washing machine	1.4
Electric fan	33.3
Air-conditioner	0.6
Sewing machine	33.5
Dining room table and chairs	34.5
Sofa and chairs	24.9
Mattress	38.6
Automobile	56.2
Motorcycle and scooter	7.4
Bicycle	3.9
Boat	8.3
Camera	2.9
	6.0

Household Expenditure Survey B.E. 2505
Monthly Family Expenditures for Goods and Services
Bangkok - Thonburi Municipal Area

Item	Average Expenditure	Group	Total
Men and boys clothing	70.41	100.0	54.8
Suits, trousers, shirts, etc.	55.25	78.4	43.0
Underwear, nightwear, socks	4.88	7.0	3.8
Footwear	8.87	12.6	6.9
Accessories	1.41	2.0	1.1
Women and girls clothing	37.52	100.0	29.2
Suits, shirts, dresses, blouses, etc.	21.97	58.7	17.1
Underwear, nightwear, socks	4.24	11.3	3.3
Footwear	5.53	14.6	4.5
Other clothing	1.54	100.0	1.2
Clothing material and services	19.01	100.0	14.8
Material and supplies	13.62	70.8	10.6
Clothing services	5.40	28.2	4.2
Furniture and equipment	11.94	100.0	5.1
Cleaning and paper supplies	16.97	100.0	7.3
Household textiles	4.38	100.0	1.9
Charcoal	22.93	18.5	9.8
Other fuel and lighting	3.10	2.5	1.3
Bottled water	0.62	0.5	0.3
Ice	7.06	5.7	3.0
Medical care	45.82	100.0	48.2
Personal care	49.25	100.0	51.8
Total transportation expense	91.78	-	100.0
Recreation	45.54	100.0	57.6
Reading	9.25	100.0	11.7
Tobacco and betel	52.58	100.0	79.6
Alcholic beverages	13.47	100.0	20.4
Gift and contributions	35.71	100.0	-

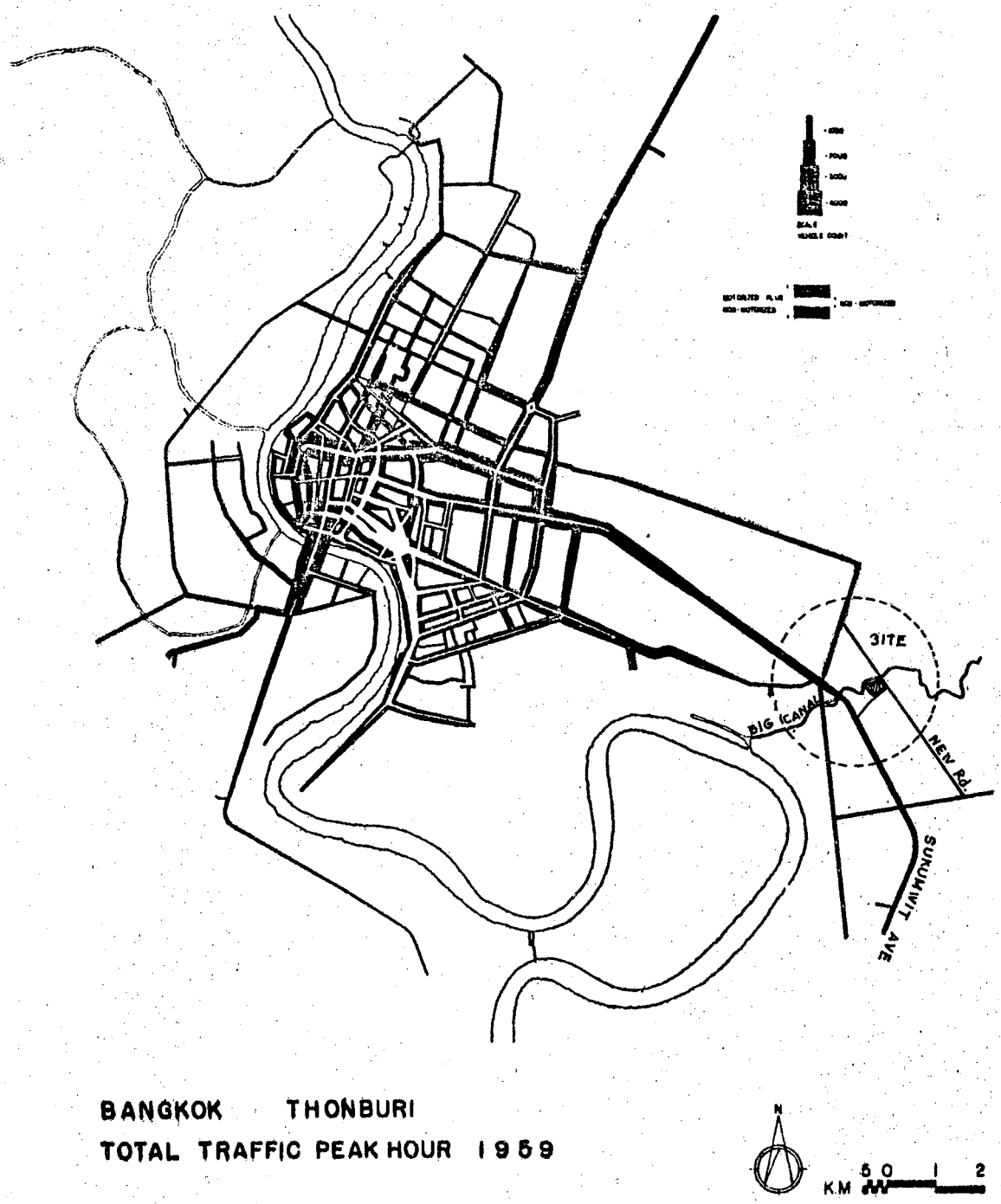


Figure 11. Density of Vehicles on Location

motorized vehicles have increased almost nine times since 1947, and passenger cars have accounted for most of this increment. The material suggests that the more pronounced increase noted following 1950 is significantly related to the inception of the various military, economic assistance and international organization activities which came into being during this period.

Another factor contributing to this growth is the general increase in area and in property in Bangkok dur to its increasing importance as commercial, governmental and tourist center within recent years.

The number of taxis have increased over sixty times since 1947 - from 100 to 6.100. This jump appears to be due to several factors: 1) The improved economic conditions referred to above; 2) Inadequate and overcrowded public transit, making taxi transportation desirable and profitable; 3) The conversion of older private cars to taxis in addition to specific imports for taxi use.

Registration of buses increased at a slightly lower rate than the average of motorized vehicles, 864% in all eleven-years period.

An increase in the use of trucks in expected in view of the physical and economic factors mentioned above, and the corresponding decreasing dependence upon waterborne transportation. This increase in truck registration 8,299 has accompanied such other changes as the development of areas inaccessible by water and the continued expansion

of the urban area and the increase in business activity.

DISTRIBUTION OF MOTORIZED VEHICLES

Amphur	No. of Vehicle	Percent
Prakanong	4141	9.7
Bangkapi	45	0.1
Bangrak	5350	12.2

6. Tenant Building: Tenant buildings are provided for fresh food by the following:

Markets
a) Fresh-food market
b) Fruit market, Gardenner and cloth market
e) Wholesale market
d) Market fair
e) Floating market

Department Store
a) Main department store
b) Junior department store

Retail Shops
a) Women's specialty
b) Men's specialty
c) Children's shop
d) Shoes shop
e) Youth shop
f) Silk fabric shop
g) Millinery
h) Teen shop
i) Infants' wear

Furniture and Home Furnishing
a) Furniture
b) Appliance
c) Draperies
d) Lamps and shades
e) China and glass
f) Floor covering
g) Antiques
h) Modern design
i) Pottery
j) Ratio and television
k) Interior decorating

l) Special furniture
m) Bar and patio

Hardware
a) Harsware
b) Paint and wallpaper
c) Home equipment
d) Plumbing supplies
e) Electrical supplies

Drug
a) Super drugs
b) Drugs
c) Pharmacy

Eating and Drinking
a) Snack bar
b) Restaurant
c) Coffee shop
d) Cocktail lounge
e) Fountain lunch

Other Stores
a) Gifts and cards
b) Religious goods
c) Art supplies and frames
d) Music and records
e) Jewelry
f) Florist
g) Fabrics
h) Liquor
i) Leather and luggage
j) Perfume and cosmetics
k) Tobacco and news
l) Camera shop
m) Silver
n) Stationary
o) Sewing machines
p) Toys
q) Sporting goods
r) Tropical fish supplies
s) Pet shop
t) Auto accessories
u) Garden shop
w) Key shop
x) Lending library
y) Souvenirs

Services
a) Barber
b) Beauty salon
c) Shoe repair
d) Cleaner
e) Laundromat

f) Photographer
g) Travel agency
h) Tailor
i) Service station
j) Airline ticket office

Institutions
a) Bank
b) Post office
c) Loan office
d) Medical and dental offices
e) General office
f) Insurance
g) Accountants

Recreational
a) Theatre
b) Auditorium
c) Bowling alley
d) Kiddieland

7. Construction: The roof of these parts is a double shell roof. Slabs will be precast and prestresed in two directions.

This part is roofed with a double skin shell. Since it is absolutely essential that constant humidity and temperature, it was decided to use a double skin shell with a large air space between the two surfaces to provide insulation and cut down the heat gain at midday which is quite considerable on a single shell. With the inside temperature to be maintained at 70° F and an outside skin temperature reaching 140° F it was found that stresses due to this stress difference of temperatures were excessive and could be very serious due to their cyclic nature. So it was decided to separate the two layers, making the lower layer in-situ and the upper layer precast, with lead bearings in between.

Precast reinforced concrete Y section piles are used for the whole project. These were found to be about 33% more economical than conventional square sectioned piles when large quantities are used.

8. Preliminary Space Requirements: The following pages show all of the related and sub-related areas in the center. Each area has been shown the relationship among seller, customer, sales area, display area, the way to keep and the way to take the goods to the customer. From this point the preliminary design takes place and the suburban center takes shape.

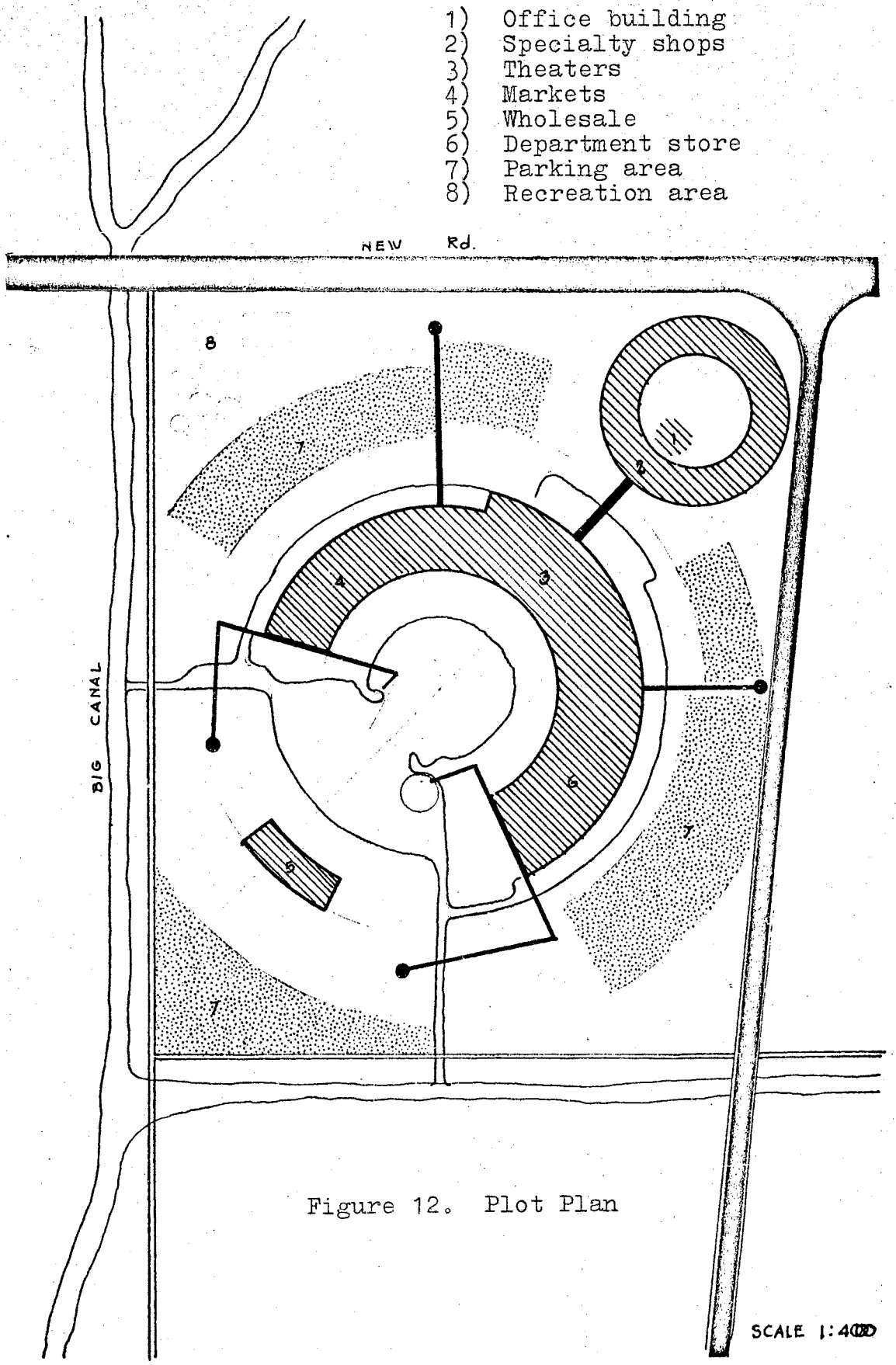


Figure 12. Plot Plan

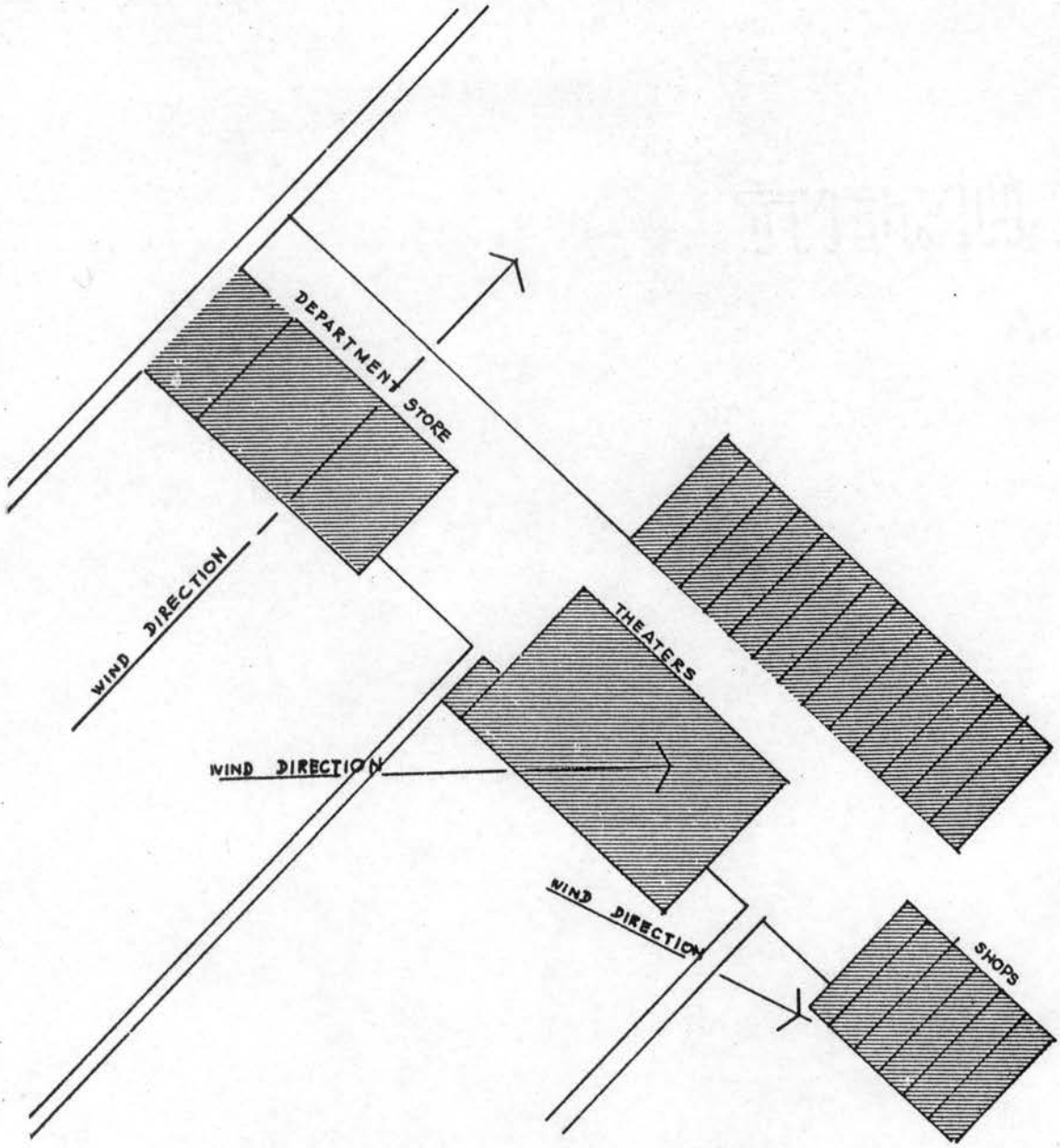


Figure 13. Wind Flow Against Department Store, Theater and Shops

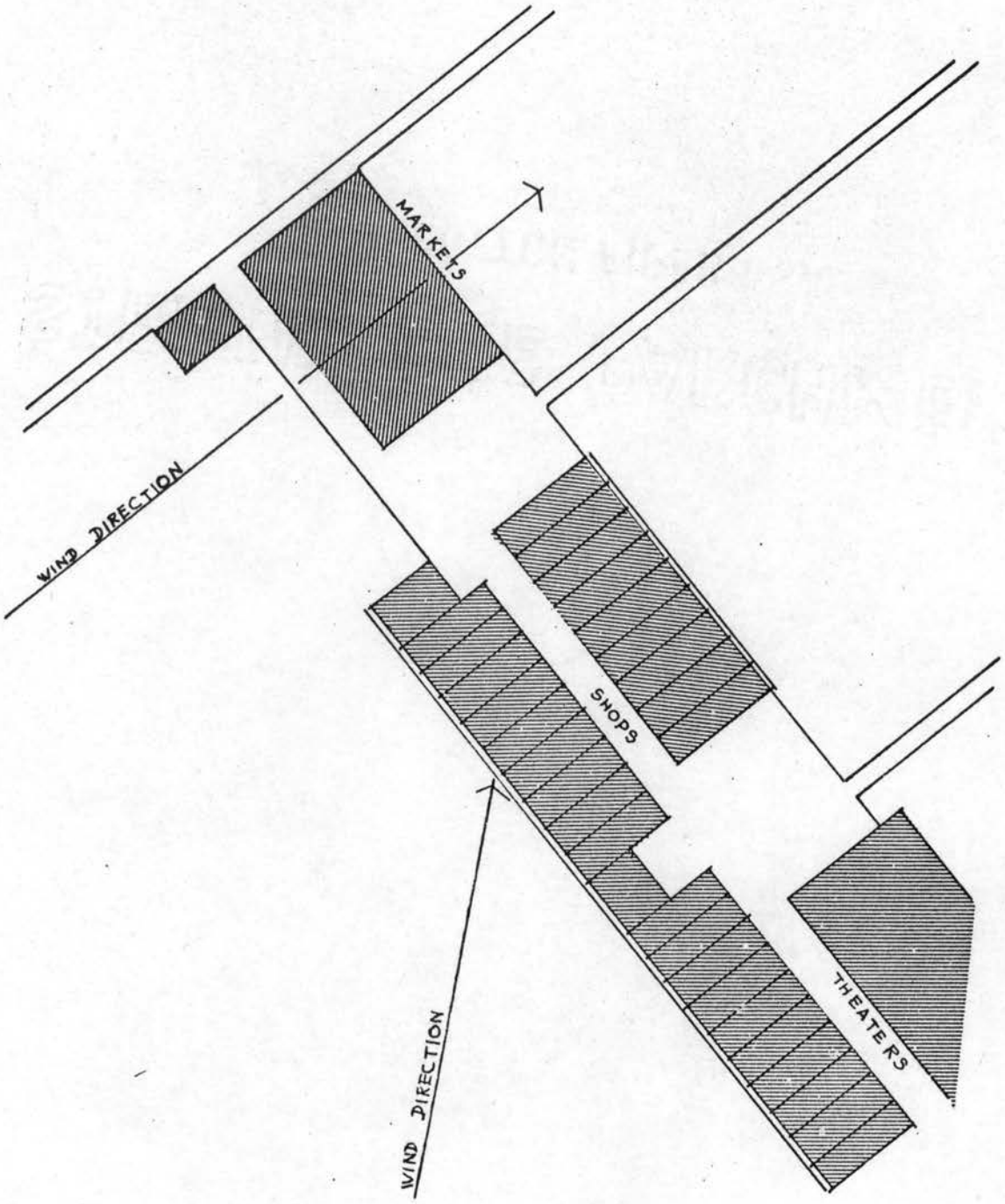


Figure 14. Wind Flow Against Markets and Shops

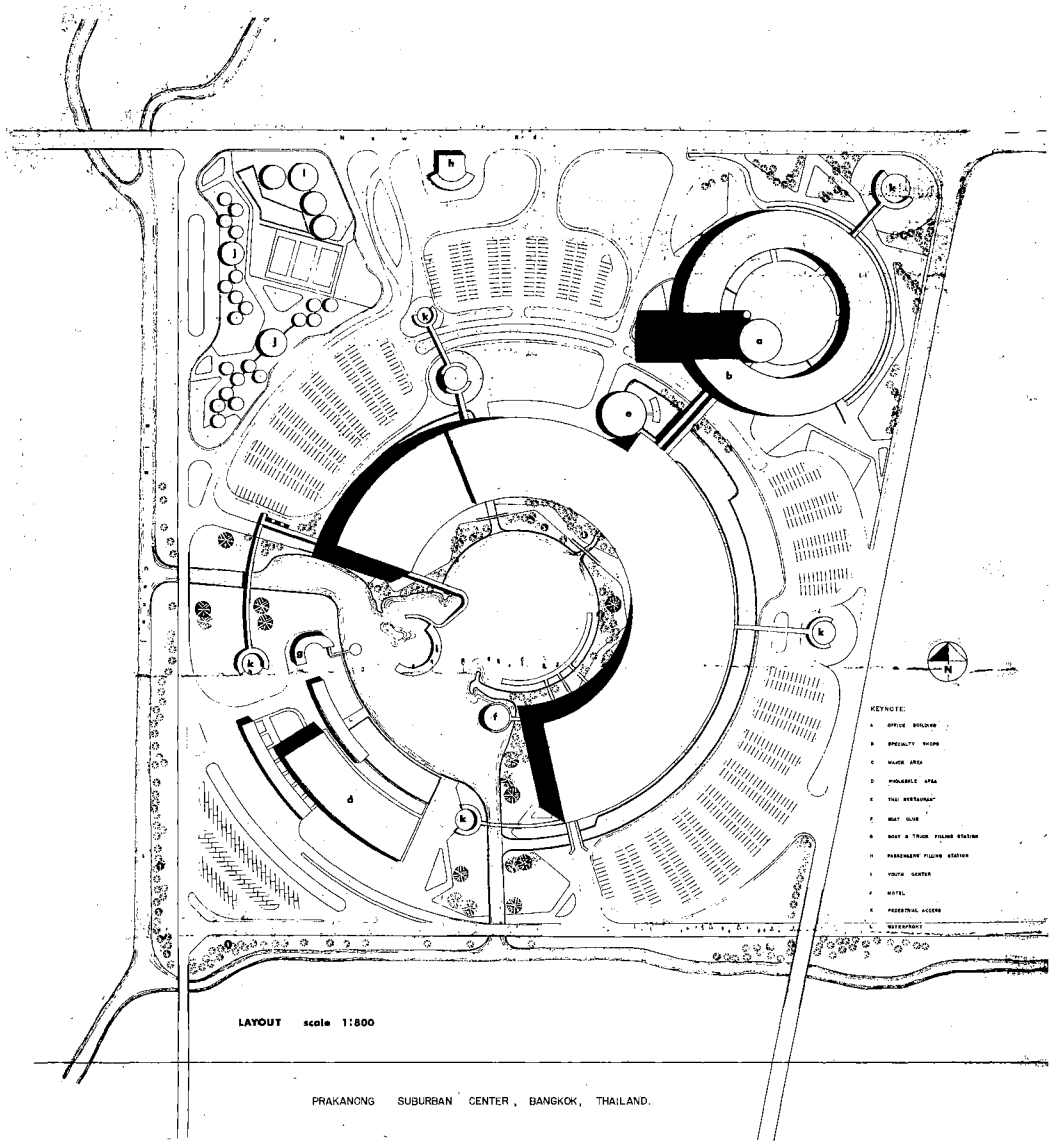
Approximate Area (sq. m.)			240,860
I. Main Part			TOTAL
First Floor			19,820
Market storage		1,080	
Mechanical area		1,200	
Mechanical and storage of theatre		2,235	
Department store storage		2,655	
Truck circulation, loading area and green space		11,650	
Second Floor			18,320
Fresh-food market		1,150	
Fruit market		1,075	
Shops		2,820	
Theaters		2,250	
Department Store		3,540	
Circulation Cores		850	
Multi-purpose plaza		3,880	
Circulation Mall		2,105	
Coffee Shop		650	
Third Floor			17,140
Clothes market		3,050	
Kitchen area		1,620	
Multi-purpose area		6,630	
Department store		5,030	
Circulation mall		810	
Fourth Floor			17,140
View observation			
Snack			
II. Second Part			TOTAL
First Floor			12,868
Multi-purpose plaza		4,825	
Storage, truck circulation		8,043	
Second Floor			10,854
Shops		7,587	
Court		2,463	
Dining area		804	

			TOTAL
III.	Third Part		
	Office Building	(804 x 20)	16,082
	Renting area	12,060	
	Utility	4,020	
IV.	Fourth Part		
	Wholesale		7,200
	Building	2,640	
	Fair ground	4,560	
V.	Fifth Part		
	Parking area	13,150+5200+6300+9150+3600 =	43,400
	Parking space	33,800	
	Water front	6,000	
VI.	Sixth Part		
	Gardenner Motel Youth Center	13,300	
VII.	Seventh Part		
	Boats' Club	2,830	
VIII.	Eighth Part		
	Green space	115,792	
	Water space	25,650	

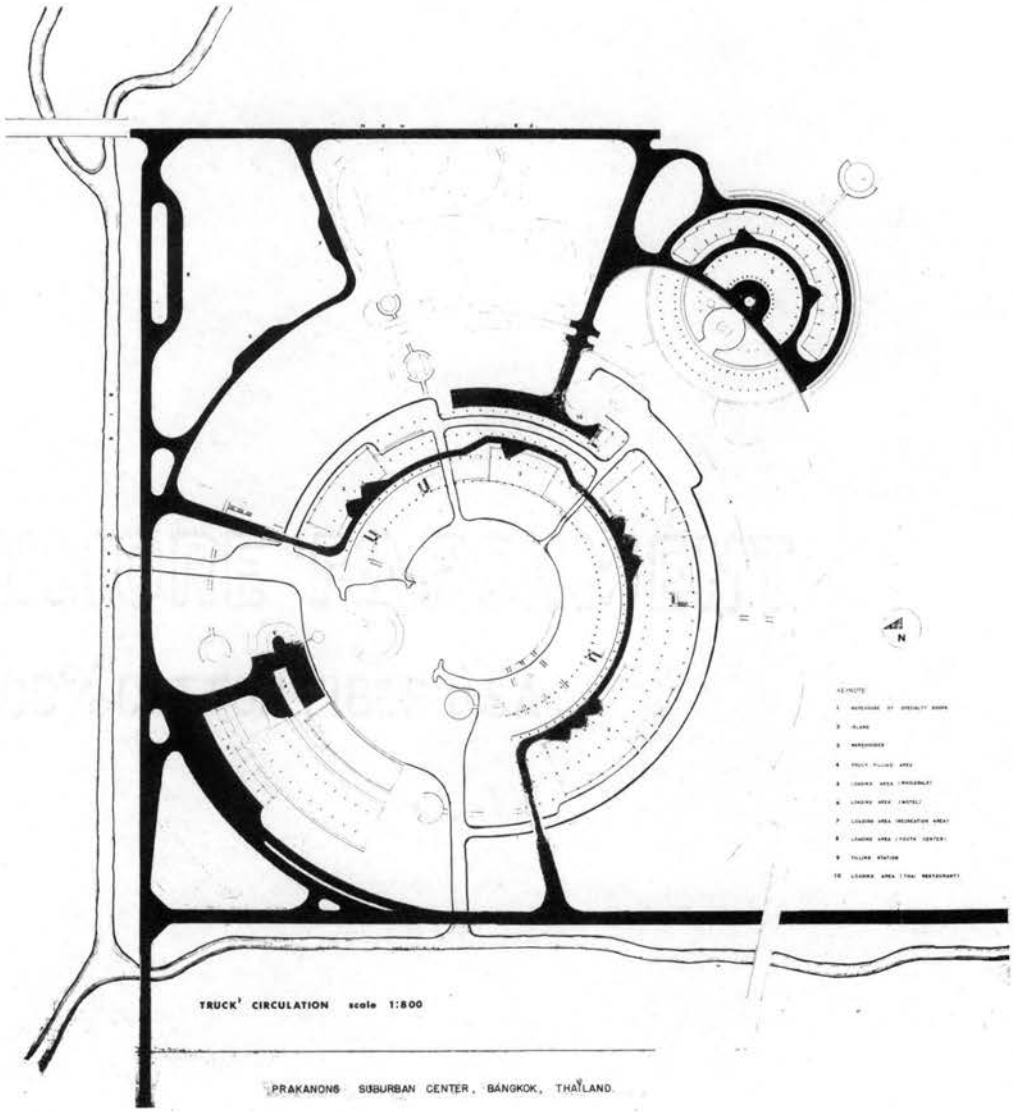
DRAWING OF PRAKANONG SUBURBAN CENTER

The location and climate of Bangkok call for consideration in arriving at a solution of the problem of efficient and esthetic lines.

The following reproductions are those of the original concept drawings. The evolved functional relationships of the various elements are best observed in the reduced scale reproductions of the original plans, sections, and diagrams of Prakanong Suburban Center, Bangkok, Thailand.

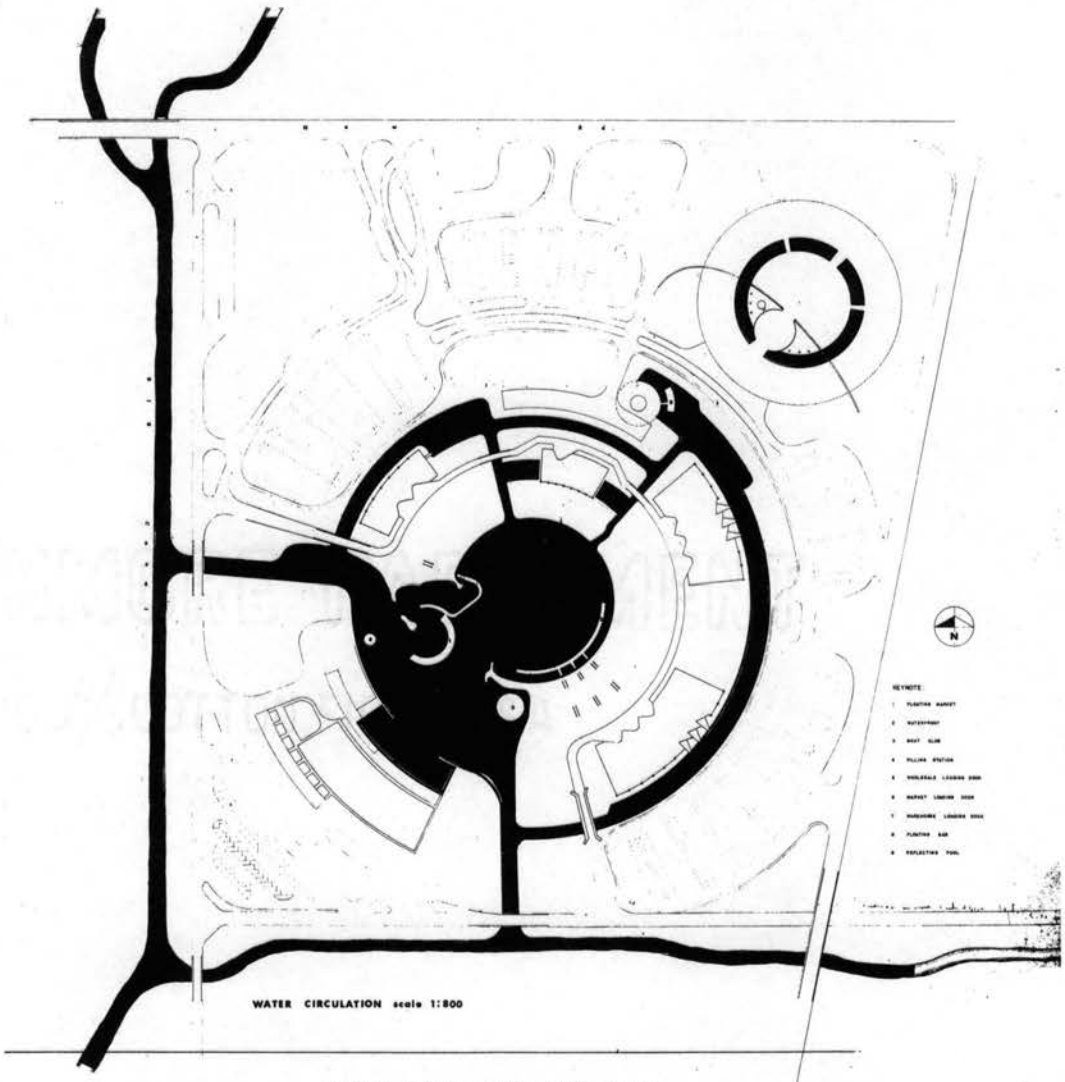


PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND.



TRUCK' CIRCULATION scale 1:800

PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND



WATER CIRCULATION scale 1:800

PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND

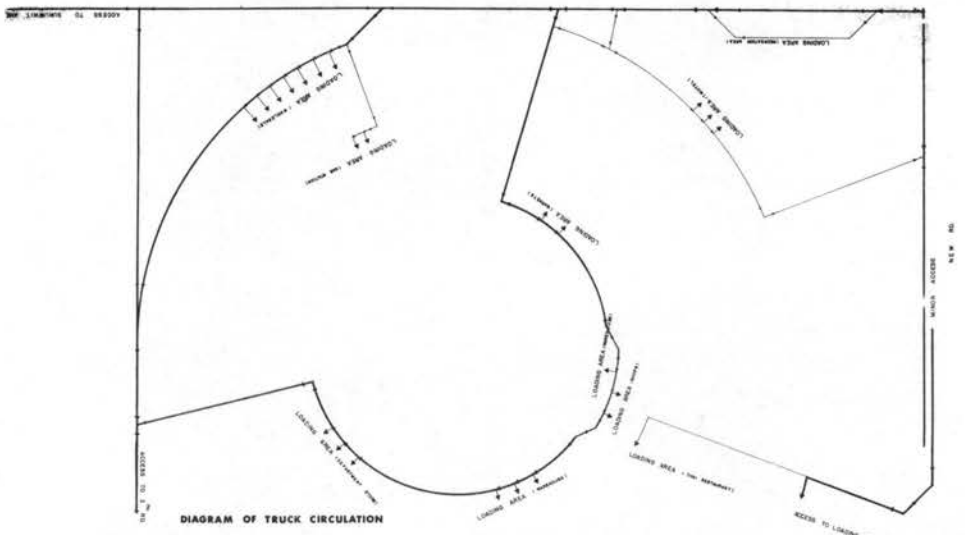
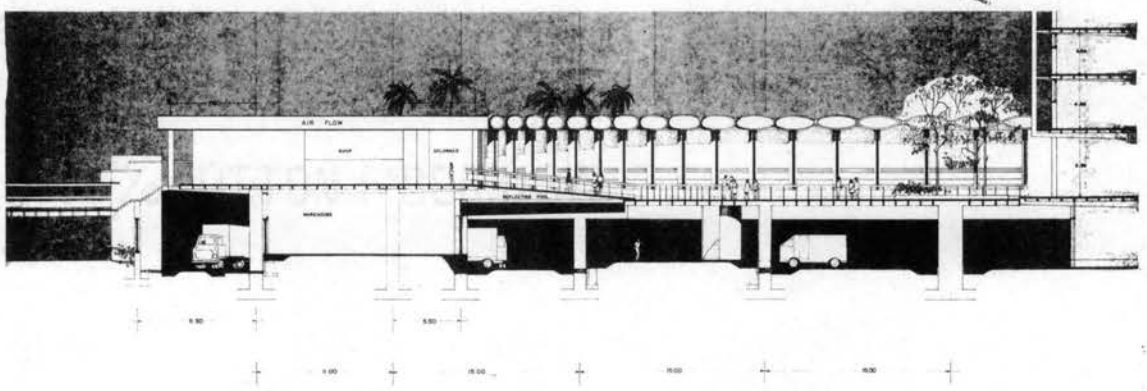


DIAGRAM OF TRUCK CIRCULATION



SECTION B-B scale 1:100

PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND.

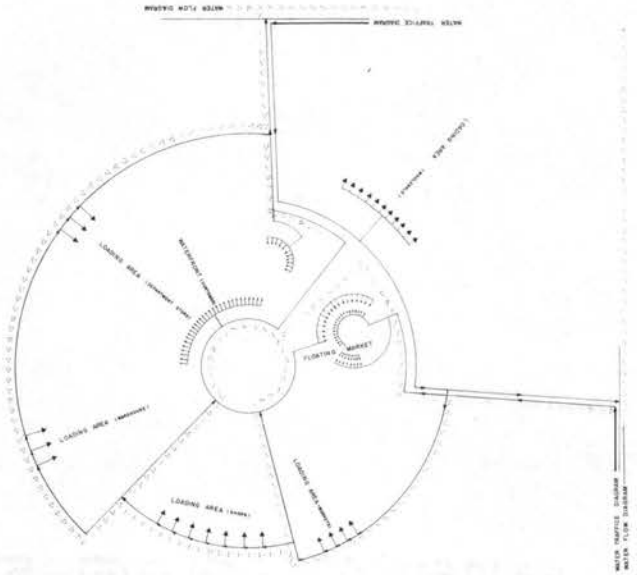
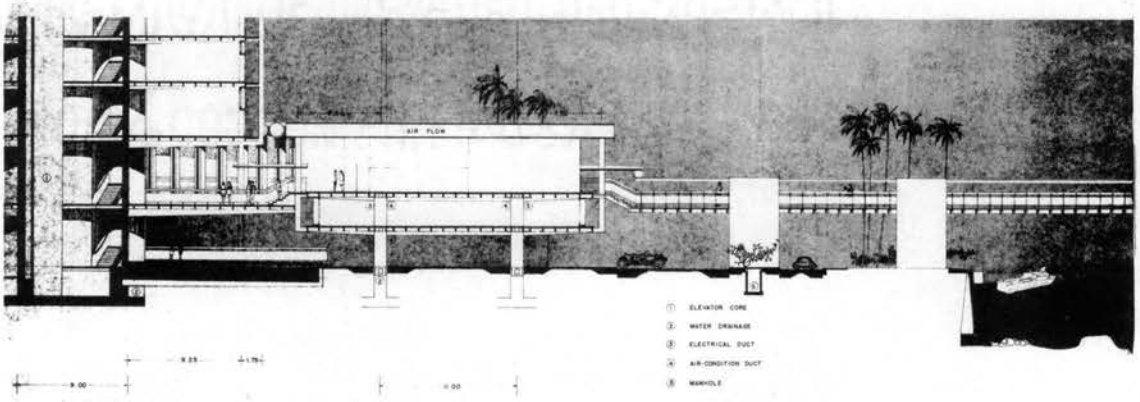
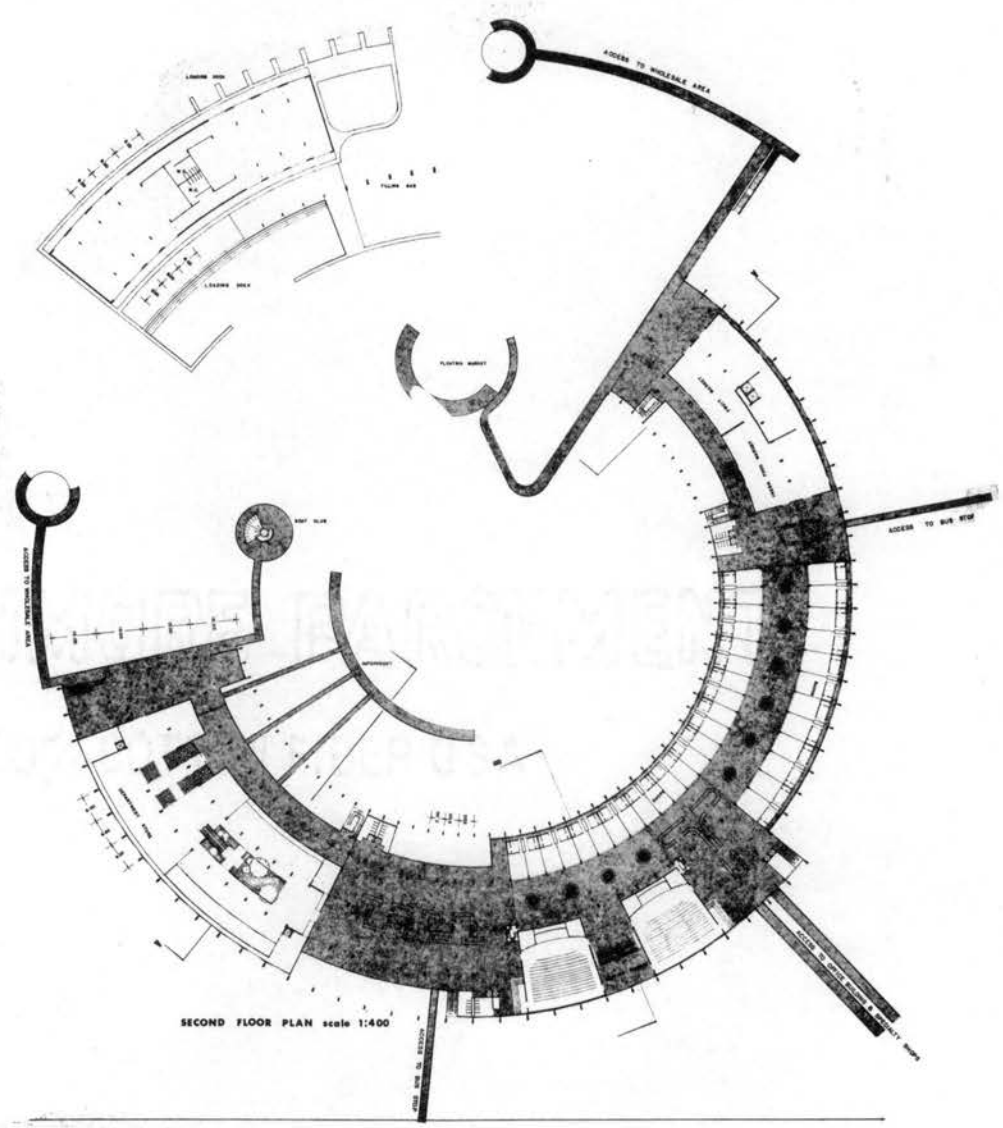


DIAGRAM OF WATER CIRCULATION

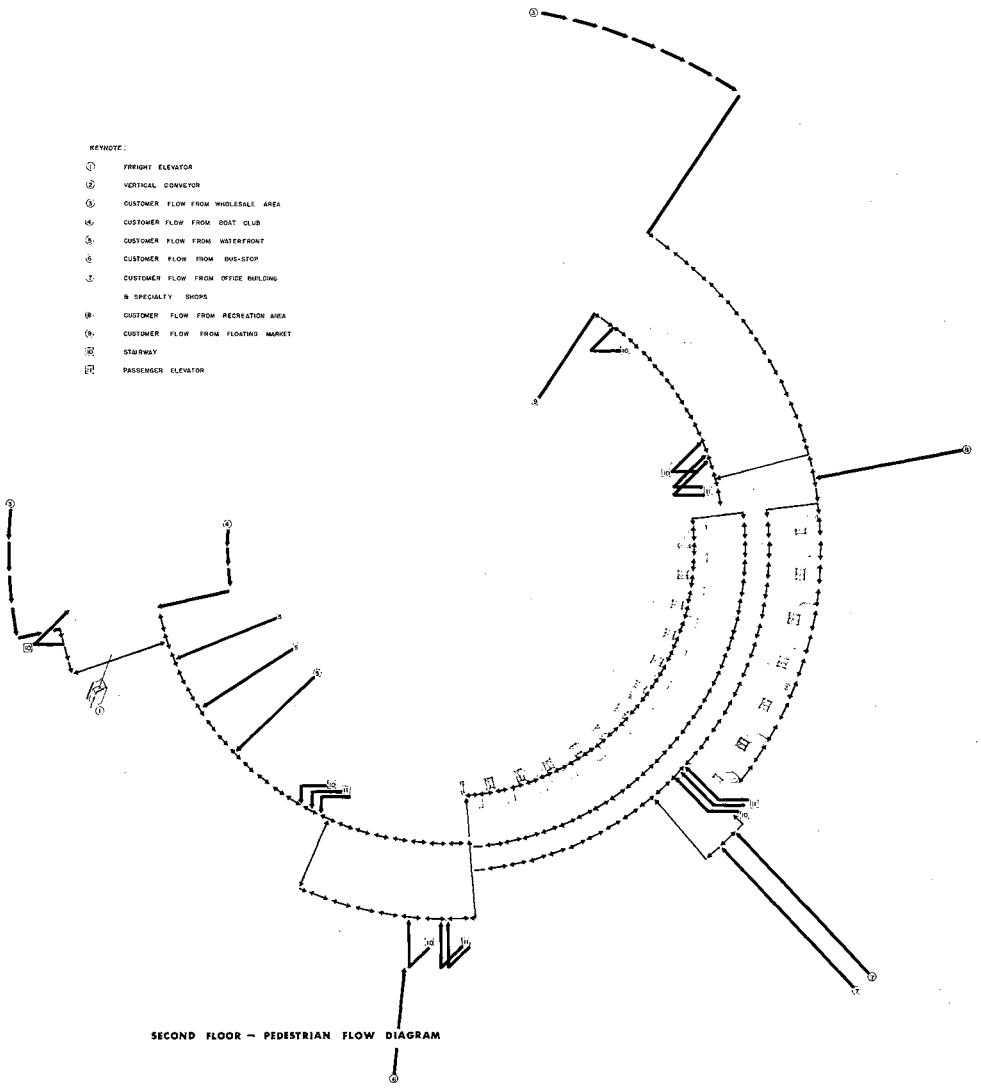


SECTION B-B scale 1:100

PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND. **5**

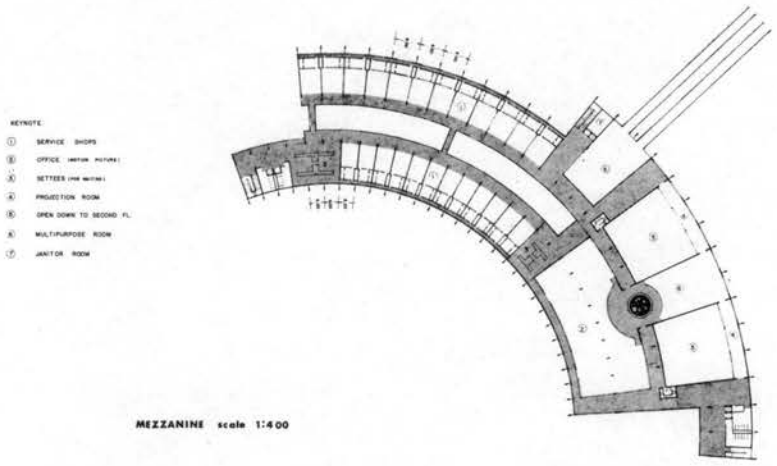


PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND.

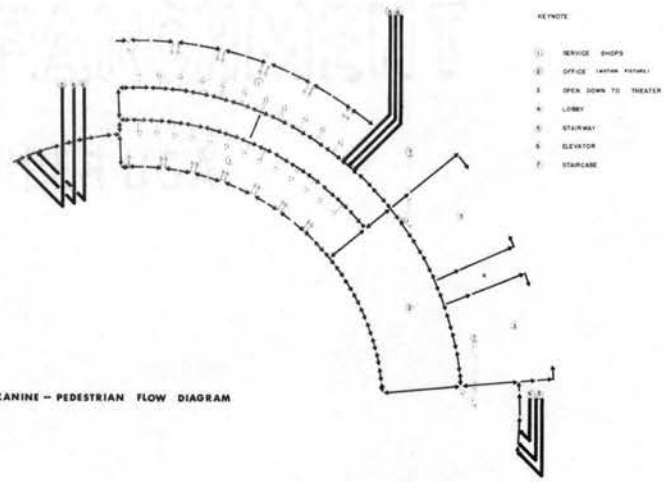


SECOND FLOOR — PEDESTRIAN FLOW DIAGRAM

PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND.



MEZZANINE scale 1:400

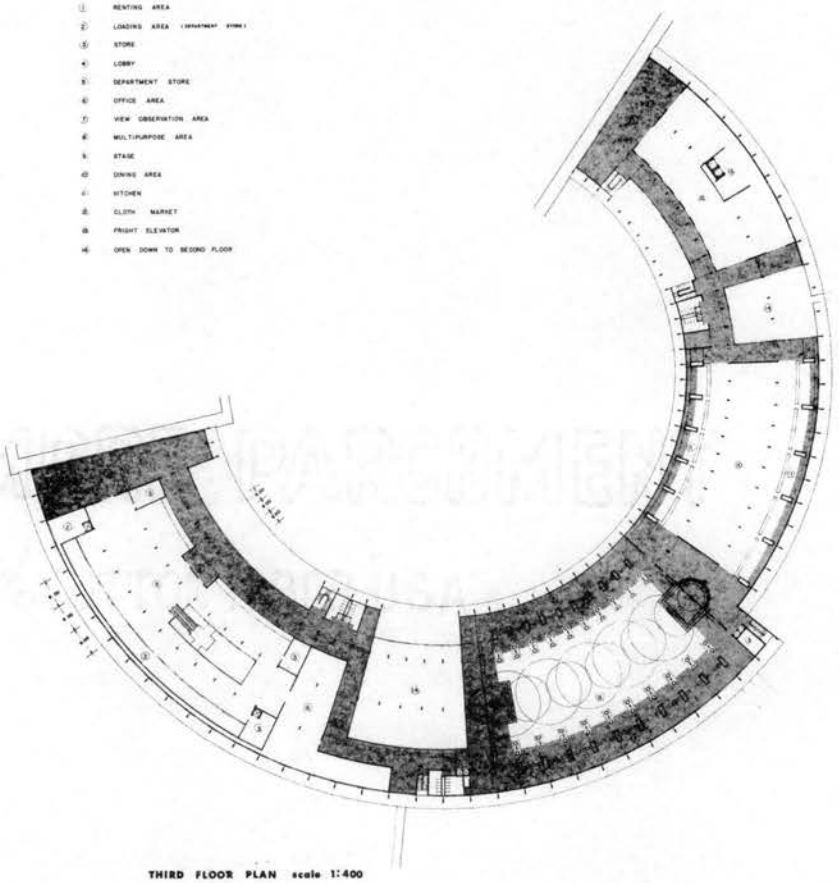


MEZZANINE – PEDESTRIAN FLOW DIAGRAM

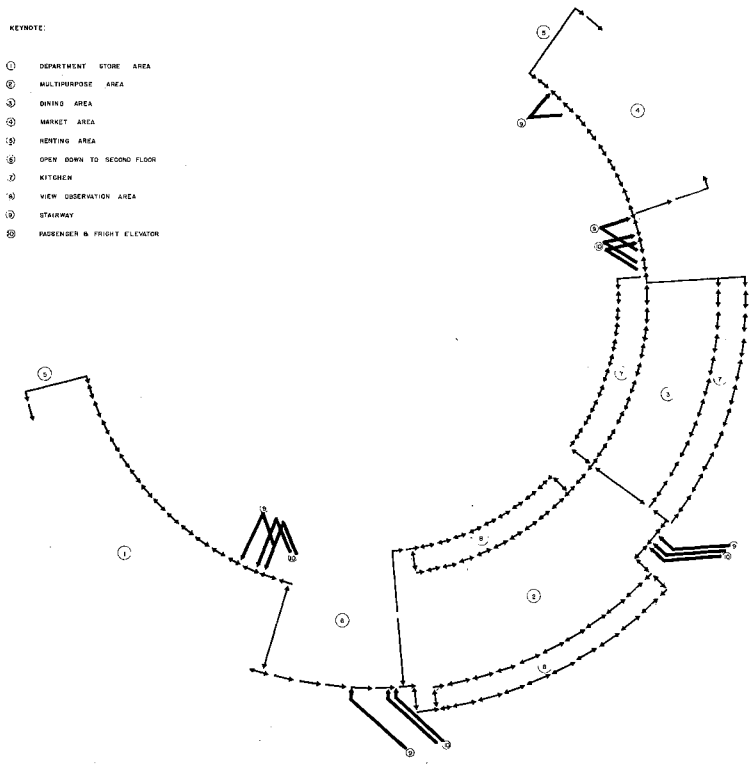
PRAKANONG SUBURBAN CENTER, BANGKOK, THAILAND.

KEYNOTE

1. RENTING AREA
2. LOADING AREA (DEPARTMENT STORE)
3. STORE
4. LOBBY
5. DEPARTMENT STORE
6. OFFICE AREA
7. VIEW OBSERVATION AREA
8. MULTI-PURPOSE AREA
9. STAGE
10. DINING AREA
11. KITCHEN
12. CLOTH MARKET
13. FREIGHT ELEVATOR
14. OPEN DOWN TO SECOND FLOOR



THIRD FLOOR PLAN scale 1:400



THIRD FLOOR – PEDESTRIAN FLOW DIAGRAM

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